BROADCOM®

Database Management for Db2 for z/OS 20.0 (Db2 Tools) Community Update Call

Db2 Tools Product Team
March 11, 2024

Disclaimer

Certain information in this presentation may outline Broadcom's general product direction. This presentation shall not serve to (i) affect the rights and/or obligations of Broadcom or its licensees under any existing or future license agreement or services agreement relating to any Broadcom software product; or (ii) amend any product documentation or specifications for any Broadcom software product. This presentation is based on current information and resource allocations as of Feb 14, 2023 and is **subject to change or withdrawal by Broadcom at any time without notice**. **The development, release and timing of any features or functionality described in this presentation remain at Broadcom's sole discretion**.

Notwithstanding anything in this presentation to the contrary, upon the general availability of any future Broadcom product release referenced in this presentation, Broadcom may make such release available to new licensees in the form of a regularly scheduled major product release. Such release may be made available to licensees of the product who are active subscribers to Broadcom maintenance and support, on a when and if-available basis. The information in this presentation is not deemed to be incorporated into any contract.

Copyright © 2022 Broadcom. All rights reserved. The term "Broadcom" refers to Broadcom Inc. and/or it's subsidiaries. Broadcom, the pulse logo, Connecting everything, CA Technologies and the CA Technologies logo are among the trademarks of Broadcom.

THIS PRESENTATION IS FOR YOUR INFORMATIONAL PURPOSES ONLY. Broadcom assumes no responsibility for the accuracy or completeness of the information. TO THE EXTENT PERMITTED BY APPLICABLE LAW, BROADCOM PROVIDES THIS DOCUMENT "AS IS" WITHOUT WARRANTY OF ANY KIND, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NONINFRINGEMENT. In no event will Broadcom be liable for any loss or damage, direct or indirect, in connection with this presentation, including, without limitation, lost profits, lost investment, business interruption, goodwill, or lost data, even if Broadcom is expressly advised in advance of the possibility of such damages.

◭ BROADCOM®

Product Owners

Andrew Badgley – andrew.badgley@broadcom.com

Jakub Hofman – jakub.hofman@broadcom.com

Srinivas Adupa – srinivas.adupa@broadcom.com

Aysen Svoboda – aysen.svoboda@broadcom.com

BROADCOM®

Agenda (1|2)

- Utilities
  - Database Analyzer optimization of utility processing in generated jobs
  - Fast Load support for building Huffman dictionaries
- Admin
  - Improved analysis when adding a partition between 2 existing partitions
  - Improved experience when converting to Partition by Range table spaces
  - New Alias and Trigger reports in RC/Query

BROADCOM®

Agenda (2|2)

- Performance

  - Detector support for excluding SQL call types

  - Sysview for Db2 enhancements around IFCIDs 1, 25, 196, 411, 412, and 1001

  - Sysview for Db2 reporting of the new PACKAGE-DEPENDENCY-LEVEL z/PARM

BROADCOM®

Utilities

BROADCOM

Database Analyzer optimization of utility processing in generated jobs

Jakub Hofman | Product Owner | jakub.hofman@broadcom.com

Optimization of utility processing in generated jobs

- New option "O" in the Job generation parms panel


```
RAPCSCH            ----      JOB GENERATION PARMS        ----  2024/03/11 05:05
COMMAND ==>

                                                    User ID:

   Choose only one of these options:
      Number of Jobs (minimum)   ==> 0001        (1 to 3599, or blank)
      Number of Steps per Job    ==>             (1 to 200, or blank)

   Jobname (1-8 characters)     ==> PDAUTIL    Type ==> MASK     (MASK or FIXED)

   Sequencing options when Jobname Type is MASK:
      Type                       ==> ALPHANUM   (ALPHANUM, NUMERIC)
      Digit(s)  *                ==>            (1 to 7)
      Start value *              ==>            (0 to 9)
      Start position *           ==>            (2-8, blank = 1st blank in mask)
      *   only valid when Sequencing Type is NUMERIC

   JCL Step Fill Model           ==> MJUTLFIL   (default: MJUTLFIL)
   One Job per Object?           ==> N          (Y, or N, or blank)
   One Utility per Step?         ==>            (Y, or N, or blank)
   One Member per Job?           ==>            (Y, or N, or blank)
   Order by Utility Codes?       ==> O          (Y, or N or O, or blank)

      Enter job information and press ENTER.  Press PF3 to end.
```

BROADCOM®

Fast Load support for building Huffman dictionaries

Jakub Hofman | Product Owner | jakub.hofman@broadcom.com

BROADCOM®

Fast Load support for building Huffman dictionaries

- Huffman compression introduced in Db2 12 FL 504

  1. Broadcom has provided the users with the support of Huffman compression earlier in 24th June 2020 (PTFs: SO14029 - 36).

  2. NEW: we provide the users with the option to build a Huffman dictionary with Fast Load when:
     1. loading an empty table;
     2. performing LOAD REPLACE without KEEPDICTIONARY.

BROADCOM®

New article and blog post

Jakub Hofman | Product Owner | jakub.hofman@broadcom.com

PDA's best practices & MRI tips and tricks blog post

- PDA's best practices documentation:
  - Available here: https://techdocs.broadcom.com/us/en/ca-mainframe-software/database-management/ca-database-analyzer-for-db2-for-z-os/20-0/using/best-practices.html

- MRI tips and tricks blog post
  - Available here: https://community.broadcom.com/mainframesoftware/blogs/lukas-patera/2024/03/11/mri-for-db2-tips-tricks

BROADCOM®

Any Feedback…?

Level Set: 20.0.11 (LU12911)

Jakub Hofman | jakub.hofman@broadcom.com

Admin

BROADCOM
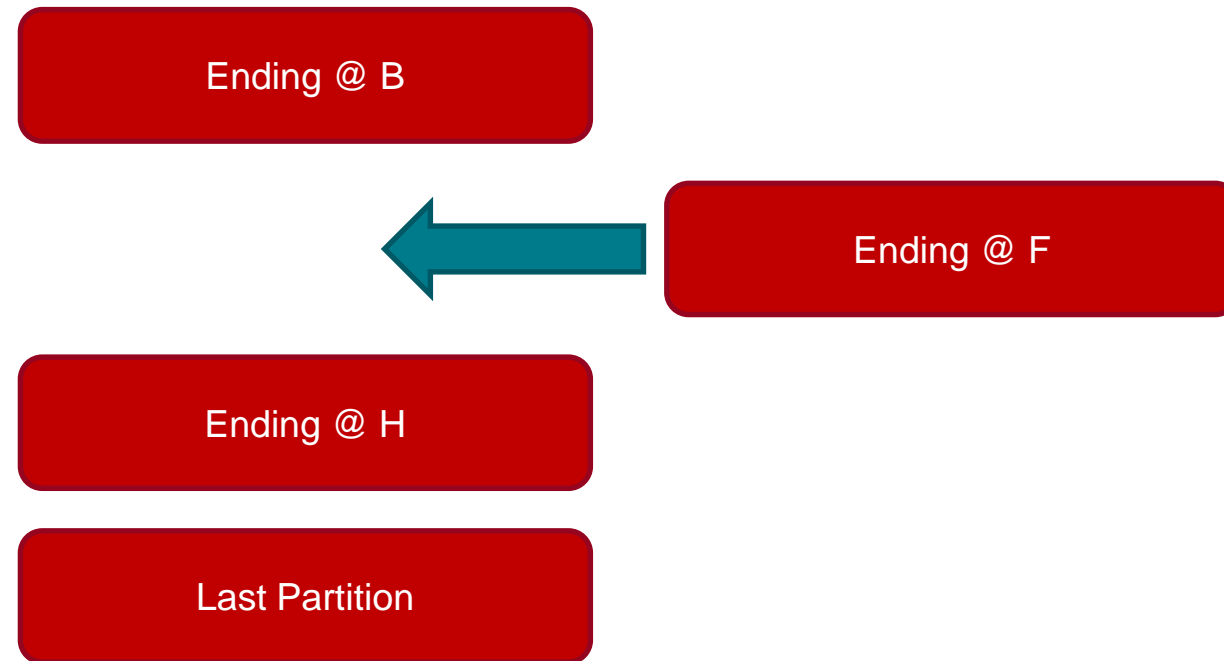
Improved analysis when adding a partition between 2 existing partitions

Andrew Badgley | Lead Product Owner | andrew.badgley@broadcom.com
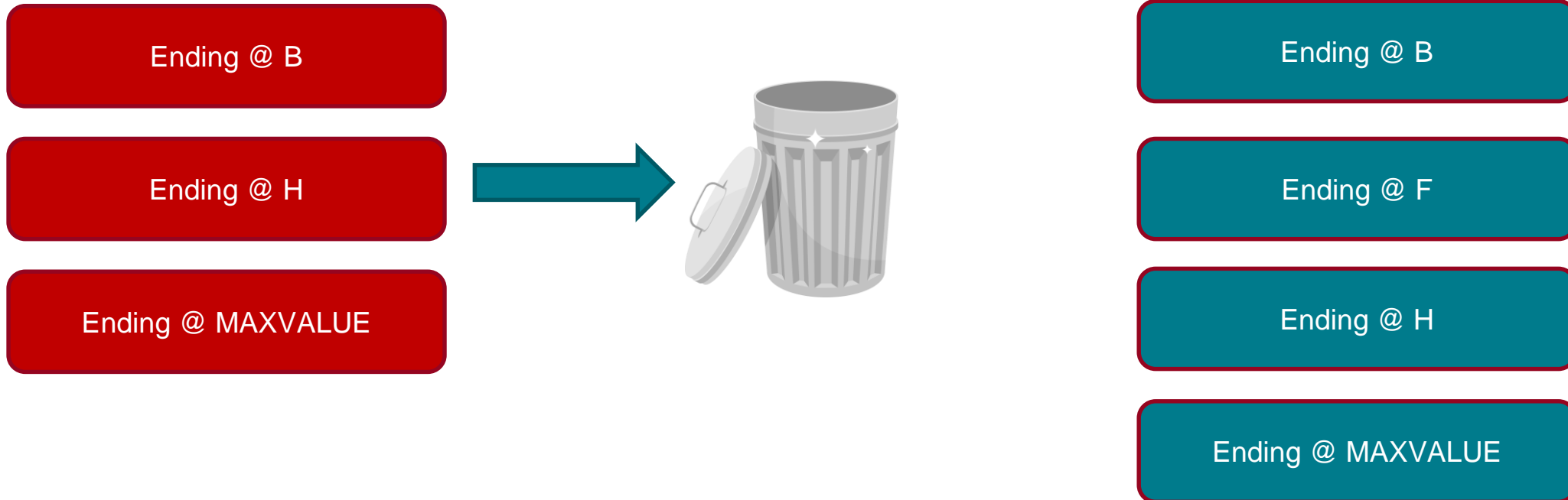
BROADCOM®

Why???

Currently for RC/Update and RC/Compare, for a PBR tablespaces, Absolute or Relative, in Db2 12 and above we have a non-optimal behavior when adding a partition in the middle.
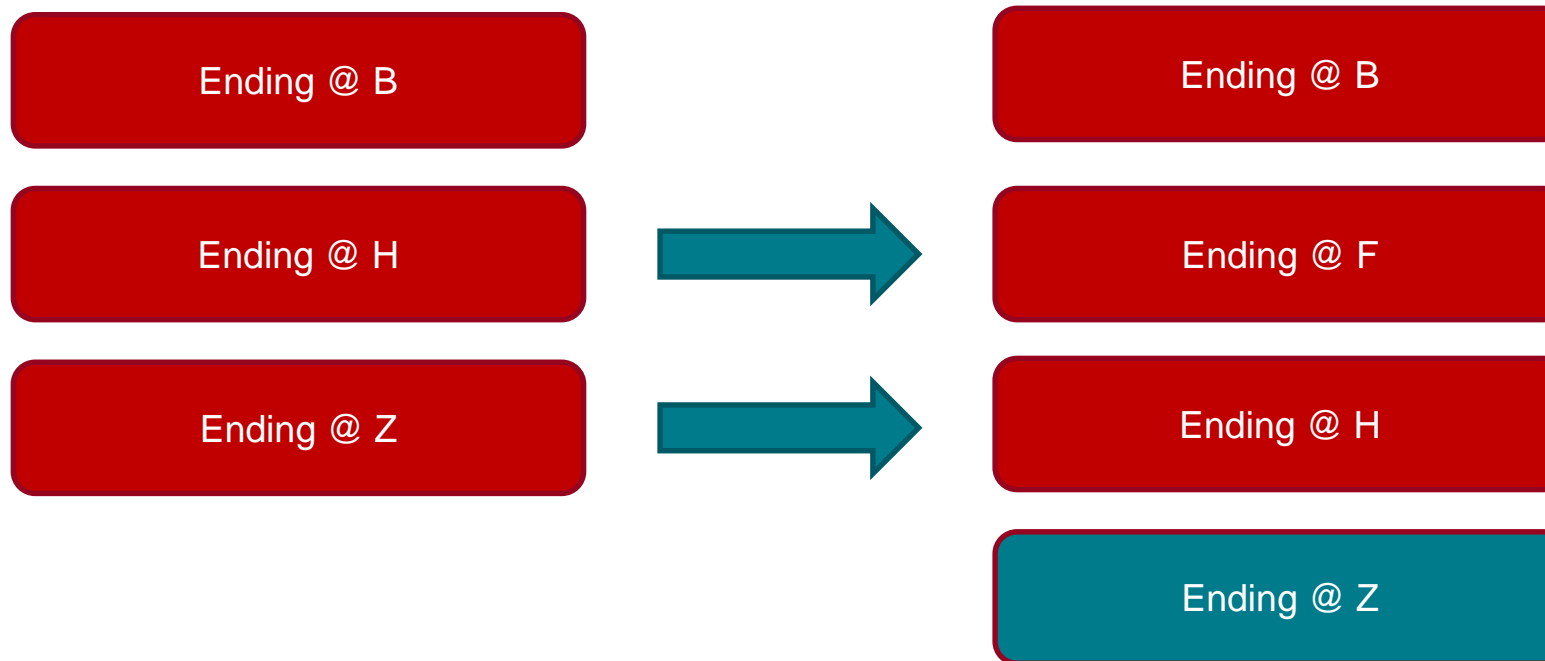
Ending @ B

Ending @ F

Ending @ H

Last Partition

BROADCOM®

PBR ENDING AT (MAX VALUE)

Analysis generates a DROP/RECREATE script.

Ending @ B

Ending @ H

Ending @ MAXVALUE

Ending @ B

Ending @ F

Ending @ H

Ending @ MAXVALUE

BROADCOM®

PBR ENDING AT (non-MAX VALUE)

Analysis generates ALTER TABLE multiple ALTER/ADD PARTITION script.

Ending @ B	→	Ending @ B
Ending @ H	→	Ending @ F
Ending @ Z	→	Ending @ H
		Ending @ Z

BROADCOM®

So what did we change???

Analysis generates single ALTER TABLE ADD PARTITION ENDING AT script.

Ending @ B

Ending @ H

Last Partition

Ending @ B

Ending @ F

Ending @ H

Last Partition
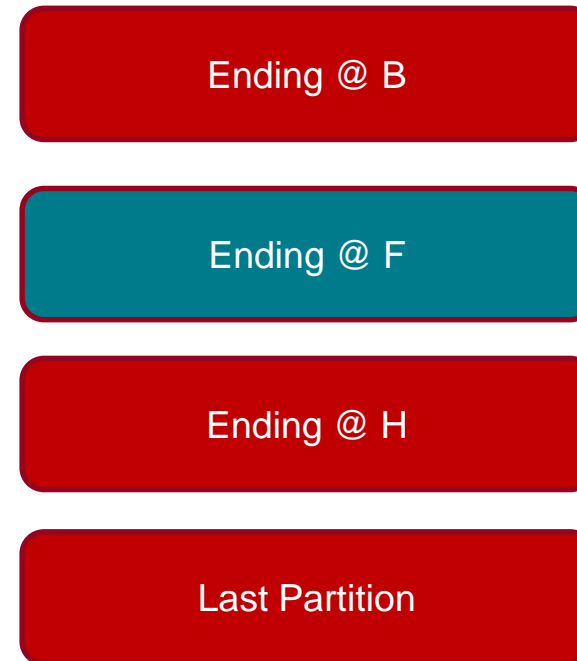
BROADCOM®

Improved experience when converting to Partition by Range table spaces

Andrew Badgley | Lead Product Owner | andrew.badgley@broadcom.com

Non-optimal conversion to PBR

- Conversion from Simple, Segmented, or ICP tables to PBR requires multiple analysis jobs.

  1. Conversion must be made to a TCP table. (Deprecated with Db2 12 M504)

     - Simple/Segmented do a Drop/Recreate

  2. Conversion can then be done from TCP table to PBR

BROADCOM®

Just convert it…

- Conversion from Simple, Segmented, or ICP tables to PBR now done in single step.
    1. Conversion now goes directly to PBR.
        - Simple/Segmented still do a Drop/Recreate

BROADCOM®

New Alias and Trigger reports in RC/Query

Andrew Badgley | Lead Product Owner | andrew.badgley@broadcom.com

Community Idea for Alias Details

- Customers requested a Detail report for Aliases

BROADCOM®

New A-D report


```
RQAD             -------------- RC/Q Alias Detail -------------- 2024/03/10 12:28
COMMAND ===> _                                           SCROLL ===> PAGE

 DB2 Object ===> A                    Option  ===> D     Where => N
 Alias Name ===> ACT                > Creator ===> TERJO03                    >
  Qualifier ===> *                  > N/A     ===> *                          >
Loc: LOCAL --------- SSID: DP31   LVL: 01 -BADANA2 -          FRAME 1 OF 1
************************************** TOP OF DATA **************************************
CMD: _____
          NAME: ACT

      CREATOR: TERJO03

     REF NAME: ACT

 REF CREATOR: DSN81210

     REF TYPE: T                          LOCATION:
        OWNER: TERJO03                  OWNER TYPE: AUTHID
    CREATEDBY: TERJO03
    CREATEDTS: 2018/12/06 / 11:41:33     ALTEREDTS: 2018/12/06 / 11:41:33


 ************************* BOTTOM OF DATA *************************************







Options: L=List, P=Plan, PK=Package, DI=Drop Impact, D=Detail
```

BROADCOM

New TG-D report

```
RQTGD              ------------- RC/Q Trigger Detail ------------- 2024/03/10 12:30
COMMAND ===>                                                  SCROLL ===> PAGE

 DB2 Object ===> TG                    Option  ===> D    Where => N
    Trigger ===> BSTG0008           > Creator ===> SARRO04                         >
     Schema ===> SARRO04            > Version ===> *                               >
Loc: LOCAL --------- SSID: DP31  LVL: 01 -BADANA2 -            FRAME 1 OF 1
************************************* TOP OF DATA *******************************
CMD:  _____
       TRIGGER: BSTG0008

        SCHEMA: SARRO04

       VERSION:

        ACTIVE:
         OWNER: SARRO04

     CREATEDBY: SARRO04                         OWNER TYPE: AUTHID
         TABLE: BSTG0008

   TBL CREATOR: SARRO04

      TRIGTIME: AFTER                            TRIGEVENT: DELETE
   GRANULARITY: ROW                                 SECURE: NO
     CREATEDTS: 2023/07/07 / 14:43:53          ALTEREDTS: 2023/07/07 / 14:43:53
          DBID: 12,593                               OBID: 4
    RELCREATED: DB2v12                               ENVID: 184
       ASUTIME: 0
    DEBUG_MODE:                                      SQLPL: NO
  ORIG_CONTOK: 1BB1F4981DAD0723
   REGENERATED: 2023/07/07 / 14:43:53            WRAPPED:
WLM_ENVIRONMENT:

        REMARK:


********************************* BOTTOM OF DATA ********************************

Options: L=List,TX=Trigger Text, D=Detail
```

BROADCOM®

Any Feedback…?

Level Set: 20.0.11 (LU12911)

Andrew Badgley| andrew.badgley@broadcom.com

Performance

BROADCOM

Detector support for excluding SQL call types

Andrew Badgley | Lead Product Owner | andrew.badgley@broadcom.com

BROADCOM®

Community Idea for improving Detector Overhead

- Customers requested having the ability to exclude stats collection for unwanted SQL call types.

BROADCOM®

What SQL call types can be excluded?

```
-------- Detector Collection Exclusion Groups Menu ----  24/03/10 12:55
Command ===> _

View Group Type    ==> X (A=Application, R=Resource, X=EXclude, K=Keys)

Profile ID ==> AGURI01                              Profile SSID ==> DP31

----------------------------------------------------------------------

    1   Collection Profile Plan Exclude/Include Group
    2   Collection Profile SQL Error Exclusion Group
    3   Collection Profile SQL Call Type Exclusion Group
```

```
------- View/Modify SQL Call Type Exclusion Group -----  24/03/10 12:53
Command ==> _                                       Scroll ==> CSR
                                                         LINE 1 OF 9
Profile ID ==> AGURI01                              Profile SSID ==> DP31

----------------------------------------------------------------------

    X - Exclude SQL Call Type

Recommended for Exclusion              Additional SQL Call Types
X CALL                                 _ DELETE
X CLOSE                                _ EXECUTE
X COMMIT                               _ EXECUTE IMMEDIATE
X DESCRIBE                             _ FETCH
X ROLLBACK                             _ INSERT
X SET                                  _ OPEN
                                       _ PREPARE
                                       _ SELECT
                                       _ UPDATE
*********************** BOTTOM OF DATA *******************************
```

BROADCOM®

Starting a Collection using Online Panels


```
----------- DETECTOR Start Collection Display ----------- 24/03/10 13:01
Command ==> _

DB2 SSID ==> DP31

Specify collection options:
 Triggered SQL                ==> Y   (Y/N)    Plan Excl/Incl List    ==> N (Y/N)
                                               SQL Call Type Excl List ==> N (Y/N)
SQL collection options:
 Standard Activity            ==> Y  (Y/N)
   Dynamic SQL Stats          ==> Y  (Y/N)    (Requires profile)
   View By Keys               ==> Y  (Y/N)    (Requires profile)
   Dynamic Exceptions         ==> Y  (Y/N)    (Requires profile)
   Static Exceptions          ==> Y  (Y/N)    (Requires profile)
 SQL Errors                   ==> Y  (Y/N/A)  (Requires profile)
   SQL Error Text             ==> Y  (Y/N)
 Host variables               ==> Y  (Y/N)    (applies to all options)

Collection Profile           ==> COLLALL_   Exception cache size MB ==> 0020 (1-20)
```

BROADCOM®

Starting a Collection using START(DTR)

SQLX(Y|N)

Specifies whether to enable exclusion of selected SQL call types from collection:

Y

Enable exclusion of SQL call types that are specified on the View/Modify SQL Call Type Exclusion Group panel.

N

Do not enable exclusion of SQL call types.

Default: N

For information about selecting SQL call types to be excluded from the collection that is running, see Exclude SQL Call Types.

BROADCOM®

Modifying an Active Collection

```
/f PTXMAN,REFRESH(DTR) DB2(ssid) SQLX(Y|N)
```

SQLX(Y|N)

Specifies whether to enable SQL call type exclusion:

Y

Enable SQL call type exclusion.

N

Disable SQL call type exclusion.

BROADCOM®

Sysview for Db2 enhancements around IFCIDs 1, 25, 196, 411, 412, and 1001

Andrew Badgley | Lead Product Owner | andrew.badgley@broadcom.com

BROADCOM®

New fields for IFCIDs 1 and 1001

- IBM has added additional fields to QVLS section of IFCIDs 1 and 1001.
  - Purpose: To help Db2 administrators troubleshoot Db2 latch related issues
  - QVLSLC62/63 (STG-MGR-LTCH-62/63)

- Updated SYSVIEW for Db2 reports:
  BTSTASM1 - Summary of Db2 System Services Address Space Statistics
  BTSTATR1 - Statistics Data Trace
  DSAISTD - DSA Subsystem Detail - Accum
  DSQHIST - DSQ History Summary Subsystem Statistics
  DSQSTATS - DSQ Subsystem Statistics - Accum
  HSLATCH - Latch Manager History
  HSULATCH - Latch Manager History Summary
  OLATCH - Latch Manager - Accum
  IQLMSTAT – IQLM Statistics

BROADCOM®

New fields for IFCID 25

- IBM has added additional values for IFCID 25 (UTILITY END) SORT_TYPE field:
    - Sort Optimization Mode (BAL/CPU/ELAP)
    - zIIPs Online (Y/N)
    - Implied Decimal Point Detected (Y/N)

- Updated SYSVIEW for Db2 reports:
    BTRECTRC - Detail Trace of DB2 Activity
    BTSQLTRL - Trace all SQL Statements
    UTILTRAC - Utility Activity Report

BROADCOM®

New fields for IFCID 196

- IBM has added additional values for IFCID 196 (TIMEOUT HEADER):
  - SRC-TIMEOUT-INTVL (Db2 field name QW0196TR)
  - HOLD-TIMEOUT-INTVL (Db2 field name QW0196HTI)
  - SRC-HOLD-TIMEOUT-INTVL (Db2 field name QW0196HTR)

- Updated SYSVIEW for Db2 reports:
  BTLKCONT - Lock Timeouts and Deadlocks
  BTSQLTRL - Trace all SQL Statements

BROADCOM®

Reports for IFCIDs 411 and 412

- IFCIDS 411 and 412 provide DDF activity grouped by Application or Userid respectively

- New Online Sysview for Db2 reports to see REMOTE Application and Userid behavior on the Db2 subsystem

- New Batch Sysview for Db2 reports BTRMTAPP and BTRMTUSR

BROADCOM®

System Statistics-select SSID-6

```
Menu   Print   Tools   Help      SYSVIEW for DB2      D12A CA31      02/06/24 16:50:23
                                      20.0.10          D12APR20                   RKLGO01


R/ISYSTMC          Additional Systems Statistics Displays


__        1 MVS ASID Displays / DB2 CPU     14 Group Buffer Pool
          2 Dataset Statistics             15 Accelerator Services
          3 System Parameters              16 Dynamic Prepare / Row Access
          4 Log Activity                   17 SQL Incompatibilities (IFCID 376)
          5 Multi-site Update Exceptions   18 Storage Statistics
          6 Thread and Command Counts      19 Storage Utilization (IFCID 225)
          7 SQL and Routine Counts         20 DB2 Messages (IFCID 197)
          8 List Prefetch / RID Pool       21 z/OS System Statistics
          9 Parallelism / Misc / IAG       22 Index FTB Optimization (389, 477)
         10 Locks and Latches              23 Utility Status
         11 DDF Activity (Remote Locations) 24 Profile Monitoring (IFCID 402)
         12 Binds and Authorization
         13 Workfile DB Utilization
```

BROADCOM®

11-3/4

System History-F6-6-11-3/4

Sysview for Db2 reporting of the new PACKAGE-DEPENDENCY-LEVEL z/PARM

Andrew Badgley | Lead Product Owner | andrew.badgley@broadcom.com

BROADCOM®

New Db2 z/Parm

- PACKAGE_DEPENDENCY_LEVEL was introduced in Db2 13 FL504

- Sets the default value of the new DEPLEVEL(PACKAGE|STATEMENT) bind option

- The Sysview for Db2 SYSPARMS display and BTSYSPRM report show the value of the new z/Parm

BROADCOM®

Any Feedback…?

Level Set: 20.0.11 (LU12911)

Andrew Badgley| andrew.badgley@broadcom.com

In Closing…

Broadcom Mainframe Technical Exchanges

- European in-person event in Prague: April 16-18 (registration open)

- North American in-person event in Plano, TX: September 10-12 (save the date)

- Global virtual event: October 8-10 (save the date)

Make plans to attend

- Network with peers and Mainframe technical experts

- Technical education, product update, how-to and roundtable sessions

- No registration fee! Open to all Broadcom customers

- Learn more: https://bit.ly/MainframeTechEx

BROADCOM®
MAINFRAME SOFTWARE

BROADCOM®

Thank You