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

Team Product Owners

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Agenda

Sysview for Db2

- Enhancements around IFCID 376
  - Dynamic SQL text during unload
  - new archive tables
- Extended Profile Monitoring Statistics Support for IFCID 402

MTC DBM

- Multiple objects selection
- Hyperlinks
- Enhanced Breadcrumbs

RC/Query

- Advanced Triggers

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Please Provide Feedback…

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Extending IFCID 376 (SQL incompatibilities data) with dynamic SQL text during unload and introducing new archive tables for IFCID 376

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Overview.

Customers would like to unload IFCID 376(Incompatible functions Executed) data including dynamic SQL text to an archive table.

This will save users time when investigating SQL incompatibilities by leveraging the new archive tables to quickly identify which SQLs are incompatible when preparing for new function levels or new Db2 version.

So we:

- Extended IFCID 376 with SQL text from SYSVIEW for Db2 dynamic SQL text database during unload process.
- Created a new archive tables for SQL Incompatibilities data (IFCID 376)

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What is new ,

Data collector changes:

- New IQL variable is introduced: IQL-DEFINE=(**SQL-INCOMPAT-TEXT**=YES/NO) to enable collection of SQL text from the cache into the SYSVIEW for Db2 Dynamic SQL Text database whenever IFCID 376 is captured

- **IQLSLCNT** IQL request that controls what events trigger SQL text collection, was updated to include a section for IFCID 376 processing; setting the variable to YES activates it

Unload utility (IDB2UIFI REQ=UNLDHIST) has been enhanced:

- Unload utility now looks for **HSTSQLDB** DDNAME to access the database

- Offloaded IFCID 376 records will include SQL text, if it is available in the Dynamic SQL Text database **and** when the SQL text is not present in original trace record

- If HSTSQLDB is not available a new INFO message will be issued in the unload job

```
DBG86009I DT31 05:26:11 SQL text database is not detected, no DDNAME HSTSQLDB found
```

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Extending IFCID 376 with SQL text

Scenario 1: History files are not given in unload job; Data Collector is running with HSTSQLDB.

What is new , --cont.

- IQL syntax has been extended with format "**OF=Hnn**" to output binary data into its hexadecimal character representation in EBCDIC encoding. This output format is intended for loading data into Db2 CHAR columns

- Archive tables updates:
  - **APPL_PGM_DETAIL** (application program details) now includes a column PKG_TOKEN_HEX to contain CONTOKEN value in hex
  - **APPL_PGM_DAILY** (application program daily summary) includes the same PKG_TOKEN_HEX column
  - **SUBSYS_SQL_DETAIL_STATIC** (static SQL details) now includes again similar column CONSIST_TOKEN_HEX and new PACKAGE column

- IQL syntax examples:
  - TOKEN DS CL8 stores value 0x12345678
  - TOKEN (OF=H16) produces value 'F1F2F3F4F5F6F7F8'

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What is new , --cont.

- Two new archive tables are introduced to contain execution details of SQL statements that are potentially incompatible with the current version of Db2:
  - APPL_SQL_INCOMPAT_DETAIL (application incompatible SQL statements)
  - APPL_SQL_INCOMPAT_PARMS (application incompatible SQL parameters)

- Tables are based on IFCID 376 APPL-SQL-INCOMPAT records.

- Post-install process was updated to include new tables:

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PTF: LU03348

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Extended Profile Monitoring Statistics Support for IFCID 402

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Overview.

SYSVIEW for Db2 now collects the (402) PROFILE EXCEPTIONS records at a fixed time interval that IBM introduced with the new DB2 V12 QW0402* metrics.

These metrics helps users monitor workload against thresholds defined in the system profiles. Capturing the delta between two intervals allow users to track profile exceptions and warnings that are triggered in specific intervals.

Enhanced profile monitoring statistics reports in SYSVIEW for Db2 to collect the (402) PROFILE EXCEPTIONS records at a fixed time interval allowing users to detect anomalies and measure workload against the thresholds defined in system profiles.

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Overview.

This enhancement covered recent changes to IFCID402 processing introduced by DB2:

1. Introduced support for new metrics, and updated the online report.

2. Introduced delta processing for the record and a new interval-based IQL exception IDSXC402.

3. Introduced a way to retrieve the record representing the profile usage statistics on demand. The existing reports were updated to be interval-based.

4. Introduced support for collecting IFCID402 to the STATS history dataset. Together with this support two new online history reports HSUPROF and HSTPROF for summary and trace are introduced.

5. Two new batch reports BTRPROFS and BTRPROFD were introduced.

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New metrics.

Several new metrics are introduced:

THREAD-MONITORED-BY-PROF - Indicates the current value of the number of threads monitored by the profile.

THREAD-SUSPEND-BY-PROF - Indicates the current number of threads suspended by the profile.

HWM-THREAD-COUNTER - Indicates the high water mark of the number of threads since DDF was started

CONNECT-MONITORED-BY-PROF - Indicates the current value of the number of connections monitored by the profile

CONNECT-MONITORED-BY-HWM - Indicates the high water mark of the number of connections since DDF was started

FIRST-TOKEN-VAR - Indicates the first token value.

FIRST-TOKEN-LEN - Indicates the length of the first token value.

FIRST-TOKEN-LONG - Indicates the first token value.

SECOND-TOKEN-VAR - Indicates the second token value.

SECOND-TOKEN-LEN - Indicates the length of the second token value.

SECOND-TOKEN-LONG - Indicates the second token value.

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New metrics - report updates.


```
R/PROFILES        DB2 profile warnings/exceptions - 30 Seco              Item 1/2
                                                            Delta
             <------- Warnings ------->  <--------------Exceptions------------->  <--------------- Monitoring --------------->
Profile ID Connects Threads  Idle Thd Connects Threads  Idle Thd Que Thds Fail Req Connects Max Conn Threads  Max Thds Susp Thd
666               0       0         0        0       0         0       0       0       38      52        0       20        0
           First Token: ::FFFF:10.175.84.31
           Second Token:
666               0     151         0        0       0         0       0       0      201     201      200      200        0
           First Token: ::FFFF:10.74.32.186
           Second Token:
```

The reports are filtered out with a dynamic WHERE clause, only profiles with any kind of activity are displayed.

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Delta processing.

The records are now DELTAed, meaning that we calculate the difference between consecutive entries for the same profile. The entries are matched based on the profile ID and the new fields Token1 and Token2.

The delta values are used in a new IQL IDSXC402 exception. This exception is triggered in case there were any exceptions or warnings that happened in the last interval.

The exception is based on the profile ID, so even if there are several different for the same profile ID in the report, a single exception will be triggered for all of them.

An existing exception EXCP0402 was updated to filter out profiles without any activity.

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New IQL exception.

Retrieval on demand.

The records can now be requested on demand. Support for this functionality was introduced by DB2 for z/OS APAR PH12041. This requirement is included in the HOLDDATA for the enhancement.

To avoid DB2 version issues a new data collector system parameter PROFILE-MONITORING was introduced which allows obtaining records on demand. The default value for this parameter is NO, and this value preserves the existing behavior. Turning the parameter ON while the necessary DB2 maintenance is not applied causes several error messages to be written out to DBGPRINT and the online IFCID402 reports to be stopped.

The new behavior introduces an interval-based real-time report.

It also turns on collecting 402 records to the history dataset and starts the online history reports.

This behavior is happening under the covers so there is nothing to show.

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Support for IFCID 402 in STAT history.

Record 402 is now supported for history collection. It will be collected on the same interval as all STATS records in case PROFILE-MONITORING=YES.

Two new online history reports HSTPROF and HSUPROF are introduced to process the records from our history datasets.

The HSTPROF is a trace report which has the same layout as the online report.

The HSUPROF is a summary report that reports the summarized/average/min/max values.

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Support for IFCID 402 in STAT history.

New batch reports.

Two batch reports are introduced – trace and summary.

The trace report prints out a header for every 402 record found in the input dataset (they cannot be paired based on the time interval since the input can be an SMF dataset instead of the Sysview for DB2 history dataset)

The summary report groups all of the records by profile ID, Token1 and Token2 and prints out the summarized report for them.

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New batch reports.

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Brief summary.

- Changed reports: PROFILES, EXCP0402

- New reports: IDSXC402, HSTPROF, HSUPROF, BTRPROFS, BTRPROFD

- New parameter: PROFILE-MONITORING=YES/NO. By default it's NO preserving the old behavior.

- Specifying YES allows interval-based processing, turns on the 402 collection to STATS history dataset and starts the online history reports.

- Specifying YES can only work if PH12041 is applied to DB2 for z/OS, otherwise the customer should expect error messages.

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Please Provide Feedback…

PTF: LU03286

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MTC DBM to support multiple objects selection, hyperlinks and enhanced breadcrumbs

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Overview – problem statement

Customers would like to perform a single action by selecting multiple objects in easy manner in MTC DBM and should be consistent in both Administration and Performance tabs.

Currently,

- Performance tab
    - does not allow selecting multiple rows
    - refreshes the current tab for every action
    - needs 3 clicks to perform an action

- Administration tab
    - does not show Breadcrumbs
    - opens new tab to show the details of table
    - needs 3 clicks to open table detail report

Overall, there are inconsistencies in both Administration and Performance tabs of MTC

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MTC DBM enhancements – Whats new

In order to resolve the inconsistencies, we have enhanced MTC DBM by making sure that both Administration and Performance tabs will have the similar kind of behavior.

This is with regards to both "**Administration and Performance**" tabs:

- Ability to select multiple rows
- Current tab gets refreshed with first selected rows output
- New tabs will be created for all the remaining rows
- Mostly used action can be performed with a single click for one object

Live Demo

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MTC DBM enhancements – cont.

MTC DBM enhancements – cont.

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PTF: LU03417

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RC/Query to generate DDL for Db2 Advanced Triggers

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Overview

Currently RC/Query does not support generate DDL for Db2's Advanced triggers (generates DDL for only Basic triggers). Many customers has shown interest in having the capability to generate the DDL for Db2 Advanced triggers.

So, we have enhanced RC/Query

- to generate DDL for both Advanced triggers
- with additional formatting improvements

Now RC/Query generates the DDL for both Basic and Advanced triggers of Db2.

Live Demo

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RC/Query: DDL for Advanced Triggers

```
EDIT        BATCH.PROCESSOR.INPUT                          Columns 00001 00072
Command ===> _____      Scroll ===> CSR
000006      CREATE OR REPLACE TRIGGER SAMVA02.ADVTRGXY
000007         VERSION V3
000008              AFTER UPDATE
000009              ON QAOFS.QA1TTB02
000010              REFERENCING
000011                          OLD_TABLE AS CROT0031
000012                          NEW_TABLE AS CRNT0031
000013            FOR EACH STATEMENT
000014      NOT SECURED
000015      DISALLOW DEBUG MODE
000016      ASUTIME NO LIMIT
000017      QUALIFIER SAMVA02
000018      WLM ENVIRONMENT FOR DEBUG MODE DSNWLMG
000019      CURRENT DATA NO
000020      DYNAMICRULES RUN
000021      APPLICATION ENCODING SCHEME EBCDIC
000022      WITHOUT EXPLAIN
000023      WITHOUT IMMEDIATE WRITE
000024      ISOLATION LEVEL CS
000025      OPTHINT ''
```

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PTFs:
LU03314, LU03315, LU03316, LU03317 and LU0331.

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In Closing…

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When is the next Community Update call?

Our next call will be February 14th, 2021

Did you miss our last call (in September)?

The replay is available here.

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CA Db2 Tools 20.0 Validation Project

https://validate.broadcom.com/key/DB2Tools200
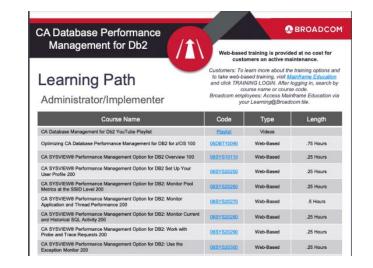
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Course Code	Title
06RCQ20010	CA RC/Query® for DB2 for z/OS Database Administration Tasks Command Overview 200
06SYS2026E	CA SYSVIEW® Performance Management Option for DB2 for z/OS - Intermediate - Digital Badge Assessment
06DBT2058E	Log Analyzer™ for Db2 for z/OS: Fundamentals Digital Badge Assessment

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