Db2 13 for z/OS FL504
Object Level Utility History
What is it and how do I use it ?

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Thank you !

All credits for this presentation go to:

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Db2 for z/OS Utilities Development, Backup and Recovery !

Agenda

- Overview
- Understanding History Information
- Using Utility History
- Closing

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The Backdrop

Utilities are essential tasks run every day to create backups, reorganize data, load data, unload data, and gather statistics. It's critical for these processes to run successfully, efficiently and in a specific timeframe to avoid application impact.

However, information about utility executions, both near real-time and historical, is difficult to gather and analyze.

Who Will Benefit From Utility History ?

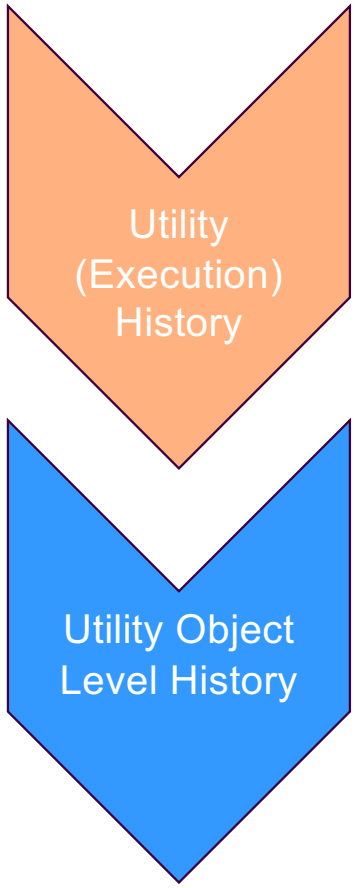
Do you need to manage and tune your utility executions ?

- ❑ Quickly check if any utilities failed in the past 24 hours and take corrective actions ?
- ❑ Assess the execution of a specific utility job ?
- ❑ Compare the performance of certain utilities over time ?
  - ❑ COPY, RUNSTATS, LOAD, REORG
- ❑ Look for
  - ❑ beneficial trends and apply the same strategy to other areas ?
  - ❑ worsening trends and take preventative actions ?
- ❑ Analyze utility executions for balancing workloads
  - ❑ Move objects from one job to another
  - ❑ Move job executions from one window to another
- ❑ When was the last REORG on table space x ?
- ❑ What is the trending size of table space x ?
- ❑ How can I determine objects affected by an active or stopped utility ?

Solution Design Points

- Collect and save useful, essential execution information common across IBM Db2 utilities in new Db2 catalog tables
  - Two-tiered table approach correlated with an event ID
    - Utility (Execution) History in SYSIBM.SYSUTILITIES
    - Utility Object-level History in SYSIBM.SYSOBJEVENTS
  - Information available in near real-time while the utility is running
  - Information easily accessible with SQL queries
- Prioritize successful utility execution over history collection
  - May not be suitable for audit purposes 

Staged Implementation



Db2 13 for z/OS – Function Level 501, Catalog Level 501

- ❑ GA May 2022

Db2 13 for z/OS – Function Level 504, Catalog Level 504

- ❑ Available October 2023
- ❑ APARs PH55476, PH55914, PH55915, PH55916, PH54919 (FL 504)

History Activation and EVENTID

- Activate utility history with UTILITY_HISTORY subsystem parameter
  - UTILITY (FL 501 and above)
    - Execution information
  - OBJECT(FL 504 and above)
    - Execution information and Object-level information
- EVENTID column in SYSUTILITIES, SYSOBJEVENTS, SYSCOPY catalog tables
- Unique utility event (execution) identifier
- Reported for each execution in job output with new message

```
DSNU3031I UTILITY HISTORY COLLECTION IS ACTIVE.
LEVEL: UTILITY-or-OBJECT, EVENTID: event-id
```

- REPORT RECOVERY shows EVENTID for SYSCOPY rows and system-level backups

SYSIBM.SYSUTILITIES Catalog Table

Db2 13 FL501

- One row for each utility execution
  - EVENTID unique utility event ID #
    - Also added to SYSCOPY
  - NAME
    - Utility executed
  - INSERTEDBY = ‚DB2‘
  - JOBNAME
  - UTILID
  - USERID
  - STARTTS
  - ENDTS
  - ELAPSEDTIME
  - CPUTIME
  - ZIIPTIME
  - RETURNCODE
  - CONDITION
    - Active, stopped, ended, terminated, forced
  - RESTART
  - NUMOBJECTS
  - LISTNAME
  - STARTLOGPOINT
  - GROUP_MEMBER
  - SORTNAME
  - SORTCPUTIME
  - SORTZIIPTIME
  - PHASEnNAME
  - PHASEnET
  - PHASEnCPUT
  - PHASEnZIIPT
  - PHASEnDATA

Where n is 1 – 14. Reserved for future use, currently set to NULL.

- Table Space DSNDB06.SYSTSUTL

SYSIBM.SYSOBJEVENTS Catalog Table

Db2 13 FL504

- One row for each partition or non-partitioned object for Db2 Utility executions
  - EVENTID utility event ID #
    - Correlates with SYSUTILITIES.EVENTID and SYSCOPY.EVENTID
  - DBID
  - PSID
  - PARTITION
    - Partition number or zero for non-partitioned objects
  - INSTANCE
  - DBNAME
  - SPACENAME
  - OBJTYPE
    - ‚T' or ‚I'
  - EVENTTS
    - Begin processing TIMESTAMP
  - COUNT
    - Number of rows, records, keys, pages or LOBs processed
  - ELAPSEDTIME
    - COPY or RECOVER time for creation or restore of sequential image copy
  - INSERTEDBY = ‚DB2'
    - ‚DB2' for IBM Db2 Utilities
- Table Space DSNDB06.SYSTSOEV

COUNT: https://www.ibm.com/docs/en/db2-for-zos/13?topic=history-utility-object-level-information-in-sysobjevents

Utility Support

Execution and Object-Level History

- ❑ CHECK DATA
- ❑ CHECK INDEX
- ❑ CHECK LOB
- ❑ COPY
- ❑ COPYTOCOPY
- ❑ LOAD
- ❑ MERGECOPY
- ❑ MODFIY RECOVERY
- ❑ MODIFY STATISTICS
- ❑ QUIESCE
- ❑ REBUILD INDEX
- ❑ RECOVER
- ❑ REORG
- ❑ REPAIR
- ❑ RUNSTATS
- ❑ UNLOAD

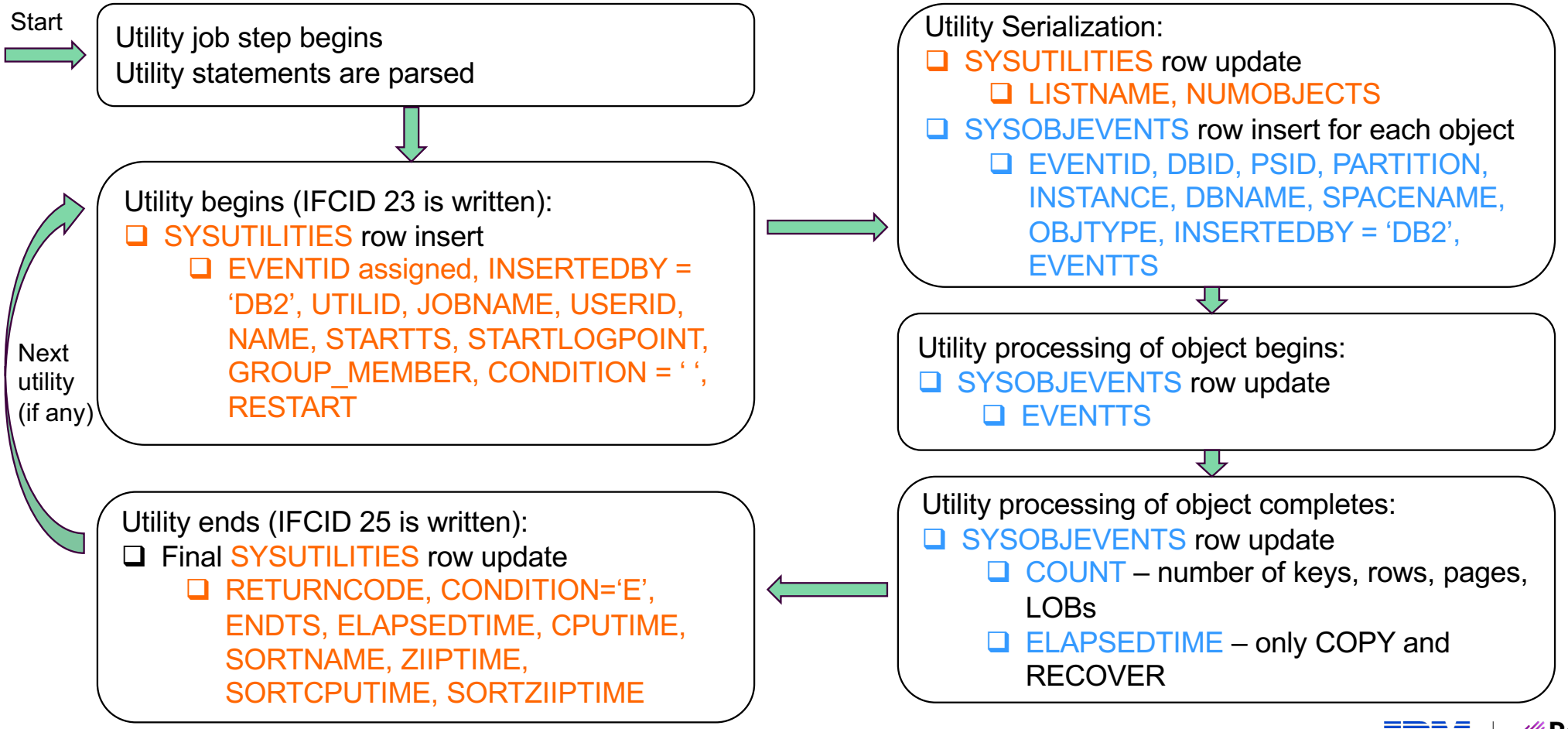
Execution History

- ❑ BACKUP SYSTEM
- ❑ CATMAINT
- ❑ REPORT RECOVERY
- ❑ REPORT TABLESPACESET
- ❑ STOSPACE

Not supported

- ❑ DIAGNOSE
- ❑ EXEC SQL
- ❑ LISTDEF
- ❑ OPTIONS
- ❑ RESTORE SYSTEM
- ❑ TEMPLATE
- ❑ Stand-alones: DSN1COPY, DSNJU003, etc.

Utility History - Flow



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Utility Execution History SYSUTILITIES row

How many SYSUTILITIES rows are inserted for a utility statement ?
It depends…

Explicit object names or no object names ➡ One row

LISTDEF list - Number of rows vary based on utility and LISTDEF options

- ❑ COPY, RECOVER, COPYTOCOPY, QUIESCE ➡ One row
- ❑ REORG TABLESPACE, RUNSTATS TABLESPACE, UNLOAD, REORG INDEX, REBUILD INDEX on a list of table spaces, MODIFY RECOVERY, MODIFY STATISTICS, MERGECOPY, REPORT RECOVERY:
  - ❑ Requested at the table space or index space level ➡ One row for each space
- ❑ REORG TABLESPACE, RUNSTATS INDEX, UNLOAD, REBUILD INDEX on a list of index spaces, CHECK INDEX:
  - ❑ Requested on one or more partitions ➡ One row for each related group of indexes or partitions
- ❑ Related means partitions in the same table space or indexes over the same table

Understanding SYSUTILITIES Columns

- EVENTID
  - Unique utility event (execution) identifier, BIGINT data type
  - Set by new Db2 sequence SYSIBM.DSNSEQ_EVENTID
  - Starts at 1000. Max value is 9,223,372,036,854,775,807.
    - May not increase sequentially according to order of utility executions
      - Each Db2 member in a data sharing group has a sequence cache
      - Sequence numbers in cache are not preserved when Db2 is restarted
  - For chronological order of utility execution use STARTTS (start timestamp) column value to order SYSUTILITIES rows in queries

- NAME
  - Utility name
  - Like utility functions are grouped together
    - REORG TABLESPACE and REORG INDEX grouped under REORG
    - RECOVER TABLESPACE and RECOVER INDEX grouped under RECOVER

Understanding SYSUTILITIES Columns (cont'd)

- JOBNAME, UTILID, USERID columns
  - Job information
- STARTTS, ENDTS columns
  - Local timestamps
- LISTNAME column
  - LISTDEF list name, otherwise NULL
- RESTART column
  - Utility restarted? 'N' or 'Y'
- STARTLOGPOINT column
  - RBA or LRSN when utility started
- GROUPMEMBER column
  - Data sharing –member name where utility executed
  - Non-data sharing -NULL
- INSERTEDBY column
  - 'DB2' for IBM Db2 utilities

Understanding SYSUTILITIES Columns (cont'd)

- NUMOBJECTS column
  - Number of objects the utility will process
  - Objects accessed for read or write
  - Matches number of SYSOBJEVENTS rows
  - Partitioned objects – each partition is counted as one object
  - Non partitioned objects – counted as one object

- RETURNCODE and CONDITION columns

RETURNCODE	CONDITION	Explanation
NULL	Blank	Utility is active or stopped. Issue –DIS UTIL(utilid) command -> DSNU105I for active or DSNU100I for stopped.
0 or 4	E	Utility ended successfully. For RETURNCODE=4, one or more warning messages issued.
8	E	Utility ended with one or more errors
8	T	Active utility accepted –TERM UTIL command and terminated itself
NULL	T	-TERM UTIL command terminated the stopped utility
NULL	F	-START DB SP ACCESS(FORCE) command terminated the stopped utility

Understanding SYSUTILITIES Columns (cont'd)

History performance statistics are consistent with IFCID 25 utility end trace record.

- ELAPSEDTIME, CPUTIME, ZIIPTIME columns
  - In microseconds (µs), divide by
    - 1 mil. for seconds
    - 60 mil. for minutes
- CPUTIME is general processor CPU time, does not include zIIP time
- ZIIPTIME when accounting class 1 trace is active, does not include SORT zIIPtime
  - Column values reflect total for all objects processed by the utility
- SORTNAME column
  - When applicable DB2SORT or DFSORT
- SORTCPUTIME, SORTZIIPTIME columns
  - When applicable and provided to Db2 by sort program
  - In µs

Example: SYSUTILITIES Row

EVENTID	NAME	INSERTEDBY
22974	COPY	DB2

JOBNAME	UTILID	USERID
TS5817I	IMAGE	TS5817

STARTTS	ENDTS	ELAPSEDTIME	CPUTIME
2024-04-29-09.11.42.018390	2024-04-29-09.11.43.836198	1817808	166244

ZIIPTIME	RETURNCODE	CONDITION	RESTART	NUMOBJECTS	LISTNAME
0	0	E	N	17	DSN8LDEF

STARTLOGPOINT	GROUP_MEMBER	SORTNAME	SORTCPUTIME
00DF04C48EEA438C7800	I9A2	?	?

Utility Object-Level History SYSOBJEVENTS Rows

SYSOBJEVENTS rows are inserted during initialization for target objects (partitions or space):

- ❑ Utility-in-progress state - UTUT, UTRW or UTRO
- ❑ Read or write access for main processing
- ❑ Set in a restrictive state during processing, i.e., RECP, RBDP, CHKP, etc.

```
DSNU3033I SYSIBM.SYSOBJEVENTS ROWS INSERTED FOR OBJECT-LEVEL HISTORY
```

Includes:

- ❑ Related LOBs, XML, and their indexes – REORG TABLESPACE AUX(YES), LOAD
- ❑ Dependent table (spaces), parent table (spaces), and their indexes – CHECK DATA, LOAD
- ❑ Exception tables and their indexes – CHECK DATA
- ❑ Mapping index – REORG TABLESPACE SHRLEVEL CHANGE

Excludes:

- ❑ Objects with errors or undefined DEFINE NO objects (except for utilities that will define them)
- ❑ Catalog and directory objects when not a target of the utility
  - ❑ DSNDB06.SYSTSCPY, DSNDB01.SYSLGRNX and others, e.g., MODIFY RECOVERY on a user table space

Utility Object-Level History SYSOBJEVENTS Rows

Special cases for SYSOBJEVENTS rows:

PBG partition grown during utility execution

- ❑ LOAD or REORG inserts a SYSOBJEVENTS row for the partition

Online REORG table space type conversion

- ❑ Initialization (UTILINIT phase)
- ❑ SYSOBJEVENTS rows inserted for original table space type
- ❑ Termination (UTILTERM phase)
- ❑ SYSOBJEVENTS rows for original table space type are deleted
- ❑ New rows inserted for new table space type

Understanding SYSOBJEVENTS Columns

- EVENTID column
  - Utility event and execution identifier
- DBID, PSID, DBNAME, SPACENAME, OBJTYPE, INSTANCE columns
  - Identifies object
- PARTITION column
  - Physical partition number for partitioned objects, always non-zero
  - Zero for non-partitioned objects
  - Consistent with how real-time statistics (RTS) information is kept
- EVENTTS column
  - Current local timestamp when processing of object begins
- COUNT column
  - Number of rows, records, keys, pages, or LOBs
  - Updated when processing of object completes, end of phase, or end of utility
- ELAPSEDTIME column (in µs)
  - COPY and RECOVER elapsed time for creation or restoration of sequential image copy
  - Can be used for recovery time estimation of image copy restoration
  - NULL for all other utilities
- INSERTEDBY column
  - 'DB2' for IBM Db2 utilities

Example: SYSOBJEVENTS Row

	EVENTID	DBID	PSID	PARTITION	INSTANCE	DBNAME
1_	22974	374	2	1	1	DSN8D13A
2_	22974	374	4	1	1	DSN8D13A
3_	22974	374	4	2	1	DSN8D13A
4_	22974	374	4	3	1	DSN8D13A
5_	22974	374	4	4	1	DSN8D13A
6_	22974	374	4	5	1	DSN8D13A
7_	22974	374	6	1	1	DSN8D13A
8_	22974	374	8	1	1	DSN8D13A
9_	22974	374	10	1	1	DSN8D13A
10_	22974	374	12	1	1	DSN8D13A
11_	22974	374	14	1	1	DSN8D13A
12_	22974	374	18	1	1	DSN8D13A

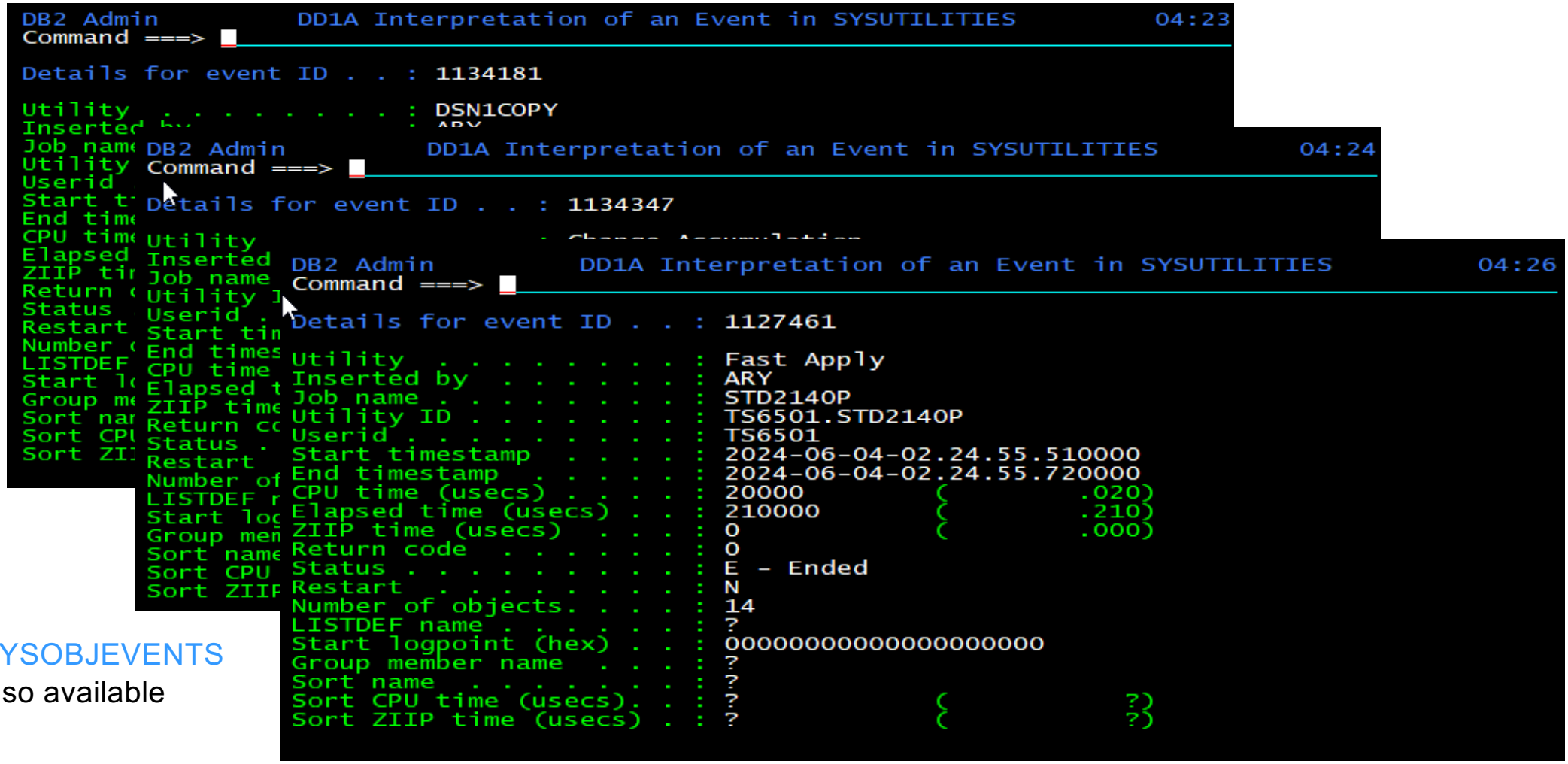
	SPACENAME	OBJTYPE	EVENTTS	COUNT	ELAPSEDTIME
1_	DSN8S13D	T	2024-04-29-09.11.42.749277	4	12097
2_	DSN8S13E	T	2024-04-29-09.11.42.835064	36	5700
3_	DSN8S13E	T	2024-04-29-09.11.42.848378	3	11267
4_	DSN8S13E	T	2024-04-29-09.11.42.863097	4	7027
5_	DSN8S13E	T	2024-04-29-09.11.42.873498	3	4607
6_	DSN8S13E	T	2024-04-29-09.11.42.895843	3	5762
7_	DSN8S13F	T	2024-04-29-09.11.42.966144	3	5190
8_	DSN8S13G	T	2024-04-29-09.11.43.064486	5	11343
9_	DSN8S13H	T	2024-04-29-09.11.43.186483	3	5341
10_	DSN8S13I	T	2024-04-29-09.11.43.260540	3	3766
11_	DSN8S13J	T	2024-04-29-09.11.43.329069	3	3771
12_	DSN8S13M	T	2024-04-29-09.11.43.397785	4	5119

Example: SYSUTILITIES and SYSOBJEVENTS Row from IBM High Performance Unload

```
DB2 Admin          DD1A Interpretation of an Event in SYSUTILITIES          04:20
Command ===>

Details for event ID . . : 1137265

Utility . . . . . : UNLOAD
Inserted by . . . . . : HPU
Job name . . . . . : TS5941T
Utility ID . . . . . : DB2UNLOAD
Userid . . . . . : TS5941
Start timestamp . . . . : 2024-06-11-04.17.33.491084
End timestamp . . . . . : 2024-06-11-04.18.09.303065
CPU time (usecs) . . . . : 131758        (          .131)
Elapsed time (usecs) . . : 35811981      (       35.811)
ZIIP time (usecs) . . . : ?             (            ?)
Return code . . . . . : 4
Status . . . . . : E - Ended
Restart . . . . . : N
Number of objects. . . . : 1
LISTDEF name . . . . . : ?
Start logpoint (hex) . . : 000000000A7E0E9E6B64
Group member name . . . : ?
Sort name . . . . . : ?
Sort CPU time (usecs). . : ?             (            ?)
Sort ZIIP time (usecs) . : ?             (            ?)
```

```
DB2 Admin          DD1A Interpretation of an Event in SYSOBJEVENTS          04:21
Command ===>

Details for event ID . . : 1137265

Utility . . . . . : UNLOAD
Object type . . . . . : T - Tablespace
Database name . . . . . : JTHDCH        DB ID . . . . . : 4046
Space name . . . . . : JTHSCHK       PS ID . . . . . : 13
Partition . . . . . : 1
Instance . . . . . : 1
Count . . . . . : 0
Elapsed time (usecs) . . : 20758         (          .020)
Event timepstamp . . . . : 2024-06-11-04.18.09.262095
```

Examples: SYSUTILITIES Rows from IBM Db2 Recovery Expert for z/OS



SYSOBJEVENTS also available

Example: SYSUTILITIES and SYSOBJEVENTS Row from IBM Db2 Cloning Tool

```
DB2 Admin          DD1A Interpretation of an Event in SYSUTILITIES          04:25
Command ===>

Details for event ID . . : 1018510

Utility . . . . . : IBM Db2 Cloning Tool 3.2 - Source job
Inserted by . . . . . : CKZ32
Job name . . . . . : RR000SRC
Utility ID . . . . . : J0487990
Userid . . . . . : TS6396
Start timestamp . . . . : 2024-04-15-07.15.24.862228
End timestamp . . . . . : 2024-04-15-07.15.27.338568
CPU time (usecs) . . . . : 156691        (         .156)
Elapsed time (usecs) . . : 2476340       (        2.476)
ZIIP time (usecs) . . . . : ?            (           ?)
Return code . . . . . : 0
Status . . . . . : E - Ended
Restart . . . . . : N
Number of objects. . . . : 0
LISTDEF name . . . . . : RR
Start logpoint (hex) . . : ?
Group member name . . . . : DD1A
Sort name . . . . . : ?
Sort CPU time (usecs). . : ?             (           ?)
Sort ZIIP time (usecs) . : ?             (           ?)
```

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Using Utility History

Execute your utilities workload

- ❑ Activate utility history collection
- ❑ History information automatically collected and accumulates over time
- ❑ Analyze utility history information
  - ❑ Rerun failed utilities
  - ❑ Calibrate utility jobs and execution

Run utilities on utility history catalog objects as needed

- ❑ COPY, REORG, RUNSTATS, etc.
- ❑ Don't include other objects because utility history will not be collected

Regularly assess size of SYSUTILITIES and SYSOBJEVENTS tables

- ❑ Delete information no longer needed
- ❑ Delete oldest by timestamp
- ❑ Optionally, keep information for your most important utilities
- ❑ SYSOBJEVENTS rows are not too useful without corresponding SYSUTILITIES rows

Utility Object-Level History

- Function may be turned on and off multiple times
- Information is not collected
  - For utilities executed on Db2 utility history catalog objects and other special cases
  - Resource-unavailable condition during the update of the utility history catalog objects
  -  Does not affect successful completion of the utility !
- Information can be inserted or deleted by users or tools
- No automated cleanup process by Db2 utilities
  - Db2 for z/OS Tools can help with this

Considerations for Queries

SQL SELECT

- ❑ Filter, order and join utility history information in SYSUTILITIES, SYSOBJEVENTS and SYSCOPY correlating on **EVENTID** column to check, analyze, compare and manage utility executions

- ❑ Use ISOLATION(UR) to avoid contention
- ❑ 'WITH UR'
- ❑ Create user defined indexes over SYSUTILITIES, SYSOBJEVENTS and SYSCOPY if needed for better performance

Negative SQLCODEs returned for SELECT on utility history catalog tables

- ❑ Function/catalog level is too low
- ❑ Utility history table spaces may be in a restricted Db2 state

Sample Queries

Utilities with errors in the last 24 hours:

```
SELECT EVENTID, NAME, JOBNAME, UTILID, STARTTS, RETURNCODE, CONDITION
  FROM SYSIBM.SYSUTILITIES
 WHERE STARTTS >= CURRENT TIMESTAMP - 1 DAYS
   AND RETURNCODE >= 8
  WITH UR;
```

All active or stopped utilities:

```
SELECT EVENTID, NAME, JOBNAME, UTILID, STARTTS, RESTART, RETURNCODE, CONDITION
  FROM SYSIBM.SYSUTILITIES
 WHERE RETURNCODE IS NULL
   AND CONDITION=‘ ‘
  WITH UR;
```

Issue –DIS UTIL(*utilid*) command to check if stopped or active.

Sample Queries

How long did a utility/job take to execute ?

```
SELECT EVENTID, NAME, JOBNAME, UTILID, STARTTS, ELAPSEDTIME, RETURNCODE, CONDITION
  FROM SYSIBM.SYSUTILITIES
 WHERE NAME     = 'utility'
   AND JOBNAME  = 'jobname'
   AND STARTTS >= CURRENT TIMESTAMP - 7 DAYS
 ORDER BY ELAPSEDTIME DESC
  WITH UR;
```

Trend utility timings – detect deviations from 'the norm':

```
SELECT NAME, JOBNAME, STARTTS, ELAPSEDTIME, CPUTIME, NUMOBJECTS, LISTNAME
  FROM SYSIBM.SYSUTILITIES
 WHERE NAME = 'utility' AND JOBNAME = 'jobname'
   AND STARTTS >= STARTTS - 6 MONTHS
 ORDER BY STARTTS
 WITH UR;
```

Sample Queries (cont'd)

Total count of executions by utility name in the past week:

```
SELECT NAME AS UTILITY_TYPE, COUNT(*) AS UTILITY_COUNT
  FROM SYSIBM.SYSUTILITIES
 WHERE STARTTS >= CURRENT TIMESTAMP - 7 DAYS
 GROUP BY NAME
  WITH UR;
```

```
+-------------------------------------------------------------------------+
|                          UTILITY_TYPE                                   | UTILITY_COUNT  |
+-------------------------------------------------------------------------+
| COPY                                                                    |              5 |
| LOAD                                                                    |             32 |
| MODIFY RECOVERY                                                         |            128 |
| REORG                                                                   |             40 |
| REPORT RECOVERY                                                         |             13 |
| RUNSTATS                                                                |              2 |
+-------------------------------------------------------------------------+
```

Sample Queries (cont'd)

Most recent utility executed on partition 3 of table space DSN8D13A.DSN8S13E:

```
SELECT O.EVENTID, O.DBNAME, O.SPACENAME, O.PARTITION,
       U.NAME, U.ENDTS, U.RETURNCODE, U.CONDITION
  FROM SYSIBM.SYSOBJEVENTS O INNER JOIN SYSIBM.SYSUTILITIES U
       ON O.EVENTID=U.EVENTID
 WHERE DBNAME='DSN8D13A'
   AND SPACENAME='DSN8S13E'
   AND PARTITION=3
 ORDER BY EVENTTS DESC
 FETCH FIRST 1 ROWS ONLY
  WITH UR;
```

```
+-----------------------------------------------------------------------------------------+
|         EVENTID         |          DBNAME          |        SPACENAME         | PARTITION |
+-----------------------------------------------------------------------------------------+
|                   22976 | DSN8D13A                 | DSN8S13E                 |         3 |
+-----------------------------------------------------------------------------------------+
```

```
-------------------------------------------------------------------------------------------------------------------+
|                            NAME                                |           ENDTS            |   RETURNCODE   | CONDITION |
-------------------------------------------------------------------------------------------------------------------+
| REORG                                                          | 2024-04-29-10.01.17.412180 |              0 | E         |
-------------------------------------------------------------------------------------------------------------------+
```


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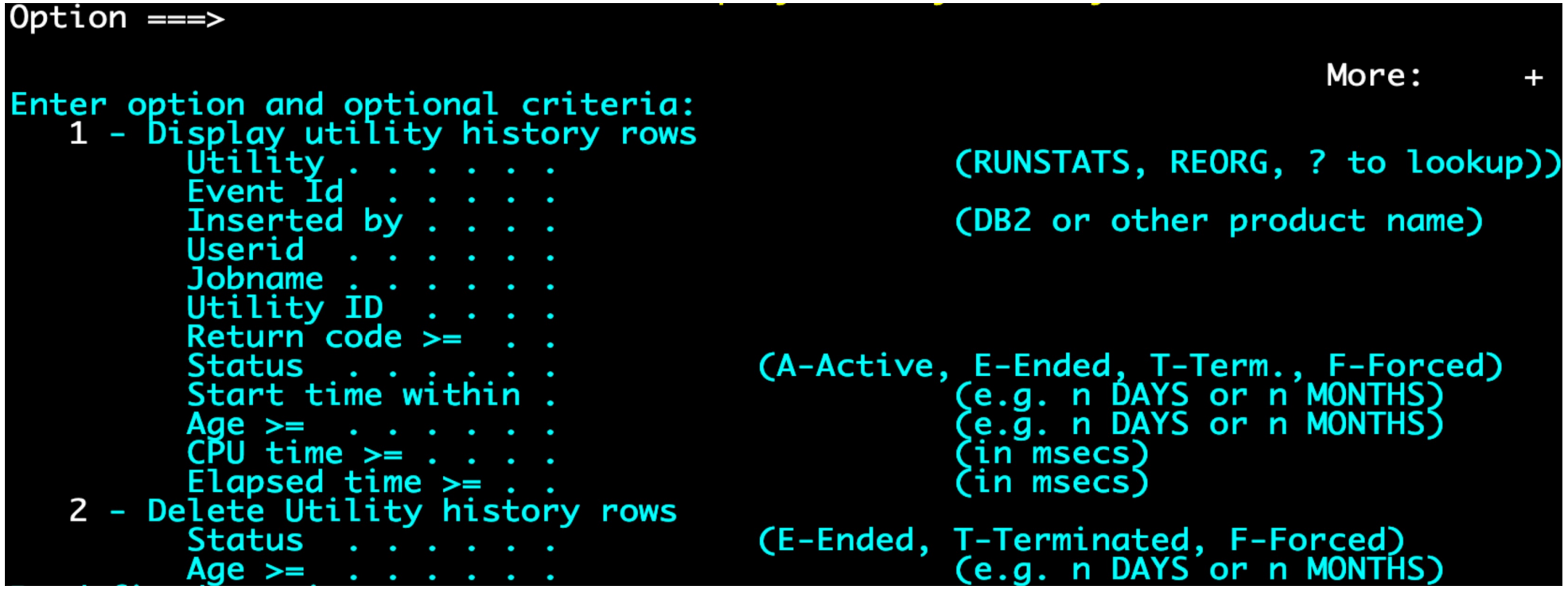
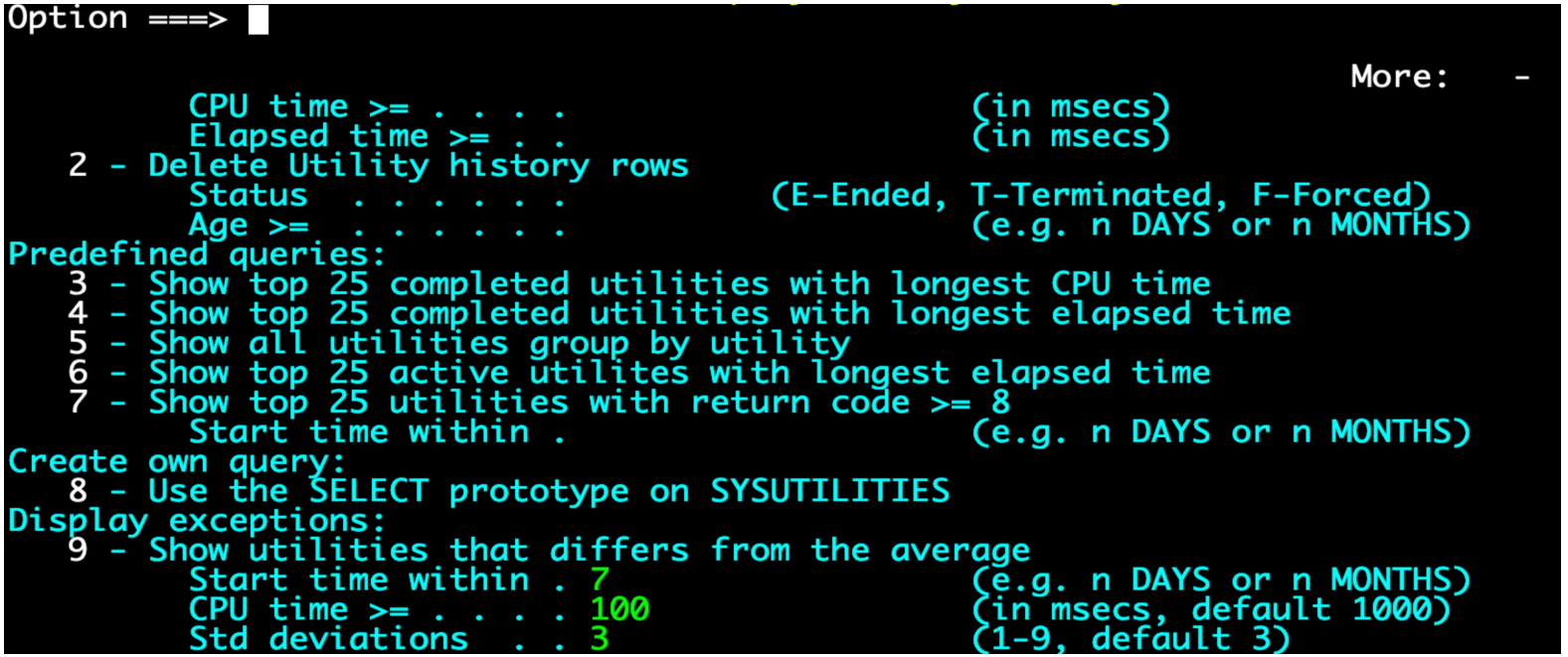
Utility History Use Cases

- Tooling should assist in the analysis
  - Here we see the options for querying the catalog from my favorite Admin Tool

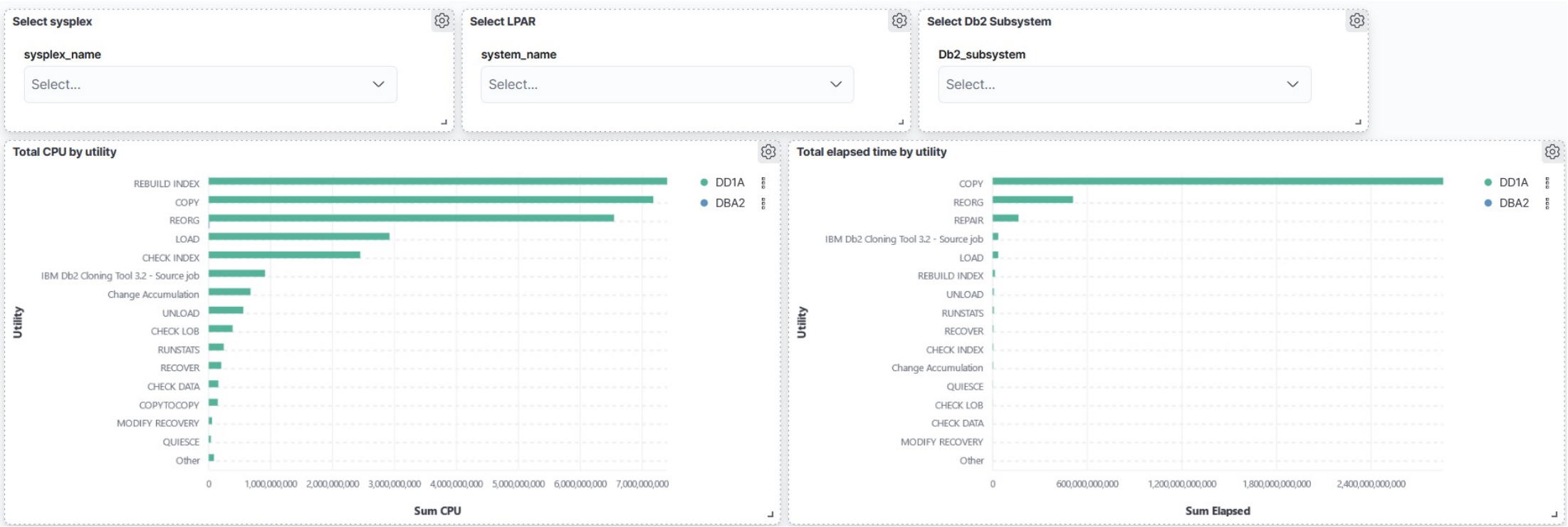


Utility History Use Cases

- Tooling can provide more complex query capabilities
  - Highlighting the most resource intensive utilities
  - Showing deviation from normal execution times etc



Utility History Use Cases – Sample Dashboard



Utility History Use Cases – Sample Dashboard

Most CPU consuming utility

Event id	Utility name	Utility id	CPU time
963,981	LOAD	LOAD1	17,346,337
915,299	COPY	TS5745.CIMSC2P	15,253,659
915,300	COPY	TS5745.CIMSC2R	15,188,828
915,298	COPY	TS5745.CIMSC2M	15,151,101
915,301	COPY	TS5745.CIMSC2Q	13,764,159
921,683	COPY	TS5745.CIMSC2M	13,436,233
921,684	COPY	TS5745.CIMSC2P	12,673,413
921,689	COPY	TS5745.CIMSC2T	12,667,908
921,685	COPY	TS5745.CIMSC2Q	12,392,854
878,114	Change Accumulation	TS3556.RDR0620P	12,290,000

Event id	Db2 subsystem	Utility name	Start	End	Utility id	User id	CPU time	Elapsed time	zIIP time	Sort CPU time	Sort zIIP time
963,981	DD1A	LOAD	2024-03-07-05...	2024-03-07-05...	LOAD1	TS6025	17,346,337	137,697,322	7,836,591	359,188	0

Utility History Use Cases

- Parameter Efficiency
  - What difference did changing parameters make to the execution ?
  - What types of objects benefitted most ?
- Problem determination - estimate time to completion
  - Example – Called out overnight due to long running utility
    - Do you cancel ?
    - Look at previous execution times and trends to make better decision
- Find unsuccessful utility executions
  - Trend failure patterns
  - Do utilities commonly fail at the same time ?
- Partition //ism
  - Are partitions handled in the most efficient way ?
- Change Management history

Usage Notes

- Rows not deleted when objects dropped
  - User responsible for deletion – keep track of sizes
- Resource unavailable stops collection but does not affect utility execution
- Near '*real-time*' updates
- Utility Restart
  - Inserts, or updates SYSOBJEVENTS as needed
  - Note: COUNT represents processing (original & restart)
  - ELAPSEDTIME for COPY/RECOVER represents restart only
- Utility failures
  - Utility Abends do not update SYSOBJEVENTS
  - TERM UTIL does not update SYSOBJEVENTS
  - START ACCESS(FORCE) does not update SYSOBJEVENTS
- BACKUP/RECOVERY of SYSOBJEVENTS/SYSUTILITIES
  - Can be backed up and recovered together
  - Cannot be combined with other tablespace(s)
  - Restriction to avoid contention if history collection is active

Agenda

- Overview
- Understanding History Information
- Using Utility History
- Closing

Future Possibilities

What other essential utility information do you need?

AHA! Ideas and requests for:

- ❑ SHRLEVEL (DB24ZOS-I-1389)
- ❑ Utility control statement (DB24ZOS-I-1447)
- ❑ Utility job output
- ❑ ZSORT (DB24ZOS-I-1433)
- ❑ DSNTIAUL support
- ❑ Ability to activate or request object-level history in job step

Publication Links

IBM Community Blog Db2 13 for z/OS: Capturing utility and object-level history
➢https://community.ibm.com/community/user/datamanagement/blogs/kate-wheat1/2023/11/21/objecthistory

Db2 13 Monitoring utility history
➢https://www.ibm.com/docs/en/db2-for-zos/13?topic=utilities-monitoring-utility-history

Db2 13 SYSIBM.SYSUTILITIES catalog table
➢https://www.ibm.com/docs/en/db2-for-zos/13?topic=tables-sysutilities

Db2 13 SYSIBM.SYSOBJEVENTS catalog table
➢https://www.ibm.com/docs/en/db2-for-zos/13?topic=tables-sysobjevents

Db2 13 Overview of what's new in Db2
➢https://www.ibm.com/docs/en/db2-for-zos/13?topic=13-overview-whats-new-in-db2#db2z_13_wnewoverview__sect-utilities

Db2 13 Function level 504 (APAR PH54919 –October 2023)
➢https://www.ibm.com/docs/en/db2-for-zos/13?topic=levels-function-level-504-apar-ph54919-october-2023

IBM Redbook Db2 13 for z/OS and More
➢https://www.redbooks.ibm.com/abstracts/sg248527.html

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