

# IBM Db2 for z/OS Utilities: The Latest Developments

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Db2 for z/OS Development

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## Agenda

- V12 quick review
- Recent Enhancements
- Summary

## Db2 12 Utilities

- REORG
  - Improved Flashcopy management
  - Improved part-level PBG REORGs
  - Up to 50% additional offload to zIIP
  - New mapping table format support
  - Display claimer information on each drain failure, not just last

## Db2 12 Utilities

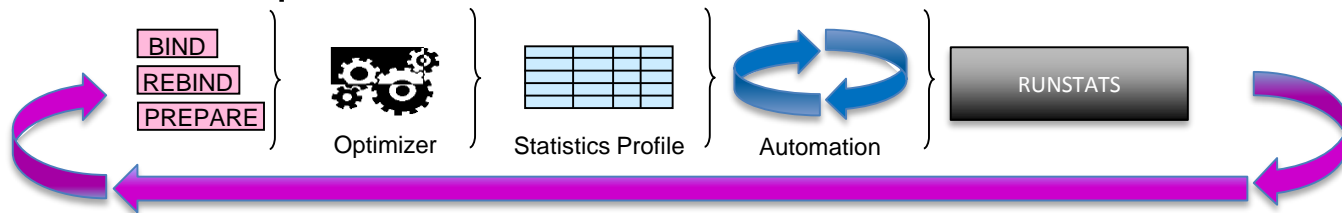
- LOAD
  - Performance improvement for LOAD PART REPLACE with dummy input
    - Against empty PBR partition – 99% CPU, 98% ET reduction
  - LOAD SHRLEVEL CHANGE PARALLEL support for PBG
  - Up to 90% additional zIIP offload
  - Maintain MAXASSIGNEDVAL for identity columns
  - Eliminate datasharing overhead with UNLOAD ISO(UR) REGISTER NO option

## Db2 12 Utilities

- Backup & Recovery
  - PIT recovery support for PBG table spaces
  - SLB and FlashCopy enhancements
    - HSM messages in utility job output
    - Multiple codypool support
  - Option to skip PIT recovery for non-updated pagesets
  - MODIFY RECOVERY delete datasets

## Db2 12 Utilities

- RUNSTATS
  - Optimizer & DDL direct update of stats profiles
  - USE PROFILE support for inline stats in REORG & LOAD
  - Inline stats support for LOAD PARALLEL
  - INVALIDATECACHE option to avoid dynamic cache invalidation
  - COLGROUP performance – 25% CPU, 15% ET reduction



## Recent News

- LOAD RESUME BACKOUT YES
  - Avoid leaving objects in RECP on LOAD failure
  - Objects left in copy-pending
  - PI08421/PI54658
- LOAD RESUME BACKOUT YES at partition-level
  - Avoid need to serialise at tablespace-level
  - PI81204/PI81244



## Recent News

- LOAD utility IGNORE(WHEN) option
  - Ignore records that do not satisfy WHEN clause instead of treating them like discarded records
  - PI44415 & PI44465
- LOAD utility additional IGNORE options
  - CONV, PART, VALPROC, IDERROR, DUPKEY
  - PI77155

## Recent News

- LOAD CONSTANT support
  - Override data in SYSREC, or supply values for fields not in SYSREC
  - PI08421

```
+--CONSTANT(-----+--'string'-----+--)->
+--X'hex-string'-----+
+--integer-----+
+--CURRENT DATE-----+
+--CURRENT TIME-----+
+--CURRENT TIMESTAMP--+
+--NULL-----+
```

- LOAD CONSTANTIF support
  - Conditionally replace input data with a constant value
  - Also support for CONSTANT with relative positioning in SYSREC
  - PI69405

## Recent News

- Faster UTS PBR conversion: Support REORG partition parallelism and honour KEEPDICTIONARY
  - PI71930
- Utility support for block level variable length key sorting in Db2 Sort
  - PI60788

## Recent News

- NOSYSCOPY option for RECOVER to support recovery to image copy not defined in SYSCOPY
  - PI67547
- Faster point-in-time recovery in RI environments
  - Smarter RI set checking
  - Customer test: RECOVER TOCOPY of single partition reduced from 5:28m to 2s
  - PI62586

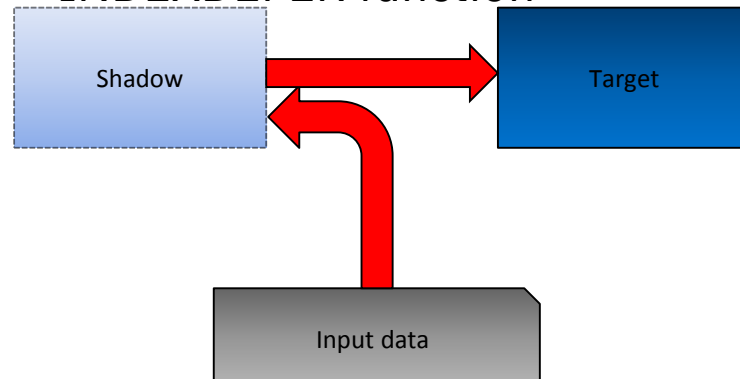
## Recent News

- LOAD support for new DATE, TIME, TIMESTAMP formats
  - PI69064

DATE_A	mm-dd-yyyy	TIME_A	hh.mm.ss	TIMESTAMP_A	yyyy-mm-dd-hh.mm.ss
DATE_B	mm-dd-yy	TIME_B	hh.mm	TIMESTAMP_B	yyyy-mm-dd-hh.mm.ss.nnnnnnn
DATE_C	yyyy-mm-dd	TIME_C	hh.mm AM	TIMESTAMP_C	yyyymmddhhmmss
DATE_D	yy-mm-dd		or hh.mm PM	TIMESTAMP_D	yymmddhhmmss
DATE_E	dd-mm-yyyy	TIME_D	hhmmss	TIMESTAMP_E	yyyymmddhhmmssnnnnnn
DATE_F	dd-mm-yy	TIME_E	hhmm	TIMESTAMP_F	yymmddhhmmssnnnnnn
DATE_G	yyyy-ddd				
DATE_H	yy-ddd				
DATE_I	mmddyyyy				
DATE_J	mmddy				
DATE_K	yyyymmdd				
DATE_L	yymmdd				
DATE_M	ddmmyyyy				
DATE_N	ddmmyy				
DATE_O	yyyddd				
DATE_P	yyddd				

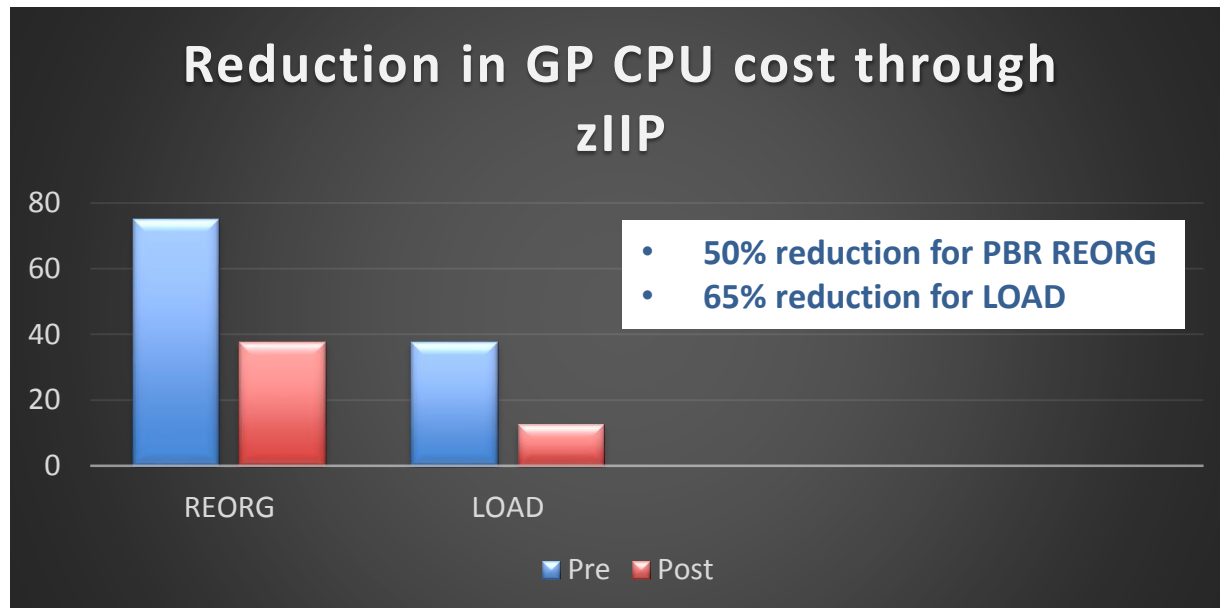
## Recent News

- LOAD REPLACE SHRLEVEL REFERENCE
- LOAD utility pre-validation
  - Including CHECK constraints
- Support usual drain options, including SWITCHTIME
- Works for partition load also
  - Logical NPSI partitions left in RBDP – INDEXDEFER function
- V11: PI67793
- V12: PI69095



## Recent News

- Retrofit zIIP offload from V12 to V11 for LOAD & REORG
  - PI73882
  - PI80243



## Recent News

- CHECK LOB performance
  - 50% CPU reduction, 90% elapsed time reduction
  - PI83928
- Storage reduction for UNLOAD of XML data
  - >4Gb per utility down to 10s of Kb
  - PI84464
- LOAD RESUME LOG NO support for inline image copies
  - PI81723/PI81724



## Recent News

- Statistics COLGROUP performance improvement for single column COLGROUPs
  - New STATCLGSRT zparm
    - Default 10Mb, avoid external sort cost
  - PI74408
  - 100m row table, 20 parts, 6 indexes
    - LOAD STATISTICS TABLE COLGROUP: 39% CPU reduction, 29% ET reduction
    - REORG STATISTICS TABLE COLGROUP: 46% CPU reduction, 37% ET reduction
    - RUNSTATS COLGROUP: 64% CPU reduction, 41% ET reduction
  - PH03678: New STATCLGMEMMSRT parameter in RUNSTATS

DSNU1387I DATA SORT FOR SINGLE COLUMN COLGROUPS AVOIDED

DSNU1388I DATA SORT NOT AVOIDED FOR COLGROUPS.

ESTIMATED SPACE REQUIRED = space-value,

SPACE SPECIFIED BY THE STATCLGSRT PARAMETER = storage-limit-value.

## Recent News

- REORG SWITCH phase performance improvement
  - Drive parallel close of part-level inline copy datasets
  - Up to 127-way parallelism
  - Particularly noticeable to tape
  - PI75816
- Reduce application impact from REORG delete of PBG parts
  - Remove need for 2nd drain at end of SWITCH phase
  - Avoid immediate -904 application failures
  - PI86522

## Recent News

- Online REORG last log iteration performance improvement
  - VVDS update before drain, only update VVDS after drain if HURP changes
  - PI83152
- Permit other utilities to run concurrently with REORG of SYSCOPY
  - PI96693
- LOAD SHRLEVEL NONE NOCHECKPEND option
  - Previously only supported for SHRLEVEL REFERENCE
  - PI85722

## Recent News

- LOAD RESUME SHRLEVEL CHANGE PARALLEL resiliency
  - Avoid deadlocks between parallel insert tasks inserting duplicate index keys
  - PI90233
- Avoid long-running UR in LOAD RESUME index build
  - Prevent replication impact
  - PI92244

```
DSNR035I  -D341 DSNRPBCW WARNING - UNCOMMITTED UR   924
AFTER 40 CHECKPOINTS -
      CORRELATION NAME = GPFE113A
      CONNECTION ID   = UTILITY
```

## Recent News

- Acquire BSAM buffers in real both below and above bar
  - PI95858
  - 30 COPY jobs, PARALLEL 3, BUFNO 99, LBI: 30x3x99x256Kb = 2.3Gb
- Improved REORG support for inline copies to tape
  - PI75518
  - V12 new FL only
- REORG to issue –DIS DB LOCKS instead of CLAIMERS if drain failure due to locks
  - E.g. 00C200EB resulting from retained locks
  - PI95911

## Recent News

- Change default for REGISTER parameter from NO to YES for UNLOAD & RUNSTATS
  - PI99075
- Reduce logging volume for REORG
  - Caused by logging of compression dictionaries in SYSUTILX
  - PI92536
- Avoid package invalidation on conversion to PBR or PBR RPN
  - Quiesce of packages still necessary
  - PH01819

## Recent News

- Issue message DSNU2930I and RC4 from REORG if detect rows in wrong partition
  - PI88906

```
DSNU2930I    csect-name - OUT OF PARTITION-SEQUENCE KEYS DETECTED FOR  
INDEX creator-name.index-name
```

- Improved cleanup of expired/deleted XML documents by REORG and additional informational messages
  - PH01354

```
DSNU2931I    csect-name - EXPIRED XML RECORDS OLDER THAN discard-threshold WILL BE  
DISCARDED FROM XML TABLE SPACE dbname.tsname
```

```
  OLDEST READ CLAIMER RBA/LRSN VALUE IS:  read-lrsn
```

```
  LAST SYSTEM COMMIT RBA/LRSN VALUE IS:  commit-lrsn
```

```
DSNU2932I    csect-name - UNLOAD PHASE STATISTICS.  NUMBER OF EXPIRED XML RECORDS  
DISCARDED = mmmmmmm for TABLESPACE dbname.tsname
```

## Recent News

- New FLASHCOPY\_XRCP zparm to support RPFC in XRC environments
  - PH01728
  - Supports RPFC delivered in z/OS 2.2 via OA55068
- Allow delete of rows that are discarded by REORG DISCARD
  - Prior to this REORG would fail
  - Updates still not allowed
  - PI98259
- COPY FLASHCOPY CONSISTENT performance improvement
  - PI93390



## Recent News

- RUNSTATS improved sampling
  - New zparm STATPGSAMP
  - Options are SYSTEM, YES, NO - default is SYSTEM
  - YES
    - TABLESAMPLE SYSTEM AUTO will be used by default when gathering stats on UTS objects
    - SAMPLE option is overridden
    - TABLESAMPLE SYSTEM will not be overridden, i.e. we will use page sampling but a sampling rate will not be overridden
  - NO
    - Do not use page sampling by default for UTS tablespaces, keep existing behavior
  - SYSTEM
    - Db2 determines default sampling method
    - Current default is NO
  - New TABLESAMPLE SYSTEM NONE option
    - Overrides STATPGSAMP zparm setting
    - SAMPLE is allowed in this instance, otherwise SAMPLE is not supported with TABLESAMPLE
  - PH07220

## Recent News

- FlashCopy performance improvement
  - Avoid repetitive scans of SYSCOPY for multiple partitions
  - PH05377
- New zparm to control padding on REORG DISCARD
  - REORG\_TS\_NOPAD\_DEFAULT
  - PH00317
- MODIFY RECOVERY FLASHCOPYONLY option
  - PH04023
- LOAD support for multiple SYSREC datasets
  - PI96136

## Summary

- Continued focus on comprehensive, efficient management of Db2 environments
- New solutions in support of ever-greater demands for simplicity, availability, efficiency

The background of the image is a dark blue overlay featuring a complex financial chart. The chart includes a candlestick pattern, a red line graph, and a blue line graph. A hand is visible on the right side, with the index finger pointing towards the chart. In the center-left, there is a white speech bubble with a black outline containing the text 'Thank You'.

Thank  
You