Datacom Community Update

Recent New Features for Datacom 15.1 Continuous Delivery

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February Snapshot: Datacom Innovation Roadmap

	Delivered	Planned	Under Consideration
Embrace Open	• Datacom systems REST API (7 DST endpoints) • Datacom SQL support in VSCode COBOL LS • SQL performance enhancements (IN, LIKE, more predicates to CBS)	• *SQL Performance Analyzer MVP • Hash Join for SQL optimizer • Education web-based training (4 modules in progress) • YouTube videos	• *Datacom business data REST API support • *Enhanced SQL Performance Analyzer • Additional SQL syntax
Simplify & Automate	• Command Quick Reference in TechDocs • CREATE TABLE with COMPRESSION • RETIX cc=4 if dups encountered	• Ideal online transaction table management	• Further simplification of MUF startup parameters • Mainframe Operational Intelligence (MOI) integration
Optimize	• VSAM support for INDEX areas (with restrictions) • Buffer Pools by Area for DATA areas (with restrictions) • Portable Software Instances (PSIs or "portable packages") for major components • Large Page Frames for DXX buffers in Alternate Buffer Pools • z/OS 2.5 compatibility • MASSADD performance	• Datacom Server 15.1 (reduced CPU utilization) • VSAM support for INDEX areas (with restrictions relaxed) • VSAM support for DATA areas (with restrictions, then restrictions relaxed) • CTS 6.1 compatibility • Improved DBC tracing	• Improved dasd utilization for compressed tables ("DSOP 6") • Enhanced Mainframe Application Tuner (MAT) integration • Mainframe Resource Intelligence (MRI) integration
Security & Data Protection	• DBSRV 15.0 possible security vulnerability	• *Support for IBM Pervasive Encryption (based on VSAM support)	• *Enhanced security for SQL performance analyzer • Security Technical Implementation Guide (STIG)

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May Snapshot: Datacom Innovation Roadmap

	Delivered	Planned	Under Consideration
Embrace Open	• Datacom systems REST API (7 DST endpoints) • Datacom SQL support in VSCode COBOL LS • SQL performance enhancements (IN, LIKE, more predicates to CBS)	• *SQL Performance Analyzer MVP • Hash Join for SQL optimizer • Education web-based training (4 modules in progress) • YouTube videos	• *Datacom business data REST API support • *Enhanced SQL Performance Analyzer • Additional SQL syntax
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Agenda

Overview of recent new features:

- SQL Hash Join

- Linear VSAM Datasets & Pervasive Encryption

- Ideal Online Transaction Management

- What's Next Preview

- Announcements

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Hash Join

May 12, 2022

Richard Williamson

Senior Principal Software Engineer

Hash Join

Agenda:

- Overview

- Key Benefits

- Hashing Explained

- When is a Hash Join Used?

- Configuration

- Turning Hashing On

- When a hash limit is reached

- New Messages

- Questions

SQL Hash Join

Use Case:

A Datacom applications now benefit from significantly improved performance with certain classes of SQL queries, especially those that do not have a "good" join key where otherwise the entire table may need to be read.

Optimize

Hash Join method now available to Datacom SQL Optimizer for automatic selection

Addresses issues for Ad hoc queries without indexes to locate matching rows

Uses 64-bit "above the bar" memory with MEMLIMIT parameters for limit customizations

Bottom Line:
Improves SQL query performance; reduces the cost of joins and subqueries

SQL Hash Join Enhancement:

- Enhances the Datacom SQL Optimizer to add "Hash Join" method, in addition to Sort-Merge and Nested Loop methods, for the purpose of processing joins and correlated subqueries

- HASH JOIN reduces the cost of joins and subqueries by building a hash table of the qualifying inner table rows in 64-bit memory ("above the bar"). Outer table qualifying rows probe this hash table to perform the join

- HASH JOIN is the fastest join when there is no matching index for the join predicates on the inner table. HASH JOIN also outperforms a merge join when a sort is required

- Activate HASH JOIN with MUF startup options HASH_QUERY_MEMLIMIT and HASH_MUF_MEMLIMIT

```
DATACOM_OPTIMIZATION = 'USE HASH JOIN'
```

```
//$$$$$$@ EXEC PGM=DBSRFPR,PARM='PLAN *.* HASH'
```

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Key Benefits

- Reduces the cost of:

  - Joins with no matching index
  - Correlated or quantified subqueries

- Builds a hash table of the qualifying inner table (or subquery) rows in 64-bit memory ("above the bar")

- Outer table qualifying rows probe this hash table to perform the join (or subquery)

- Hash is the fastest join method when there is no matching index for the join predicates on the inner table

- Outperforms a merge join when a sort is required

  - A sort-merge join has the overhead of sorting the inner table and often the outer table as well

  - A nested loop join without a matching index must sequentially search all qualifying rows of the inner table for each outer table qualifying row

- Replaces sequential scan of subquery temporary table with fast direct hash lookup

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Hashing Explained

- A hash join is a kind of nested-loop join with the hash table providing quick random access to the
inner table in lieu of an index

- The join column(s) (or subquery predicate column)
are used to compute an index into an array of pointers to rows

- Using a large hash table, few rows will have the
 same hash value, and provide very quick direct access

- "Above the bar" memory is allocated 1MB at a time
as needed

HASH TABLE

Key:
"Paloma Guerrero"
Value:
"Toronto"

Key:
"Katie Huang"
Value:
"New York"

Key:
"Karl Dippmann"
Value:
"Manila"

Hash
Function

Key   Bucket

00 "New York"
01
02
03 "Toronto"
04
05 "Manila"
06

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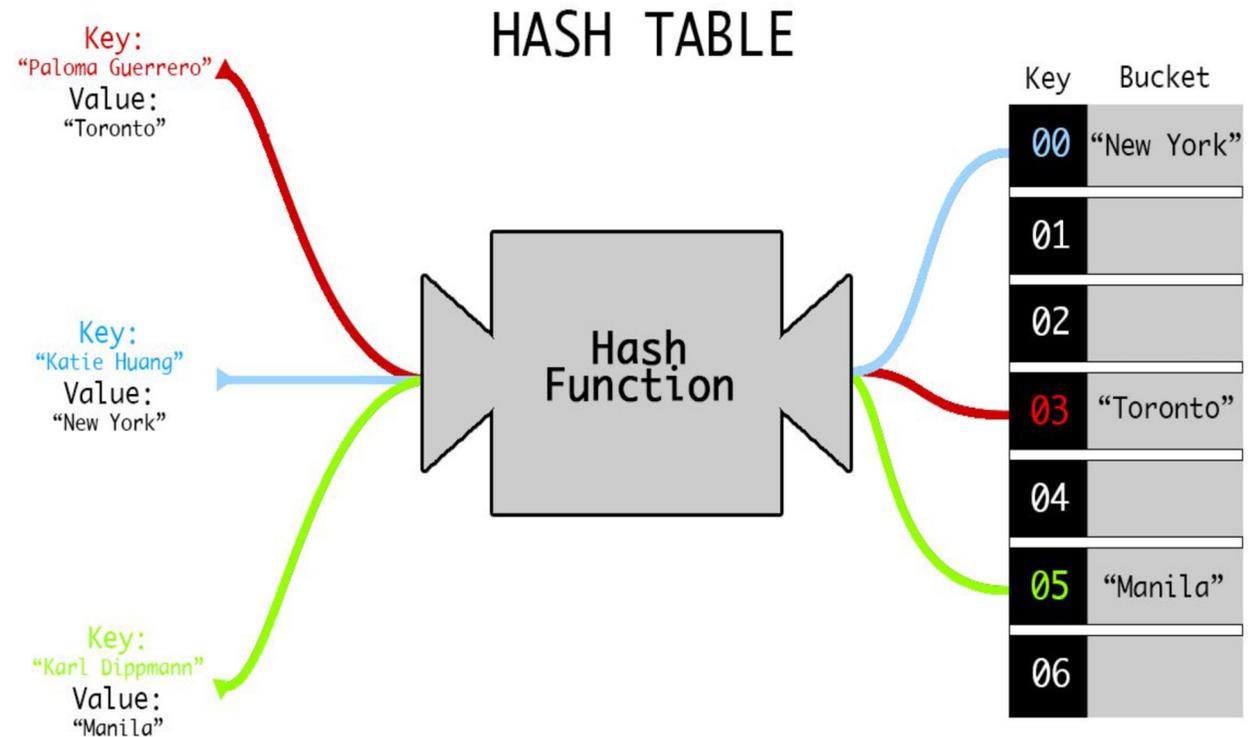
When is a Hash Join Used?

- The Optimizer is conservative in selecting a hash join to avoid cases where it is not the best join method by only selecting a hash join when there is no matching index for the equijoin columns of the inner table

  - A low cardinality non-join first key column does not force a hash join since CBS skip-sequential processing allows fast access

- Hashing is always used for temporary tables which have no index, such as a Nested Table Expression (NTE) and a materialized view

- A hash join can be forced with DATACOM_OPTIMIZATION = 'USE HASH JOIN' in the ON clause

- Before, a sort-merge join would normally be used, but with SQL_OPTIMIZATION_LEVEL 1 set, this is not allowed. And the input/outer/left table would always be sorted if the result of a previous join. And large sorts copy the data multiple times. So a hash join is faster than a sortmerge join

- A hash table is also used for all correlated or quantified subqueries

  - This provides direct access to the data instead of sequentially scanning a temporary table

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Configuration

Parms to control use of 64-bit memory

HASH_MUF_MEMLIMIT

This parameter limits the amount of 64-bit memory SQL can use for hashing

- valid values 0 - 19G
- **Zero turns use of hashing off for SQL**
- **Default: zero**
- SQLCODE -588 indicates this limit was reached
- It is strongly suggested that at least as much memory is allowed as for a TTM virtual table, since hashing is used in place of a TTM table
- The decision to use hashing is made a bind time. Therefore, a query must be rebound after hashing is turned on to actually use hashing. The DBSFRPR batch utility may be used to rebind embedded host language static queries
- When hashing is turned off (by setting HASH_MUF_MEMLIMT = 0), existing queries are automatically rebound before execution begins to not use hashing

HASH_QUERY_MEMLIMIT

This parameter limits the amount of 64-bit memory a single query can use for hashing

- valid values 1M - 19G
- Default: no limit
- Values greater than HASH_MUF_MEMLIMIT are, in effect, no limit since HASH_MUF_MEMLIMIT is reached first
- SQLCODE -589 indicates this limit was reached

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Configuration

Create new SQL system database

- There is a new SQL System table that reports hash table use

- It is in a new SQL System Database (which will later have additional system tables)

- SAMPJCL member is in the PTF LU05231 ++HOLD

- The new base is 1016, and it is created using SQL (and PREINIT)

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Turning hashing on

- You must rebind static SQL plans to use HASH JOIN:

  //STEP010 EXEC PGM=DBSRFPR,PARM='PLAN *.* HASH'

- The new hash keyword is used only to save rebound plans that now use hash tables

- Also, temporarily clear the Source Cache (or cycle MUF) for dynamic plans so a rebind can occur

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When a hash limit is reached

1. The query is terminated and resources released

2. The query is marked with the hash limit it exceeded
   a. If the query is in the Source Cache, it is saved to disk
   b. If host language static query, the permanent plan is updated

3. The SQL SYSOUT contains a message showing the query, the limit hit, and the current number of rows

4. The query is rebound to not use hash tables and restarted, and No SQLCODE is returned to the application
   (unless DATACOM_OPTIMIZATION = 'USE HASH JOIN')

The SQL Performance Analyzer shows the memory used for hashing

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New Messages

-588 - HASH MUF MEMLIMIT nnn MB EXCEEDED AT nnn ROWS FOR authid.tblName

Reason:

A query attempted to acquire more 64-bit memory for hash tables than currently available based on the HASH_MUF_MEMLIMIT. The query was rebound to not use hash tables and restarted. This error is not returned to the application, since the query was restarted. However, it is counted in the list of SQLCODEs to track how often this occurs.

Action:

To allow the query to use hash tables, increase HASH_MUF_MEMLIMIT, and rebind the query.

-589 - HASH QUERY MEMLIMIT nnn MB EXCEEDED AT nnn ROWS FOR authid.tblName

Reason:

A query attempted to acquire more 64-bit memory for hash tables than HASH_QUERY_MEMLIMIT allows. The query was rebound to not use hash tables and restarted. This error is not returned to the application, since the query was restarted. However, it is counted in the list of SQLCODEs to track how often this occurs.

Action:

To allow the query to use hash tables, increase HASH_QUERY_MEMLIMIT, and rebind the query.

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Questions?

Linear VSAM Datasets & Pervasive Encryption

May 12, 2022

Joe Lynn

Software Architect

Linear VSAM Datasets & Pervasive Encryption

Agenda:

- Overview

- VSAM Media Manager

- Elements of VSAM Support Available

- Performance Expectations, small

- Feature Rollout

- CXX

- Each Individual Dataset

- Restrictions

- Messages

- Questions

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VSAM Linear Datasets with Pervasive Encryption

Delivered

Use Case:
DBAs get Pervasive Encryption support, increased zIIP offload (improving ROI) without application changes or outages.

Optimize

✓ Datasets can now be defined as VSAM, and not just EXCP type

✓ Performs I/O in SRB mode (zIIP enabled I/O)

✓ Encryption & decryption support with IBM Pervasive Encryption

Bottom Line:
Potential additional zIIP offload (depending on environment). Pervasive Encryption is available for Datacom datasets, providing end-to-end encryption some sites require.

VSAM Linear Datasets Enhancement:

• This enhancement provides the ability to store Datacom/DB data and indexes in VSAM Linear datasets managed by Media Manager (in addition to the current BDAM datasets with EXCP)

• Ability to convert databases, singularly at your convenience; one time action to convert and implement Pervasive Encryption

• Future I/O-related enhancements by IBM (written to benefit VSAM and Db2, etc.) will be inherited right away, without requiring Datacom development

• Further zIIP offload (I/O is started on an SRB instead of a TCB that drives an SRB -- eliminates SRB/TCB switching)

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VSAM Media Manager

- Media Manager: Low-level access method for VSAM

- As IBM develops new hardware features, they add support in MMGR

  - ➢ Performs I/O in SRB mode

  - ➢ AMODE 64 support – Support for buffers <u>and control blocks</u> above the bar

  - ➢ High Performance FICON (zHPF) – Transport Mode versus traditional Channel Mode I/O

  - ➢ Pervasive Encryption

  - ➢ Much easier to use than EXCP

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Elements of VSAM Support Available

- Performance expectations

- Feature rollout

- New Directory CXX level set must be applied

- Each individual dataset must be handled

- Many restrictions

- Examples

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Performance Expectations, small

- Datacom is architected to minimize I/O

- Users tune the environment to minimize I/O

- Every I/O (EXCP and VSAM) causes bytes to be shipped down channel

- It is not easy to measure actual CPU and elapsed time with real applications

- Do not *expect* to see noticeable CPU or elapsed savings

  - Be pleasantly surprised for anything beneficial

- VSAM Linear exploits the newest and best

  - Software abilities

  - Hardware abilities

  - It is faster

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Feature Rollout

- It is a major feature with many ripple effects

  - Most will not be visible or measurable

- If you have a private QA environment

  - Pick the biggest, busiest area

  - Stress test your available QA regressions

  - Compare your results, previous EXCP to new VSAM

- In a test system, start with one area

  - After several weeks, convert additional areas

  - Vet proper execution for several months

- For production

  - Start with low-volume areas with low impact

  - Start with areas allowed to be closed for the conversion

- VSAM Linear is better

  - For a pile of reasons

  - Over a 'long' time all areas should be converted

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New Directory CXX level set required

- CXX level option to allow VSAM

  - CXXMAINT OPTION=ALTER,OPTION2=Y_VSAM to set (N_VSAM to remove)

  - Allows: DBUTLTY INIT TYPE_IO=VSAM/EXCP

- Causes DBUTLTY and MUF to apply selected 'Best Practices'

  - Hopefully, all are already active

  - Requires and forces
    - Data fast search
    - Data high use
    - Area extent validation
    - No single user
    - CXX history
    - Converts DSOP 0 and DSOP 1 to DSOP 4
    - Datacom/AD MUF to LOG_RECORD_FORMAT 1 (recommended for Datacom/DB)
    - MUF command forced: IO_STYLE_NEWER

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Each individual dataset must be handled

- IDCAMS
    - DEFINE CLUSTER (
    - NAME(clusterdsn)
    - LINEAR
    - DATACLASS(name) STORAGECLASS(name)
    - CYL(n,n)
    - CONTROLINTERVALSIZE(blocksize)
    - EATTR(OPT) SHAREOPTIONS(3 3))
    - DATA (NAME(clusterdsn.DATA))

- Main rules for dataset
    - LINEAR EATTR(OPT) NOREUSE SHAREOPTIONS(3 3)
    - SMS
    - Cylinder aligned
    - Stripes 1
    - 3390
- … continued

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Each individual dataset (cont'd)

- DBUTLTY function INIT common for index and data areas

  - Add keyword TYPE_IO= with VSAM (or EXCP)
    - This will default to what the JCL DDNAME points to

  - At INIT the CXX must be set with VSAM.

  - DBUTLTY must run authorized to open VSAM

  - Keyword 'VOLUMES=' is allowed but ignored

  - Performs all the required editing
    - Many requirements, all documented

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Each individual dataset (cont'd)

INIT for index area

- BLKSIZE defaults to 4k, allowed as 4096 or 8192

- BLKSIZE= less than 4k rounded up to 4k, less than 8k to 8k

- OLDEP=NO is required
  - Defaults for bases 256-5000
  - Must be specified for bases 1-255

- For index areas, FORMAT2 is required
  - Defaults for all bases
  - Error if FORMAT1 is specified

INIT for data areas

- Supported block sizes
  - 4k - 4,096 (12 blocks per track)
  - 8k - 8,182 (6 blocks per track)
  - 16k - 16,384 (3 blocks per track)
  - 24k - 24,536 (2 blocks per track)

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Each individual dataset (cont'd)

- VSAM block sizes, bytes per track, bytes per cylinder

  - 4096 x 12 r/t = 49,152 track or 737,280 cylinder

  - 8192 x 6 r/t = 49,152

  - 16384 x 3 r/t = 49,152

  - 24576 x 2 r/t = 49,152

- EXCP block sizes, bytes per track, bytes per cylinder

  - 4,096 x 12 r/t = 49,152 track or 737,280 cylinder

  - 7548 x 7 = 52,836 x 15 = 792,540

  - 13682 x 4 = 54,728 x 15 = 792,540

  - 18452 x 3 = 55,356 x 15 = 830,340

  - 27998 x 2 = 55,996 x 15 = 839,940

- So with larger block sizes used with EXCP, will need more space for VSAM datasets

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Each individual dataset (cont'd)

Conversion without outage for DBUTLTY INIT

- DBUTLTY function PREINIT
  - Add keyword TYPE_IO= with VSAM (or EXCP) is required
  - For index areas, OLDEP=NO is required
  - For index areas, FORMAT2 is required
  - For index areas, IXXAREA=IXX is required
  - For data areas supported block sizes 4K, 8K, 16K, or 24k
  - DBUTLTY must run authorized to open VSAM

24x7 conversion

- ONLINE_AREA_MOVE (OAM) when block size same (4k, 8k, 16k, 24k)
  - May not use/keep the same DSN
  - Moves blocks from old to new
  - Updates CXX stored DSN at completion
  - You still must fix DBUTLTY INIT JCL for DSN and keywords

- Blocksize Alter 24x7 (BA24) - Not currently available
  - Row mover, one by one
  - Each must be logged as a moved row
  - Much slower than OAM which is block mover
  - Rows moved by Native Sequence key so fully reorganized
  - Used to 'right size' a data area

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Many Restrictions

- Initial GA feature, restrictions to ensure easy success

- No data areas with DB table encryption

- No system areas: CXX, LXX, FXX

- No MUFPLEX with a Coupling Facility (Shadow without C.F. is ok)

- Need common memory module DBPCCPR (using CAIRIM) at 2020 or later

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Examples, OAM, BA24

Message examples
- `DB02818I - ONLINE_AREA_MOVE 3311 IXX STATUS COMPLETE, AREA STILL OPEN E>V M:S-0:3 IO-42`
- `DB02818I - ONLINE_AREA_MOVE 3319 IXX STATUS COMPLETE, AREA STILL OPEN V>E M:S-0:1 IO-8`
- `DB02818I - ONLINE_AREA_MOVE 3318 IXX STATUS COMPLETE, AREA STILL OPEN M:S-0:8 IO-7,781`
- `DB02837I - ONLINE_TABLE_MOVE 3318 AR1 STATUS COMPLETE, AREA STILL OPEN M:S-0:32 IO-112`
- `DB02837I - ONLINE_TABLE_MOVE 3319 AR2 STATUS COMPLETE, AREA STILL OPEN E>V M:S-0:42 IO-761`
- `DB02832I - BLOCK ALTER 24X7 3310 AR2 STATUS STARTED BLOCK SIZE 4,096 24,576`
- `DB02832I - BLOCK ALTER 24X7 3310 AR1 STATUS COMPLETE, AREA STILL OPEN M:S-0:33 IO-23`
- `DB02832I - BLOCK ALTER 24X7 3319 AR2 STATUS COMPLETE, AREA STILL OPEN E>V M:S-0:42 IO-577`
- `DB02843I - DATA AREA INFO - 320 AR4  P-ENCR  AREAEV  04096  TBNM-HST`

DBUTLTY examples
- `INIT AREA=IXX,DBID=497,TYPE_IO=VSAM,OPTION2=FORMAT2,OLDEP=NO,BLKSIZE=4096`
- `INIT AREA=A01,DBID=497,TYPE_IO=VSAM`
- `PREINIT AREA=IXX,DBID=797,BLKSIZE=8192,IXXAREA=IXX,OLDEP=NO,TYPE_IO=VSAM`
- `PREINIT AREA=I01,DBID=797,BLKSIZE=4096,TYPE_IO=VSAM`

MUF command examples, note NEW_DSN is required
- `COMM OPTION=CONSOLE,OPTION2='ONLINE_AREA_MOVE 797,IXX,NEW_DSN'`
- `COMM OPTION=CONSOLE,OPTION2='ONLINE_AREA_MOVE 797,I01,NEW_DSN'`
- `DB00626I - HISTORY_MUF_MESSAGE COMM ONLINE_TABLE_MOVE 3318,AR4,NEW_DSN`

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Examples: Messages - Open, Close

Open close messages, EXCP

- `DB01404I - DATA SET OPENED, AR13314  DCMQA7  1 OF 1   EXT-1 CYL-4 EOF-Y EXCP`
- `DB01404I - DATA SET OPENED, IXX3312  DCMQA7  1 OF 1   EXT-1 CYL-21 EOF-Y EAV EXCP`
- `DB01404I - DATA SET OPENED, A01778   DCMQA2  1 OF 3   EXT-1 CYL-35 EOF-N EXCP`
- `DB01404I - DATA SET OPENED, A01778   DCMQA5  2 OF 3   EXT-16 CYL-16 EOF-N EXCP`
- `DB01404I - DATA SET OPENED, A01778   DCMQA7  3 OF 3   EXT-16 CYL-16 EOF-Y EXCP`
- `DB01404I - DATA SET CLOSED, AR13315  DCMQA7  1 OF 1`

Open close messages, VSAM

- `DB01423I - DATA SET OPENED, AR1316   VOL-1 EXT-1 CYL-20 BS-4K MORE-Y SPACE=(C,20,1) VSAM`
- `DB01423I - DATA SET OPENED, IXX002   VOL-1 EXT-1 CYL-42 BS-4K MORE-Y EAV SPACE=(C,42,21) VSAM`
- `DB01423I - DATA SET OPENED, IXX320   VOL-1 EXT-1 CYL-3 BS-4K MORE-Y ENCR SPACE=(C,3,1) VSAM`
- `DB01423I - DATA SET CLOSED, A01789   VOL-1 EXT-12 CYL-39 BS-4K MORE-Y VSAM`
- `DB01423I - DATA SET CLOSED, C02794   VOL-1 EXT-2 CYL-42 BS-4K MORE-Y EAV VSAM`
- `DB01423I - DATA SET CLOSED, AR4320   VOL-1 EXT-1 CYL-4 BS-4K MORE-Y ENCR VSAM`

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Examples: Messages - Extend

Extend messages, EXCP

- `DB01705I - DYNAMIC EXTEND START IXX03318 CYL 3 DCMQA.QAMUFL.IXX3318.OAM#1 EXCP`

- `DB01706I - DYNAMIC EXTEND END AR13315 CYL 2 DCMQA7 VOL 1 VOLS 1 EXT 2 CYL +1`

Extend messages, VSAM

- `DB01705I - DYNAMIC EXTEND START IXX03311 CYL 2 DCMQA.QAMUFL.IXX3311.OAM#1 VSAM`

- `DB01710I - DYNAMIC EXTEND END AR403310 CYL 4 VOL 1 EXT 2 CYL +1 MORE YES (NEW EXTENT)`

- `DB01710I - DYNAMIC EXTEND END AR103316 CYL 4 VOL 1 EXT 1 CYL +2 MORE YES (OLD EXTENT)`

Extend messages, unchanged, same for EXCP and VSAM

- `DB01709I - EXTEND SIZE AR13315 CYL 1 - AREA FULL  - JCL CYL 1`

- `DB01709I - EXTEND SIZE AR13315 CYL 1 - AREA FULL  - JCL CYL 1 FLEX 1 (1 * 100%)`

- `DB01709I - EXTEND SIZE IXX03318 CYL 1 - OAM  - JCL CYL 1`

- `DB01707I - FLEX EXTEND SUCCESSFUL AR103317`

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Examples: Messages - VSAM error

- `DB01422E - VSAM ERROR - 497 IXX variable`

  - Many possible errors

  - Occurs where error occurs, in DBMUFPR or DBUTLTY

  - Error examples but probably not all
    - MMGRCALL error-numbers-from-z/OS
    - MMGRSERV error-numbers-from-z/OS
    - CALL TO IGGCSI00 FAILED RC= with error codes from z/OS
    - DATASET NOT A VSAM CLUSTER
    - DATASET WITH NO VSAM DATA
    - MMGRSRV VTOC with error codes from z/OS
    - ENCRYPTED TABLE
    - NOT CXX VSAM
    - LXX VSAM NOT OK
    - CXX VSAM NOT OK
    - FXX VSAM NOT OK
    - MMGRSRV CON-O with error codes from z/OS
    - MMGRSRV EXT with error codes from z/OS
    - BLKSIZE NOT 4K 8K
    - BLKSIZE NOT 4K 8K 16K 24K
    - CONTROL INTERVAL SIZE NE BLKSZ
    - 10-20 more ..

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Examples: Messages - VSAM error

DB01426W - VSAM WARNING - 497 IXX variable STORCLAS=x DATACLAS=y

- With 'REUSE SET' expected 'NOREUSE' is not set, recommended, not required (one per copy of MUF/DBUTLTY)
- With 'NOT GT 255 EXTENTS' expected and is not set, recommended, not required (one per copy MUF/DBUTLTY)
- With 'SIZE LE 4G' expected and is not set, recommended, not required (one per copy MUF/DBUTLTY)
- With 'x' the storage class
- With 'y' the data class

DB01427E - VSAM ERROR - dbid area MMGRCALL vsam-error-info

- IO error with reason in better text when reasonable
- RBA IS TOO LARGE
- CONNECTION ERROR
- LOW STORAGE/FAULT IN PARMLST
- ENCRYPT FIELDS INCONSISTENT
- ENCRYPT FORMAT FLAG ERROR
- CATALOG ERROR

Also, only VSAM return code - 76(005)

- Will have produced a DB01422 error message in either MUF or DBUTLTY

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Questions?

Online Transaction Management

May 12, 2022

Becky Medley

Senior Software Engineer

Ideal Online Transaction Management

Agenda:

- Overview

- Online Transaction Management

- Online Editing

- Granularity/Flexibility

- Improved Clarity

- Questions

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Ideal Online Transaction Management

Use Case:
A CICS or Ideal Administrator can update transaction information individually for Ideal transactions in a production environment (add, remove, or update the transaction) without a CICS outage affecting all users and applications in the region.

Optimize

✓ Removes downtime during CICS-related Ideal table changes; enabling 24x7 operation

✓ Maintain all user-defined transactions online, one by one, instead of re-assembling entire table

✓ Enables multiple people to add/remove transactions online without affecting other transactions

Bottom Line:
Maintenance of Ideal transaction tables without an outage, increasing application availability

Ideal Online Transaction Management Enhancement:

- Changing certain CICS-related information for a transaction currently requires an outage of the CICS region. As part of our 24x7 initiative, this feature allows the maintenance of these Ideal transaction tables without an outage, increasing application availability

- Enables granularity, addressing a single transaction rather than a set of transactions. A developer can install, update or remove a transaction in their test environment independently

- Ability to group transactions as desired; can install and remove an entire group or move the group to another list (to add it to another region)

- Ideal transaction changes can be made completely online

- Improved clarity on what runs in each region – regions will each have a list named accordingly

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Online Transaction Management

- New way of defining and maintaining Ideal transactions

- SCF still uses SC00TRAN for product startup and split/swap

- Uses lists and groups similar to CICS RDO

- Single memory table used by all transaction types

- Lookup uses hashing method to reduce search time

- Built from VLS at startup

  - VLSUTIL can be used to transport groups to other regions

- Maintenance of transactions can be decentralized

  - Multiple people can add/remove transactions online without affecting other transactions

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Online Editing

- All updates to Ideal transaction definitions can now be done entirely online

- Use LIST and GROUP editors to re-arrange content, add, update or delete entries

- INSTALL transactions immediately via primary or line command.

- REMOVE transactions (can use line command before you delete the entry)

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Granularity / Flexibility

- Ability to change a single transaction instead of a whole set of transactions
  - Can install and remove just a single transaction

- Ability to group transactions as desired – by system, application, etc.
  - Can install and remove the entire group

- Can move an entire group to another list
  - Adds those transactions to another region

- Groups need not be part of a list

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Improved Clarity

- Easier to see what transactions are running in each region

- Simplifies management of MRO

  – Each region will have a LIST named according to the region

For each region:

- DISplay TRAnsactions

  – Shows transaction definitions currently installed in Ideal and what group installed from

  – Searchable

  – Cross-checked with PCT

- DISplay PCT

  – Shows transactions defined to CICS that use SCF (or DFHWBA)

  – Searchable

  – Cross-checked with Ideal transaction table

Questions?

Summary

Enhancement Solution #'s:

- SQL Hash Join – **LU05231**

- Linear VSAM Datasets – **LU04745**

- Ideal Online Transaction Management (*to be delivered soon*)

- To learn more about our latest enhancements, please visit techdocs.broadcom.com!

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Poll

How do you feel about the Hash Join enhancement?

(Select all that apply)

1. This enhancement addresses my pain points

2. This enhancement does not address a problem at my site

3. I have planned or will plan to implement this enhancement

4. I will not be able to implement this enhancement at my site

5. I need to know more. Please reach out to me for follow up

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Poll

How do you feel about the VSAM Linear Dataset with Pervasive Encryption enhancement?

(Select all that apply)

1. This enhancement addresses my pain points

2. This enhancement does not address a problem at my site

3. I have planned or will plan to implement this enhancement

4. I will not be able to implement this enhancement at my site

5. I need to know more. Please reach out to me for follow up

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Poll

How do you feel about the Ideal Online Transaction Management enhancement?

(Select all that apply)

1. This enhancement addresses my pain points
2. This enhancement does not address a problem at my site
3. I have planned or will plan to implement this enhancement
4. I will not be able to implement this enhancement at my site
5. I need to know more. Please reach out to me for follow up

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What's Next on the Datacom Roadmap?

Under Consideration

Snapshot: Datacom Innovation Roadmap

	Delivered	Planned	Under Consideration
Embrace Open	• Datacom systems REST API (7 DST endpoints) • Datacom SQL support in VSCode COBOL LS • SQL performance enhancements (IN, LIKE, more predicates to CBS)	• *SQL Performance Analyzer MVP • Hash Join for SQL optimizer • Education web-based training (4 modules in progress) • YouTube videos	• *Datacom business data REST API support • *Enhanced SQL Performance Analyzer • Additional SQL syntax
Simplify & Automate	• Command Quick Reference in TechDocs • CREATE TABLE with COMPRESSION • RETIX cc=4 if dups encountered	• Ideal online transaction table management	• Further simplification of MUF startup parameters • Mainframe Operational Intelligence (MOI) integration
Optimize	• VSAM support for INDEX areas (with restrictions) • Buffer Pools by Area for DATA areas (with restrictions) • Portable Software Instances (PSIs or "portable packages") for major components • Large Page Frames for DXX buffers in Alternate Buffer Pools • z/OS 2.5 compatibility • MASSADD performance	• Datacom Server 15.1 (reduced CPU utilization) • VSAM support for INDEX areas (with restrictions relaxed) • VSAM support for DATA areas (with restrictions, then restrictions relaxed) • CTS 6.1 compatibility • Improved DBC tracing	• Improved dasd utilization for compressed tables ("DSOP 6") • Enhanced Mainframe Application Tuner (MAT) integration • Mainframe Resource Intelligence (MRI) integration
Security & Data Protection	• DBSRV 15.0 possible security vulnerability	• *Support for IBM Pervasive Encryption (based on VSAM support)	• *Enhanced security for SQL performance analyzer • Security Technical Implementation Guide (STIG)

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Poll

Would you be willing to speak to us regarding these enhancements?

(Select all that apply)

1. Yes, regarding Datacom REST APIs (Systems or Business APIs)
2. Yes, regarding Datacom SQL Performance Analyzer or other SQL
3. Yes, regarding additional ways to monitor my databases
4. Yes, regarding simplifying startup parameters or DB utilities
5. Yes, regarding improved DASD utilization for compressed tables

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Poll

Do you have additional pain points you'd like to talk to us about?

1. I would like to have a meeting
2. I would not like to have a meeting

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Partnering with You – How you Can Get Involved

We're Interested In Your Thoughts
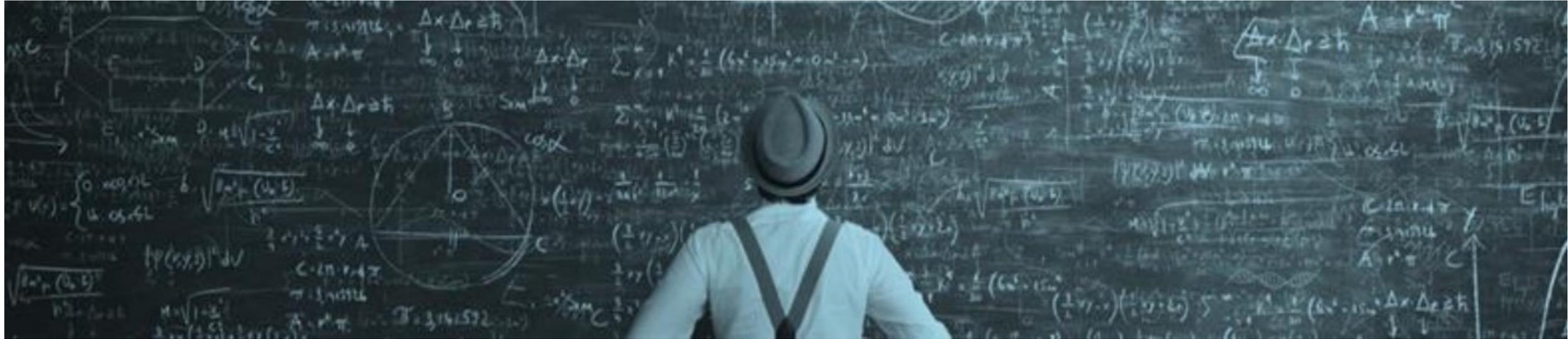
Join us on our **journey** to achieve our ongoing **vision**, we are **actively seeking feedback and suggestions from our customers**. We want to hear your voice!

- Submit your ideas on Datacom/CADRE community.broadcom.com
- Vote and comment on ideas that are important to you

- Join our validation program to influence our product direction
  - End-of-Sprint review meetings
  - Early access to new features and enhancements

- Attend our monthly webcasts – check out the Communities site for upcoming sessions
  - 2nd Thursday each month
- *NEW: Quarterly Office Hours*

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Quarterly Office Hours

Tab into our Subject Matter Experts

- Worldwide Office Hours

- 2022 Kick-off session: **Thursday, June 9 @ 11:00 (ET)**
  - Community post coming soon!

- Come prepared to share topics and requirements that are top of mind
  - New feature ideas, enhancements, live Q&A

- Network with other customers, partners, Datacom CADRE User Group Leads, and the Datacom Product Leadership team

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Low cost for Broadcom customers

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Broadcom Mainframe Technical Exchange

October 4 – 6, 2022

- Mark your calendars to attend this content-packed, virtual technical education event

- Education sessions, product roadmaps, demos and roundtables

- No registration fee! Open to all Broadcom customers

- Bookmark the event page for the latest event updates: **http://bit.ly/2022TechExchange**

Questions

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Thank You