

CA Datacom® Multi-user start-up options Old and New

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Agenda

- ✓ What's changed?
- One site's Production MUF Start-up parameters
- Open Discussion





Production MUF start-up parameters



DIAGOPTION

DIAGOPTION A,10000 Inefficient SQL request report threshold
DIAGOPTION 3,16,ON CA Ideal/MetaCOBOL PROGRAM NAME IN RXX
DIAGOPTION 17,16,ON Faster BUFFER_POOL adds

- Some are valuable as short-term diagnostics
- Some are valuable site-specific options
- Review whenever upgrading release, as they may have been replaced
- DIAGOPTION settings can be adjusted on the fly, as needed



DIAGOPTION A – Potential SQL tuning opportunities

--- SQL OPTIMIZATION REPORT ---

STAMP: 2021-03-27 21.25.11 JobName: USTMPC30 ACCESSOR-ID: SYSUSR

MSG=ACTIVITY FOR QUERY SYSUSR . SQL79AAB41521D05C .2

MSG=DECLARE C1 CURSOR FOR SELECT * FROM SPW_STK_AUD WHERE MSG_TYPE = 'I1I

MSG=NPT00' AND UPD_DT <= '20210313' QUERYNO 543004001

MSG= SETS INDEX DATA QUAL ACCEPTED I/O CBS OPT REASONS

MSG=TABLE <DSG.SPW_STK_AUD > USING KEY <K0010>

MSG=00001 008220626 000228034 000000000 000228034 0152101 < I P Y >

END ACTIVITY



Dynamic Extend - Superior protection from RC 07 or 08

DYNAMIC_EXTEND_FLEX 24,1000,500,200,150,101

- Very effective in dealing with unexpected spikes in table growth
- Triggered when the same area is extended within 24hrs
- Percentage multiplier for the original Dynamic Extend value
- Different multipliers depending on size (#cyls)
 - <1,1-100,101-1000,1001-10000,>10000



DYNAMIC_EXTEND_RETRY 75,50,25

- If extend fails due to B37abend, MUF will retry with smaller percentage multiplier

Audit trail enhancements

HISTORY_EVENT_TABLE YES DATABASE MAINTENANCE EVENT HISTORY

- New EVT table in database 1007 with special self-maintaining space attributes
- CATALOG, DEFRAG, OLREORG, ONLINE_AREA_MOVE

HISTORY_MUF_MESSAGES YES AUDIT TRAIL OF VARIOUS ACTIVITY

- DEFRAG, OLREORG, LOAD...MULTUSE=YES
- 1000 ALTER and CATALOG



(See also **CXXMAINT ALTER OPTION2=HIST00nn** and **REPORT AREA=CXX,DBID=nnnn,TYPE=Z** for CXX internal history)

zHPF Exploitation

IO_STYLE_NEWER YES

MESSAGE_ZHPF NO

ENHANCED I/O ROUTINES

CONFIRM ZHPF (SEE DB00818I)

- If you see more than one DB00818I message, then something is wrong
 - Check D IOS,ZHPF console command and SYS1.PARMLIB(IECIOSnn) for ZHPF=YES
- If you see DB00818I for LXX then upgrade to latest maintenance
- If you use CDC, there will be one DB00818I for CDCLXX0 - TYPE I/O
- New zHPF stats in MUF shutdown (or ALL_INFO) report



IO ZHPF STARTED

33,282,277

IO ZHPF NO, OTHER

2,472,496

Logging

LOGPEND 5000 LOG PEND – New default 5000
 LOGPOOL 10 # OF LOG BUFFERS FOR ROLLBACK
 LOGRCV NO LOG RECOVERY FILE AVAILABLE
 LOGSPILL 75,70,25,30,20 LOG %FULL MSG,%FORCE CKP,%FORCE
 * SPILL,%FORCE SCAN,%FORCE REDO

- LOGPEND now forced to 5000 minimum. Recommend higher.
- LOGSPILL *b* value should be lower than *a* to eliminate jobs preventing spill

WRITEPEND	WRITE	IO		15,379		
LOGPOOL	BUFFER	WAITS		0		
<u>AREA</u>	<u>REQUESTS</u>	<u>I/O READS</u>	<u>I/O WRITES</u>	<u>LOGICAL READS</u>	<u>LOGICAL WRITES</u>	
LXX	0	25,433	2,115,200	25,433	68,657,617	



Logging – “recent” additional options

LOG_RECORD_FORMAT 1	SMALLER LXX RECORDS
LOG_RECORD_USER_CMPRS YES	COMPRESSED TBLS COMPRESSED ON LXX
LOG_ROLLBACK_MINUTES 5	LONG-RUNNING ROLLBACK MSG INTERVAL
LOG_ROLLBACK_RECORDS 50000	DEFINITION OF A "LONG ROLLBACK"

- LXX can be one of the heaviest hit datasets
- Optimisation of LXX improves performance of maintenance applications
- LXX dataset should be larger than in previous releases
- Online Table Move and OLREORG can flood LXX/RXX with MOVER records
- Long running rollbacks should be eliminated if possible



Message enhancements

MESSAGE DD@MSG, DB00133, DB00141, DB00148, DB00151, DB00153, DB00321
MESSAGE DD@MSG, DB00607, DB00613, DB00622-DB00628, DB00811-DB00816
MESSAGE DD@MSG, DB00818, DB00822, DB00903, DB00904, DB00906, DB01101
MESSAGE DD@MSG, DB01110, DB01111, DB02407, DB02408, DB02805, DB02843
MESSAGE DD@MSG, DB05108, DB05109
MESSAGE NO, DB00102
MESSAGE YES, DB00152



DB ENDED STATS IN APP JESMSG LG

- Use DD@MSG to dramatically reduce console clutter and improve console performance
- Switch from DB00102 to DB00151+DB00152 for free powerful performance stats
- More on this in the Application Tuning session

Sequential Read Ahead monitoring

MESSAGE_DETAIL_G YES

GETIT/GETPS PROCESSING STATS

- Summary statistics message for any native or physical SRA application
- Sequential read ahead can be a big performance boost, or a hindrance
- More on this in the Application Tuning session

DB00148I - M_D_G USTMP06K... 911 F01 SB+32 GB-61440 ROW-5,030 IO-42 BLK-24 GETIT

DB00148I - M_D_G USTMP04Z... 165 F02 SB-128 BLK-9 IO-0 EXTRACT-M-P



Simplifying message monitoring

```
MESSAGE_TYPE_OVERRIDE W,00309 LOG AREA FULL, JOB PREVENTING SPILL  
MESSAGE_TYPE_OVERRIDE I,01002 PXX AREA RESET  
MESSAGE_TYPE_OVERRIDE I,01111 TABLE AAA ALREADY OPENED/CLOSED  
MESSAGE_TYPE_OVERRIDE I,02330 SHADOW START  
MESSAGE_TYPE_OVERRIDE W,02405 PXX START DUMP  
MESSAGE_TYPE_OVERRIDE W,02809 LAST DBUTLTY LOAD/RETIX SORT=0
```

- Overrides default A/C/E/I/W message type indicators
- Massively simplify CA OPS/MVS message processing rules
- Reducing CA OPS/MVS overhead
- Quick email alerts for items requiring attention



Adding task id to step-related messages

MUF *,99,NO,YES MUF LOGICAL NAME,#EXTRA RUNUNITS,
* ENDED NOMAINT, TASK ID ON OPEN/CLO

- Easy to group DB00133I and DB00151I (or DB00102I) messages for a particular task
- Can be used to provide a high-water mark, and trend analysis for task usage

DB00133I - JOB OPEN UAPYP455 70230 UAPYBCH JOB02005 TASK-63

DB00133I - JOB OPEN PCDRN025 70231 PCDRBCH JOB02019 TASK-64

DB00133I - JOB OPEN USTMP1ZQ 70232 USTMBCH JOB02015 TASK-65

DB00607I - BASE 219 ACCESS OFF (BASE IS CLOSED) JOB-USTMP1ZQ NUMBER-70232

DB00903I - OPENED, BASE - 219

DB00141I - DBUTLTY START EXTRACT-U-N 219 F01 USTMP1ZQ 70232 JOB02015-3 DIXA USTMBCH

DB00133I - JOB OPEN PCDRN006 70233 PCDRBCH JOB02023 TASK-66

DB00151I - ENDED UAPYP455 70230 JOB02005-5 RQ-35 IO-12 E-M:S-0:4 R-M:S-0:0.00 TASK-63



Optimising a local Shadow MUF

MUFPLEX PMØPLEX, *, , 120, S_NO_STRUCTURE

- New option S_NO_STRUCTURE
- Only if shadow MUF is on the same LPAR
- Simplifies shadow MUF internal operation
- Reduced memory requirement
- If using LFAREA, less wasted memory



Enhanced index queue processing

QUEUE_PER_KEYID YES USE IXX FORMAT2 FEATURE
X_INDEX_QUEUE_STATS YES INDEX QUEUE INFO EOJ REPORT

- Reduces index queue depth
- Requires indexes to be converted to FORMAT2
 - DBIN1PR/SYSIN1ST DEFAULT INIT_IXX_OPTION2=FORMAT2
 - ONLINE_INDEX_FORMAT2 *dbid* is extremely quick



Reducing PXX dump sizes

RCERROR MINIMAL,NO,02052 INVALID TABLE NAME

RCERROR MINIMAL,NO,06006 TABLE NOT OPEN FOR UPDATE

RCERROR MINIMAL,NO,43002 INDEX IS NOT LINKED TO THIS CXX

RCERROR MINIMAL,NO,51001 INVALID MIX OF DATACOM/DB UTILITIES

RCERROR MINIMAL,NO,72001 DATA AREA IS FOR WRONG BASE OR AREA

- The above return codes do not need a full Master List dump
- Reduces dump overhead



Replacing dumps with messages

RCERROR_MESSAGE YES,05034 TABLE NOT OPEN

RCERROR_SUPPRESS 300,05034 MAX OF 1 RC05(34) MSG EVERY 5 MINS

- Useful to diagnose unexplained spikes in Datacom return codes
- RCERROR_SUPPRESS prevents flood of messages
- This one exposed a very old bug in MetaCOBOL applications
 - Bug in MetaCOBOL DLM macro had been fixed long ago
 - But applications compiled before then still infected



DB02407E - RCERROR_MESSAGE PRSU213 43103 JOB08395 05(34) RELFL 0 F02 0006B750

SMP optimisation

```
BREAK          1000          ALLOW INTERRUPT
SMPTASK        3,2,2,SRB      SMP SUBTASKS-MAX,ACTIVE,READY2RUN
SMPTASK_USING_IEAV YES
```

- SRB mode required to exploit zIIP
- BREAK can now be up to 2500
- Quiet MUFs should use Ready-to-run 4
- Ready-to-run 2 uses more zIIP CPU but reduces delays



Reducing SQL dump sizes

SQL_CODE_ERROR -2,00000080	CA DEFAULT IS 00210000
SQL_CODE_ERROR -117,00000080	CA DEFAULT IS 04E94080
SQL_CODE_ERROR -128,00000080	CA DEFAULT IS 00194000
SQL_CODE_ERROR -999,00000080	CA DEFAULT IS 0FFBC000

- The above return codes do not need a large PXXSQL dump
- Reduces dump overhead

```
-- DATA BASE SQL ERROR SUMMARY 5/14/2021 13:53:07 --  
SQLSTATE 56S08 OCCURRED WITH SQL ERROR CODE -128 IN PROG texpRead AT LINE 3184 (TEXPSRV)  
ERROR MESSAGE TEXT: LUW 00000674U- ACCESSOR DEV007 REQ 878023482 ABORTED  
AUTH-ID.PLAN NAME: DSG.PSRV13345800000674  
COMMAND(STATEMENT ID): QEXEC(STATEMENT 186)  
JOB NAME: PSRV00, RUN UNIT: 57429, TERMINAL ID: 0674  
----- END OF ERROR DIAGNOSTICS -----
```



Final tweaks

X_EOJ_OK_S_DELAY 060 WAIT SECONDS FOR CICS+SERVER TASKS

- Give CICS or Server tasks a chance to complete when using EOJ_OK

X_MSB_MSGS YES DB00813I DB00814I DB00815I DB00816I

- Very useful system rates stats messages every 2 minutes.



X_TRACE_RQ_SIZE 64K DCTRACE TABLE SIZE (DEFAULT 16K)

- Extend Sysview trace table size

Summary

- There are a lot more MUF start-up options than we have discussed
- Each MUF has different requirements
- Challenge everything
- Measure, implement, confirm
- Please share your experiences



Questions & Answers





Thank You

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