




CA IDMS™ Version 18+ zIIP Saves You Money

IUA/CA IDMS™ Technical Conference
December 2-5, 2014




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Abstract

- Using zIIP in CA IDMS™ Versions 18.0 + will save your organization money. Even if you exploit zIIP in CA IDMS 17, versions 18.0 and beyond will save you more money. Significant architectural changes have been made to how CA IDMS utilizes zIIP processors, resulting in an increased percentage of CPU time spent on zIIP. This presentation shows you how, from implementation to measurement.



2

Agenda

- A few words about Humana Inc.
- A few words about a zIIP processors
- A few words about running CA IDMS on zIIPs
- A few words about monitoring CA IDMS on zIIPs
- Our experiences running CA IDMS V17/V18+ on zIIPs
- Is zIIP right for YOU?
- Summary

A few words about Humana Inc.

- 18 Production CVs – Network access only (no SQL)
 - 700,000,000+ transactions/week
 - DC/CICS/UCF/LU6.2 front-ends
- Our SYSTEM
 - CPU: 2827-H32 (2) (EC12)
 - Engines: 7 (4 GP/3 SP), 8 (5 GP/4 SP)
 - Opsys: z/OS 2.1
 - LPARS: 15+ (CA IDMS runs on 4)

A few words about a zIIP processors

- System/z Integrated Information Processor
- May be physically identical to CP/GP processor
- Configured by operating system to be different
- Available on z9/z10/z196/zEC12 & beyond
- Limited to (at most) one zIIP processor per CP/GP
- IBM incentive to stay on mainframe
 - IBM was losing billable CPU cycles to other platforms
 - Decided if they were going to lose the billables – at least keep them on the mainframe

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5

A few words about a zIIP processors (cont.)

- IBM and CA do not impose software charges on zIIP capacity/utilization
 - Runs uncapped by default
- One-time charge for purchase of zIIP processor (less expensive than CP/GP)
 - Includes no-charge replacement by faster zIIP engines when upgrading to a new machine
 - (may not be true for all CPU upgrades)
- SRB enclave tasks
 - SRBs are very lightweight and efficient threads of execution that are available only to supervisor state/privileged mode software.
 - http://www.ca.com/Files/WhitePapers/ziip_exploitation_wp3.pdf
by Peter Morrison, CA NetMaster® development

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6

A few words about running CA IDMS on zIIPs

- CA IDMS uses Workload Manager to create a dependent enclave for each OS task capable of servicing work type IDMS
- It then schedules a separate pre-emptible SRB into each such enclave
- In CA IDMS, this means:
 - All system mode work is eligible except
 - Physical I/O
 - SVC processing
 - User-written exits
 - Database procedures
 - SQL-invoked routines

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7

A few words about running CA IDMS on zIIPs (cont.)

- Possess / Purchase zIIP processors
- Migrate to CA IDMS V18 or V18.5
 - Sessions at CA/IUA Tech Conference
 - IDMS Community Site
- Code ZIIP=Y in startup parameters
 - Even if no zIIP processors are detected, will allow simulation testing
- Authorize load libraries from which nucleus modules, line drivers, and service drivers are loaded

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8

zIIP=Y in startup JCL

```
//IDMP75DB EXEC PGM=RHDCOMVS,REGION=2047M,
//      PARM=('S=075','DMCL=DMPCV75','FSTG=3750','MT=Y
//      'SVC=250','WTO=WTOLV','ZIIP=Y','AUTOTASK
//      'SUBT=6')
//*-----*
//*      IDMP75DB --      PROD RELEASE 18.0      CV      *
//*      RETRIEVAL CV FOR IQ CVS                      *
//*-----*
//**+JBS MESSAGE *'DC013005'* ,API=01
//**+JBS ACTIVATE IDMSP.CV75,API=01,LOCAL
//**
//STEPLIB DD DSN=IDMS.PROD.SYS.LOADLIB,
//      DISP=SHR
//CDMSLIB DD DSN=IDMS.PROD.HUMANA.LOADLIB.CV62,
//      DISP=SHR
//      DD DSN=IDMS.PROD.HUMANA.LOADLIB,
//      DISP=SHR
//      DD DSN=IDMS.PROD.SYS.LOADLIB,
//      DISP=SHR
//      DD DSN=SYS1.CEE.SCEERUN,
//      DISP=SHR
//      DD DSN=IDMS.PROD.XA.SUBSLOAD,
//      DISP=SHR
//      DD DSN=IDMS.PROD.EMER.LOADLIB,
//      DISP=SHR
//      DD DSN=IDMS.PROD.APPL.LOADLIB,
//      DISP=SHR
```

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9

A few words about running CA IDMS on zIIPs (cont.)

- Loadlib authorized does NOT mean DDNAME must be authorized
- DC016106 ZIIP=N if loadlib not authorized
- Load module executed to start CA IDMS CV must be loaded from authorized loadlib
- IBM LE library must be authorized and in the CDMSLIB concatenation
- +IDMS DC016105 xx zIIP processors detected.
 - You should consider using ZIIP=Y (if you specify ZIIP=N but could specify ZIIP=Y)

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10

Loading zIIP-required modules from non-Authorized loadlib

```
JES2 JOB LOG -- SYSTEM SYST -- NODE HUMANA
--- FRIDAY, 21 NOV 2014 ---
IEF695I START IDMD23DB WITH JOBNAME IDMD23DB IS ASSIGNED TO USER IDMD23DB, GROUP
$HASP373 IDMD23DB STARTED
ACF9CCCD USERID IDMD23DB IS ASSIGNED TO THIS JOB - IDMD23DB
IEF403I IDMD23DB - STARTED - TIME=12.33.47
+IDMS DC016106 ZIIP=N forced. Module RHUCNIRY was loaded from an unauthorized li
+ DDN=CDMSLIB VOLSER=DDBD18 DSN=IDMS.DBA.SYS.LOADLIB.COPY
+IDMS DC016106 ZIIP=N forced. Module IDMSUXIT was loaded from an unauthorized li
+ DDN=STEPLIB VOLSER=DDBD18 DSN=IDMS.DBA.SYS.LOADLIB.COPY
+IDMS DC016109 XTIOI disabled for dynamic allocation
+IDMS DC016106 ZIIP=N forced. Module RHDCCSA was loaded from an unauthorized li
+ DDN=CDMSLIB VOLSER=DDBD18 DSN=IDMS.DBA.SYS.LOADLIB.COPY
+IDMS DC016106 ZIIP=N forced. Module IDMSLKM was loaded from an unauthorized li
+ DDN=CDMSLIB VOLSER=DDBD18 DSN=IDMS.DBA.SYS.LOADLIB.COPY
+IDMS DC016106 ZIIP=N forced. Module RHDCNLT was loaded from an unauthorized li
+ DDN=CDMSLIB VOLSER=DDBD18 DSN=IDMS.DBA.SYS.LOADLIB.COPY
+IDMS DC016106 ZIIP=N forced. Module IDMSNLT was loaded from an unauthorized li
+ DDN=CDMSLIB VOLSER=DDBD18 DSN=IDMS.DBA.SYS.LOADLIB.COPY
```

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11

Starting CV with ZIIP=N when zIIP processors detected

```
12.09.15 S0111815 ---- FRIDAY, 21 NOV 2014 ----
12.09.15 S0111815 IEF695I START IDMD23DB WITH JOBNAME IDMD23DB IS ASSIGNED TO
12.09.15 S0111815 $HASP373 IDMD23DB STARTED
12.09.18 S0111815 ACF9CCCD USERID IDMD23DB IS ASSIGNED TO THIS JOB - IDMD23DB
12.09.18 S0111815 IEF403I IDMD23DB - STARTED - TIME=12.00.18
12.09.18 S0111815 +IDMS DC016105 02 ZIIP processors detected. You should consi
12.09.18 S0111815 +IDMS DC016109 XTIOI disabled for dynamic allocation
12.09.18 S0111815 +IDMS DC390009 V23 STARTING IDMS-CV/DC INITIALIZATION - R18.
12.09.18 S0111815 +IDMS DC391511 V23 Lock Manager for Warmstart initialization
12.09.18 S0111815 +IDMS DC202001 V23 Starting WARMSTART
12.09.18 S0111815 +IDMS DC202004 V23 WARMSTART bypassed - IDMS Inactive
12.09.18 S0111815 +IDMS DC391512 V23 Lock Manager for Warmstart terminated
12.09.19 S0111815 IXL014I IXLCONN REQUEST FOR STRUCTURE IDMS_DBADICT 829
12.09.19 S0111815 +IDMS DC215999 V23 IXLCONN RC=00000000 Reason=00000000 Name
829 WAS SUCCESSFUL. JOBNAME: IDMD23DB ASID: 00FA
829 CONNECTOR NAME: IXCL00020001 CFNAME: CFP1
12.09.19 S0111815 +IDMS DC040101 V23 LOCK MANAGER STORAGE ESTIMATE = 485K
12.09.19 S0111815 +IDMS DC329001 V23 TRANSACTION MANAGER STORAGE ESTIMATE =
12.09.19 S0111815 +IDMS DC040102 V23 LOCK MANAGER STORAGE FORMATTED; 485K
12.09.19 S0111815 +IDMS DC329002 V23 TRANSACTION MANAGER STORAGE FORMATTED;
12.09.19 S0111815 +IDMS DC390010 V23 LOADING NUCLEUS
12.09.20 S0111815 +IDMS DC390015 V23 OPENING LINE CONSOLE
12.09.20 S0111815 +IDMS DC390015 V23 OPENING LINE UCFLINE
```

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12

A few words about monitoring CA IDMS on zIIPs

- Ensure zIIP was enabled
 - Check DCPROFIL
- Run Health Checks for CA IDMS
- DCMT D STAT SYS
 - Look at Total Sys and User Time for zIIP and non-zIIP
 - Look at Total Swaps
- DCMT D SUBTASK EFFECTIVENESS
 - Look at Total CPU Time (TCB & SRB)

DCPROFIL task output showing zIIP status and number of processors detected

```
TAPE: GJI00B          NUMBER OF SCTS: 0010
TOOLS TAPE: GJI00B
ENDEVOR/DB TAPE: GJI00B  OPERATING SYSTEM: z/OS  ZIIP=Y
                           zIIP ENGINES: 0003
                           TRACE SAVE: OFF (DDLDCL06)

SYSTEM TRACE: YES

CWA SIZE: 0000000180    DMCL TABLE: DMPCV75

SCRATCH HWM 0000000003    PRIMARY STORAGE
                        PROTECT KEY: 08

SIZE OF XA STORAGE AREA: 0109641728    ACTIVE TRANSACTION
COUNT: 0024

QUEUE AREA
LOW PAGE: 0008105001    SECURITY
HIGH PAGE: 0008106000    SECURITY SYSTEM: CA ACF2
                        SIGNON SECURITY: OFF

DC VERSION ID: 0075    SVC NUMBER: 250

USER TRACE BUFFERS: 0253    GETMAIN SUBPOOL: 001
```

DCMT D STAT SYS showing zIIP-related information

D STAT SYS			14:57:38.6150 Tot System Time		
12:20:35.88 14/325 Current Time			00:00.131307 Tot User Time		
22:03:49.20 14/319 Startup Time			14:35:04.0561 zIIP on zIIP Time		
			04:21.314171 zIIP on CP Time		
			161,670,287 Number of Swaps		
TASKS: 73275504 Processed			0 Abended 194 Max Tasks		
5493 System			0 Runaway 0 Times At Max		
0 Deadlocks			0 Dead Victims		
TRANS: 148718411 Processed			186 Max Conc		
Ext Proc 73266952			72 Ext Conc 140 Max Erus		
0 Dist Proc			0 Dist Norm 0 Dist Conc		
DATABASE: 1556379153 Calls			1352192146 Recs Rqst		
0 Buff Wait			127207737 Recs Cur R/U		
612 Page Writ			0 Via Noflo		
602819298 Tot Locks			267 Via Ovflo		
			0 Recs Reloc		
INDEX: 0 SR8 Splits			0 SR7 Stores		
0 SR8 Spawns			0 SR7 Erases		
0 Orph Adopt			1 Min Level		
			5 Max Level		
SQL: 0 Commands			0 Rows Inserted		
0 AM Recomp			0 Rows Deleted		
			0 Sorts		
			0 Tuples Sorted		

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15

DCMT D SUBTASK EFF showing zIIP-related information

D SUBT EFF						
*** Subtask display ***						
Subtask	Elapsed time		Total CPU time		% CPU SRB	
Name	TCB	SRB	TCB	SRB	TCB	SRB

MAINTASK	00:24.485219	00:04.205688	00:06.995254	00:00.542347	28 12	Y
SUBT0001	00:00.008937	00:00.610052	00:00.001139	00:00.020988	12 03	Y
SUBT0002	00:00.177711	00:09.893579	00:00.017630	00:01.051751	09 10	Y
SUBT0003	00:22.908220	07:58.502039	00:02.677407	02:22.126515	11 29	Y
SUBT0004	06:40.835942	04:18:37.0683	00:52.980757	40:03.746770	13 15	Y
SUBT0005	01:48:06.9716	1:02:57:30.65	17:09.369384	13:55:50.5027	15 51	Y

Totals	01:55:35.3877	1:07:24:20.93	18:12.041574	14:38:17.9911	15 46	
V75 ENTER NEXT TASK CODE: CA IDMS release 18.0 tape GJI00B node CV75						
-						

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16

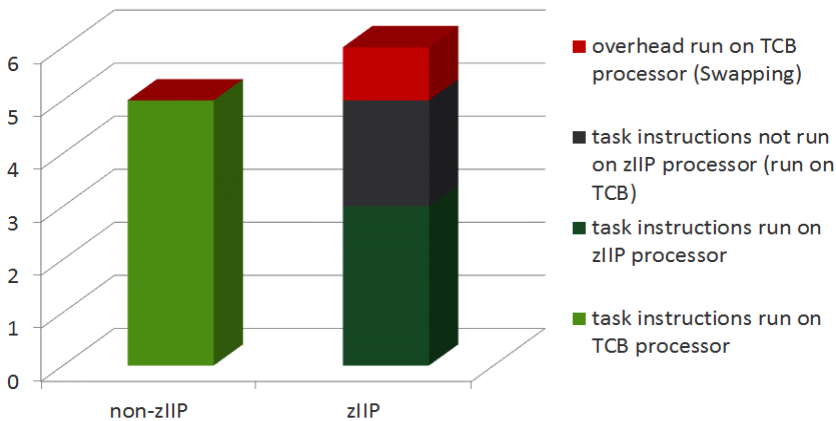
Our experiences running CA IDMS V17 & V18 on zIIPs

	R17.0	R18.0	RO63129
TCB as % of all CPU	25	50	02
SRB as % of all CPU	75	50	98
% of all CPU sent to zIIP	25	50	98
% of sent zIIP run on zIIP	88	100	100
Swaps/task	1	.5	1.4
TCB (charged) cpu/task	0.0006048	0.0003516	0.0000115

Our experiences running CA IDMS V17 & V18 on zIIPs (cont.)

- All production V17 CVs Apr 2009
- \$125K / year reduced software costs on V17 (maybe)
- APPLY ALL PTFs that reference 'zIIP'
 - RO11137, RO11160, RO11185, RO15224, RO15272, RO17569 + (V17)
 - RO33580, RO39073, **RO63129** + (V18)
- Multitasking works well with zIIPs
- All production V18 CVs upgraded in 2012
- \$100K / year additional reduced software costs estimated running V18 (maybe)

Is zIIP right for you?



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19

Is zIIP right for you? (cont.)

- Based upon: CPU seconds are a constant function of # instructions
- Bottom Line – if TCB cpu/second is lower with zIIP, then zIIP is right for you
 - If **BLACK+RED** is less than **GREEN**, success

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20

Is zIIP right for you? (cont.)

- How to make zIIP right for you?
 - Segregate swap-intensive processes in a non-zIIP CV
 - Swap start-up configurations (zIIP=Y vs. zIIP=N) between swap-intensive and non-swap-intensive time periods within the same CV
 - Daily onlines (zIIP=N) vs. Nightly batch (zIIP=Y)
 - Would require 2 recycles/day
 - Open an issue in support of [19600373-1](#)
 - Support of a SYSIDMS/ SYSGEN option to allow zIIP exploitation to be excluded for swap-intensive processes such as CA ADS or DC COBOL

Summary

- Easy to Implement
- Easy to Monitor
- Great Results

Online Session Evaluation

Please provide your feedback
this session: D3

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<http://communities.ca.com>

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Questions and Answers

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