

On behalf of CA Mainframe Application Tuner development team, I am happy to announce another batch of exciting new features for CA MAT v12.

What is new and available for you?

- DB2 WLM managed stored procedures (External Stored Procedures and User Defined Functions) support
- DB2 WLM JAVA AGENT support
- CSECT DESCRIPTION enhancement phase II
- Sampling architecture improvements – PC and SVC

Continue reading for more detailed descriptions.

### DB2 WLM managed stored procedures (ESPs and UDFs):

Feature brings ability of CA MAT v12 to measure and obtain relevant data for WLM managed External Store Procedures and User Defined Function, written in ASM REXX C COBOL PL/I, enabling more profound tuning opportunity identification.

In order to collect the data simply measure WLM spawned address space via standard monitor definition (see fig. 1) and then analyze the collected data under Interactive Analysis option 10 -DB2 View (see fig. 2 and 3).

CA MAT	Monitoring Criteria		
COMMAND ==>			
Specify parameters for monitoring session:		Profile: ESPABATW	
Description ==>			
Batch reports ==>	N (Y or N)		
PMA reports ==>	N (Y or N)		
Monitor dataset ==>	'APM.QATT.V12QA.&PROFILE.&SYSTIME'		
Specify target name: (Job required)			
Job ==>	D11EWLM1	Step ==>	Pstep ==>
Multi-Step Monitoring ==>	NO (YES or NO)		
Specify target systems in SYSPLEX: (default is local system only)			
System ==>	CA11	>	>
Specify parameters for target job name:			
Monitor duration ==>	60S	(Used as estimate)	
Monitor entire step ==>	NO	(Yes or No)	
Observations Requested ==>	6000		
DD name for load modules ==>			
Tab to the environment for additional monitoring options and press			
ENTER to select:	All Jobs	CICS	IMS
	DB2	Java	
Press END to save changes; enter CANCEL to exit without saving			

Fig.1 – Example Monitoring Criteria setup for WLM AS measurement.

CA MAT ----- DB2View -----										Row 1 to 7 of 7
COMMAND ==>										SCROLL ==> CSR
Primary Commands: SQL (all/sampled), SEQ (sort), ADDHelp										Profile: ESPAWLM
Line commands: S - Select SQL E - Explain SQL										Options: NORMAL
SD - Show Declare I - Explain Information										SQL: All
C - Code Details D - Statement Detail										Sort: Sequence
EI - Explain Immediate										DB2 SSID: D11E
										DB2 Rel: 11.1.0
DBRM or	D Data			Declare	Call				Requesting	
LC Package	S From Stmt Num Type			Collection Stmt	Length Count			Cursor Name Thread	Location	Oper ID
-----										
>										
---	ESPAS	S B	67	DROP	CUPOFJTK	NA	25	2	00000000	10.230.41.233
---	ESPAS	S B	99	CREATE	CUPOFJTK	NA	226	2	00000000	10.230.41.233
---	ESPAS	S B	226	INSERT	CUPOFJTK	NA	71	198	00000000	10.230.41.233
---	ESPAS	S B	272	OPEN	CUPOFJTK	NA	105	2 C1	00000000	10.230.41.233
---	ESPAS	S B	304	FETCH	CUPOFJTK	NA	105	200 C1	00000000	10.230.41.233
---	ESPAS	S H	321	UPDATE	CUPOFJTK	NA	58	198 C1	00000000	10.230.41.233
---	ESPAS	S H	350	CLOSE	CUPOFJTK	NA	105	2 C1	00000000	10.230.41.233
***** End of Table *****										

CA MAT ----- DB2View -----										Row 1 to 7 of 7
COMMAND ==>										SCROLL ==> CSR
Primary Commands: SQL (all/sampled), SEQ (sort), ADDHelp										Profile: ESPABATW
Line commands: S - Select SQL E - Explain SQL										Options: NORMAL
SD - Show Declare I - Explain Information										SQL: All
C - Code Details EI - Explain Immediate										Sort: Sequence
										DB2 SSID: D11E
										DB2 Rel: 11.1.0
DBRM or	D Data			Thread	Requesting WLM	Executing				Unique
LC Package	S From Stmt Num Type			Count	Job Name	Job Name	Applenv	Qualifier Cursor Name	Routine Name	Samps
-----										
<>										
---	ESPAS	S B	67	DROP	0	ESAPASR	D11EWLM1	D11EWLM1	MANKA12	1
---	ESPAS	S B	99	CREATE	0	ESAPASR	D11EWLM1	D11EWLM1	MANKA12	1
---	ESPAS	S B	226	INSERT	0	ESAPASR	D11EWLM1	D11EWLM1	MANKA12	2
---	ESPAS	S H	272	OPEN	0	ESAPASR	D11EWLM1	D11EWLM1	MANKA12	0
---	ESPAS	S H	304	FETCH	0	ESAPASR	D11EWLM1	D11EWLM1	MANKA12	0
---	ESPAS	S H	321	UPDATE	0	ESAPASR	D11EWLM1	D11EWLM1	MANKA12	0
---	ESPAS	S H	350	CLOSE	0	ESAPASR	D11EWLM1	D11EWLM1	MANKA12	0
***** End of Table *****										

Fig 2 and 3 - WLM related data display

Tip: Ensure you have all relevant columns in the analysis screen visible. Using advanced command CUST you can enable / disable / reorder / filter your view to your needs.

This Enhancement can be obtained via regular maintenance stream under [#SO09066](#)

For more information see documentation of: [Analysis for WLM](#)

## DB2 WLM JAVA AGENT support:

This enhancement extends previous functionality of WLM data collection (see above) of JAVA WLM stored procedures support. Data can be found and analyzed on JAVA Interactive Analysis option 12 – Java Virtual Machine view (see fig. 4).

To enable data collection using CA MAT JAVA AGENT it is enough to add javaagent option to jvmopt on USS and a LIBPATH in envfile of targeted DB2 subsystem. By this AGENT is automatically triggered when SP is run on DB2 spawned WLMJ (JAVA) address space. (e.g. see fig. 5)

```
CA MAT ----- Java Transactions -----
COMMAND ==>

Primary commands: Mode URL / Application / Via / Current,
                  GARBage, ENVironment, SQL

Line commands: A - Application Classes
               V - via Classes
               C - Current Classes
               S - SQL
               D - Delays
               N - Transaction/URL/
                  Stored Procedure Method

LC Transaction/URL/Procedure      Active% InvWait% VolWait% Total% Visual
-----
> com.ca.mat.agent.storedproc.DOBProc1 100.00 0.00 0.00 100.00
***** End of Table *****

CA MAT ----- Java SQL Statements -----
COMMAND ==> _

Primary commands: GARBage, ENVironment

Line commands: S - Display SQL

Transaction: com.ca.mat.agent.storedproc.DOBProc1.getDOB1
Class Name: *
Method Name: *
Line Number: *

LC SQL Statement                  Total      Avg Resp   Max R
Count                               Time (ms)   Time
-----
> UPDATE SERIA01.TTUNDOB SET DOB = 62 2598.00 318
***** End of Table *****

CA MAT ----- Java Classes -----
COMMAND ==>

Primary commands: GARBage, ENVironment

Line commands: D - Delays          NC - Class Name
               S - SQL             NM - Method Name

Transaction: com.ca.mat.agent.storedproc.DOBProc1.getDOB1

LC Class Name                    Method Name          Line #
-----
> com/ca/mat/agent/storedp getDOB1 46
  com/ca/mat/agent/storedp getDOB1 40
***** End of Table *****
```

Fig 4 – JAVA information collected by WLM JAVA AGENT – SQL / CLASSES up to statement level

```
Entered PM36156 version at time: Thu Jun 20 15:05:51 2019

Default EBCDIC encoding is 500; as CCSID char: 'Cp500'
Java method is defined to be stored in a jar.
CAMAT: processing option : BASE=/a/pallu01/JVM/matagent/WLM/workspace
CAMAT: processing option : CONTROL=11100000000000000000
CAMAT: Critical message option enabled
CAMAT: Warning message option enabled
CAMAT: Info message option enabled
CAMAT: Base directory name is /a/pallu01/JVM/matagent/WLM/workspace
CAMAT: Current log file : /a/pallu01/JVM/matagent/WLM/workspace/ttl17105444 15
CAMAT.3BC9200000000001B.: Thu Jun 20 15:05:51 2019 : 0 : Running shared lib
CAMAT.3BC9200000000001B.: Thu Jun 20 15:05:51 2019 : 0 : Setting up SIGSEGV
CAMAT.3BC9200000000001B.: Thu Jun 20 15:05:51 2019 : 0 : Setting up SIGBUS h
CAMAT.3BC9200000000001B.: Thu Jun 20 15:05:51 2019 : 0 : Setting up SIGFPE h
CAMAT.3BC9200000000001B.: Thu Jun 20 15:05:51 2019 : 0 : Signal handler enva
CAMAT.3BC9200000000001B.: Thu Jun 20 15:05:51 2019 : 2 : Using 31-bit Java a
CAMAT.3BC9200000000001B.: Thu Jun 20 15:05:51 2019 : 2 : Collection cell fac
CAMAT.3BC9200000000001B.: Thu Jun 20 15:05:51 2019 : 0 : Sampling thread cre
Generated signature before convert: ()V
Processing IN and INOUT parameters of the Java method
invoking class: com/ca/mat/agent/storedproc/DOBProc1, method: getDOB1
CAMAT.3BB0B80000000001C.: Thu Jun 20 15:05:52 2019 : 2 : Shared library on-1
CAMAT.3BB0B80000000001C.: Thu Jun 20 15:05:52 2019 : 0 : Monitor monitor th
Back from Call: Processing time was 2.213800
Processing OUT and INOUT parameters of the Java method
Number of result sets is 0
Return Status: Execution=0, Debug=0
```

Fig 5 – JAVA WLM AGENT trace in the log of WLMJ AS

To obtain **DB2 WLM JAVA AGENT support** apply following enhancement  
PTF: [#SO08989](#)

For more information see documentation of: [Analysis for WLM](#)

### What does CSECT DESCRIPTION II feature contain:

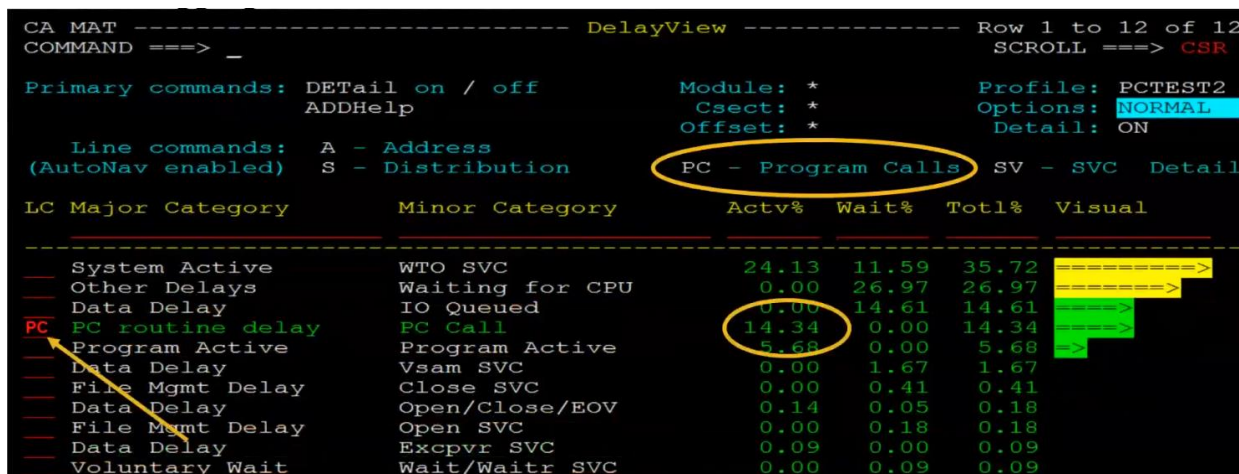
This feature is continuation of our effort to bring more comprehensive and contextual information for CA MAT v12 during data analysis time. In this phase we have added and updated thousands of CSECT descriptors for IDMS / ACF / TSS / DATACOM & IDEAL as well as IBM DB2 / MQ and CICS. This enhancement can be obtained via [#SO08951](#)

### Sampling architecture improvements – PC and SVC

This enhancement sees a reworking of the CA MAT sampling architecture. It brings the sampling mechanism more in line with recent development in hardware and software and adds features to display more information about your sampled application under PC Routine and SVC information categories thus help you to understand the causes of delays.

- PC routine display

Before our data was presented in aggregated way for most of Program Calls (PC) under PC CALL delay type. With the enhancement you can use new PC line command and expand the category for more granular and detailed information or update, display the service description (see fig. 6 and 7).



```
CA MAT ----- DelayView ----- Row 1 to 12 of 12
COMMAND ==> _ SCROLL ==> CSR

Primary commands: DETail on / off      Module: *      Profile: PCTEST2
                  ADDHelp              Csect: *      Options: NORMAL
                  Line commands: A - Address      Offset: *     Detail: ON
                  (AutoNav enabled) S - Distribution

LC Major Category      Minor Category      Actv%  Wait%  Totl%  Visual
-----
System Active          WTO SVC              24.13  11.59  35.72  =====>
Other Delays           Waiting for CPU      0.00   26.97  26.97  =====>
Data Delay             IO Queued            0.00   14.61  14.61  =====>
PC PC routine delay    PC Call              14.34   0.00  14.34  =====>
Program Active         Program Active       5.68   0.00   5.68   =====>
Data Delay             Vsam SVC             0.00   1.67   1.67   =====>
File Mgmt Delay        Close SVC            0.00   0.41   0.41   =====>
Data Delay             Open/Close/EOV       0.14   0.05   0.18   =====>
File Mgmt Delay        Open SVC             0.00   0.18   0.18   =====>
Data Delay             Excpvr SVC           0.09   0.00   0.09   =====>
Voluntary Wait         Wait/Waitr SVC       0.00   0.09   0.09   =====>
```

Fig 6 – PC line command on DelayView (Opt. 2) in interactive Analysis



```

CA MAT ----- Program Calls ----- Row 1 to 12 of 71
COMMAND ==> - SCROLL ==> CSR

Primary commands: REGister Profile: PCTEST2

Line commands: S - Service Description L - Listing of Calling Csect
               U - Update Service Description

LC Calling Calling Calling PC Component PC Visual
Module Csect Offset Number or Module

-----
. NUCLEUS IEAVTSMG 0000009E 0000030F IEAVSTAI 0.05
CNZINLPA CNZS1WTO 000005CC 0000030F IEAVSTAI 0.05
CNZINLPA CNZS1WTO 00006752 00000411 IEAVH708 0.63
CNZINLPA CNZS1WTO 00006A10 0000041B CNZS1TRC 0.18
CNZINLPA CNZS1WTO 0000E42C 00000B00 XCF 0.27
CNZINLPA CNZS1WTP 000003A6 0000011A ISGGRT 0.23
CNZINLPA CNZS1WTP 00000A6E 0000011A ISGGRT 0.23
CNZINLPA CNZS1XIT 00001B36 00000311 IGVVSTOR 0.05
CNZINLPA CNZS1XIT 00001FAC 0000011A ISGGRT 0.41
CNZINLPA CNZS1XIT 0000219C 0000011A ISGGRT 0.32
IGG0CLHA IGG0CLHA 00001C3A 00001E01 **N/A** 0.05
VSMPGM64 VSMP64IO 00001262 00002002 **N/A** 0.90

```

Fig 7 – PC line command on DelayView (Opt. 2) in interactive Analysis

- SVC information

Prior to the enhancement we would attribute the SVC activity solely to the application. With the enhancement installed you have the information split from application and attributed to particular SVC handler where you can drill down using line command C for callerid information and subsequently L for display listing information to pin point a location where particular SVC was used. Other information has been supplemented like:

- SVC number
- SVC Module Name
- SVC Type and Authorization
- SVC Attribute
- SVC Locks

```

CA MAT ----- CodeView ----- Row 1 to 24 of 101
COMMAND ==> SCROLL ==> CSR

Primary commands: Mode Pseudo / Module / Csect / 4GL,
                  PSEUDO, REGISTER, ADDHELP Profile: SPISLOAD
Line commands: A - Associate C - Callerid D - Delays N - Long Name Options: NORMAL
               I - Info L - Listing S - Distribution Mode: CSECT
               H - Histogram NH - Normalized Histogram

Extended Callerid: CC - Current CA - Application CV - Via

LC Module Csect Description L C X Actv% Wait% Totl% Visual Over
-----
C . NUCLEUS IEAVESVC SVC flih handler B Y Y 4.17 0.00 4.17 0.00
PISLOAD SPISLOAD B Y 2.26 64.01 66.27 0.00
PDERRC1 PDERLPA Dynamic LPA A Y Y 0.80 0.00 0.80 0.00
IGC0001A IGC0001A Basic I/O and device support A Y Y 0.58 0.00 0.58 0.00
IEWLDR00 IEWLSFT0 Linkage editor A Y Y 0.24 0.18 0.42 0.00
. NUCLEUS IEAVTST1 Slip service B Y 0.24 0.00 0.24 0.00
. NUCLEUS IAXVF In MVS nucleus B Y Y 0.20 0.00 0.20 0.00
IGWLDL1S .DYNLPA Dynamic LPA A Y Y 0.17 0.00 0.17 0.00
.ESQA Y Y 0.16 0.00 0.16 0.00
. NUCLEUS IEAVELK Spin lock service B Y Y 0.13 0.00 0.13 0.00
.XMS0005 SMSPDSE1 Cross Memory Routine Y 0.10 0.00 0.10 0.00
. NUCLEUS IEAVLSEN Supervisor control B Y Y 0.10 0.00 0.10 0.00
. NUCLEUS IAXVP In MVS nucleus B Y Y 0.09 0.00 0.09 0.00
. NUCLEUS ISVSSCQ Input/output Supervisor (IOS) B Y 0.09 0.00 0.09 0.00
. NUCLEUS IAXVG In MVS nucleus B Y Y 0.08 0.00 0.08 0.00
. NUCLEUS CSRCPEL Integrated cryptographic services facility B Y Y 0.07 0.00 0.07 0.00

```

Fig 8 – Separate display of SVC handler with ability to drill down via callerid command

This enhancement can be obtained through application of following enhancement PTF:  
[#SO08560](#)

For more information on the SVC support, see [Display Delay Locations \(DelayView\)](#) and in the same manner for PC Routine support, see [Display Program Calls \(DelayView\)](#).

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For more information about CA *Mainframe Application Tuner* V12, see the release notes in [CA MAT V12 documentation](#).

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Thank you for choosing *CA Mainframe Application Tuner* to improve your application performance. Should you be interested in live demo? Update on product direction or POC? Feel free to contact us directly. Together with Product Manager Ekaterina Tumanova ([Ekaterina.Tumanova@broadcom.com](mailto:Ekaterina.Tumanova@broadcom.com)), we are always interested in your thoughts and feedback.

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