

Business Centric
Performance
Reporting with CA
MICS: Giving the
Business What it
Wants

Mainframe and
Multi-Platform Application
Development
MR120SN

Session Abstract

Business transactions today span technologies - the Web to CICS to DB2 then to MQ and back - but some systems monitors only report by technology and only in real-time, creating a disconnect between what you can report to management, and what the business needs to know to deliver solutions. Learn how CA MICS Resource Management can help you correlate and report on business transaction performance, anchored on the "unit of work id" (UOWID), while retaining individual transaction components to report their response time and resource usage for problem resolution.

Biography

Scott Barry, Principal Consultant, SBBWorks, Inc.

- > EMAIL: sbarry@sbbworks.com
- > More than 25 years of hands-on experience with resource management products; CA MICS, MXG, SAS installation, tailoring and administration
- > Consulting practice focusing on IT management disciplines; chargeback/cost allocation, enterprise reporting, and capacity/performance management

Session Agenda

- > Describe Today's Enterprise Application Environment
- > Performance Analysis Techniques
- > Common Element: Unit-of-Work (UOW) ID
- > Information Data Source Considerations
- > CA MICS DIAs and Detail Transaction Analysis
- > CA MICS Reporting Scenario: CICS, DB2, MQSeries
- > CA MICS Environment Setup Considerations
- > Conclusions and Summary

Understand Today's Enterprise Application Environment

- > Enterprise application system cross technologies
- > Web client requests mainframe services, typically multiple regions/subsystems:
 - Web server generates MQSeries message for client,
 - CICS transaction(s) initiated; DB2 services required,
 - return back to CICS, then MQ, then back to web client.
- > Several performance delay challenges to impact service
- > Disparate operating environments; networking factors

Performance Analysis Techniques

> Real-time - immediate alerts to track/respond:

- interactive monitors – multiple platforms, subsystems
- background monitoring - send alert, if defined end-to-end threshold exceeded

> After the fact – management reports, exceptions, graphs:

- Log/SMF activation - post-processing of event, interval data
- Monitor transaction activity – avg/max response time within hour, day
- Trending analysis – transaction performance over time
- Focus typically performed within a single technology area

Performance Analysis Techniques

Problem Diagnosis using CA MICS

- > Correlate each related transaction event using UOW identifier as anchor and Transaction Start Timestamp.
- > Choose key consumption and delay metrics for problem cause identification
- > Dump/collect select SMF/log data for input to CA MICS
- > Identify time-period for problem diagnosis
- > Load CA MICS unit database for analysis, using TEST / SPECIAL unit setup for detail data with TAPEff
- > Generate adhoc reports or CSV-format outputs with SAS

Common Element: Unit-of-Work (UOW) ID

- > IBM Definition: In advanced program-to-program communications, a unique label assigned to the unit of work. The ID is established when the program on the source system is started and is associated with each job started by that source system on the target system. The unit-of-work identifier provides a beginning-to-end audit trail within an APPC network.
- > *Reference: <http://ibm.com/software/globalization/terminology/>*

Information Data Source Considerations

SMF/Log Monitor Data Collection

- > CICS SMF 110, subtype 1 – transaction
- > DB2 SMF 101, subtype 0 - thread and package; must consider ACCUMACC, thread-reuse issue, and CICS-DB2 interface ACCOUNTREC(UOW) setting
- > MQSeries SMF 116, subtypes 1/2 - message and queue event – requires ACCOUNTING CLASS 3 activation
- > Others: IMS transaction, WebSphere (WAS) event data
- > Correlate above transaction data sources by UOW ID and Event Start Timestamp

Information Data Source Considerations

Performance Metric Choices by Category

- > Event Elapsed time; CPU time consumed
- > Internal/external delay time - external request, DB2 LOCKs, limited processing resources
- > Excessive data-access activity (GETPAGE, I/O, Mode Switch)
- > Subsystem/Region transaction initiation delayed due to Max-Task/Max-TCBs threshold exceeded

CA MICS DIAs and Detail Transaction Analysis

- > CICS Analyzer: CICCSU (Transaction)
- > DB2 Analyzer: DB2DSU (Thread) and DB2DPP (Package)
- > MQSeries: MQATAA (Message), MQAQAA (Queue)
- > Other analysis opportunities:
 - IMS Analyzer: IMSISU (transaction)
 - Web Analyzer: WEBSAF (Java / J2EE) event
 - CA IDMS Analyzer: IDMSUA (UOW support - future)

CA MICS Reporting Scenario: CICS, DB2, MQSeries

> Review one real-life example case:

> Considerations:

- Must limit time-range due to large SMF/log data-volume
- Perform SMF data extract to separate data files, input data to CA MICS test unit database, analyze using already developed CA MICS/SAS code
- Transaction data correlation not straightforward – for example, MQSeries CICS data has incorrect UOW, only CICS transaction/task number
- Key CA MICS setup parameters to optimize processing time

CA MICS Reporting Scenario: CICS, DB2, MQSeries CICS Transaction Event

- > Source: DETAIL CICCUSU, typically from TAPECSU
- > Discard observations with hex-zero values for CICUOWID
- > Use CICTSKNR to map to MQSeries to get correct UOWID
- > Sort: CICUOWID (common UOWID), STARTTS
- > Identification variables: SYSID, CSUAPPL, TRANCODE, PROGRAM, ENDTS
- > Consumption/duration variables: CSUCPUTM, CSUTRSTM, CSURESTM, CSUQRCTM, CSUPETTM
- > Delay variables: CSUDS1WT, CSUDSWAT CSUOTWAT, CSUDB2WT, CSUSUSTM, CSUQRDLY, CSUOTWAT

CA MICS Reporting Scenario: CICS, DB2, MQSeries

DB2 Thread Event

- > Source: DETAIL DB2DSU, typically from TAPEDSU
- > Discard all observations except DSUCATYP=4 (CICS)
- > Capture DB2UNIQ to map DB2DSU to DB2DPP (package)
- > Sort: DSUCICUW (common UOWID), STARTTS
- > Identification variables: SYSID, DB2ID, DB2CONN, DB2CORR, ENDTS
- > Consumption/duration variables: DSUTC2TM, DSUET2TM, DSUTCBTM, DSUELPTM, DSUSGPGR
- > Delay variables: DSUAWJTM (wait time - global locks), DSUWLGTM (wait time - log write IO), DSUSPETM (wait time - TCB), DSUOTSTM (wait time - other).

CA MICS Reporting Scenario: CICS, DB2, MQSeries DB2 Thread (Package-level) Event

- > Source: DETAIL DB2DPP, typically from TAPEDPP
- > DB2DSU/DB2DPP correlated using DB2UNIQ to get DSUCICUW
- > Sort: DSUCICUW maps to common UOWID, STARTTS
- > Parse DB2PKNM to report on 3rd sub-field only - PKGINFO
- > Identification variables: SYSID, DB2ID, DB2CONN, PKGINFO, ENDTS
- > Consumption/duration variables: DPPTCBTM, DPPELPTM, DPPSQLC
- > delay variables: DPPALGTM (archive log wait time), DPPAWJTM (global locks wait time), DPPAWSTM (stored proc wait time), DPPAWRTM (wait time - READ other)

CA MICS Reporting Scenario: CICS, DB2, MQSeries MQSeries Message (Channel) Event

- > Source: DETAIL MQATAA, typically from TAPETAA
- > Use MQSTASK to map to MQSeries to related CICS CICUOWID; also subset MQSATYP for CICS or IMS
- > Sort: CICUOWID maps to common UOWID, STARTTS
- > Identification variables: SYSID, MQMSSI, TAACHNL, TAACHNLC, TRANCODE (CICS) or PSBNAME (IMS)
- > Consumption/duration variables: TAACPUTM, TAAEXCTM, TAACMN, TAAGETB, TAAPUTB
- > Delay variables: TAASUSTM, TAATOMTM, various "Wait Time Journal Write" metrics

MICS Reporting Scenario: CICS, DB2, MQSeries MQSeries Message (Queue) Event

- > Source: DETAIL MQAQAA, typically from TAPEQAA
- > Use MQSTASK to map to MQSeries to related CICS CICUOWID; also subset MQSATYP for CICS or IMS
- > Sort: CICUOWID maps to common UOWID, STARTTS
- > Identification variables: SYSID, MQMSSI, QAAOBJNM, MQSCONNM, MQSCORR, TRANCODE or PSBNAME
- > Consumption/duration variables: QAAGETB, QAAPUTB, QAAQCPTM
- > Delay variables: various "Wait Time Journal Write" metrics

MICS Reporting Scenario: CICS, DB2, MQSeries

MICS/SAS Processing Flow for combined report

- > Create CA MICS detail files for CICCSU, DB2DSU, DB2DPP, MQAQAA – consider input data-volume challenges
- > Sort CICCSU, DB2DSU by UOWID and STARTTS
- > Build SAS format mapping DB2UNIQ to UOWID (DSU_UOW)
- > Merge DSU_UOW to DB2DPP to get UOWID
- > Sort DB2DPP, MQAQAA by UOWID and STARTTS
- > Combine all files in SAS Data Step, using SET with a BY UOWID STARTTS; derive SRC variable for identification
- > Generate detail report using SAS PROC PRINT with ID statement (UOWID SOURCE STARTTS)

CA MICS Reporting Scenario: CICS, DB2, MQSeries

CICS Transaction Statistics – download/import to Excel

The screenshot shows an Excel spreadsheet with the following columns and data:

	A	B	C	D	E	H	J	L	M	R	T	V	W	X	Y		
1	UOWINFO	SOURCE	SYS	SUBSYS	ConnID	Queue	CorrID / PkgInfo / Queue	START	END	CICS TCB CPU Sec	CICS Wait for-Disp Time	CICS Waits First Dispatch	CICS Total I/O Wait Tm	CICS Journal Wait Tm	CICS Other Disp Time	CICS Quasi-Reent Mode CPU Sec	CICS Quasi-Reent Mode Delay Time
2	0x2F3E889E83F	...M	PRD1	MQPD	CICP	XRFA.REQ	02APR08:09:11:31.7202	02APR08:09:11:34.4000									
3	0x2F3E889E83F	...M	PRD1	MQPD	CICP	XRFA.REP	02APR08:09:11:31.7202	02APR08:09:11:34.4000									
4	0x2F3E889E83F	C...	PRD1	CICP	CICP	QR11	02APR08:09:11:34.2758	02APR08:09:11:34.4015	0.0145	0.3748	0.006	0.0015	0.0015	10.3825	0.081	0.0044	0.3744
5	0x2F3E889E83F	.T..	PRD1	DB2P	CICP	QR11	02APR08:09:11:34.3058	02APR08:09:11:44.8700									
6	0x2F3E889E83F	..P.	PRD1	DB2P	CICP	QR11QR11	02APR08:09:11:34.3058	02APR08:09:11:44.8700									
7	0x2F3E889E83F	..P.	PRD1	DB2P	CICP	QR11LINK	02APR08:09:11:34.3058	02APR08:09:11:44.8700									

Callouts in the image identify the following areas:

- System / Subsystem:** Points to columns B (SOURCE), C (SYS), and D (SUBSYS).
- Program Identification:** Points to column E (ConnID) and column H (Queue).
- UOW ID:** Points to column A (UOWINFO).
- Data Source:** Points to column B (SOURCE).
- Transaction Start / End:** Points to columns H (START) and I (END).
- CICS Stats:** Points to columns J through Y, which contain various performance metrics.

CA MICS Reporting Scenario: CICS, DB2, MQSeries

MQ Queue Statistics

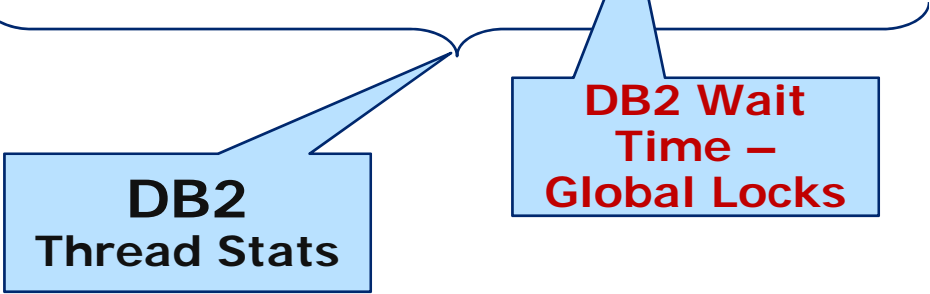
CA World prez CICS-DB2-MQ details.xlsx - Microsoft Excel											CO	CP	CQ	CR
	A	B	C	D	E	F	G	H			MQ_Queue CPU Sec	MQ_Queue Elapsed Time	MQ_Queue Bytes Processed GET&PUT	MQ CPU Svc Units
1	UOWINFO	SOURCE	SYS	SUBSYS	ConnID	CorrID / PkgInfo / Queue	START	END						
2	0x2F3E889E83F	...M	PRD1	MQPD	CICP	XRFA.REQ	02APR08:09:11:31.7202	02APR08:09:11:34.4000			0.000208	0.000209	3903	3.8749
3	0x2F3E889E83F	...M	PRD1	MQPD	CICP	XRFA.REP	02APR08:09:11:31.7202	02APR08:09:11:34.4000			0.000591	0.000622	96000	11.016
4	0x2F3E889E83F	C...	PRD1	CICP	CICP	QR11	02APR08:09:11:34.2758	02APR08:09:11:34.4015						
5	0x2F3E889E83F	.T..	PRD1	DB2P	CICP	QR11	02APR08:09:11:34.3058	02APR08:09:11:44.8700						
6	0x2F3E889E83F	..P.	PRD1	DB2P	CICP	QR11QR11	02APR08:09:11:34.3058	02APR08:09:11:44.8700						
7	0x2F3E889E83F	..P.	PRD1	DB2P	CICP	QR11LINK	02APR08:09:11:34.3058	02APR08:09:11:44.8700						

**MQ
Stats**

CA MICS Reporting Scenario: CICS, DB2, MQSeries

DB2 Thread Statistics

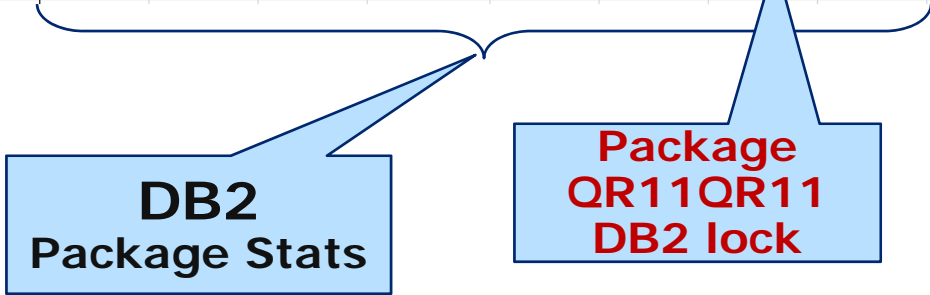
CA World prez CICS-DB2-MQ details.xlsx - Microsoft Excel										AM	AN	AR	AS	AT	AV	AW	BC
A	B	C	D	E	F	G	H			DB2_Thread DB2_Thread Waits - Glbl. Lock	DB2_Thread DB2_Thread Waits - Lock/Latch	DB2_Thread Waits - Sync. Exec.	DB2_Thread DB2_Thread Total CPU Svc Units	DB2_Thread DB2_Thread In-DB2 CPU Svc Units	DB2_Thread Wait_Tm - Global Locks	DB2_Thread Wait_Tm - Service Task Time	DB2_Thread DB2_Thread Total Elapsed Time Sec
1	UOWINFO	SOURCE	SYS	SUBSYS	ConnID	Queue	START	END									
2	0x2F3E889E83F	...M	PRD1	MQPD	CICP	XRFA.REQ	02APR08:09:11:31.7202	02APR08:09:11:34.4000									
3	0x2F3E889E83F	...M	PRD1	MQPD	CICP	XRFA.REP	02APR08:09:11:31.7202	02APR08:09:11:34.4000									
4	0x2F3E889E83F	C...	PRD1	CICP	CICP	QR11	02APR08:09:11:34.2758	02APR08:09:11:34.4015									
5	0x2F3E889E83F	.T..	PRD1	DB2P	CICP	QR11	02APR08:09:11:34.3058	02APR08:09:11:44.8700	1	16	6	200.883	165.9493	7.025	0.004	10.4661	
6	0x2F3E889E83F	..P.	PRD1	DB2P	CICP	QR11QR11	02APR08:09:11:34.3058	02APR08:09:11:44.8700									
7	0x2F3E889E83F	..P.	PRD1	DB2P	CICP	QR11LINK	02APR08:09:11:34.3058	02APR08:09:11:44.8700									



CA MICS Reporting Scenario: CICS, DB2, MQSeries

DB2 Package Statistics

CA World prez CICS-DB2-MQ details.xlsx - Microsoft Excel																
	A	B	C	D	E	F	G	H	BO	BP	BQ	BU	BY	BZ	CE	CF
1	UOWINPO	SOURCE	SYS	SUBSYS	ConnID	CorrID / PkgInfo / Queue	START	END	DB2_Pkg Waits - Available TCB	DB2_Pkg Waits - Archive Reads	DB2_Pkg Waits - Claims Release	DB2_Pkg Waits - Lock/Latch	DB2_Pkg Waits - Sync Exec	DB2_Pkg TCB CPU Svc Units	DB2_Pkg Wait_Tm - Global Locks	DB2_Pkg Wait_Tm - Sync Exec Unit Switch
2	0x2F3E889E83F	..M	PRD1	MQPD	CICP	XRFA.REQ	02APR08:09:11:31.7202	02APR08:09:11:34.4000								
3	0x2F3E889E83F	..M	PRD1	MQPD	CICP	XRFA.REP	02APR08:09:11:31.7202	02APR08:09:11:34.4000								
4	0x2F3E889E83F	C...	PRD1	CICP	CICP	QR11	02APR08:09:11:34.2758	02APR08:09:11:34.4015								
5	0x2F3E889E83F	.T..	PRD1	DB2P	CICP	QR11	02APR08:09:11:34.3058	02APR08:09:11:44.8700								
6	0x2F3E889E83F	..P.	PRD1	DB2P	CICP	QR11QR11	02APR08:09:11:34.3058	02APR08:09:11:44.8700	0	0	0	1	2	19.0724	7.025	0.0011
7	0x2F3E889E83F	..P.	PRD1	DB2P	CICP	QR11LINK	02APR08:09:11:34.3058	02APR08:09:11:44.8700	0	0	0	14	4	146.6827	0	0.0029



CA MICS Environment Setup Considerations

- > SPECIAL database - tailored setup for DETAIL (use USRXfff exit) or TAPEfff (Detail on Tape or DASD) only
- > TEST database – alternate to SPECIAL database
- > CICS component (CMF) – copy DETAIL CICCDC01 file from a MICS unit or input CMF dictionary records
- > CA MICS input exit _USRSEL for input data filter
- > Same-day analysis challenge – extract SMF data extract, then input data to CA MICS

Conclusions and Summary

- > Cross-technology IT application solutions are ideal candidate for performance problems
- > CA MICS centralized repository provides a foundation to correlate various IT technologies and platforms using the common element structure, including UOWID
- > Challenge: interpret each data source's UOWID – requires some SAS programming work
- > CA MICS and SAS offer optimized environment to process large data-volumes and create valuable reporting tool

Q&A and Discussion

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6	6	6	6	6	6	6	6	6	6	6
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8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9

FILL IN THE CIRCLE OF THE APPROPRIATE RATING

Comprehension of subjects covered
EXCELLENT (1) (2) (3) (4) (5) POOR

Practical value of material covered
EXCELLENT (1) (2) (3) (4) (5) POOR

Speakers preparedness & knowledge of subjects covered
EXCELLENT (1) (2) (3) (4) (5) POOR

Quality & Quantity of visual aids
EXCELLENT (1) (2) (3) (4) (5) POOR

Speakers ability to control discussions and keep session moving
 Excellent Good Poor

Allocation of time among various subjects covered
 Too much time Appropriate Not enough time

Is this session part of your:
 Primary conference Another conference

Were your expectations of this session met?
 Yes No