



IBM Software Group

OMEGAMON DB2 Performance Expert on z/OS Fundamentals

DB2 Information Management Software



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DB2 for z/OS L2 Performance



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Product Name Soup

- DB2 Performance monitor (or DB2PM)
- DB2 Performance expert (or DB2PE) = DB2PM + Buffer Pool Analyzer (BPA)
- After Candle acquisition, new name, new brand, ...
- We will only discuss the BATCH component (briefly)

IBM Tivoli OMEGAMON XE for DB2 Performance Expert on z/OS

V4.1.0 announced Aug 15 2006

DB2 Performance Reporting

- **Instrumentation interface and trace classes**
- Data Collection
- Working with Batch Reporting
 - f* Report sets ...
- Performance Database

DB2's Instrumentation Facility Interface

- **Trace types**

- Accounting
- Audit
- Performance
- Statistics
- Monitor
- Global

- **Trace classes**

- Multiple trace classes per trace type
- IFCID as basic unit of reporting
 - ◆ **Instrumentation Facility Component Identifier**

- **Trace destinations**

- SMF - Daily monitoring
- GTF - High volume
- OPx - Online monitoring
- (SRV - Exit to a user-written routine)

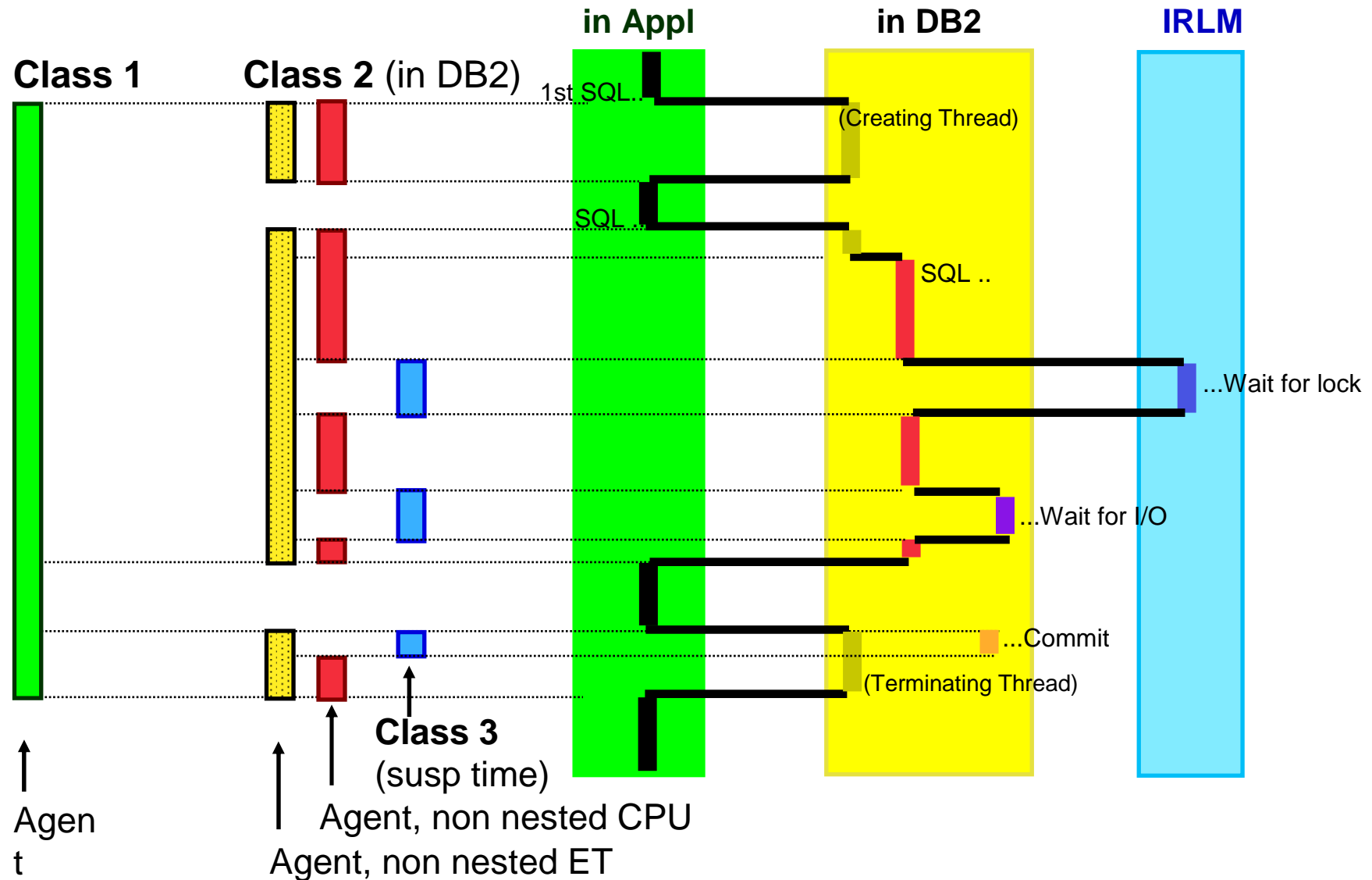
- **Trace headers (TDATA)**

- CORrelation header
- CPU header
- DISTributed header
- TRAcE header

- **Qualifications**

- AUTHID
- PLAN
- LOCATION
- IFCID
- More in V9

DB2 Times Terminology - Accounting Class 1,2,3



DB2 Times Terminology

PLAN

- **Class 1 times**
 - Application time from connect to DB2 (thread creation) till disconnect (thread termination)
 - Both class 1 elapsed time and class 1 CPU time are reported.
- **Class 2 times**
 - Time spent within DB2
 - Both class 2 elapsed time and class 2 CPU time are reported.
- **Class 3 times**
 - Thread suspension time, e.g. for synchronous I/O
- **Class 5 times**
 - Time spent for IFI calls.
 - Both class 5 elapsed time and class 5 CPU time are reported.

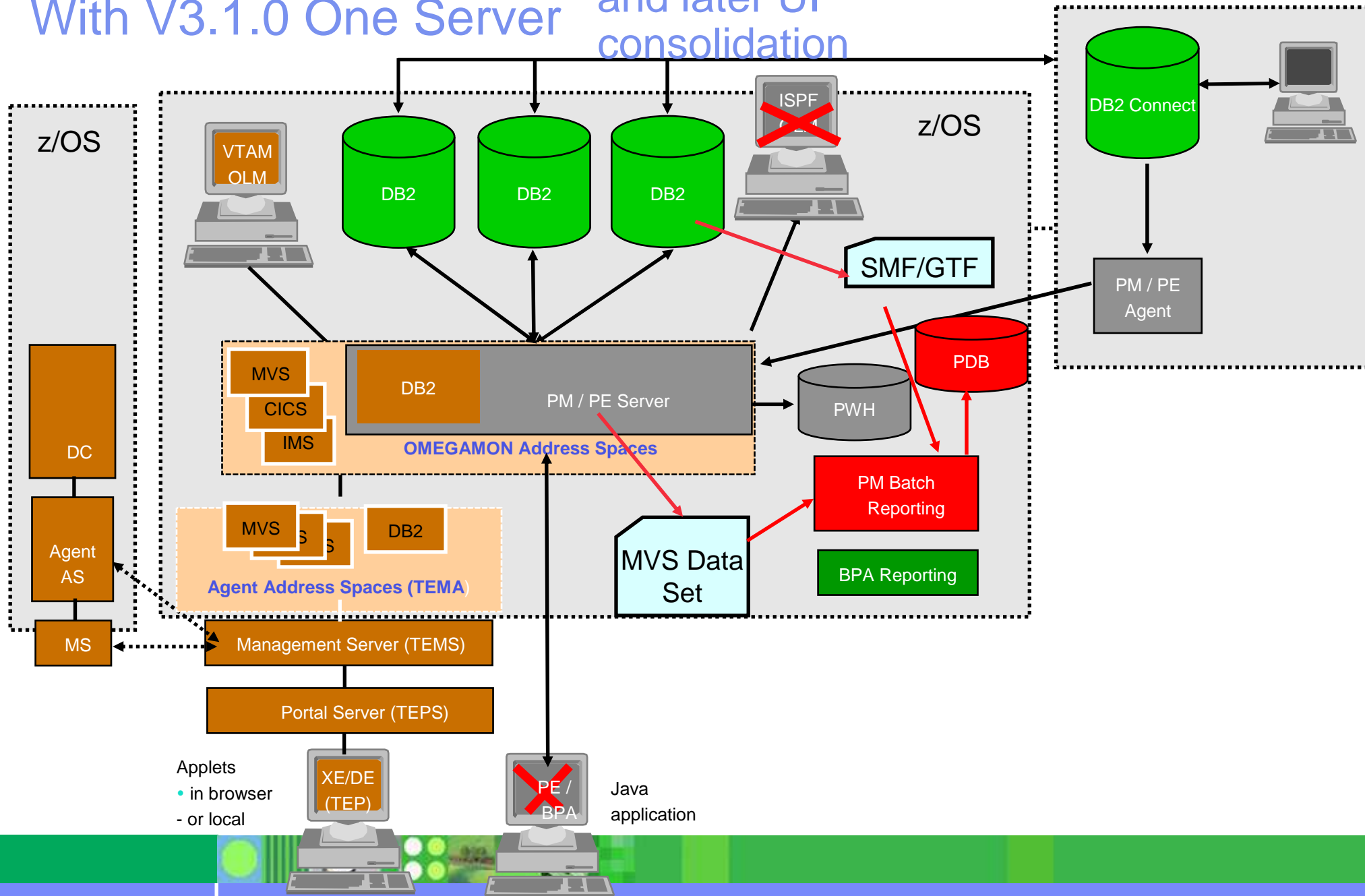
PACKAGE or DBRM

- **Class 7 times**
 - Like class 2, but on package/DBRM level.
 - Both class 7 elapsed time and class 7 CPU time are reported.
- **Class 8 times**
 - Like class 3, but on package/DBRM level.

DB2 Performance Reporting

- Instrumentation interface and trace classes
- **Data Collection**
- Working with Batch Reporting
 - f* Report sets ...
- Performance Database

With V3.1.0 One Server and later UI consolidation



Collect Report Data using DB2 PE

- Allows **collecting IFCIDs** in TSO data set.
 - Data is immediately available
 - No need to bother system operator with SMF/GTF handling.
- Handy function to (automatically) collect trace data for problem analysis
- Allows to specify DB2 PM reports instead of DB2 trace classes
- Allows to collect trace data **asynchronously**
 - Supported start criteria:
 - ◆ Time
 - ◆ Exception
 - ◆ Immediate
 - Supported stop criteria
 - ◆ Duration
 - ◆ Number of records
 - ◆ Thread termination
- Nice for customers - but we usually deal with SMF and/or GTF

Collect Data using GTF / SMF

- Important not to lose trace records or too flood the system with trace records
 - SMF
 - ♦ Losing trace records usually not a problem
 - ♦ Flooding could be a problem
 - ♦ Usually ok for stats and accounting
 - ♦ Not often used for performance traces
 - ♦ SMF 100 = DB2 statistics
 - SMF 101 = DB2 accounting
 - SMF 102 = DB2 performance
 - ♦ SMF must be active and SMFPRMxx member allows 100-102
eg. SYS(TYPE(0:255),...)
 - GTF
 - ♦ Losing trace records could be a problem
 - ♦ GTF data set is used in wrap-around
 - ♦ GTF data set cannot use extents
 - ♦ Often used for performance trace data
 - ♦ GTF can use multiple data sets in parallel
 - ♦ GTF can use more buffers
 - ♦ Trace only DB2 events

DB2 Performance Reporting

- Instrumentation interface and trace classes
- Data Collection
- **Working with Batch Reporting**
 - f* Report sets ...
- Performance Database

Working with Batch Reporting

- Batch jobs can be created with
 - ISPF Editor
 - Interactive Report Facility of DB2 PM
- DB2 PM Reporting commands
 - One command per report set, subcommands for Reports / Traces / File / Save
 - Plus various options
 - EXEC as last command to start execution
- Reducing the amount of data
 - FROM / TO - Limits the amount of records to be processed by time.
 - INCLUDE / EXCLUDE - Limits the amount of records to be processed by DB2 PM identifiers.
 - TOP (Accounting only) - Shows top resource consumers.
 - Exception Processing

Working with Batch Reporting...

•Input

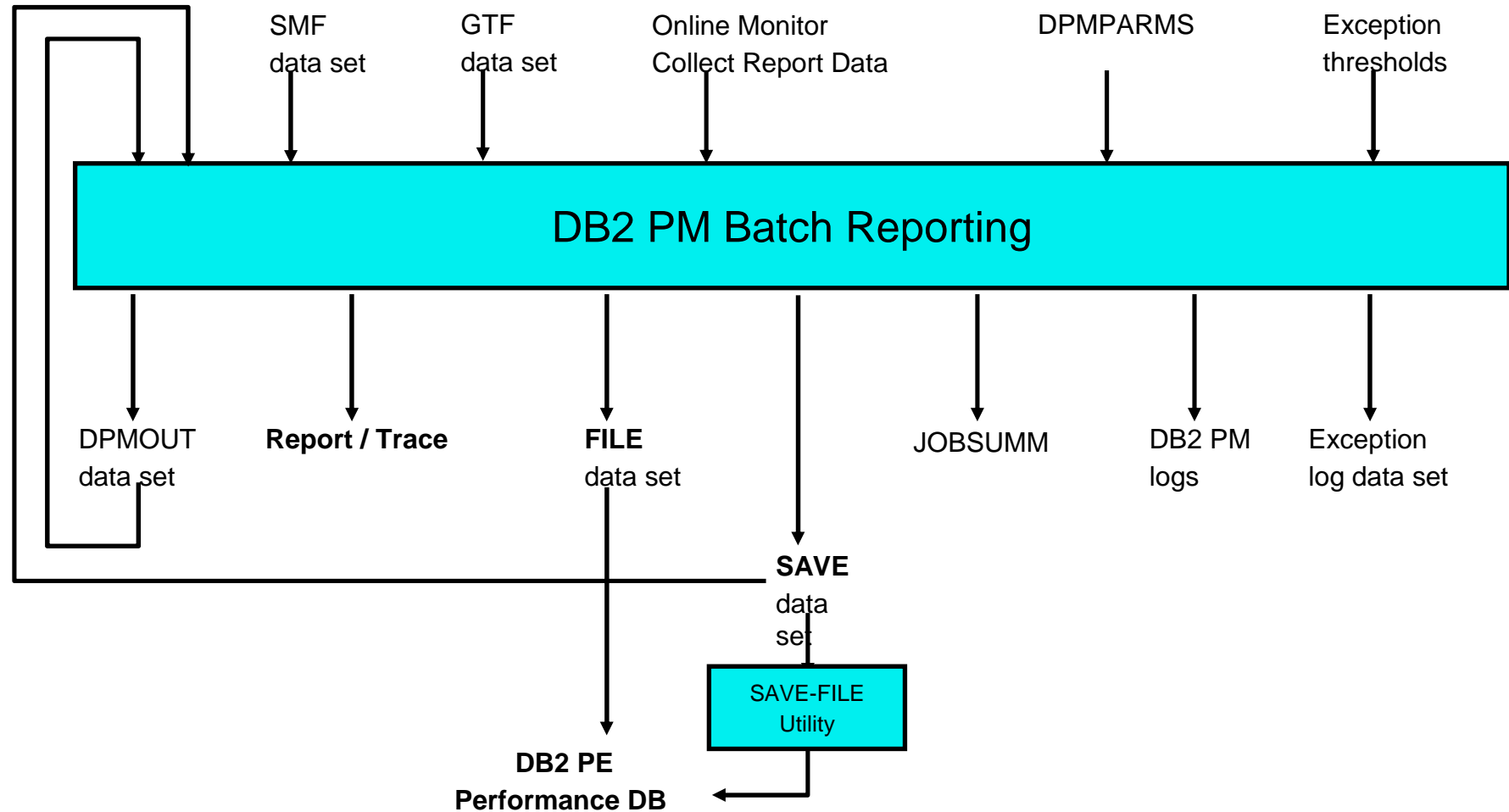
- DB2 trace data from SMF / GTF/ or TSO seq.dataset (collected and saved from DB2 PM Collect Report Data function)
- DPMOUT / SAVE (trace) data processed and saved in a former DB2 PM run.
- Processing parameters (Timezone, Mainpack, Correlation transl.,etc.)
- Exception thresholds

•Output

- Report
 - ◆accumulated, summarized by DB2 PM identifiers, calculated averages
- Trace
 - ◆individually DB2 in chronological order
- DPMLOG
 - ◆execution log shows messages issued during DB2 PM processing
- JOBSUMM
 - ◆summary about which traces were processed
- Exception log

Working with Batch Reporting... (Input / Output)

- Generates output SAVE / FILE
 - ◆ DB2 load utility format
 - ◆ usable for later Reporting



DB2 PM Reports

- Report facility which
 - Takes SMF, GTF or TSO data sets as input (collected by 'Collect Report Data'), SAVED (DPMOUT) data
 - Generates a variety of customizable reports and traces:
 - ◆ Statistics
 - ◆ Accounting
 - ◆ Subsystem Parameters
 - ◆ Locking
 - ◆ SQL Activity
 - ◆ I/O Activity
 - ◆ Utility
 - ◆ Audit
 - ◆ Record Trace
 - ◆ Explain
 - ◆ System parms

DB2 PM Reports...

- Many options to select which/how data is being reported
 - ◆ Reduce, Include/Exclude, From/to
 - ◆ Summarizedby, Orderby
 - ◆ Layout
 - ◆
- ➔ Differentiate mainly between "reports" and "traces"
 - ➔ Reports are a summary of a number of events
 - ➔ Traces are individual events
- Allows to **tailor online** the layout of Accounting and Statistics reports and traces

Minimal Batch JCL

```
//PTSTVART JOB (STEEGMA,XXX,090,281926),'BART.STEEGMANS',
//      MSGLEVEL=(1,1),USER=STEEGMA,
//      NOTIFY=STEEGMA,MSGCLASS=H,TIME=60,REGION=256M
/*JOBPARM S=MVS1
/**
/**      DB2PE - REPORT GENERATION
/**
//DB2PMJB EXEC PGM=DB2PM
//STEPLIB DD DISP=SHR,DSN=DB2DUMP.OMPE41.D071028.LEVEL2.TKANMOD
//      DD DISP=SHR,DSN=DB2DUMP.OMPE41.D070411.FINAL.TKANMOD
/**
/** !-----INPUTDSN
/** v
//INPUTDD DD DISP=SHR,DCB=BUFNO=50,
//      DSN=STEEGMA.TRACE.UNICODE.IFC247.SMF
/**
//SYSOUT DD SYSOUT=*
//JOBSUMDD DD SYSOUT=*,
//      DCB=BLKSIZE=133
//MSGRPTDD DD SYSOUT=*,
//      DCB=BLKSIZE=133
//SYSPRINT DD SYSOUT=*,
//      DCB=BLKSIZE=133
//SYSIN DD *
.....
```

➔ Limit output lines

```
//OUT1 DD
, SYSOUT=*,OUTLIM=50000
...
//SYSIN DD *
...
RETRACE TRACE
      DDNAME(OUT1)
```

- ➔ Big input files and using many commands may require you to manually allocate certain workfiles
Documented in the PE Report Command Reference

Working with Batch Reporting (DB2 PM command sample)

```
//SYSIN DD *
* -- Generate DB2 PE reports
GLOBAL TIMEZONE(+7:00)
        FROM (04/21/01,22:01:00.00)
        TO (04/21/01,23:01:00.00)
        INCLUDE (DB2ID(DSN7))
```

➔ TIMEZONE +7 means GMT -7H

➔ Dates are mm/dd/yy by default

ACCOUNTING

```
REPORT LAYOUT (LONG)
        ORDER (CONNTYPE)
        EXCLUDE (PACKAGE(*))
TRACE TOP (10 ONLY INAPPLET)
        LAYOUT (LONG)
REPORT LAYOUT(LONG)
        ORDER (PLANNAME)
```

➔ Do as much filtering as possible as early as possible

Do it in the GLOBAL command if you can

STATISTICS

```
REPORT LAYOUT (LONG)
```

■ DB2 PE sorts trace to make sure records are in the correct sequence, but can be time consuming with big traces

➔ GLOBAL PRESORTED(ACCEPT) avoids sort and ignores out of sequence records

➔ GLOBAL PRESORTED(ENFORCE) avoids sort and terminates when encountering an out of sequence record

SYSPARMS

```
TRACE
```

EXEC

JOBSUMM - Job Summary Log

OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V4)
JOB SUMMARY LOG

PAGE: 1
RUN DATE: 10/27/06 07:28:10.12

MSG.ID.	LOCATION	GROUP	SSID	MEMBER	TIMESTAMP

FPEC4060I	BEBBCM_SDTE	SSYSDTE	SDTE	SDTE	09/20/06 13:24:45.21
	DB2 START TRACE NUMBER 05 DB2 SUBSYSTEM ID = SDTE				
	TEXT = -START TRACE (PERFM)CLASS (1 2 3 4 6 8 9 12 13)RMID (*)DEST (SMF)PLAN (*)AUTHID (*)IFCID (247)				
	BUFSIZE (*)				
FPEC4065I	BEBBCM_SDTE	SSYSDTE	SDTE	SDTE	09/20/06 13:25:13.55
	DB2 STOP TRACE NUMBER 05 DB2 SUBSYSTEM ID = SDTE				
	TEXT = -STOP TRACE (PERFM)CLASS (1 2 3 4 6 8 9 12 13)RMID (*)DEST (SMF)PLAN (*)AUTHID (*)TNO (*)				
FPEC4005I	BEBBCM_SDTE	SSYSDTE	SDTE	SDTE	
	NUMBER OF RECORDS PROCESSED WITHOUT A CPU HEADER WAS 503				
FPEC4010I	BEBBCM_SDTE	SSYSDTE	SDTE	SDTE	
	NUMBER OF RECORDS PROCESSED WITHOUT A CORRELATION HEADER WAS 10				
FPEC4055W	BEBBCM_SDTE	SSYSDTE	SDTE	SDTE	
	DATABASE/PAGESET TRANSLATION ROUTINE WAS UNABLE TO PERFORM 9 TRANSLATIONS				

JOBSUMM - Job Summary Log ...

- ➔ IFCID 105 OBID translation
- ➔ from OBID into object name
- ➔ IFCID 106 ZPARM info

GROUP: SSSYDTE		IFCID FREQUENCY DISTRIBUTION LOG												
SUBSYSTEM: SDTE							MEMBER: SDTE							
DB2 VERSION: V8							ACTUAL FROM: 09/20/06 13:20:43.16							
							TO: 09/20/06 13:25:33.30							
IFCID	INPUT COUNT	INPUT PCT OF TOTAL	PROCESSED COUNT	PROCESSED PCT OF TOTAL	IFCID	INPUT COUNT	INPUT PCT OF TOTAL	PROCESSED COUNT	PROCESSED PCT OF TOTAL	IFCID	INPUT COUNT	INPUT PCT OF TOTAL	PROCESSED COUNT	PROCESSED PCT OF TOTAL
1	2	0.39%	2	0.39%	80	4	0.79%	4	0.79%					
2	2	0.39%	2	0.39%	81	4	0.79%	4	0.79%					
3	6	1.19%	6	1.19%	82	4	0.79%	4	0.79%					
4	1	0.19%	1	0.19%	83	5	0.99%	5	0.99%					
5	1	0.19%	1	0.19%	88	3	0.59%	3	0.59%					
6	19	3.77%	19	3.77%	89	3	0.59%	3	0.59%					
7	19	3.77%	19	3.77%	98	22	4.37%	22	4.37%					
13	1	0.19%	1	0.19%	99	22	4.37%	22	4.37%					
14	1	0.19%	1	0.19%	100	47	9.34%	47	9.34%					
15	29	5.76%	29	5.76%	101	36	7.15%	36	7.15%					
16	2	0.39%	2	0.39%	105	6	1.19%	6	1.19%					
18	31	6.16%	31	6.16%	106	2	0.39%	2	0.39%					
20	4	0.79%	4	0.79%	107	1	0.19%	1	0.19%					
22	1	0.19%	1	0.19%	112	1	0.19%	1	0.19%					
29	5	0.99%	5	0.99%	127	1	0.19%	1	0.19%					
30	5	0.99%	5	0.99%	128	1	0.19%	1	0.19%					
44	66	13.12%	66	13.12%	177	3	0.59%	3	0.59%					
45	66	13.12%	66	13.12%	202	1	0.19%	1	0.19%					
53	4	0.79%	4	0.79%	213	3	0.59%	3	0.59%					
58	8	1.59%	8	1.59%	214	3	0.59%	3	0.59%					
60	5	0.99%	5	0.99%	218	4	0.79%	4	0.79%					
61	1	0.19%	1	0.19%	225	2	0.39%	2	0.39%					
63	3	0.59%	3	0.59%	230	1	0.19%	1	0.19%					
64	2	0.39%	2	0.39%	239	3	0.59%	3	0.59%					
72	4	0.79%	4	0.79%	247	13	2.58%	13	2.58%					
73	4	0.79%	4	0.79%	254	2	0.39%	2	0.39%					
74	4	0.79%	4	0.79%	261	3	0.59%	3	0.59%					
75	4	0.79%	4	0.79%	350	3	0.59%	3	0.59%					
TOTAL INPUT TRACE RECORDS =						503								
TOTAL PROCESSED TRACE RECORDS =						503								

Statistics Report Set

- Based on DB2 Statistics records (IFCID 1,2, 225).
- Used as a prime indicator for **subsystem-related** problems.
- Contains information about
 - ◆ SQL usage (DML, DCL, DDL, direct row access)
 - ◆ Stored proc, triggers, UDFs
 - ◆ EDM pool
 - ◆ Subsystem services
 - ◆ Open/Close activity
 - ◆ Log activity
 - ◆ Plan/package processing
 - ◆ DB2 commands
 - ◆ RID list processing, Dynamic statement cache
 - ◆ Authorization management
 - ◆ Locking activity / Data-sharing locking
 - ◆ Query parallelism
 - ◆ *CPU times*
 - ◆ DB2 IFI requests, IFC, and data capture
 - ◆ DB2 latch counters
 - ◆ Buffer pool and Group buffer pool activity
 - ◆ DDF activity
 - ◆ *Storage statistics*
- Many of the DB2 statistics counters are running counters.
- So you need at least 2 stats records for a trace or report
 - Traces show *delta* records between 2 subsequent DB2 stats records.
 - Reports summarize statistics over user-defined intervals.

Statistics Report Set

DBM1 AND MVS STORAGE BELOW 2 GB		QUANTITY	DBM1 AND MVS STORAGE BELOW 2 GB CONTINUED		QUANTITY
TOTAL DBM1 STORAGE BELOW 2 GB	(MB)	567.98	24 BIT LOW PRIVATE	(MB)	0.22
TOTAL GETMAINED STORAGE	(MB)	487.16	24 BIT HIGH PRIVATE	(MB)	1.55
VIRTUAL BUFFER POOLS	(MB)	N/C	31 BIT EXTENDED LOW PRIVATE	(MB)	26.09
VIRTUAL POOL CONTROL BLOCKS	(MB)	N/C	31 BIT EXTENDED HIGH PRIVATE	(MB)	586.06
EDM POOL	(MB)	52.49	EXTENDED REGION SIZE (MAX)	(MB)	1846.00
COMPRESSION DICTIONARY	(MB)	0.62	EXTENDED CSA SIZE	(MB)	79.84
CASTOUT BUFFERS	(MB)	0.00			
DATA SPACE LOOKASIDE BUFFER	(MB)	N/C	AVERAGE THREAD FOOTPRINT	(MB)	1.50
HIPERPOOL CONTROL BLOCKS	(MB)	N/C	MAX NUMBER OF POSSIBLE THREADS		740.42
DATA SPACE BP CONTROL BLOCKS	(MB)	N/C			
TOTAL VARIABLE STORAGE	(MB)	68.02			
TOTAL AGENT LOCAL STORAGE	(MB)	32.42			
TOTAL AGENT SYSTEM STORAGE	(MB)	23.89			
NUMBER OF PREFETCH ENGINES		123.00			
NUMBER OF DEFERRED WRITE ENGINES		300.00			
NUMBER OF CASTOUT ENGINES		0.00			
NUMBER OF GBP WRITE ENGINES		0.00			
NUMBER OF P-LOCK/NOTIFY EXIT ENGINES		0.00			
TOTAL AGENT NON-SYSTEM STORAGE	(MB)	8.52			
TOTAL NUMBER OF ACTIVE USER THREADS		6.00			
RDS OP POOL	(MB)	2.24			
RID POOL	(MB)	2.29			
PIPE MANAGER SUB POOL	(MB)	0.00			
LOCAL DYNAMIC STMT CACHE CNTL BLKS	(MB)	16.68			
THREAD COPIES OF CACHED SQL STMTS	(MB)	0.09			
IN USE STORAGE	(MB)	N/A			
STATEMENTS COUNT		N/A			
HWM FOR ALLOCATED STATEMENTS	(MB)	N/A			
STATEMENT COUNT AT HWM		N/A			
DATE AT HWM		N/A			
TIME AT HWM		N/A			
BUFFER & DATA MANAGER TRACE TBL	(MB)	6.59			
TOTAL FIXED STORAGE	(MB)	1.18			
TOTAL GETMAINED STACK STORAGE	(MB)	11.62			
STORAGE CUSHION	(MB)	119.58			

- ➔ AVG thread footprint and max number of possible threads is NOT from IFCID 225
- ➔ Calculated by PE with input from DB2 development

Statistics Report Set

DBM1 STORAGE ABOVE 2 GB			REAL AND AUXILIARY STORAGE		
	QUANTITY			QUANTITY	
FIXED STORAGE	(MB)	N/A	REAL STORAGE IN USE	(MB)	476.22
GETMAINED STORAGE	(MB)	N/A	AUXILIARY STORAGE IN USE	(MB)	177.61
COMPRESSION DICTIONARY	(MB)	N/A			
CACHED DYNAMIC SQL STATEMENTS (MAX)	(MB)	N/A			
DBD CACHE (MAX)	(MB)	N/A			
VARIABLE STORAGE	(MB)	N/A			
VIRTUAL BUFFER POOLS	(MB)	N/A			
VIRTUAL POOL CONTROL BLOCKS	(MB)	N/A			
CASTOUT BUFFERS	(MB)	N/A			
STAR JOIN MEMORY POOL	(MB)	N/A			

- ➔ STATISTICS FILE SPREADSHEETDD(ddname)
- ➔ New with PK31073
- ➔ Allows to write IFCID 225 data out in CSV file format

LOCATION: DBP1	DB2 PERFORMANCE EXPERT (V2)	PAGE: 1-69
GROUP: N/P	RECORD TRACE - LONG	REQUESTED FROM: ALL 09:29:00.00
MEMBER: N/P		TO: DATES 11:01:00.00
SUBSYSTEM: DBP1		ACTUAL FROM: 10/24/06 09:51:25.37
DB2 VERSION: V7		PAGE DATE: 10/24/06
PRIMAUTH CONNECT	INSTANCE	END_USER
ORIGAUTH CORRNAME	CONNTYPE	RECORD TIME
PLANNAME CORRNUMBR	TCB CPU TIME	ID
WS_NAME	DESTNO ACE IFC	DESCRIPTION
TRANSACT	DATA	
SYSOPR DBP1 BF85E6B1B32B 'BLANK'	'BLANK'	
SYSOPR 016.WVSM 'BLANK'	10:30:01.54624237	954594 1 1 SYSTEM STATS
'BLANK' T 01	2.20849273	

QSST DATA		
QSSTGPLF 14674	QSSTFPLF 14607	QSSTFREF 14
QSSTGPLV 755895	QSSTFPLV 754770	QSSTFREV 1599541
QSSTGETM 112503	QSSTFREM 109695	QSSTRCNZ 0
QSSTABND 0		

- ➔ Raw record trace also contains the QSST data that you also have in a dump
- ➔ Does NOT get formatted by statistics trace or report

Accounting Report Set

- Based on DB2 accounting records (IFCID 3, 239)
- Contains local and distributed DB2 activity associated with a thread.
- Contains DBRM/package accounting information.
- Contains information about
 - Identification of thread
 - Elapsed, CPU, and wait times
 - SQL statements counters
 - RID list processing
 - Query parallelism
 - Group buffer pool and buffer pool activity
 - Data-sharing locking
 - Stored Procedures
 - Locking activity
 - Resource limit facility (RLF)
 - Distributed data facility (DDF)
 - Packages & DBRMs executed
- Can identify TOP resource consumers.
- Short and long flavor
- Report and trace
 - Traces more useful for dynamic SQL (as stmt usually changes)
- Used as a prime indicator for **thread-related** problems.

Accounting Report Set

- Get an idea about what's running – CONNTYPE report (no package info at this time)
 - One set of accounting information per DB2 connection type
 - TSO
 - DB2CALL
 - CICS
 - BATCH (DLI batch)
 - IMS-BMP ...
 - DB2-PRIV
 - DRDA
 - UTILITY
 - RRS

```
//SYSIN DD *
GLOBAL
TIMEZONE (+5:00)
    INCLUDE (DB2ID(DB2A))
ACCOUNTING
REPORT
ORDER (CONNTYPE) DDNAME (ACRPCN)
EXCLUDE (PACKAGE (*))
LAYOUT (LONG)
```

```
LOCATION: DP3G                                OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V4)                                PAGE: 1-1
GROUP: DSNDP3G                                ACCOUNTING REPORT - LONG                                REQUESTED FROM: NOT
SPECIFIED
MEMBER: DP33                                    TO: NOT
SPECIFIED
SUBSYSTEM: DP33                                ORDER: CONNTYPE                                INTERVAL FROM:
07/09/08 18:00:00.00                            SCOPE: MEMBER                                    TO:
DB2 VERSION: V8
07/09/08 19:59:59.96

CONNTYPE: CICS

ELAPSED TIME DISTRIBUTION                        CLASS 2 TIME DISTRIBUTION
-----
```

APPL	===== > 99%	CPU	===== > 28%
DB2		NOTACC	
SUSP	> 1%	SUSP	===== >
72%			

ORDER processing

- Like GROUP BY processing in SQL

Table 2. Performance Expert identifiers used with ORDER subcommand option

Performance Expert Identifier	ACCT	AUD	I/O	LOCK	SQL	STAT	UTIL
BPID (Buffer pool ID)			●				
CLASS (DB2 trace class)	●	●	●	●	●		●
CONNECT (Connection ID)	●	●	●	●	●		●
CONNTYPE (Connection type)	●	●	●	●	●		●
CORRNAME (Correlation name)	●	●	●	●	●		●
CORRNMBR (Correlation number)	●	●	●	●	●		●
DATABASE (Database name)			●	●			
ENDUSER (End user ID)	●	●		●	●		
INSTANCE (Instance number)							●
INTERVAL (Interval)	●		●			●	
MAINPACK (Main package)	●						
OBJECT (Object type)		●					
ORIGAUTH (Original authorization ID)	●	●	●	●	●		●
PACKAGE (Package information) or PROGRAM (Program information)	●						
PAGESET (Page set name)			●	●			
PLANNAME (Plan name)	●	●	●	●	●		●
PRIMAUTH (Primary authorization ID) or AUTHID (Authorization ID)	●		●	●	●		●
REQLOC (Requester location)	●	●	●	●	●		●
TRANSACTION (End user transaction name)	●	●		●	●		
WSNAME (End user workstation name)	●	●		●	●		

Accounting Report Layout(long) extract

LOCATION: DB2P	DB2 PERFORMANCE EXPERT (V2)	PAGE: 1-15					
GROUP: N/P	ACCOUNTING REPORT - LONG	REQUESTED FROM: ALL 18:10:29.45					
MEMBER: N/P		TO: DATES 18:25:30.19					
SUBSYSTEM: DB2P	ORDER: CONNTYPE	INTERVAL FROM: 07/21/06 18:10:29.58					
DB2 VERSION: V7	SCOPE: MEMBER	TO: 07/21/06 18:25:30.08					
CONNTYPE: DRDA							
ELAPSED TIME DISTRIBUTION		CLASS 2 TIME DISTRIBUTION					
APPL ===== > 100%	CPU ===== > 15%						
DB2	NOTACC => 3%						
SUSP => 2%	SUSP ===== > 82%						
AVERAGE	APPL(CL.1)	DB2 (CL.2)	IFI (CL.5)	CLASS 3 SUSPENSIONS	AVERAGE TIME	AV.EVENT	HIGHLIGHTS
ELAPSED TIME	6.448931	0.129922	N/P	LOCK/LATCH(DB2+IRLM)	0.002757	0.99	#OCCURENCES : 12261
NONNESTED	6.258099	0.010702	N/A	SYNCHRON. I/O	0.078429	26.13	#ALLIEDS : 0
STORED PROC	0.190832	0.119219	N/A	DATABASE I/O	0.074907	25.33	#ALLIEDS DISTRIB: 0
UDF	0.000000	0.000000	N/A	LOG WRITE I/O	0.003522	0.79	#DBATS : 12261
TRIGGER	0.000000	0.000000	N/A	OTHER READ I/O	0.024741	1.30	#DBATS DISTRIB. : 0
				OTHER WRTE I/O	0.000247	0.01	#NO PROGRAM DATA: 18
CPU TIME	0.022237	0.019570	N/P	SER.TASK SWTCH	0.000162	0.04	#NORMAL TERMINAT: 12261
AGENT	0.022237	0.019570	N/A	UPDATE COMMIT	0.000125	0.03	#ABNORMAL TERMIN: 0
NONNESTED	0.004760	0.004304	N/P	OPEN/CLOSE	0.000000	0.00	#CP/X PARALLEL. : 0
STORED PRC	0.017478	0.015267	N/A	SYSLGRNG REC	0.000033	0.00	#IO PARALLELISM : 0
UDF	0.000000	0.000000	N/A	EXT/DEL/DEF	0.000000	0.00	#INCREMENT. BIND: 10183
TRIGGER	0.000000	0.000000	N/A	OTHER SERVICE	0.000004	0.00	#COMMITTS : 13132
PAR.TASKS	0.000000	0.000000	N/A	ARC.LOG(QUIES)	0.000000	0.00	#ROLLBACKS : 110
				ARC.LOG READ	0.000000	0.00	#SVPT REQUESTS : 26
SUSPEND TIME	0.005267	0.106344	N/A	DRAIN LOCK	0.000000	0.00	#SVPT RELEASE : 2
AGENT	N/A	0.106344	N/A	CLAIM RELEASE	0.000000	0.00	#SVPT ROLLBACK : 0
PAR.TASKS	N/A	0.000000	N/A	PAGE LATCH	0.000008	0.05	MAX SQL CASC LVL: 5
STORED PROC	0.005267	N/A	N/A	NOTIFY MSGS	0.000000	0.00	UPDATE/COMMIT : 15.65
UDF	0.000000	N/A	N/A	GLOBAL CONTENTION	0.000000	0.00	SYNCH I/O AVG. : 0.003002
				COMMIT PH1 WRITE I/O	0.000000	0.00	
NOT ACCOUNT.	N/A	0.003817	N/A	ASYNCH CF REQUESTS	0.000000	0.00	
DB2 ENT/EXIT	N/A	8.46	N/A	TOTAL CLASS 3	0.106344	28.51	
EN/EX-STPROC	N/A	253.60	N/A				
EN/EX-UDF	N/A	0.00	N/A				

Time to get the SP/UDF going
 Waiting for WLM to start the AS
 Wait for an available TCB to run on

Accounting Trace Layout(long) extract

```

LOCATION: BEBBCM_SDTE          OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V4)          PAGE: 1-12
GROUP: SSSYSDTE              ACCOUNTING TRACE - LONG                      REQUESTED FROM: NOT SPECIFIED
MEMBER: SDTE                 TO: NOT SPECIFIED
SUBSYSTEM: SDTE              ACTUAL FROM: 09/20/06 13:24:55.82
DB2 VERSION: V8
    
```

```

----- IDENTIFICATION -----
ACCT TSTAMP: 09/20/06 13:24:55.82  PLANNAME: DSNREXX          WLM SCL: 'BLANK'          CICS NET: N/A
BEGIN TIME : 09/20/06 13:24:52.84  PROD TYP: N/P              CICS LUN: N/A
END TIME   : 09/20/06 13:24:55.82  PROD VER: N/P              LUW NET: BEKB0300        CICS INS: N/A
REQUESTER  : BEBBCM_SDTE            CORRNAME: EIDESDTE         LUW LUN: A0SDTE
MAINPACK   : DSNREXX                CORRNMBR: 'BLANK'          LUW INS: BF6F2D0FE57A    ENDUSER  : 'BLANK'
PRMAUTH    : EI0006N                CONNTYPE: DB2CALL          LUW SEQ:                   1    TRANSACT: 'BLANK'
ORIGAUTH   : EI0006N                CONNECT : DB2CALL          WSNAME   : 'BLANK'
    
```

```

MVS ACCOUNTING DATA : EDB2
ACCOUNTING TOKEN(CHAR): N/A
ACCOUNTING TOKEN(HEX) : N/A
    
```

```

ELAPSED TIME DISTRIBUTION          CLASS 2 TIME DISTRIBUTION
-----
APPL |                               CPU   |> 1%
DB2  |===== > 52%                   NOTACC |===== > 52%
SUSP |===== > 47%                   SUSP  |===== > 47%
    
```

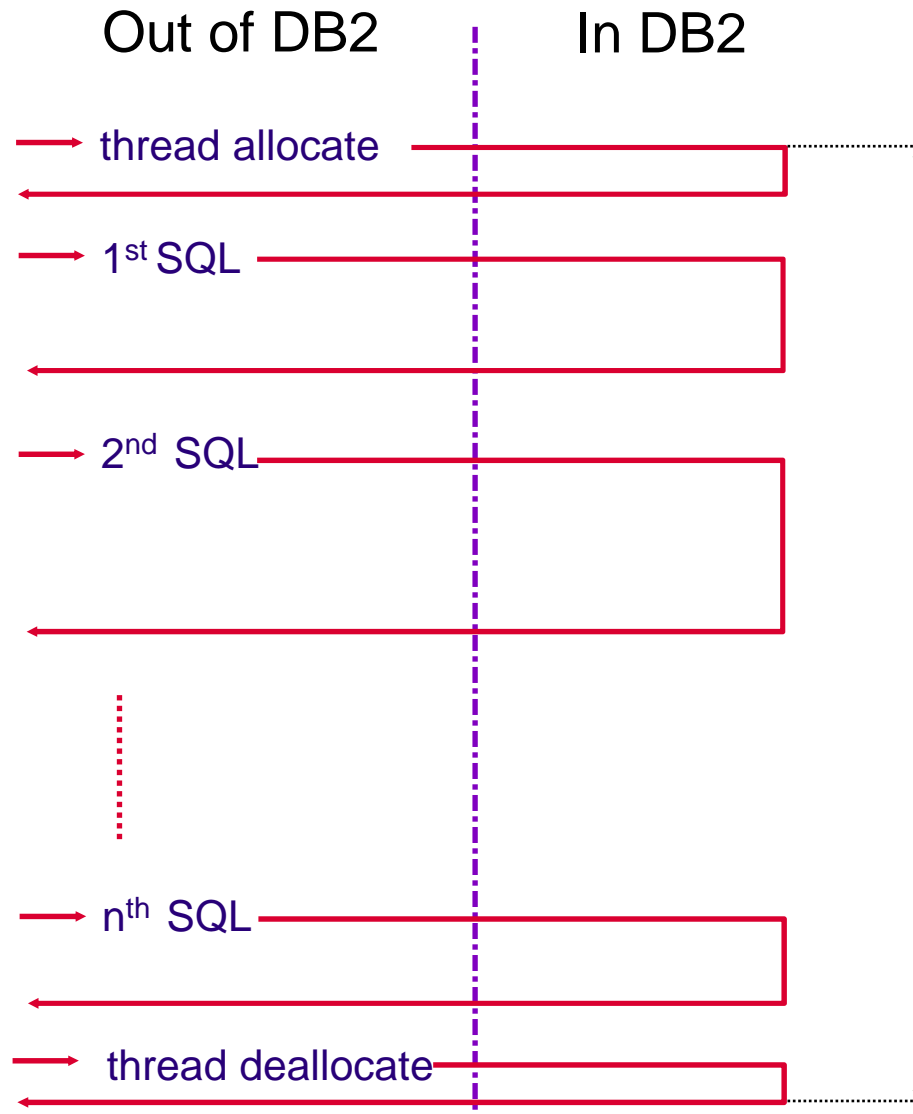
TIMES/EVENTS	APPL(CL.1)	DB2 (CL.2)	IFI (CL.5)	CLASS 3 SUSPENSIONS	ELAPSED TIME	EVENTS	HIGHLIGHTS
ELAPSED TIME	2.983795	2.976362	N/P	LOCK/LATCH(DB2+IRLM)	0.000000	0	THREAD TYPE : ALLIED
NONNESTED	2.983795	2.976362	N/A	SYNCHRON. I/O	0.129328	16	TERM.CONDITION: NORMAL
STORED PROC	0.000000	0.000000	N/A	DATABASE I/O	0.129328	16	INVOKE REASON : DEALLOC
UDF	0.000000	0.000000	N/A	LOG WRITE I/O	0.000000	0	COMMITTS : 1
TRIGGER	0.000000	0.000000	N/A	OTHER READ I/O	0.197046	1	ROLLBACK : 0
CP CPU TIME	0.018188	0.017090					SVPT REQUESTS : 0
AGENT	0.018188	0.017090					SVPT RELEASE : 0
NONNESTED	0.018188	0.017090					SVPT ROLLBACK : 0
STORED PRC	0.000000	0.000000					INCREM.BINDS : 0
UDF	0.000000	0.000000					UPDATE/COMMIT : 1.00
TRIGGER	0.000000	0.000000					SYNCH I/O AVG.: 0.008083
PAR.TASKS	0.000000	0.000000					PROGRAMS : 1
IIPCP CPU	0.000000	N/A					MAX CASCADE : 0
IIP CPU TIME	0.000000	0.000000	N/A	PAGE LATCH	0.000000	0	PARALLELISM : NO
				NOTIFY MSGS	0.000000	0	

zIIP CPU

- IIPCP CPU eligible but did not run on a zIIP
- IIP CPU run on a zIIP

f Included in CP CPU time

Response Time: DB2 View



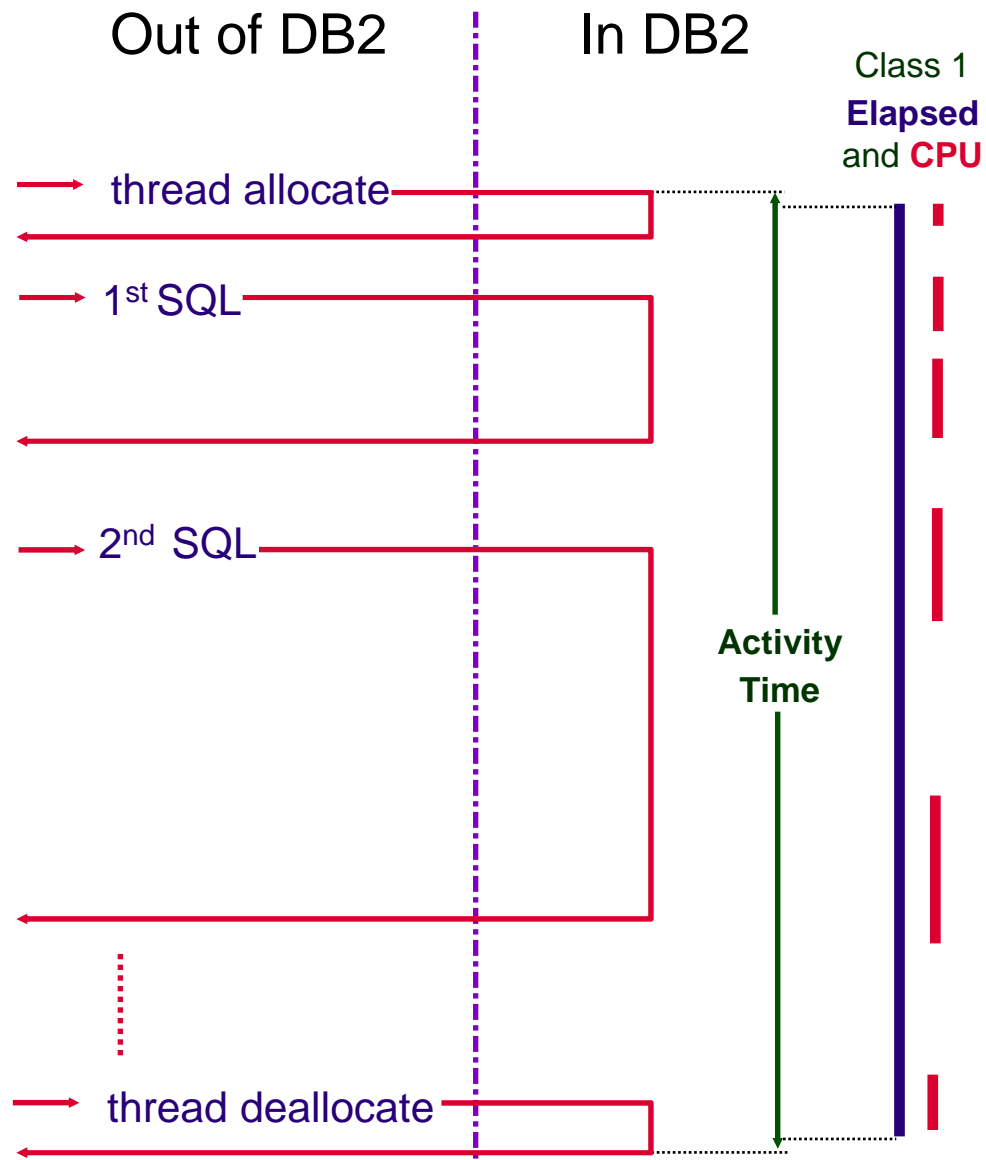
DB2 can collect data during the entire thread life: *activity time*.

It includes time spent in:

- presentation layer (GUI)
- application logic
- network
- DB2 processing

It is practically **DB2 Accounting Class 1** elapsed time.

Accounting Class 1 Data

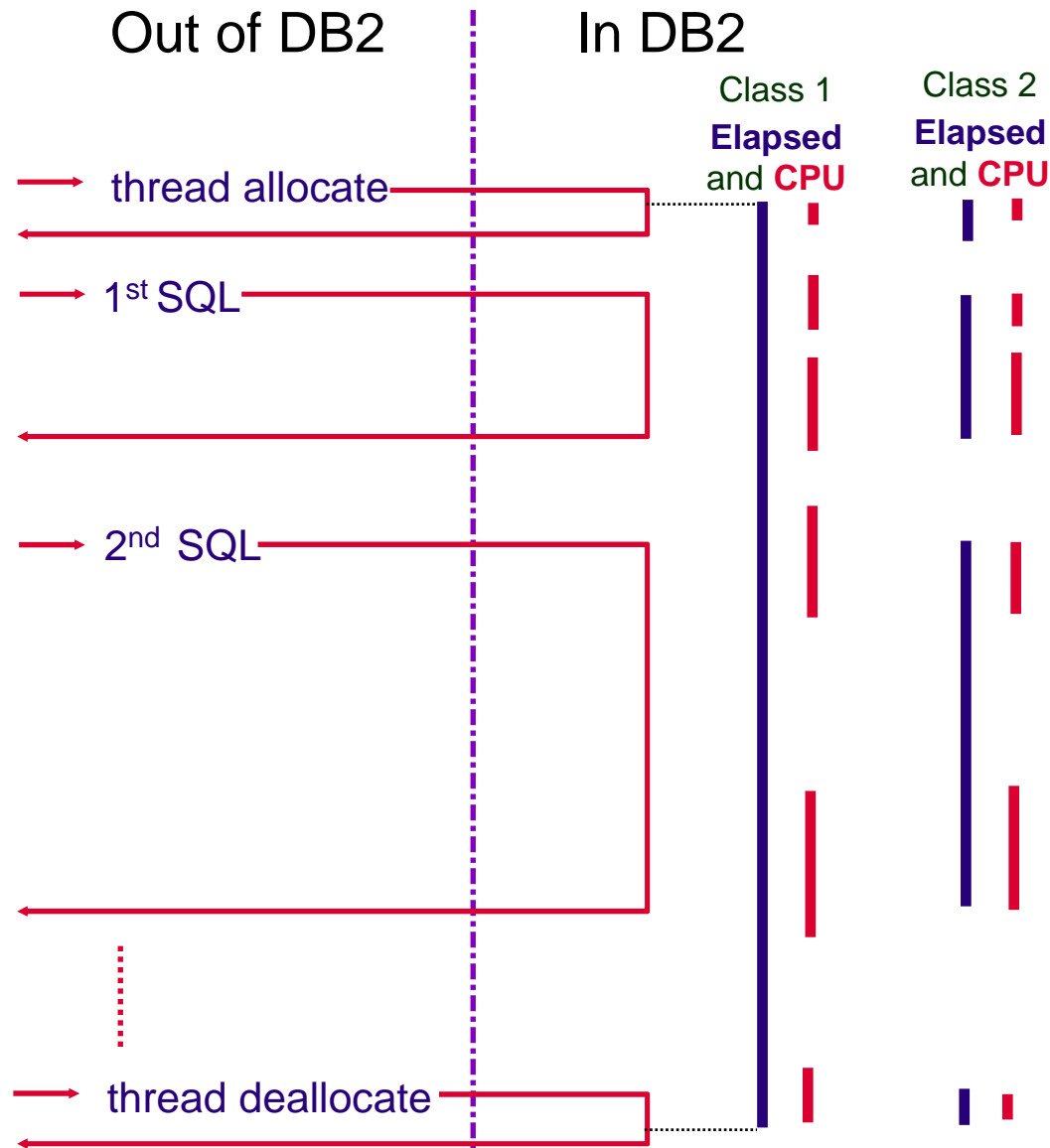


For local applications DB2 provides an accumulative timer which includes both CPU spent in application and CPU spent in DB2.

Activity Time is very close to **Class 1 Elapsed Time**

- For local applications
 - (Elapsed - CPU) time can point to application inefficiencies.
 - Be careful with thread reuse
- For distributed applications that value is not relevant.

Accounting Class 2 Data



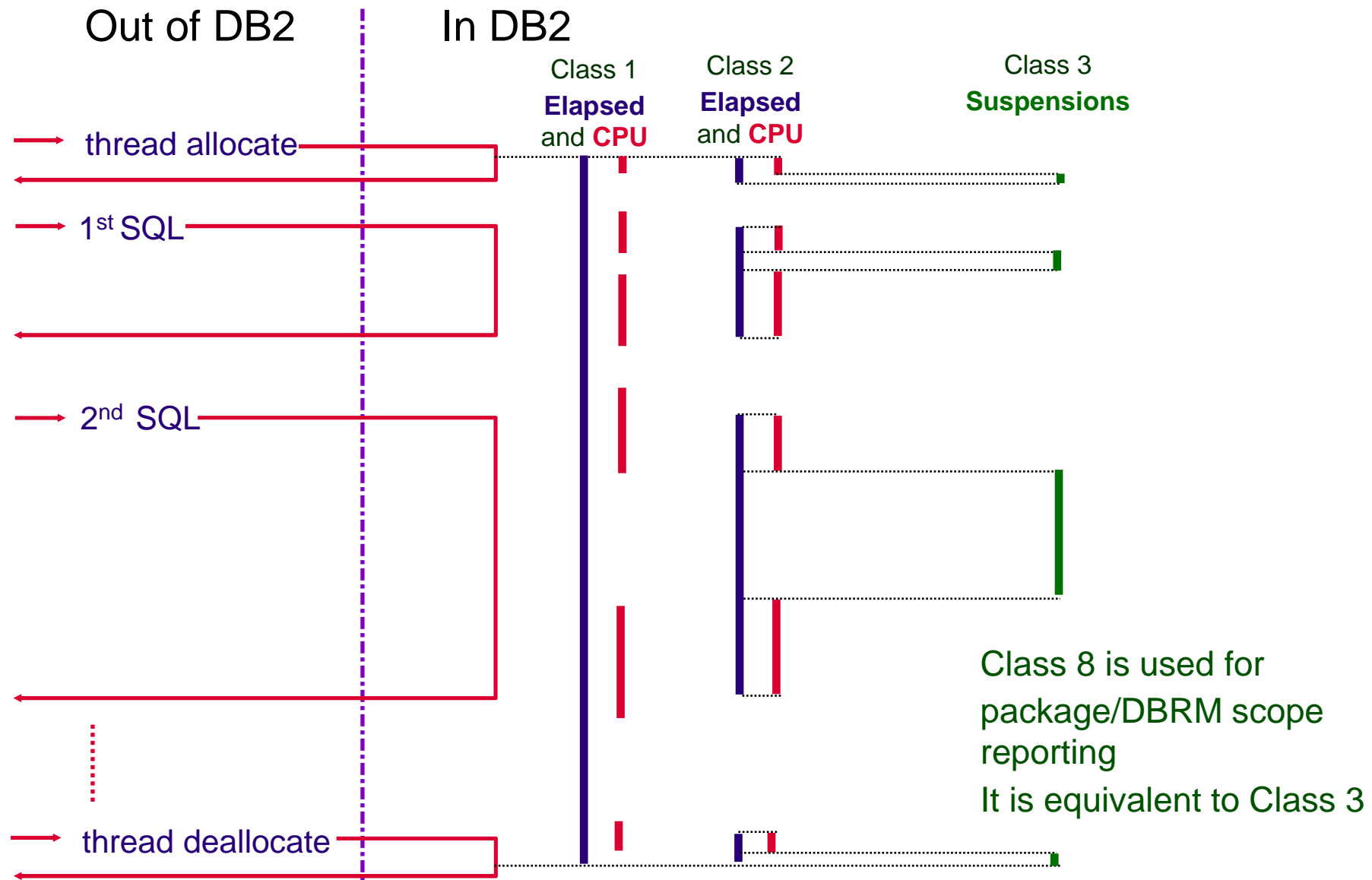
Class 2 timers are accumulative

Time spent out of DB2 =
 Class 1 Elapsed - Class 2 Elapsed

Waiting in DB2 =
 Class 2 Elapsed - Class 2 CPU

Class 7 is used for
 package/DBRM scope reporting
 It is equivalent to Class 2

Accounting Class 3 Data



Elapsed Time Distribution



Accounting Report Layout(long) extract

NORMAL TERM.	AVERAGE	TOTAL
-----	-----	-----
NEW USER	0.00	0
DEALLOCATION	0.00	0
APPL.PROGR. END	0.00	0
RESIGNON	0.00	0
DBAT INACTIVE	0.00	0
TYPE2 INACTIVE	0.00	0
RRS COMMIT	0.00	0
END USER THRESH	0.10	95
BLOCK STOR THR	0.00	0
STALENESS THR	0.00	0

- ➔ New user / Resignon / DBAT inactive indicate thread reuse
- ➔ Rollup accounting active and records rolled up in the trace
- ➔ Then averages are calculated base on total "transactions", not # occurrences

Accounting Report Set (long) - pre V8 package accgt

```

-----
|PROGRAM NAME          CLASS 7 CONSUMERS
|FIJDCAIB              => 3%
|FIMDCHR               |
|FIMDEXR               |
|FIMDIRQ               |
|FIMDLIST              ===> 6%
|FIMDMRPB              =====> 53%
|FIMDMTO1              => 2%
|FIMDMTO2              |
|FIMDMTO3              => 2%
|FIMDMTO4              =====> 11%
|FIMDPH0               |
|FIMDPH1               =====> 22%
|FIMDREP               |
-----
    
```

FIMDMRPB	VALUE	FIMDMRPB	TIMES	FIMDMRPB	AVERAGE TIME	AVG.EV	TIME/EVENT
-----	-----	-----	-----	-----	-----	-----	-----
TYPE	PACKAGE	ELAP-CL7 TIME-AVG	6.680010	LOCK/LATCH	0.003073	46.50	0.000066
		CPU TIME	1.227790	SYNCHRONOUS I/O	3.218596	554.00	0.005810
LOCATION	SYSDSN8	AGENT	1.227790	OTHER READ I/O	1.379313	136.50	0.010105
COLLECTION ID	FIJ1	PAR.TASKS	0.000000	OTHER WRITE I/O	0.451942	17.00	0.026585
PROGRAM NAME	FIMDMRPB	SUSPENSION-CL8	5.380605	SERV.TASK SWITCH	0.327681	13.50	0.024273
		AGENT	5.380605	ARCH.LOG(QUIESCE)	0.000000	0.00	N/C
OCCURRENCES	2	PAR.TASKS	0.000000	ARCHIVE LOG READ	0.000000	0.00	N/C
SQL STMT - AVERAGE	10975.00	NOT ACCOUNTED	0.071615	STORED PROC SCHED	0.000000	0.00	N/C
SQL STMT - TOTAL	21950	AVG.DB2 ENTRY/EXIT	21978.00	UDF SCHEDULE	0.000000	0.00	N/C
STOR PROC EXECUTED	0	DB2 ENTRY/EXIT	43956	DRAIN LOCK	0.000000	0.00	N/C
UDF EXECUTED	0			CLAIM RELEASE	0.000000	0.00	N/C
USED BY STOR PROC	0	CPU SERVICE UNITS	5513.00	PAGE LATCH	0.000000	0.00	N/C
USED BY UDF	0	AGENT	5513.00	NOTIFY MESSAGES	0.000000	0.00	N/C
USED BY TRIGGER	0	PAR.TASKS	0.00	GLOBAL CONTENTION	0.000000	0.00	N/C
SUCC AUTH CHECK	0			TOTAL CL8 SUSPENS.	5.380605	767.50	0.007011

Accounting package sections (acctg trace)

```

-----
| PROGRAM NAME                CLASS 7 CONSUMERS          |
| REPORT1                     |=====|> 56%                               |
| RETRSET                      |=====|> 44%                               |
-----

```

REPORT1	VALUE	REPORT1	TIMES	REPORT1	TIME	EVENTS	TIME/EVENT
TYPE	PACKAGE	ELAPSED TIME - CL7	0.307480	LOCK/LATCH	0.000000	0	N/C
LOCATION	VGLDVOG	CP CPU TIME	0.009147	SYNCHRONOUS I/O	0.010964	2	0.005482
COLLECTION ID	UPGMPACK	AGENT	0.009147	OTHER READ I/O	0.000000	0	N/C
PROGRAM NAME	REPORT1	PAR.TASKS	0.000000	OTHER WRITE I/O	0.000000	0	N/C
CONSISTENCY TOKEN	17F3161407E055CF	IIP CPU TIME	0.000000	SERV.TASK SWITCH	0.230648	13	0.017742
ACTIVITY TYPE	NONNESTED	SUSPENSION-CL8	0.241612	ARCH.LOG(QUIESCE)	0.000000	0	N/C
ACTIVITY NAME	'BLANK'	AGENT	0.241612	ARCHIVE LOG READ	0.000000	0	N/C
SCHEMA NAME	'BLANK'	PAR.TASKS	0.000000	DRAIN LOCK	0.000000	0	N/C
SQL STATEMENTS	100	NOT ACCOUNTED	0.056721	CLAIM RELEASE	0.000000	0	N/C
SUCC AUTH CHECK	NO			PAGE LATCH	0.000000	0	N/C
		CP CPU SU	184	NOTIFY MESSAGES	0.000000	0	N/C
		AGENT	184	GLOBAL CONTENTION	0.000000	0	N/C
		PAR.TASKS	0	TOTAL CL8 SUSPENS.	0.241612	15	0.016107
		IIP CPU SU	0				
		DB2 ENTRY/EXIT	251				

REPORT1	ELAPSED TIME	EVENTS	REPORT1	ELAPSED TIME	EVENTS
GLOBAL CONTENTION L-LOCKS	0.000000	0	GLOBAL CONTENTION P-LOCKS	0.000000	0
PARENT (DB,TS,TAB,PART)	0.000000	0	PAGESET/PARTITION	0.000000	0
CHILD (PAGE,ROW)	0.000000	0	PAGE	0.000000	0
OTHER	0.000000	0	OTHER	0.000000	0

Accounting package (trace) - new V8 sections

REPORT1	TOTAL
-----	-----
SELECT	0
INSERT	0
UPDATE	0
DELETE	0
DESCRIBE	0
PREPARE	0
OPEN	0
FETCH	0
CLOSE	0
LOCK TABLE	0
CALL	0
REPORT1	TOTAL
-----	-----
BPOOL HIT RATIO (%)	0
GETPAGES	0
BUFFER UPDATES	0
SYNCHRONOUS WRITE	0
SYNCHRONOUS READ	0
SEQ. PREFETCH REQS	0
LIST PREFETCH REQS	0
DYN. PREFETCH REQS	0
PAGES READ ASYNCHR.	0

REPORT1	TOTAL
-----	-----
TIMEOUTS	0
DEADLOCKS	0
ESCAL.(SHARED)	0
ESCAL.(EXCLUS)	0
MAX PG/ROW LOCKS HELD	0
LOCK REQUEST	0
UNLOCK REQUEST	0
QUERY REQUEST	0
CHANGE REQUEST	0
OTHER REQUEST	0
TOTAL SUSPENSIONS	0
LOCK SUSPENS	0
IRLM LATCH SUSPENS	0
OTHER SUSPENS	0

- More detailed SQL stmt type info / Total BP info / locking info at package level
- This info will be enabled/disabled with accounting class(10) after PK28561
- OMPE always prints these sections even if class 10 is not active (with zero totals as shown above)

Accounting Top processing

■ TOP fields - plan related

- f* INAPPLET
- f* INDB2ET
- f* OUTDB2ET
- f* INAPPLPT
- f* INDB2PT
- f* OUTDB2PT
- f* INAPPLWT
- f* INDB2WT
- f* OUTDB2WT
- f* TOTSUSTM
- f* DMLSTAT
- f* DDLSTAT
- f* UPDPERCM
- f* CMPERUPD
- f* TOTSUSP
- f* GETPAGES
- f* NOTACCT
- f* BUFUPDTS
- f* SYNCREAD
- f* TOTPREF

■ TOP fields - package related

- f* PINDBET
- f* PINDBPT
- f* PTSUSTME
- f* PNOTACCT

Accounting Top processing example

- Generate an accounting trace report of
 - ONLY the TOP 20
 - DRDA transactions
 - That used the most class2 CPU time
 - Write report to a DDNAME ACTRDRDA
 - Only for DB2A
 - Adjust the time by (subtracting) 5 hours
- If package information (IFCID 239) is present also package info
- Check if rollup is active

```
//SYSIN DD *
GLOBAL
TIMEZONE (+5:00)
INCLUDE (DB2ID(DB2A))
ACCOUNTING
TRACE
LAYOUT (LONG)
INCLUDE (CONNTYPE(DRDA))
TOP (20 ONLY INDB2PT)
DDNAME (ACTRDRDA)
```

LOCATION: DP3G GROUP: DSNDP3G MEMBER: DP33 SUBSYSTEM: DP33 DB2 VERSION: V8	OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V4) ACCOUNTING TRACE - LONG	PAGE: 1-1 REQUESTED FROM: NOT SPECIFIED TO: NOT SPECIFIED ACTUAL FROM: 07/09/08 19:
TOP FIELD: PROCESSING (CL.2) TIME SPENT IN DB2		TOP NUMBER REQUESTED: 20
----- IDENTIFICATION -----		
ACCT TSTAMP: 07/09/08 19:32:45.90 BEGIN TIME : 07/09/08 19:03:20.45 END TIME : N/P REQUESTER : DP3G MAINPACK : *ROLLUP* PRIMAUTH : RW110 ORIGAUTH : RW110	PLANNAME: DISTSERV PROD TYP: N/P PROD VER: N/P CORRNAME: javaw.ex CORRNMBR: e CONNTYPE: DRDA CONNECT : SERVER	WLM SCL: DDFDB2 LUW NET: DP33 LUW LUN: DP33 LUW INS: C2A6A1712E7D LUW SEQ: 1
		CICS NET: N/A CICS LUN: N/A CICS INS: N/A ENDUSER : rw110 TRANSACT: javaw.exe WSNAME : DSDLDAVISB1

INCLUDE / EXCLUDE options

Table 3. Performance Expert identifiers used with INCLUDE and EXCLUDE subcommand option

Performance Expert identifier	ACCT	AUD	I/O	LOCK	RT	SQL	STAT	UTIL	GLOB
ACE (Agent control element address)					t,f	r,t,p			all
CLASS (DB2 trace class)					t,f				all
CONNECT (Connection ID)	r,t,p,f	r,t,p,f	r,p	r,t,p,f	t,f	r,t,p		r,t,p	all
CONNTYPE (Connection type)	r,t,p,f	r,t,p,f	r,p	r,t,p,f	t,f	r,t,p		r,t,p	all
CORRNAME (Correlation name)	r,t,p,f	r,t,p,f	r,p	r,t,p,f	t,f	r,t,p		r,t,p	all
CORRNMBR (Correlation number)	r,t,p,f	r,t,p,f	r,p	r,t,p,f	t,f	r,t,p		r,t,p	all
DATABASE (Database name)			r,p	r,t,p,f					all
DATASET (Data set name)			r,p						all
ENDUSER (End user ID)	r,t,p,f	r,t,p,f		r,t,p,f	t,f	r,t,p,f			
FIELD (Comparison with data in a record field)					t,f				all
GROUP (Group name)	r,t,p,f	r,t,p,f	r,p	r,t,p,f	t,f	r,t,p	r,t,p,f	r,t,p	all
IFCID (Instrumentation Facility Component Identifier)					t,f	r,t,p			all
INSTANCE (Instance number)	r,t,f	r,t,p,f		t,f	t,f	r,t,p		r,t,p	all
LOCATION (Location name)	r,t,p,f	r,t,p,f	r,p	r,t,p,f	t,f	r,t,p	r,t,p,f	r,t,p	all
MAINPACK (Main package)	r,t,p,f								
MEMBER (Member name)	r,t,p,f	r,t,p,f	r,p	r,t,p,f	t,f	r,t,p	r,t,p,f	r,t,p	all
ORIGAUTH (Original authorization ID)	r,t,p,f	r,t,p,f	r,p	r,t,p,f	t,f	r,t,p		r,t,p	all
PACKAGE (Package information) or PROGRAM (Program information)	r,t,p,f								
PAGESET (Page set name)			r,p	r,t,p,f					all
PLANNAME (Plan name)	r,t,p,f	r,t,p,f	r,p	r,t,p,f	t,f	r,t,p		r,t,p	all

Table 3. Performance Expert identifiers used with INCLUDE and EXCLUDE subcommand option (continued)

Performance Expert identifier	ACCT	AUD	I/O	LOCK	RT	SQL	STAT	UTIL	GLOB
PRIMAUTH (Primary authorization ID) or AUTHID (Authorization ID)	r,t,p,f	r,t,p,f	r,p	r,t,p,f	t,f	r,t,p		r,t,p	all
REQLOC (Requester location)	r,t,p,f	r,t,p,f	r,p	r,t,p,f	t,f	r,t,p		r,t,p	all
RESOURCETYPE (Resource type)				r,t,p,f					
RMD (Resource manager identifier)					t,f				all
SQLCODE					t,f	t			
SUBSYSTEMID (Subsystem ID)	r,t,p,f	r,t,p,f	r,p	r,t,p,f	t,f	r,t,p	r,t,p,f	r,t,p	all
THREADTYPE (Thread type)	r,t,p,f	r,t,p,f	r,p	r,t,p,f	t,f	r,t,p		r,t,p	
TRANSACTION (End user transaction name)	r,t,p,f	t,p,f	r,t,p,f	t,f	r,t,p,f				
TYPE (Event type)				r,t,f					
WSNAME (End user workstation name)	r,t,p,f	t,p,f		r,t,p,f	t,f	r,t,p,f			

Note: The use of PLANNAME as a filter for Accounting reports in a DDF environment can cause unexpected results. See "Special considerations for DDF trace data" on page 37.

Accounting Trace (short)

LOCATION: SYSDSN7		DB2 PERFORMANCE MONITOR (V7)							PAGE: 1-1				
GROUP: DSN7		ACCOUNTING TRACE - SHORT							REQUESTED FROM: NOT SPECIFIED				
MEMBER: SG71									TO: NOT SPECIFIED				
SUBSYSTEM: SG71									ACTUAL FROM: 04/24/01 08:21:22.85				
DB2 VERSION: V7									PAGE DATE: 04/24/01				
PRIMAUTH	CORRNAME	CONNECT	ACCT	TIMESTAMP	COMMITTS	OPENS	UPDATES	INSERTS	EL. TIME(CL1)	EL. TIME(CL2)	GETPAGES	SYN.READ	LOCK SUS
PLANNAME	CORRNMBR	THR.TYPE	TERM.	CONDITION	SELECTS	FETCHES	DELETES	PREPARE	CPU TIME(CL1)	CPU TIME(CL2)	BUF.UPDT	TOT.PREF	LOCKOUTS
JEN	JENJBMRM	BATCH	08:21:22.85	5435	17	2429	322	2104	18.854923	12.994234	42692	1057	10
FIJ1BAT	'BLANK'	ALLIED	NORM	DEALLOC	3505	6288	233	0	3.657565	2.598451	17997	351	0
PROGRAM NAME	TYPE	SQLSTMT	CL7	ELAP.TIME	CL7 CPU TIME	CL8	SUSP.TIME	CL8	SUSP				
FIMDPH0	PACKAGE	27		0.062866	0.003673		0.058697		2				
FIMDPH1	PACKAGE	403		3.598929	0.599123		2.994598		354				
FIMDIRQ	PACKAGE	2		0.002423	0.000706		0.001796		1				
FIMDCHR	PACKAGE	6		0.073416	0.001200		0.072333		2				
FIMDREP	PACKAGE	27		0.002771	0.002436		N/P		N/P				
FIMDEXR	PACKAGE	49		0.003984	0.003895		N/P		N/P				
FIMDMRPB	PACKAGE	10975		6.664664	1.235758		5.358279		751				
FIMDMTO1	PACKAGE	263		0.320842	0.039257		0.283440		62				
FIMDMTO2	PACKAGE	92		0.010085	0.008776		N/P		N/P				
FIMDMTO3	PACKAGE	250		0.326448	0.049734		0.274011		27				
FIMDMTO4	PACKAGE	4761		1.480512	0.557355		0.871868		132				
FIJDCAIB	PACKAGE	456		0.447282	0.096527		0.333334		66				
JEN	JENJBMRM	BATCH	08:21:28.53	8964	1	1	0	0	1.179661	1.046372	529	33	0
FIJ1BAT	'BLANK'	ALLIED	NORM	DEALLOC	1159	229	0	0	0.166724	0.140499	0	7	0
PROGRAM NAME	TYPE	SQLSTMT	CL7	ELAP.TIME	CL7 CPU TIME	CL8	SUSP.TIME	CL8	SUSP				
FIMDLIST	PACKAGE	1390		1.046320	0.140450		0.896530		36				

Accounting INTERVAL processing

- Can 'roll up' accounting records in intervals, for example 5 minute interval in case you need need to see how the system performs over time
 - For example to find a peak or drop in workload
 - Use REDUCE INTERVAL(x) and REPORT ORDER(INTERVAL)
 - Is processing intensive to generate such a report. Therefore filter as much as possible
 - May also need to adjust
`//SORTWK0x DD UNIT=SYSDA,SPACE=(CYL,(500,500))`
 - Or add more SORTWKxx DD statements for sorting
- Also works for STATISTICS
 - ➡ Don't 'roll up' statistics into INTERVALs smaller than the DB2 STATIME interval
 - Eg if STATIME=5 , using INTERVAL(1) does not make any sense
Report will show 5 identical values for 5 minutes

Accounting INTERVAL processing example

- Generate an accounting report report
 - For 1 minute interval
 - Per connection type
 - Write report to a DDNAME ACTRDRDA
 - Takes a lot of work to produce.
 - Therefore limit the scope as much as you can
 - Only for D2PL
 - Using FROM , TO
 - Only for specific plans ..

```
//SYSIN DD *
GLOBAL
TIMEZONE (+5:00)
FROM(,08:55:00.00)
TO(,09:05:00.00)
INCLUDE( DB2ID(D2PL))
ACCOUNTING
REDUCE
INTERVAL(1)
REPORT
LAYOUT(LONG)
ORDER(CONNTYPE-INTERVAL)
```

```
LOCATION: MEMD2PB                                OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V4)
GROUP: D2PBDSNG                                ACCOUNTING REPORT - LONG
MEMBER: D2PL                                    ORDER: CONNTYPE-INTERVAL
SUBSYSTEM: D2PL                                SCOPE: MEMBER
DB2 VERSION: V8
EXCLUDE(PACKAGE(*))
PAGE: 1-1
REQUESTED FROM: ALL 08:
TO: DATES 09:
INTERVAL FROM: 06/30/08 08:
TO: 06/30/08 09:

...
CONNTYPE: DRDA INTERVAL: 06/30 08:55 - 06/30 08:56
...
CONNTYPE: DRDA INTERVAL: 06/30 08:56 - 06/30 08:57
...
CONNTYPE: DRDA INTERVAL: 06/30 08:57 - 06/30 08:58
...
CONNTYPE: DRDA INTERVAL: 06/30 08:58 - 06/30 08:59
...

CONNTYPE: IMS-MPP INTERVAL: 06/30 08:55 - 06/30 08:56
...
CONNTYPE: IMS-MPP INTERVAL: 06/30 08:56 - 06/30 08:57
...
CONNTYPE: IMS-MPP INTERVAL: 06/30 08:57 - 06/30 08:58
...
CONNTYPE: IMS-MPP INTERVAL: 06/30 08:58 - 06/30 08:59
```

Accounting only package info

- Both package and DBRM
- Be careful when rollup is active

```
//SYSIN DD *
GLOBAL
  TIMEZONE (+5:00)
  INCLUDE (DB2ID(DB2A))
ACCOUNTING
REPORT
  ORDER (PROGRAM) DDNAME (ACRPPG)
  LAYOUT (SHORT)
```

LOCATION: DP3G	OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V4)	PAGE: 1-1
GROUP: DSNDP3G	ACCOUNTING REPORT - SHORT	REQUESTED FROM: NOT SPECIFIED
MEMBER: DP33		TO: NOT SPECIFIED
SUBSYSTEM: DP33	ORDER: PACKAGE	INTERVAL FROM: 07/09/08 18:
DB2 VERSION: V8	SCOPE: MEMBER	TO: 07/09/08 19:

PACKAGE	TYPE	#OCCURS	SQLSTMT	CL7 CPU TIME	CL8 SUSP
			CL7 ELAP.TIME	CL8 SUSP.TIME	
'BLANK'.'BLANK'.DSNTIAUL	DBRM	1	373.00 0.344343	0.013646 0.329956	25.00
'BLANK'.'BLANK'.NAA0210	DBRM	4	26.0K 0.918041	0.641476 0.185402	402.25
'BLANK'.'BLANK'.NAC0310	DBRM	1	360.3K 16.550562	13.319734 1.034322	1673.00

System Parameters Report Set

- **SYSPARMS TRACE** command
- Show configuration information of subsystem.
 - so called "ZPARM's"
- Based on IFCID 106 (ZPARMS) , 202 (BP config)
- **ALWAYS** good to verify these in each trace/report
- New entry is produced when system parameters change.
- Buffer pool and group buffer pool changes are reported as well.

Locking Report Sets

- Provides detail information about
 - DB2 transaction locks
 - ◆ Suspensions
 - ◆ Timeouts
 - ◆ Deadlocks
 - DB2 drain locks and DB2 claims
 - DB2 lock avoidance and related data, like page latches
 - Global locks in a data sharing environment
- Reports summarize locking information per DB2 PM identifier.
 - Lock suspension report
 - Lockout report
- Traces list individual locking events.
 - Lock suspension trace
 - Deadlock trace
 - Timeout trace
 - Lockout trace
 - Lock detail trace

Locking Report - Suspension

- LOCKING REPORT

LEVEL(SUSPENSION)
ORDER(DATABASE-PAGESET)

- Requires perf class(6) data
- Locking is an IRLM "thing" so does not show (all) DB2 latches

➔ Look for objects with many suspensions

➔ Look for objects with long AET per suspension

```

.....
LOCATION: DP10
GROUP: DSNDP10

DB2 PERFORMANCE MONITOR (V8.1)
LOCKING REPORT - SUSPENSION

ORDER: DATABASE-PAGESET
SCOPE: GROUP

PAGE 1-69
REQUESTED FROM: NOT SPECIFIED
TO: NOT SPECIFIED
INTERVAL FROM: 07/10/06 15:03:51.82
TO: 07/10/06 15:07:35.68

DB2 VERSION: V8

DABISKR
TKRACTIV
DP14

--- LOCK RESOURCE ---
TYPE NAME

--- SUSPEND REASONS ---
TOTAL LOCAL GLOB. S.NFY
SUSPENDS LATCH IRLMQ OTHER

--- RESUME REASONS ---
NORMAL TIMEOUT/CANCEL DEADLOCK
AET NMBR AET NMBR AET

PAGE PAGE=X'0473B6'
BPID=BP4
PAGEPLCK PART= 6
PAGE=X'045A11'
BPID=BP4
PAGEPLCK PART= 1
PAGE=X'0473B6'
BPID=BP4
PAGESET N/P
** SUM OF DP14
    
```

LOCK RESOURCE	TOTAL SUSPENDS	LOCAL LATCH	GLOB. IRLMQ	S.NFY OTHER	NORMAL AET NMBR	TIMEOUT/CANCEL AET NMBR	DEADLOCK AET
PAGE PAGE=X'0473B6' BPID=BP4	1	0	0	0	1	0.003462	0
PAGEPLCK PART= 6 PAGE=X'045A11' BPID=BP4	1	0	0	0	1	0.001018	0
PAGEPLCK PART= 1 PAGE=X'0473B6' BPID=BP4	11	0	10	0	11	0.007481	0
PAGESET N/P	283	4	275	0	283	0.002007	0
** SUM OF DP14	296	4	285	0	296	0.002212	0

Locking Trace

LOCATION: SYSDSN7		DB2 PERFORMANCE MONITOR (V7)				PAGE: 1-1	
GROUP: DSN7		LOCKING TRACE - DETAIL				REQUESTED FROM: NOT SPECIFIED	
MEMBER: SG71						TO: NOT SPECIFIED	
SUBSYSTEM: SG71						ACTUAL FROM: 04/21/01 22:01:36.62	
DB2 VERSION: V7		SCOPE: MEMBER				PAGE DATE: 04/21/01	
PRMAUTH	CORRNAME	CONNTYPE	EVENT	TIMESTAMP	--- L O C K R E S O U R C E ---		
ORIGAUTH	CORRNMBR	INSTANCE	RELATED	TIMESTAMP	EVENT	TYPE	NAME
PLANNNAME	CONNECT						EVENT SPECIFIC DATA
SYSOPR	020.CLST	'BLANK'	22:01:36.62217251	UNLOCK	N/P	N/P	DURATION=PLAN STATE=X'00' XES PROP=N
SYSOPR	AT01	B2BB079820D3	22:01:36.62217251	REQUEST			RSN CODE=X'40' RTNCD=12 XES FORC=N
	'BLANK'	SG53					NMODIFY LOCAL L-LOCK
							HASH =X'00000000'
SYSOPR	022.CKPA	'BLANK'	22:01:36.62572268	LOCK	PAGESET	DB =DSNDB06	DURATION=ALLOCATN STATE=IS XES PROP=Y
SYSOPR	0201	B2BB079821AE	22:01:36.62572268	REQUEST		OB =SYSUSER	RSN CODE= 0 RTNCD= 0 XES FORC=N
	'BLANK'	SG53					NMODIFY GLOBAL L-LOCK XES ASYN=N
							HASH =X'00000F06'
			22:01:36.62580782	LOCK	PAGESET	DB =DSNDB06	DURATION=ALLOCATN STATE=IS XES PROP=Y
			22:01:36.62580782	REQUEST		OB =SYSPLAN	RSN CODE= 0 RTNCD= 0 XES FORC=N
							NMODIFY GLOBAL L-LOCK XES ASYN=N
							HASH =X'00000A06'
			22:01:36.62595584	CLAIM	PAGESET	DB =DSNDB06	DURATION=COMMIT CLASS=RR
			22:01:36.62595584	ACQUIRE		OB =DSNAUH01	RSN CODE= 0 RTNCD= 0
			22:01:36.62605962	LOCK	DATAPAGE	DB =DSNDB06	DURATION=MANUAL STATE=S XES PROP=N
			22:01:36.62605962	REQUEST		OB =SYSUSER	RSN CODE= 0 RTNCD= 4 XES FORC=N
						PAGE=X'000002'	NMODIFY GLOBAL L-LOCK
							PARENT =X'1151E804'
							HASH =X'00035802'

Locking Trace - Deadlock

```

LOCATION: SG71                DB2 PERFORMANCE MONITOR (V7)                PAGE: 1-8
GROUP: N/P                  LOCKING TRACE - DEADLOCK                    REQUESTED FROM: NOT SPECIFIED
MEMBER: N/P                                                         TO: NOT SPECIFIED
SUBSYSTEM: SG71                                                    ACTUAL FROM: 04/20/01 18:17:54.70
DB2 VERSION: V7                SCOPE: MEMBER                            PAGE DATE: 04/20/01
PRMAUTH CORRNAME CONNTYPE
ORIGAUTH CORRNMBR INSTANCE  EVENT TIMESTAMP      --- L O C K   R E S O U R C E ---
PLANNAME CONNECT           RELATED TIMESTAMP EVENT   TYPE      NAME
-----
FRNI      FRNI      CICS      18:21:24.84026606 DEADLOCK
FRNI      GT06      B527EABFBD93 N/P
FRNMFRNI  CNATB02C                DATAPAGE DB  =FRNDB110
                                      OB   =AVT06TS
                                      PAGE=X'000302'
                                COUNTER = 117K    WAITERS = 2
                                TSTAMP  =04/20/01 18:21:24.83
                                HASH    =X'00D60F02'
                                ----- BLOCKER is HOLDER -----
                                LUW=DB2K.DB2K.B527EAC7A2C1
                                MEMBER  =N/P      CONNECT =CNATB02C
                                PLANNAME=FRNMFRNI CORRID  =GT13FRNI
                                DURATION=COMMIT   PRMAUTH=FRNI
                                STATE   =X
                                ----- WAITER -----*VICTIM*-
                                LUW=DB2K.DB2K.B527EABFBD93
                                MEMBER  =N/P      CONNECT =CNATB02C
                                PLANNAME=FRNMFRNI CORRID  =GT06FRNI
                                DURATION=MANUAL   PRMAUTH=FRNI
                                REQUEST =LOCK     WORTH   = 17
                                STATE   =S
                                ....
                                ....
    
```

- ➔ Deadlock (172) and timeout (196) info can almost always be obtained
- ➔ Are written with stats trace class(3) that is normally always active
- ➔ LOCKING TRACE LEVEL (LOCKOUT) Lists both deadlocks and timeouts

SQL Activity Report Set

- Unit of reporting is a SQL statement within a thread.
- Reports details of SQL statement activity:
 - Workload highlights
 - Scan, RID list, and query parallelism activity
 - Sort and I/O activities
 - Lock suspensions, and page locking
 - Exit activity
 - Data capture activity
 - Prepare (minibind) information
 - Accounting
 - Host variable value
- Provides various levels of summarization.
 - Occurrence
 - Statement number
 - Cursor
 - Program
 - Statement type

SQL Activity Report Set ...

- Can merge distributed activity belonging to the same logical unit of work
- Traces show SQL statement activity of one thread
 - Can only handle 999 threads at a time
- Reports show SQL statement activity of an aggregation of threads, e.g. primauth-planname (default) combinations

```
SQLACTIVITY REPORT
      SUMMARIZEBY ( STMTNO )
      WORKLOAD ( SCAN )
      SORTBY ( TCBTIME )
      ORDER ( PLANNAME )
```

- Support of Query Sysplex Parallelism
 - Records of parallel tasks reported for the originating task
 - Workload reported for each member
 - CPU times in Query Parallelism workload block normalized to processor speed of originating task

SQL Activity Report Set ...

- Very processing intensive
 - Try to limit the scope as much as possible
 - FROM / TO, INSTANCE / PLANNAME ...
 - Make sure to allocate enough and big //SORTWKxx DD
 - Make sure to allocate a big //SQLWORK DD
 - Sometimes results in 'funny' abends
 - S0C4 in sort
 - Sometimes more //SORTWKxx helps
 - S878 , S80A because
 - Sometimes playing with the REGION parm helps

SQL Activity Report Set ...

➔ sqlactivity
 trace
 summarizeby(cursor)
 workload(none)

LOCATION: DB8A		OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V4)			
GROUP: N/P		SQL ACTIVITY - TRACE			
MEMBER: N/P					
SUBSYSTEM: DB8A					
DB2 VERSION: V8					
SUMMARIZED BY CURSOR					
PRIMAUTH: BART		CONNECT : BATCH	CORRNAME: DB8AEJ2C CONNTYPE: TSO		
ORIGAUTH: BART		PLANNAME: DSN8BH81	CORRNMBR: 'BLANK' THRDTYPE: ALLIED		
ENDUSER : 'BLANK'		WSNAME : 'BLANK'	TRANSACTION: 'BLANK'		
TRACE # 1.1		DB2 LUWID: USIBMSC.SCPDB8A.X'BFA27B976FB5'		ACE ADDRESS: X'2023FCA8'	
START TIME: 10/31/06 08:47:46.06		START ELAPSED: 0.000332	START REASON: CREATE THREAD		
STOP TIME : 10/31/06 08:47:46.09		STOP ELAPSED : 0.000829	STOP REASON : TERMINATE THREAD		
EVENT	COUNT	TOT.ELAPS AET/EVENT	TOTAL TCB TCB/EVENT	DETAIL	

DBRM		DSN8BC3			
TELE1	1	0.006945	0.003317	STMTTYPE	COUNT
		0.006945	0.003317	CLOSE	1
				FETCH	43
				OPEN	1
TELE2	2	0.002606	0.001558	STMTTYPE	COUNT
		0.001303	0.000779	CLOSE	2
				FETCH	10
				OPEN	2
TELE3	3	0.002489	0.001452	STMTTYPE	COUNT
		0.000830	0.000484	CLOSE	3
				FETCH	6
				OPEN	3
# 541	1	0.000288	0.000142	UPDATE	ISO(CS) REOPT(NO) KEEP UPD LOCKS: N/A
		0.000288	0.000142		

SQL Activity Report Set ...

→ sqlactivity
 trace
 summarizeby(occurrence)
 workload(all)

```

LOCATION: DB8A                                OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V4)
GROUP: N/P                                  SQL ACTIVITY - TRACE
MEMBER: N/P
SUBSYSTEM: DB8A
DB2 VERSION: V8

SUMMARIZED BY OCCURRENCE, WITH ALL WORKLOAD

.....

TRACE # 1.1                                DB2 LUWID: USIBMSC.SCPDB8A.X'BFA27B976FB5'
                                           ACE ADDRESS: X'2023FCA8'

START TIME: 10/31/06 08:47:46.06  START ELAPSED:          0.000332  START REASON: CREATE THREAD
STOP TIME : 10/31/06 08:47:46.09  STOP ELAPSED :      0.000829  STOP REASON : TERMINATE THREAD

NL      EVENT          TIMESTAMP    ELAP.TIME  TCB  TIME          DETAIL
-----
FETCH          08:47:46.08    0.000512  0.000282  STMT#          495 CURSOR: TELE3          SQLST:00000 SQLCO:  0
                                           SENSITIVE(UNS)  ORIENTATION(NEXT)

--- WORKLOAD HILITE ---
SCANS   :    3 RECS/SORT:  N/P I/O REQS:    N/P SUSPENDS   :    N/P EXITS    :    23 AMS          :    N/P
ROWSPROC:  62 WORK/SORT:  N/P AET/I/O :    N/P AET/SUSP   :    N/P AET/EXIT :  0.000003 AET/AMS      :    N/P
PAGESCAN:  13 PASS/SORT:  N/P DATACAPT:  N/P RIDS UNUSED:  N/P CHECKCON :    N/P DEGREE REDUCTION :    N/P
LOB_PAGSCAN:  0      LOB_UPD_PAGE :    0

--- SCAN ACTIVITY ---
-----ROWS-----  --QUALIFIED AT--  -----ROWS-----  --PAGES-  -----RI-----
DATABASE PAGESET  SCANS  PROCESS  EXAMINE  STAGE 1  STAGE 2  INSERTS  UPDATES  DELETES  SCANNED  SCANS  DELETES
MEMBER   TYPE
DSN8D81A 12          1        1         0         0         1         0         0         0         2         0         0
N/P      INDX
DSN8D81A 21          1        42        41         1         2         0         0         0         10        0         0
N/P      INDX
DSN8D81A 21          1        19        19         0         0         0         0         0         1         0         0
N/P      SEQD
TOTAL          3        62        60         1         3         0         0         0         13        0         0

--- EXITS ---
MEMBER  VALIDATION TOTAL  AET/EXIT  EDIT TOTAL  AET/EXIT
N/P          0          N/C         23    0.000003
    
```


SQL Activity Report Set ...

→ sqlactivity
trace
summarizeby(occurrence)
workload(all,vars)

```

LOCATION: DB8A                                OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V4)
GROUP: N/P                                  SQL ACTIVITY - TRACE
MEMBER: N/P
SUBSYSTEM: DB8A
DB2 VERSION: V8

                                KLOAD
                                CORRNAME: DB8REJ2C  CONNTYPE: TSO
                                CORRNMBR: 'BLANK'   THRDTYPE: ALLIED
                                TRANSACT: 'BLANK'

                                ACE ADDRESS: X'2023FCA8'

START TIME: 10/31/06 08:47:46.06  START ELAPSED:      0.000332  START REASON: CREATE THREAD
STOP TIME : 10/31/06 08:47:46.09  STOP ELAPSED :    0.000829  STOP REASON : TERMINATE THREAD

NL  EVENT          TIMESTAMP  ELAP.TIME  TCB  TIME          DETAIL
-----
DBRM                                DSN8BC3
OPEN  08:47:46.08  0.000039  0.000024  STMT#    492  CURSOR: TELE3          ISO(CS) SQLST:00000 SQLCO:  0
                                REOPTIMIZED(NO)  KEEP UPDATE LOCKS(NO)  SCROLL(NO)  SENSITIVE(UNS) TABLE(UNS)

--- HOST VARIABLES ---
LOCATION : DB8A          COLLID :          PROGRAM : DSN8BC3          CONSID_TOKEN : X'17F44F39047E486B'
STMT_NO : 492          FORMAT : 1 - COMPLETE  NO.SQLDA ENTRIES : 2

.....
ENTRY_NO. : 1          NAME :          NULL_INDICATOR : NO  SQLTYPE : 452
DATA_TYPE : FIXED-LENGTH CHARACTER STRING  DATA_LENGTH : 15
PRECISION : N/A  SCALE : N/A  ADDR_HOST_VAR : X'24602151'  ADDR_IND_VAR : X'24602A58'
DATA      : SMITH
.....
ENTRY_NO. : 2          NAME :          NULL_INDICATOR : NO  SQLTYPE : 448
DATA_TYPE : VARYING-LENGTH CHARACTER STRING  DATA_LENGTH : 12
PRECISION : N/A  SCALE : N/A  ADDR_HOST_VAR : X'246022F0'  ADDR_IND_VAR : X'24602A58'
DATA      : %
.....
    
```

→ Requires IFCID 247 input host variable
 → Only IFCID 247 supported
 If you need 248 (output host var) use retrace

Rectrace with IFCID 248 ...

➔ IFCID 248 output host variable

```

PRIMAUTH CONNECT  INSTANCE      END_USER      WS_NAME      TRANSMACT
ORIGAUTH CORRNAME  CONNTYPE      RECORD TIME  DESTNO ACE IFC DESCRIPTION  DATA
PLANNAME CORRNMBR          TCB CPU TIME          ID
-----
BART  BATCH      BFA27B976FB5 'BLANK'      'BLANK'      'BLANK'
BART  DB8AEJ2C TSO          08:47:46.08417492  1375  7 248 SQLDA & HOST  NETWORKID: USIBMSC  LUNAME: SCPDB8A  LUWSEQ: 1
DSN8BH81 'BLANK'          0.01861695          VAR TRACING
-----
|0000 C4C2F8C1 40404040 40404040 40404040 40404040 40404040 40404040 40404040 | DB8A
|0020 4040C4E2 D5F8C2C3 F3404040 40404040 40404040 17F44F39 047E486B 00000007 | DSN8BC3 .4|..=,.....
|0040 002C4000 000001EF 004E0054 00560004 C4C2F8C1 00000007 C4E2D5F8 C2C3F3 | .. ..+.....DB8A....DSN8BC3
|.....
|0000 01C0000C 24602869 24602A58 00000002 00000000 00004040 40404040 40404040 | .{...-...-.....
|0020 40404040 40404040 40404040 40404040 40404040 00000000 00000000 00000000 | .....
|0040 00000000 00000000 00000000 0000          | .....
|.....
|0000 000A0006 C4C1D5C9 C5D3          | ....DANIEL
-----
.....
                08:47:46.08419397  1377  7 248 SQLDA & HOST  'BLANK'
                0.01862627          VAR TRACING  NETWORKID: USIBMSC  LUNAME: SCPDB8A  LUWSEQ: 1
-----
|0000 C4C2F8C1 40404040 40404040 40404040 40404040 40404040 40404040 40404040 | DB8A
|0020 4040C4E2 D5F8C2C3 F3404040 40404040 40404040 17F44F39 047E486B 00000007 | DSN8BC3 .4|..=,.....
|0040 002C4000 000001EF 004E0054 00560004 C4C2F8C1 00000007 C4E2D5F8 C2C3F3 | .. ..+.....DB8A....DSN8BC3
|.....
|0000 01C40004 24602878 24602A58 00000004 00000000 00004040 40404040 40404040 | .D...-...-.....
|0020 40404040 40404040 40404040 40404040 40404040 00000000 00000000 00000000 | .....
|0040 00000000 00000000 00000000 0000          | .....
|.....
|0000 00080004 F0F9F6F1          | ....0961
-----
.....
BART  BATCH      BFA27B976FB5 'BLANK'      'BLANK'      'BLANK'
BART  DB8AEJ2C TSO          08:47:46.08432648  1381  7 58 END SQL  <-- NETWORKID: USIBMSC  LUNAME: SCPDB8A  LUWSEQ: 1
DSN8BH81 'BLANK'          0.01865004

```

Record Trace Report Set

- Formats individual IFCID trace records.
- Records can be shown in a short, long, or dump format.
- Represents most detailed level of performance data.
- Unfortunately have to resort too often to this gory level of detail



Record Trace Report Set

- Instance number
- ACE just a number (real address at the end of the trace)
- Some fields just have field name
 - f* Usually serviceability fields
 - f* see DSNWMSGSGS or code for details

```

LOCATION: SYSDSN7                DB2 PERFORMANCE MONITOR (V7)                PAGE: 1-1
GROUP: DSN7                    RECORD TRACE - LONG                    REQUESTED FROM: NOT SPECIFIED
MEMBER: SG71                                                            TO: NOT SPECIFIED
SUBSYSTEM: SG71                                                         ACTUAL FROM: 04/21/01 22:01:36.61
DB2 VERSION: V7                                                         PAGE DATE: 04/21/01

PRIMAUTH CONNECT  INSTANCE  END_USER  WS_NAME  TRANSACT
ORIGAUTH CORRNAME CONNTYPE  RECORD TIME  DESTNO ACE IFC  DESCRIPTION  DATA
PLANNAME CORRNMER  TCB CPU TIME  ID

-----
JEN  DB2CALL  B2BB07981C7B 'BLANK'  'BLANK'  'BLANK'
JEN  JEN      DB2CALL  22:01:36.61635282  1  1  4 TRACE  --> NETWORKID: DEIBMIPS LUNAME: IPVAMG53 LUWSEQ: 1
PMOMCT 'BLANK'  N/P          START      MESSAGE: -START TRACE (A )C (01 02 03 05 07 08 30 )
                                                RMID (* )D (OPX )PLAN (* )AUTHID (* )IFCID
                                                (3 6 7 8 9 44 45 106 213 214 215 216 226 227
                                                239 )BUFSIZE (512 )
                                                QW0004CM X'200000D704001302'
    
```

QW0004CM (S) TRACE CLASS MASK USED.

Record Trace Report Set

```

LOCATION: SYSDSN7                      DB2 PERFORMANCE MONITOR (V7)                      PAGE: 1-22
GROUP: DSN7                          RECORD TRACE - LONG                                      REQUESTED FROM: NOT SPECIFIED
MEMBER: SG71                                                                    TO: NOT SPECIFIED
SUBSYSTEM: SG71                                                                ACTUAL FROM: 04/21/01 22:01:36.61
DB2 VERSION: V7                                                                PAGE DATE: 04/21/01

PRIMAUTH CONNECT  INSTANCE  END_USER  WS_NAME  TRANSACT
ORIGAUTH CORRNAME CONNTYPE  RECORD TIME  DESTNO ACE IFC  DESCRIPTION  DATA
PLANNAME CORRNMBR          TCB CPU TIME          ID

-----
SYSOPR  SG53      B2BB07982279 'BLANK'      'BLANK'      'BLANK'
SYSOPR  020.CLST 'BLANK'      22:01:36.62880381  29  4  21 LOCK DETAIL  NETWORKKID: DEIBMIPS LUNAME: IPVAMG53 LUWSEQ: 1
'BLANK' AT01          N/P

|-----
|LOCK RES TYPE: N/P                      NAME: N/P
|IRLM FUNC CODE : UNLOCK (ANY)          RETURN TOKEN: X'00000000'      REQUEST TOKEN      : X'00000000'
|LOCK STATE      : X'00'                DB2 TOKEN      : X'80A78000114CC048'  IRLM RETURN CODE  : 12
|LOCK ATTRIBUTES: NMODIFY NOFORCE       PROP TO XES   : NO              ASYN TO XES      : NO
|LOCK DURATION   : PLAN                  REQUEST TYPE:  IRLM RETURN SUBCODE: B'0100000000000000'
|PARENT TOKEN    : X'00000000'          GLOBAL/LOCAL: LOCAL           OWNER             : 'BLANK'
|CACHED STATE    : N/A                  LOCK HASH VALUE : X'00000000'

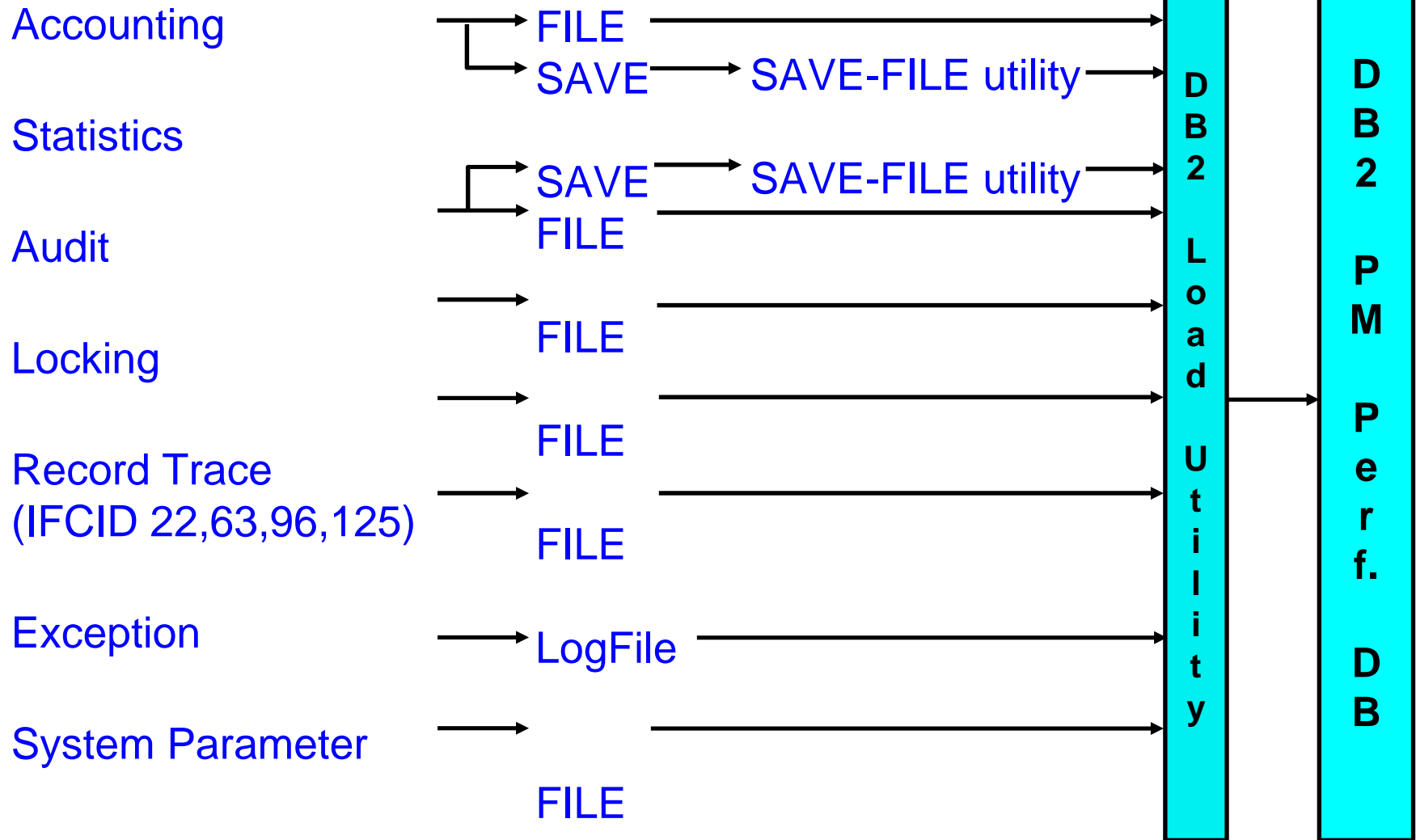
|QW0021CL X'0000'      QW0021U X'00B0000011533EC8'  QW0021FL B'00000000'  QW0021CT X'00000000'
|QW0021F3 B'00000000'  QW0021O X'00B0003E11533E38'  QW0021IR X'0000'      QW0021F2 B'00000000'
|-----
    
```

DB2 Performance Reporting

- Instrumentation interface and trace classes
- Data Collection
- Working with Batch Reporting
 - f* Report sets ...
- **Performance Database**

Performance Database - Which Data and How

- 'FILE/SAVE' data produced by DB2 PM reports:



DB2 PE Performance database

- Load trace data into DB2 tables to allow SQL statements against data
 - f* Summarized (report) or raw (trace)
- Not all IFCIDs are supported
- Documented in "Chapter 19. The Performance Database and the Performance Warehouse" of OMPE Reporting User's Guide
- **Can be interesting if INTERVAL(1) is not granular enough**
- Sample JCL for **acctg** on STLMVS1 in **DB2DUMP.OMPE.JCL**
 - f* 1. DB2PMDB Run on MVS1 to save accounting trace to a file
 - f* 2. DGOACFGE Run on EC to create performance database
 - f* 3. DGOALFGE Run on EC to load accounting file into performance database
 - f* 4. DGOAQFIL Run on EC, the query to get the incoming transaction number

References

Manuals:

- f* DB2 Performance Expert V2 <http://www-3.ibm.com/software/data/db2imstools/db2tools/db2pe/index.html>
- f* DB2 Performance Monitor for OS/390 V8 <http://www-3.ibm.com/software/data/db2imstools/db2tools/db2pm/index.html>
- f* DB2 Buffer Pool Analyzer for z/OS V2 <http://www-3.ibm.com/software/data/db2imstools/db2tools/bpa/index.html>
- f* DM Tools Library (complete library of all tools, including additional updates) <http://www-306.ibm.com/software/data/db2imstools/db2tools-library.html>
- f* IBM Tivoli OMEGAMON XE for DB2 on z/OS <http://publib.boulder.ibm.com/tividd/td/IBMTivoliOMEGAMONXEforDB2onzOS3.0.html>

Redbooks:

- f* A Deep Blue View of DB2 Performance: IBM Tivoli OMEGAMON XE for DB2 Performance Expert on z/OS <http://www.redbooks.ibm.com/abstracts/sg247224.html> (May 2006)
- f* DB2 Performance Expert for z/OS V2 (SG24-6867-01) <http://www.redbooks.ibm.com/abstracts/sg246470.html> (June 2004)
- f* DB2 Performance Expert for Multiplatform V2 (SG24-6470) <http://www.redbooks.ibm.com/abstracts/sg246470.html> (Feb. 2005)

The end

- Any questions ?

