

IBM Software Group

OMPE Fundamentals

DB2 Information Management Software



Bart Steegmans
DB2 for z/OS L2 Performance

© 2012 IBM Corporation

Acknowledgement and Disclaimer

- Measurement data included in this presentation are obtained by the members of the DB2 performance department at the IBM Silicon Valley Laboratory.
- The materials in this presentation are subject to
 - ▶ Enhancements at some future date,
 - ▶ A new release of DB2, or
 - ▶ A Programming Temporary Fix
- The information contained in this presentation has not been submitted to any formal IBM review and is distributed on an “As Is” basis without any warranty either expressed or implied. The use of this information is a customer responsibility.

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 = OMPE**

Currently V5.1.1 GA-ed June 2012

DB2 Performance Reporting

- **Instrumentation interface and trace classes**
- Data Collection
- Working with Batch Reporting
 - ▶ 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 **F**acility **C**omponent **I**Dentifier

- **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

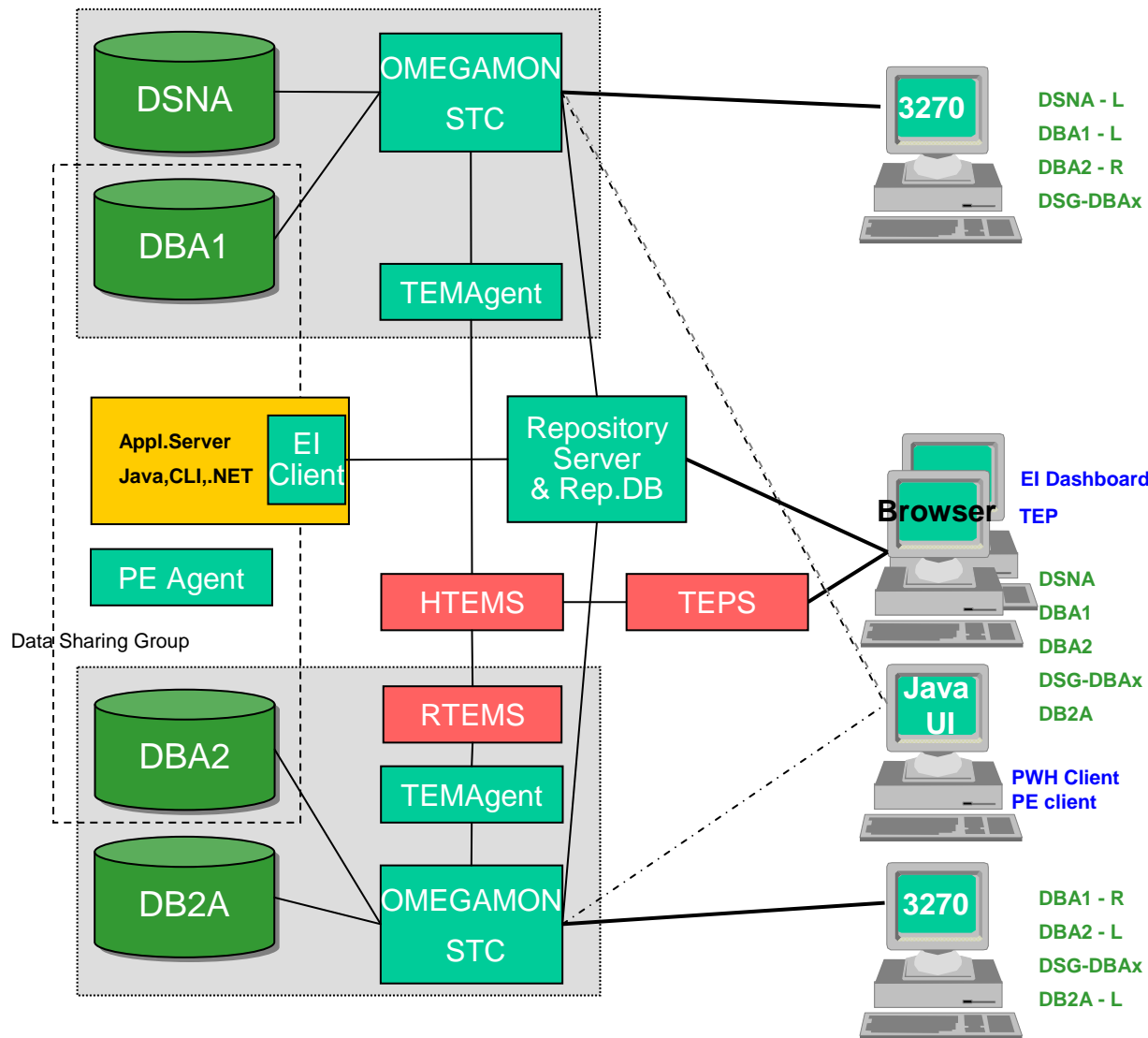
- **Qualifications**

- AUTHID
- PLAN
- LOCATION
- IFCID
- More since V9

DB2 Performance Reporting

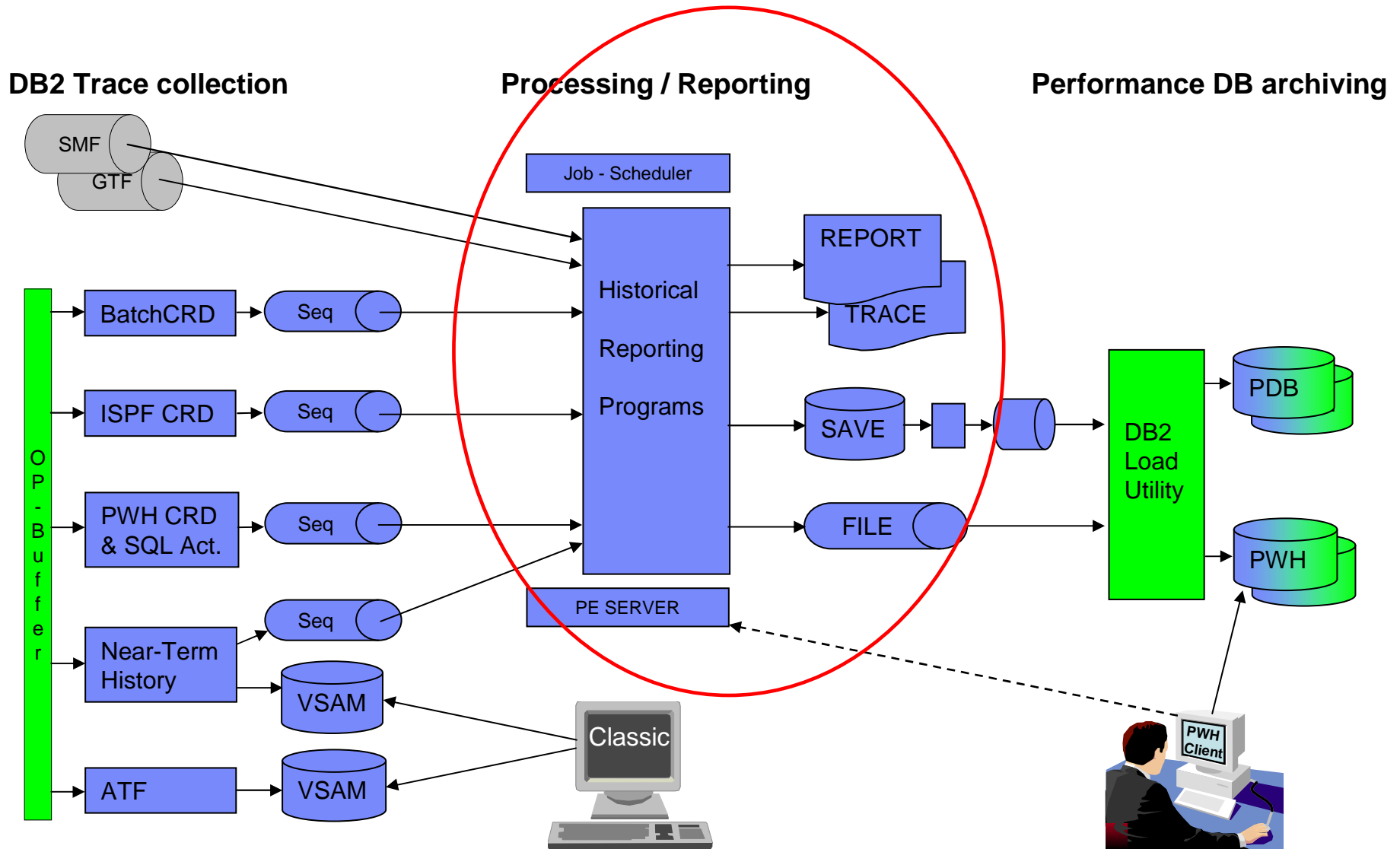
- Instrumentation interface and trace classes
- **Data Collection**
- Working with Batch Reporting
 - ▶ Report sets ...
- Performance Database

The Architectural Overview - the components



- Batch Reporting
- 3270 user Interface
 - allows to monitor local members as well as remote DSG member
- 2nd STC and 3270 user Interface
 - failover for DSG + monitor single DB2 on 2nd LPAR
- Agent, TEMS, TEP + Browser
 - graphical UI, SYSPLEX view and DWL navigation cross OMEGAMON family monitors
 - alternative direct connection to Hub TEMS w/o Remote TEMS
- End-to-end SQL monitoring "Extended Insight" - OMPE Browser, optional part of TEP,
- PE Agent
 - for DB2 Connect monitoring
- PWH and PE client Java UI

A wide variety of historical processing options



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

Collect Report Data using OMPE

- 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 OMPE 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

DB2 Performance Reporting

- Instrumentation interface and trace classes
- Data Collection
- **Working with Batch Reporting**
 - ▶ 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...

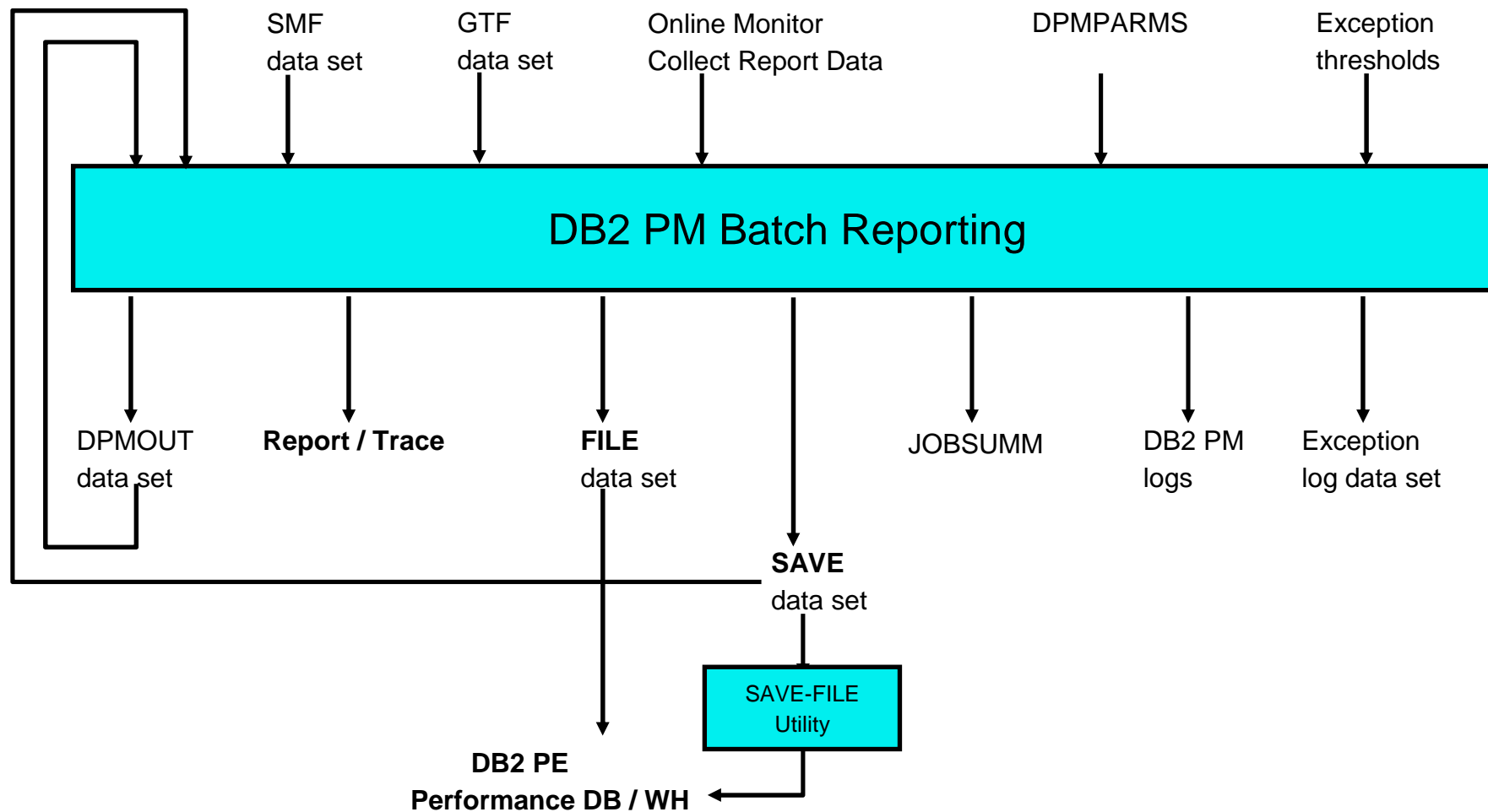
•Input

- 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
 - ◆individual DB2 events typically 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)



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

DB2 PM Reports...

- Many options to select which/how data is being reported
 - ◆ Reduce, Include/Exclude, From/to
 - ◆ Summarizeby, Order
 - ◆ 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

```
//P27021RP JOB (7949,SYS),'DB2PTF',CLASS=A,MSGCLASS=K,
//          MSGLEVEL=(1,1),REGION=0M,NOTIFY=&SYSUID
//*
//*      OMPE - REPORT GENERATION
//*
//DB2PMJB EXEC PGM=DB2PM
//* On MCEVS6 - OMPE V510
//STEPLIB DD DISP=SHR,DSN=DB2TOOLS.OME510.VS6RTE.RKANMOD.D12012
//*
//* !-----INPUTDSN
//* v
//INPUTDD DD DISP=SHR,DCB=BUFNO=50,
//          DSN=ONTOP.GS300.P27021.C624.SMF12234
//*
//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 (OMPE 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)
TRACE LAYOUT (LONG)
```

SYSPARMS

```
TRACE
```

■ 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

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	SSYS DTE	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	SSYS DTE	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	SSYS DTE	SDTE	SDTE	
	NUMBER OF RECORDS PROCESSED WITHOUT A CPU HEADER WAS 503				
FPEC4010I	BEBBCM_SDTE	SSYS DTE	SDTE	SDTE	
	NUMBER OF RECORDS PROCESSED WITHOUT A CORRELATION HEADER WAS 10				
FPEC4055W	BEBBCM_SDTE	SSYS DTE	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

ACTUAL FROM: 09/20/06 13:20:43.16
TO: 09/20/06 13:25:33.30

GROUP: SSSYDTE
SUBSYSTEM: SDTE
DB2 VERSION: V8

IFCID FREQUENCY DISTRIBUTION LOG
MEMBER: SDTE

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.
- LAYOUT (LONG) trace/report report contains information about
 - ◆ SQL usage (DML, DCL, DDL, direct row access, currently committed ,)
 - ◆ Stored proc, triggers, UDFs
 - ◆ EDM pool, Dynamic stmt cache
 - ◆ Subsystem services , accounting rollup
 - ◆ Open/Close activity
 - ◆ Log activity
 - ◆ Plan/package processing
 - ◆ DB2 commands
 - ◆ RID list processing
 - ◆ 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, workfile usage
 - ◆ Global DDF activity , and DRDA remote locations section
 - ◆ *Storage statistics (including short on storage metrics)*
- 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 (Trace vs. Report)

LOCATION: DSNP OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V5R1)

GROUP: N/P STATISTICS REPORT - LONG

MEMBER: N/P

SUBSYSTEM: DSNP

DB2 VERSION: V10 SCOPE: MEMBER

----- HIGHLIGHTS -----

INTERVAL START : 08/17/12 00:00:00.06 SAMPLING START: 08/17/12 00:00:00.06 TOTAL THREADS : 912.7K

INTERVAL END : 08/17/12 23:59:00.00 SAMPLING END : 08/17/12 23:59:00.00 TOTAL COMMITS : 8359.1K

INTERVAL ELAPSED: 23:58:59.935304 OUTAGE ELAPSED: 0.000000 DATA SHARING MEMBER: N/A

CPU TIMES	TCB TIME	PREEMPT SRB	NONPREEMPT SRB	TOTAL TIME	PREEMPT IIP SRB	/COMMIT
SYSTEM SERVICES ADDRESS SPACE	8:05.013248	21:20.445149	12.782106	29:38.240503	N/A	0.000213
DATABASE SERVICES ADDRESS SPACE	21:51.008289	13:35.088803	16.280806	35:42.377897	3:19:20.488131	0.000256
IRLM	0.320224	0.000000	22.664271	22.984495	N/A	0.000003
DDF ADDRESS SPACE	2:12.462002	2:50:01.556367	2:15.574735	2:54:29.593103	2:37:50.897412	0.001252
TOTAL	32:08.803762	3:24:57.090319	3:07.301917	4:00:13.195998	5:57:11.385543	0.001724

➡ Total COMMITS now INCLUDES DDF (DBAT) work, so /COMMIT numbers are more meaningful

LOCATION: DSNP OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V5R1)

GROUP: N/P STATISTICS TRACE - LONG

MEMBER: N/P

SUBSYSTEM: DSNP

DB2 VERSION: V10

----- HIGHLIGHTS -----

INTERVAL START: 08/17/12 00:00:00.06 INTERVAL ELAPSED: 59.935356 TOTAL COMMITS: 1991

INTERVAL END : 08/17/12 00:01:00.00 TOTAL THREADS : 164

CPU TIMES	TCB TIME	PREEMPT SRB	NONPREEMPT SRB	TOTAL TIME	PREEMPT IIP SRB	/COMMIT
SYSTEM SERVICES ADDRESS SPACE	0.274923	0.191157	0.003380	0.469460	N/A	0.000236
DATABASE SERVICES ADDRESS SPACE	0.125073	0.154113	0.001046	0.280232	4.626544	0.000141
IRLM	0.000003	0.000000	0.011636	0.011639	N/A	0.000006
DDF ADDRESS SPACE	0.042180	1.929492	0.040648	2.012320	1.228113	0.001011
TOTAL	0.442178	2.274762	0.056710	2.773651	5.854657	0.001393

PAGE: 1-10

REQUESTED FROM: NOT SPECIFIED

TO: NOT SPECIFIED

ACTUAL FROM: 08/17/12 00:00:00.06

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(DSNP))
ACCOUNTING
REPORT
    ORDER (CONNTYPE) DDNAME (ACRPCN)
    EXCLUDE (PACKAGE (*))
LAYOUT (LONG)
```

LOCATION: DSNP	OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V5R1)	PAGE: 1-	
1			
GROUP: N/P	ACCOUNTING REPORT - LONG	REQUESTED FROM: NOT	
SPECIFIED			
MEMBER: N/P		TO: NOT	
SPECIFIED			
SUBSYSTEM: DSNP	ORDER: CONNTYPE	INTERVAL FROM:	
08/17/12 00:00:00.2			
DB2 VERSION: V10	SCOPE: MEMBER	TO:	
08/17/12 23:59:59.9			
CONNTYPE: CICS			
ELAPSED TIME DISTRIBUTION		CLASS 2 TIME DISTRIBUTION	
-----		-----	
APPL	===== > 75%	CPU	===== > 25%
DB2	==== > 8%	SECPU	
SUSP	===== > 17%	NOTACC	==== > 6%
		SUSP	===== > 69%

INCLUDE / EXCLUDE options

OMEGAMON XE for DB2 PE identifier	ACCT	AUD	I/O	LOCK	RT	SQL	STAT	UTIL
ACE (Agent control element address)					t,f	r,t,p		
CLASS (DB2 trace class)					t,f			
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
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
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
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
DATABASE (Database name)			r,p	r,t,p,f				
DATASET (Data set name)			r,p					
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			
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
IFCID (Instrumentation Facility Component Identifier)					t,f	r,t,p		
INSTANCE (Instance number)	r,t,f	r,t,p,f		t,f	t,f	r,t,p		r,t,p
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
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
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
PACKAGE (Package information) or PROGRAM (Program information)	r,t,p,f							
PAGESET (Page set name)			r,p	r,t,p,f				
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

OMEGAMON XE for DB2 PE identifier	ACCT	AUD	I/O	LOCK	RT	SQL	STAT	UTIL
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
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
RESOURCETYPE (Resource type)				r,t,p,f				
RMID (Resource manager identifier)					t,f			
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
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
TRANSACT (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:**
1. 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.
 2. The commands are abbreviated as follows: ACCT (ACCOUNTING), AUD (AUDIT), I/O (IOACTIVITY), LOCK (LOCKING), RT (RECTRACE), SQL (SQLACTIVITY), STAT (STATISTICS), and UTIL (UTILITY).
 3. Subcommands are abbreviated as r (REDUCE), t (TRACE), p (REPORT), and f (FILE), whereas "all" applies to all subcommands.

ORDER processing

- Like GROUP BY processing in SQL
- See OMPE Command Reference for more details

➔ = New in V511

OMEGAMON XE for DB2 PE Identifier	Accounting	Audit	I/O Activity	Locking	SQL Activity	Statistics	Utility Activity
ACTNAME (Activity)	●						
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)	●	●	●	●	●		●
PARTNBR (Partition number)			●				
PRMAUTH (Primary authorization ID) or AUTHID (Authorization ID)	●		●	●	●		●
REQLOC (Requester location)	●	●	●	●	●		●
➔ THREADTYPE (Thread type)	●						
TRANSACTION (End user transaction name)	●	●		●	●		
WSNAME (End user workstation name)	●	●		●	●		

Correlation ID Translation

- 12 Byte Correlation ID is a composed string
- The 12 Byte string is separate/translated into two fields which can be used separately in filtering and ORDER processing
 - Correlation Name
 - Correlation Number
- Default translation is ...

Connection Type	1	2	3	4	5	6	7	8	9	10	11	12
Batch	Correlation name: job name								Correlation number: blank			
TSO, DB2 call attach	Correlation name: original authorization ID								Correlation number: blank			
CICS	Correlation number: pool thread				Correlation name: transaction ID							
IMS	Correlation number: application PSBNAME				Correlation name: application PST							
RRS	Correlation name: the first 8 characters of the correlation ID provided by the application during signon								Correlation number: the remaining 4 characters			

- ... but any other translation can be defined in DPMPARMS
- Add `//DPMPARMS DD DSN=` to your job

Accounting Report Layout(long) extract

LOCATION: DSNP	OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V5R1)	PAGE: 1-13
GROUP: N/P	ACCOUNTING REPORT - LONG	REQUESTED FROM: NOT SPECIFIED
MEMBER: N/P		TO: NOT SPECIFIED
SUBSYSTEM: DSNP	ORDER: CONNTYPE	INTERVAL FROM: 08/17/12 00:00:00.25
DB2 VERSION: V10	SCOPE: MEMBER	TO: 08/17/12 23:59:59.98

CONNTYPE: DRDA

AVERAGE	APPL(CL.1)	DB2 (CL.2)	IFI (CL.5)	CLASS 3 SUSPENSIONS	AVERAGE TIME	AV.EVENT	HIGHLIGHTS
ELAPSED TIME	0.051700	0.007955	N/P	LOCK/LATCH(DB2+IRLM)	0.000247	0.02	#OCCURRENCES : 2615657
NONNESTED	0.048314	0.004978	N/A	IRLM LOCK+LATCH	0.000176	0.00	#ALLIEDS : 0
STORED PROC	0.003293	0.002884	N/A	DB2 LATCH	0.000071	0.02	#ALLIEDS DISTRIB: 0
UDF	0.000000	0.000000	N/A	SYNCHRON. I/O	0.004791	1.46	#DBATS : 2615657
TRIGGER	0.000093	0.000093	N/A	DATABASE I/O	0.004578	1.36	#DBATS DISTRIB. : 0
				LOG WRITE I/O	0.000213	0.10	#NO PROGRAM DATA: 2
CP CPU TIME	0.001126	0.001021	N/P	OTHER READ I/O	0.000155	0.04	#NORMAL TERMINAT: 2615657
AGENT	0.001126	0.001021	N/A	OTHER WRTE I/O	0.000000	0.00	#DDFRSAF ROLLUP: 0
NONNESTED	0.000781	0.000720	N/P	SER.TASK SWTCH	0.000076	0.01	#ABNORMAL TERMIN: 0
STORED PRC	0.000343	0.000299	N/A	UPDATE COMMIT	0.000000	0.00	#CP/X PARALLEL. : 0
UDF	0.000000	0.000000	N/A	OPEN/CLOSE	0.000036	0.00	#IO PARALLELISM : 0
TRIGGER	0.000003	0.000003	N/A	SYSLGRNG REC	0.000033	0.00	#INCREMENT. BIND: 3979
PAR.TASKS	0.000000	0.000000	N/A	EXT/DEL/DEF	0.000004	0.00	#COMMITTS : 2628161
				OTHER SERVICE	0.000002	0.00	#ROLLBACKS : 34
SECP CPU	0.000000	N/A	N/A	ARC.LOG(QUIES)	0.000000	0.00	#SVPT REQUESTS : 0
				LOG READ	0.000000	0.00	#SVPT RELEASE : 0
SE CPU TIME	0.000834	0.000774	N/A	DRAIN LOCK	0.000159	0.00	#SVPT ROLLBACK : 0
NONNESTED	0.000695	0.000635	N/A	CLAIM RELEASE	0.000000	0.00	MAX SQL CASC LVL: 2
STORED PROC	0.000137	0.000137	N/A	PAGE LATCH	0.000000	0.00	UPDATE/COMMIT : 0.15
UDF	0.000000	0.000000	N/A	NOTIFY MSGS	0.000000	0.00	SYNCH I/O AVG. : 0.003277
TRIGGER	0.000002	0.000002	N/A	GLOBAL CONTENTION	0.000000	0.00	
				COMMIT PH1 WRITE I/O	0.000000	0.00	
PAR.TASKS	0.000000	0.000000	N/A	ASYNCH CF REQUESTS	0.000000	0.00	
				TCP/IP LOB XML	0.000000	0.00	
SUSPEND TIME	0.000028	0.005429	N/A	TOTAL CLASS 3	0.005429	1.53	
AGENT	N/A	0.005429	N/A				
PAR.TASKS	N/A	0.000000	N/A				
STORED PROC	0.000028	N/A	N/A				
UDF	0.000000	N/A	N/A				
NOT ACCOUNT.	N/A	0.000731	N/A				
DB2 ENT/EXIT	N/A	4.28	N/A				
EN/EX-STPROC	N/A	2.29	N/A				
EN/EX-UDF	N/A	0.00	N/A				
DCAPT.DESCR.	N/A	N/A	N/P				
LOG EXTRACT.	N/A	N/A	N/P				

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

DB2 Times Terminology

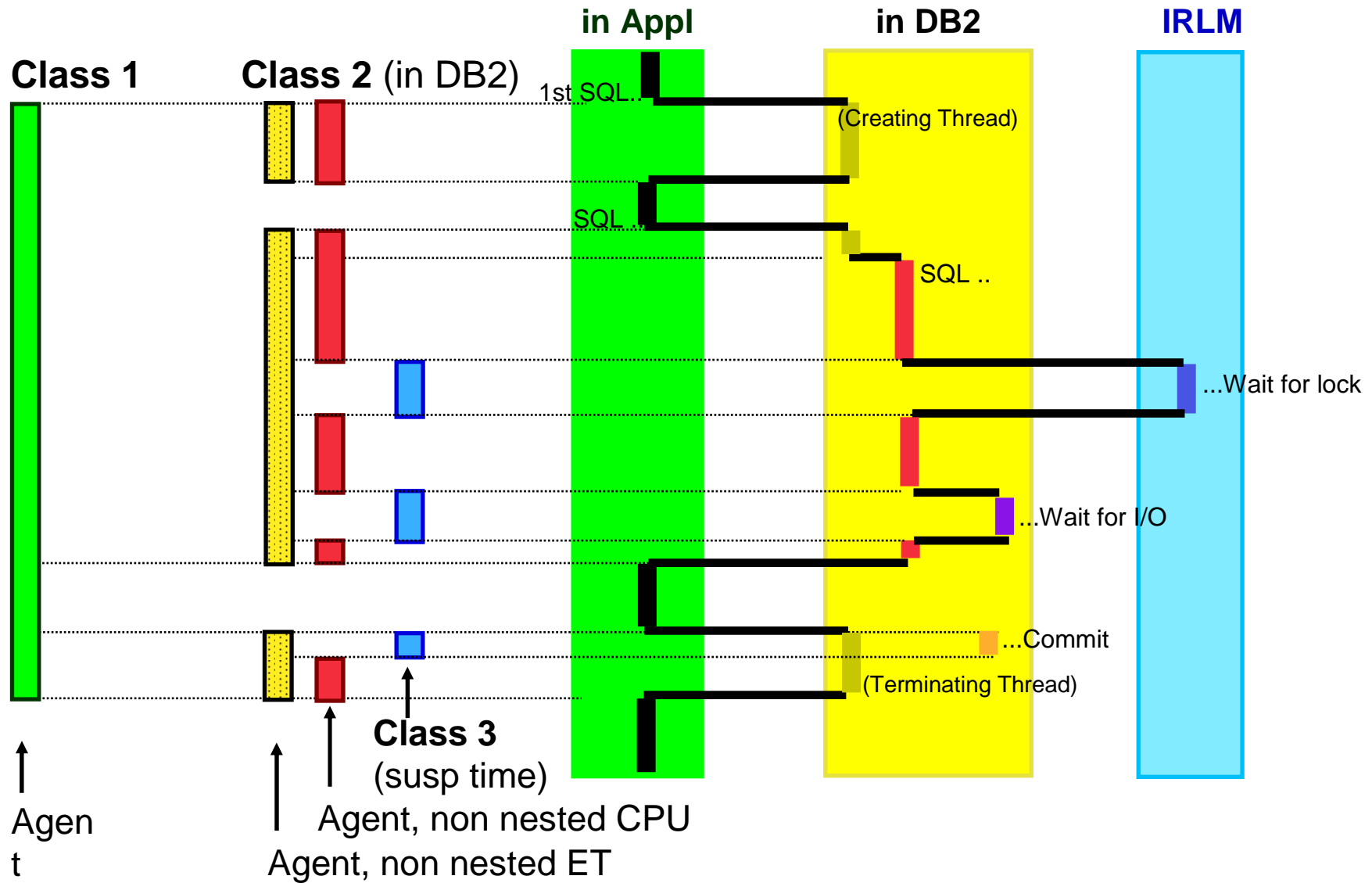
PLAN

- **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 Times Terminology - Accounting Class 1,2,3



Accounting Trace Layout(long) extract

```

LOCATION: PB2BXMFB          OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V5R1)          PAGE: 1-2
GROUP: PB2BGRP           ACCOUNTING TRACE - LONG          REQUESTED FROM: NOT SPECIFIED
MEMBER: PB03                                                    TO: NOT SPECIFIED
SUBSYSTEM: PB03                                                ACTUAL FROM: 06/01/12 15:55:49.25
DB2 VERSION: V9
    
```

```

----- IDENTIFICATION -----
ACCT TSTAMP: 06/01/12 15:55:49.25  PLANNAME: db2jcc_a          WLM SCL: PRDONL2          CICS NET: N/A
BEGIN TIME : 06/01/12 15:55:39.79  PROD TYP: JDBC DRIVER      CICS LUN: N/A
END TIME   : 06/01/12 15:55:49.25  PROD VER: V2 R6 M0         LUW NET: GA4E3032        CICS INS: N/A
REQUESTER  : ::10.78.48.50          CORRNAME: db2jcc_a         LUW LUN: B848
MAINPACK   : SYSSTAT               CORRNMBR: ppli             LUW INS: C9A6D885236E    ENDUSER  : MRCPRD1
PRMAUTH    : MRCPRD1               CONNTYPE: DRDA             LUW SEQ: 4               TRANSACT: db2jcc_application
ORIGAUTH   : MRCPRD1               CONNECT : SERVER           WSNAME   : lrtp5040
    
```

TIMES/EVENTS	APPL (CL.1)	DB2 (CL.2)	IFI (CL.5)	CLASS 3 SUSPENSIONS	ELAPSED TIME	EVENTS	HIGHLIGHTS
ELAPSED TIME	9.465156	1.083279	N/P	LOCK/LATCH(DB2+IRLM)	0.000139	43	THREAD TYPE : DBAT
NONNESTED	8.385914	0.066915	N/A	IRLM LOCK+LATCH	N/A	N/A	TERM.CONDITION: NORMAL
STORED PROC	1.079241	1.016364	N/A	DB2 LATCH	N/A	N/A	INVOKE REASON : TYP2 INACT
UDF	0.000000	0.000000	N/A	SYNCHRON. I/O	0.113006	208	PARALLELISM : NO
TRIGGER	0.000000	0.000000	N/A	DATABASE I/O	0.110862	207	QUANTITY : 0
				LOG WRITE I/O	0.002144	1	COMMITTS : 1
CP CPU TIME	0.719893	0.697889	N/P	OTHER READ I/O	0.001117	2	ROLLBACK : 0
AGENT	0.719893	0.697889	N/A	OTHER WRTE I/O	0.000000	0	SVPT REQUESTS : 0
NONNESTED	0.055983	0.048433	N/P	SER.TASK SWTCH	0.000000	0	SVPT RELEASE : 0
STORED PRC	0.663911	0.649456	N/A	UPDATE COMMIT	0.000000	0	SVPT ROLLBACK : 0
UDF	0.000000	0.000000	N/A	OPEN/CLOSE	0.000000	0	INCREM.BINDS : 23
TRIGGER	0.000000	0.000000	N/A	SYSLGRNG REC	0.000000	0	UPDATE/COMMIT : 4541.00
PAR.TASKS	0.000000	0.000000	N/A	EXT/DEL/DEF	0.000000	0	SYNCH I/O AVG.: 0.000543
				OTHER SERVICE	0.000000	0	PROGRAMS : 2
SECP CPU	0.057763	N/A	N/A	ARC.LOG(QUIES)	0.000000	0	MAX CASCADE : 1
SE CPU TIME	0.000000	0.000000					
NONNESTED	0.000000	0.000000					
STORED PROC	0.000000	0.000000					
UDF	0.000000	0.000000					
TRIGGER	0.000000	0.000000					
PAR.TASKS	0.000000	0.000000					

➔ Specialty Engine CPU

- SECP CPU eligible but did not run on a zIIP (zAAP)
- ▶ Included in CP CPU time
- SE CPU run on a zIIP (zAAP)

Accounting Report Layout(long) extract

NORMAL TERM.	AVERAGE	TOTAL
-----	-----	-----
NEW USER	0.00	0
DEALLOCATION	0.20	20175
APPL.PROGR. END	0.00	0
RESIGNON	0.80	80678
DBAT INACTIVE	0.00	0
TYPE2 INACTIVE	0.00	95
RRS COMMIT	0.00	0
END USER THRESH	0.00	0
BLOCK STOR THR	0.00	0
STALENESS THR	0.00	0

- ➔ New user / Resignon / DBAT inactive indicate thread reuse (RRS commit can also reuse thread)
- ➔ Rollup accounting active and multiple acctg records rolled up into a single trace trace
- ➔ Averages are calculated based on # occurrences
 - ➔ # occ = # acctg recs when no rollup or #acctg recs * accumacc value (*)

(*) actually we know how many recs rolled up and use that value, but should be close if not too many stale records

Accounting Report Set (long) - Package accounting

```

GROUP: DSNPT0G                ACCOUNTING REPORT - LONG                REQUESTED FROM: NOT SPECIFIED
MEMBER: PT0D                  ORDER: CONNTYPE                    TO: NOT SPECIFIED
SUBSYSTEM: PT0D              SCOPE: MEMBER                        INTERVAL FROM: 08/13/12 06:00:04.86
DB2 VERSION: V10
CONNTYPE: DB2CALL            TO: 08/13/12 10:39:17.76

(CONTINUED)
-----
| PROGRAM NAME                | CLASS 7 ELAPSED TIME CONSUMERS
| DSQFSDB2                    | |
| DSQFSDB7                    | |
| DSQGBOR                     | |
| DSQGCSQL                    | |
| DSQGDTVQ                    | |> 1%
| DSQGDYSQ                    | |
| DSQGESQL                    | |> 1%
| DSQGESQM                    | |===== > 55%
| DSQGFSQS                    | |
| DSQGFSUS                    | |===== > 20%
| DSQGICVS                    | |
...
...
(CONTINUED)
-----
| PROGRAM NAME                | CLASS 7 CP CPU TIME CONSUMERS
| DSQFSDB2                    | |
| DSQFSDB7                    | |
| DSQGBOR                     | |
| DSQGCSQL                    | |
| DSQGDTVQ                    | |
| DSQGDYSQ                    | |
| DSQGESQL                    | |
| DSQGESQM                    | |===== > 78%
| DSQGFSQS                    | |
| DSQGFSUS                    | |===== > 8%
| DSQGICVS                    | |
    
```

- ➔ Each grouping (ORDER) shows the packages encountered in the acctg records that went in to this plan ORDER level
- ➔ First visually CL7 ET consumed in %
- ➔ Then visually CL8 CPU consumed in %
- ➔ Be careful same program name can appear multiple times (in different collections – look at the detailed sections to make sure you have the right one)
- ➔ *ROLLUP* package can indicate:
 - ➔ Using CPU //
 - ➔ Accounting rollup prior to V10 (still no detail for CL10 info in V10)

Accounting Report Set (long) - Package accounting

DSQGESQM	VALUE	DSQGESQM	TIMES	DSQGESQM	AVERAGE TIME	AVG.EV	TIME/EVENT
-----	-----	-----	-----	-----	-----	-----	-----
TYPE	PACKAGE	ELAP-CL7 TIME-AVG	2:37.547703	LOCK/LATCH	0.017786	42.47	0.000419
LOCATION	USTSYIPT0D	CP CPU TIME	2:21.224699	IRLM LOCK+LATCH	0.000335	0.20	0.001641
COLLECTION ID	Q	AGENT	2:21.224699	DB2 LATCH	0.017451	42.27	0.000413
PROGRAM NAME	DSQGESQM	PAR.TASKS	0.000000	SYNCHRONOUS I/O	0.634727	698.49	0.000909
ACTIVITY TYPE	NONNESTED	SE CPU TIME	0.000000	OTHER READ I/O	0.494961	404.75	0.001223
ACTIVITY NAME	'BLANK'	SUSPENSION-CL8	1.278264	OTHER WRITE I/O	0.026058	9.56	0.002726
SCHEMA NAME	'BLANK'	AGENT	1.278264	SERV.TASK SWITCH	0.104705	16.77	0.006242
SUCC AUTH CHECK	0	PAR.TASKS	0.000000	ARCH.LOG(QUIESCE)	0.000000	0.00	N/C
OCCURRENCES	93	NOT ACCOUNTED	15.044740	ARCHIVE LOG READ	0.000000	0.00	N/C
NBR OF ALLOCATIONS	649	AVG.DB2 ENTRY/EXIT	112.91	DRAIN LOCK	0.000000	0.00	N/C
SQL STMT - AVERAGE	13.94	DB2 ENTRY/EXIT	10501	CLAIM RELEASE	0.000000	0.00	N/C
SQL STMT - TOTAL	1296	CP CPU SU	5066356.40	PAGE LATCH	0.000027	0.05	0.000505
NBR RLUP THREADS	93	AGENT	5066356.40	NOTIFY MESSAGES	0.000000	0.00	N/C
		PAR.TASKS	0.00	GLOBAL CONTENTION	0.000000	0.00	N/C
		SE CPU SU	0.00	TCP/IP LOB XML	0.000000	0.00	N/C
				TOTAL CL8 SUSPENS.	1.278264	1.2K	0.001091
DSQGESQM	AVERAGE TIME	AV.EVENT	DSQGESQM	AVERAGE TIME	AV.EVENT		
-----	-----	-----	-----	-----	-----		
GLOBAL CONTENTION L-LOCKS	0.000000	0.00	GLOBAL CONTENTION P-LOCKS	0.000000	0.00		
PARENT (DB,TS,TAB,PART)	0.000000	0.00	PAGESET/PARTITION	0.000000	0.00		
CHILD (PAGE,ROW)	0.000000	0.00	PAGE	0.000000	0.00		
OTHER	0.000000	0.00	OTHER	0.000000	0.00		

➔ Also SE CPU time at package level

- ➔ OCCURRENCES - # IFCID 239 entry for this package (in this (ORDER) grouping)
- ➔ NBR OF ALLOCATIONS - # times switched to the package
- ➔ NBR RLUP THREADS (new in V10) package level detail info with rollup (nt class10)
- ➔ Averages based on # NBR RLUP THREADS (= #OCC with no rollup)

CL8 info

Accounting Report Set (long) - Package acctg CL10

DSQGESQM	AVERAGE	TOTAL	DSQGESQM	AVERAGE	TOTAL	DSQGESQM	AVERAGE	TOTAL
SELECT	0.00	0	BPOOL HIT RATIO (%)	99.25	N/A	TIMEOUTS	0.00	0
INSERT	0.12	11	GETPAGES	4185.6K	389262K	DEADLOCKS	0.00	0
UPDATE	0.04	4	BUFFER UPDATES	890.5K	82816786	ESCAL.(SHARED)	0.00	0
DELETE	0.06	6	SYNCHRONOUS WRITE	0.05	5	ESCAL.(EXCLUS)	0.04	4
			SYNCHRONOUS READ	698.41	64952	MAX PG/ROW LOCKS HELD	477.02	44363
DESCRIBE	0.00	0	SEQ. PREFETCH REQS	2036.97	189438	LOCK REQUEST	1904.25	177095
PREPARE	0.00	0	LIST PREFETCH REQS	4.84	450	UNLOCK REQUEST	636.86	59228
OPEN	0.00	0	DYN. PREFETCH REQS	1976.46	183811	QUERY REQUEST	0.00	0
FETCH	0.00	0	PAGES READ ASYNCHR.	30603.12	2846090	CHANGE REQUEST	224.92	20918
CLOSE	0.00	0				OTHER REQUEST	0.00	0
LOCK TABLE	0.00	0				TOTAL SUSPENSIONS	0.20	19
CALL	0.00	0				LOCK SUSPENSIONS	0.00	0
						IRLM LATCH SUSPENS.	0.20	19
						OTHER SUSPENS.	0.00	0

- ➔ Only available when accounting trace class 10 is active
- ➔ Not available when rollup accounting is in effect (in plan for Vnext)
- ➔ BP info is not at BP level, but all BP together
- ➔ Note that sum SQL here is not same as SQL STMT TOTAL (CL10 section does not include things like SET stmts, so expect <=)
- ➔ OMPE will always print these sections even if CL10 is not active (with all zeroes)

Accounting reporting “pitfalls”

- ACCOUNTING
TRACE LAYOUT(x)
INCLUDE(PACKAGE(ABC))
 - You expect to see only these acctg records (IFCID 3+239) where package ABC is present (at least I do)
 - HOWEVER ,
ALL plan level acctg records are printed, and when printing the package level info, only package ABC is printed
 - There is no easy way to print all the plan level records that executed a certain package (at least not that I am aware of)
- When rollup accounting is used, an individual accounting record is ACCUMACC transactions rolled up into 1 accounting record
 - In ACCOUNTING REPORT, averages take into account the actual number of tran (+/- ACCUMACC * # trace recs)
 - ACCOUNTING TRACE prints individual records
so the times and #SQL are the TOTALs of all ACCUMACC tran in the record

Accounting Top processing

■ TOP fields - plan related

- ▶ INAPPLET (default)
- ▶ INDB2ET
- ▶ OUTDB2ET
- ▶ INAPPLPT
- ▶ INDB2PT
- ▶ OUTDB2PT
- ▶ INAPPLWT
- ▶ INDB2WT
- ▶ OUTDB2WT
- ▶ TOTSUSTM
- ▶ DMLSTAT
- ▶ DCLSTAT
- ▶ DDLSTAT
- ▶ UPDPERCM
- ▶ CMUPERUPD
- ▶ TOTSUSP
- ▶ GETPAGES
- ▶ NOTACCT
- ▶ BUFUPDTS
- ▶ SYNCREAD
- ▶ TOTPREF

■ TOP fields - package related

- ▶ PINDBET
- ▶ PINDBPT
- ▶ PTSUSTME
- ▶ 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 DP33
 - 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(DP33))
ACCOUNTING
TRACE
LAYOUT (LONG)
INCLUDE (CONNTYPE(DRDA))
TOP (20 ONLY INDB2PT)
DDNAME (ACTRDRDA)
```

```
LOCATION: DP3G OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V4) PAGE: 1-1
GROUP: DSNRP3G ACCOUNTING TRACE - LONG REQUESTED FROM: NOT SPECIFIED
MEMBER: DP33 TO: NOT SPECIFIED
SUBSYSTEM: DP33 ACTUAL FROM: 07/09/08 19:32:45.90
DB2 VERSION: V8
```

TOP FIELD: PROCESSING (CL.2) TIME SPENT IN DB2 **TOP NUMBER REQUESTED: 20**

```
----- IDENTIFICATION -----
ACCT TSTAMP: 07/09/08 19:32:45.90 PLANNAME: DISTSERV WLM SCL: DDFDB2 CICS NET: N/A
BEGIN TIME : 07/09/08 19:03:20.45 PROD TYP: N/P CICS LUN: N/A
END TIME : N/P PROD VER: N/P LUW NET: DP33 CICS INS: N/A
REQUESTER : DP3G CORRNAME: javaw.ex LUW LUN: DP33
MAINPACK : *ROLLUP* CORRNMBR: e LUW INS: C2A6A1712E7D ENDUSER : rw110
PRMAUTH : RW110 CONNTYPE: DRDA LUW SEQ: 1 TRANSACT: javaw.exe
ORIGAUTH : RW110 CONNECT : SERVER WSNAME : DSDLDAVISB1
```

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

➔ I hardly ever use SHORT reports - Too afraid of missing something

Accounting INTERVAL processing

- Can 'roll up' accounting records in intervals, for example 5 minute interval in case you 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
 - E.g. 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)
EXCLUDE(PACKAGE(*))
```

```
LOCATION: MEMD2PB                OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V4)                PAGE: 1-1
      GROUP: D2PBDSNG                ACCOUNTING REPORT - LONG                REQUESTED FROM: ALL      08:55:00.00
      MEMBER: D2PL                    ORDER: CONNTYPE-INTERVAL                TO: DATES      09:05:00.00
      SUBSYSTEM: D2PL                SCOPE: MEMBER                            INTERVAL FROM: 06/30/08 08:55:00.00
DB2 VERSION: V8                                TO: 06/30/08 09:05:00.00
...
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 (prior to V10)

```
//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 18:00:00.00
DB2 VERSION: V8	SCOPE: MEMBER	TO: 07/09/08 19:59:59.96

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

System Parameters Report Set

- **SYSPARMS TRACE** command
- Show configuration information of subsystem.
 - so called "ZPARM's"
- Based on IFCID 106 (ZPARMS) , 202 (BP config), 230 (GBP config, [201(BP alter), 256(GBP alter)])
- **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
 - Lock detail 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 performance class(6) data
- Locking is an IRLM "thing" – shows only DB2 page latches (not LCxx)

➔ 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

DB2 VERSION: V8

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

-----SUSPEND REASONS-----RESUME REASONS-----
--- LOCK RESOURCE --- TOTAL LOCAL GLOB. S.NFY --- NORMAL --- TIMEOUT/CANCEL --- DEADLOCK ---
MEMBER TYPE NAME SUSPENDS LATCH IRLMQ OTHER NMBR AET NMBR AET NMBR AET
-----
DABISKR
TKRACTIV
DP14 PAGE PAGE=X'0473B6' 1 0 0 0 1 0.003462 0 N/C 0 N/C
BPID=BP4 0 0 1
PAGEPLCK PART= 6 1 0 0 0 1 0.001018 0 N/C 0 N/C
PAGE=X'045A11' 1 0 0
BPID=BP4
PAGEPLCK PART= 1 11 0 10 0 11 0.007481 0 N/C 0 N/C
PAGE=X'0473B6' 1 0 0
BPID=BP4
PAGESET N/P 283 4 275 0 283 0.002007 0 N/C 0 N/C
** SUM OF DP14 ** 296 4 285 0 296 0.002212 0 N/C 0 N/C
          9 0 1
    
```

Locking Report – Detail (new in V511)

LOCKING REPORT

LEVEL(DETAIL)

ORDER(DATABASE-PAGESET)

Requires performance class(7) data – eg. IFCID 21

➔ Look for objects with many locks (local or XES)

➔ Look for objects with long duration locks

```

LOCATION: STLECL1                OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V5R1M1)                PAGE: 1-14
GROUP: N/P                      LOCKING REPORT - DETAIL
MEMBER: N/P                      ORDER: DATABASE-PAGESET                REQUESTED FROM: NOT SPECIFIED
SUBSYSTEM: VA1A                 SCOPE: MEMBER                          TO: NOT SPECIFIED
DB2 VERSION: V10                INTERVAL FROM: 08/20/12 16:52:08.38
                                TO: 08/20/12 16:54:00.02
    
```

DATABASE PAGESET	--- LOCK TYPE	R E S O U R C E NAME	TOTAL REQ	--REQ		TYPE--					--LOCK STATE--				--LOCK DURATION--				
				LOCAL YES	LOCK CHNGE	UNLOCK OTHER	IS S	IX X	SIX U	NSU	MAN MAN+1	CMT CMT+1	ALLOC OTHER	COND AUTREL					
D264AA																			
IZSMTCB1	DBALLOC	N/P	10	10	8	2	0	0	0	0	0	4	6	0	0				
				0	0	0	0	10	0			0	0	0	0				
	DRAIN CS	N/P	14	14	13	1	0	0	0	0	10	0	4	0	4				
				0	0	0	11	2	0			0	0	0	0				
	DRAIN RR	N/P	4	4	4	0	0	0	0	0	0	0	0	4	0				
				0	0	0	2	2	0			0	0	0	0				
	DRAIN W	N/P	4	4	4	0	0	0	0	0	0	0	0	4	0				
				0	0	0	2	2	0			0	0	0	0				
	OPENLOCK	N/P	424	424	212	212	0	0	0	0	0	424	0	0	0				
				0	0	0	0	212	0			0	0	0	0				
	** SUM OF IZSMTCB1	**	456	456	241	215	0	0	0	0	0	438	6	12	4				
...																			
	TOTAL																		
D264AA			750	750	464	286	6	6	0	0	0	589	53	108	43				
				0	0	0	64	402	0			0	0	0	0				
...																			
	GRAND TOTAL		2808	2808	1547	1087	51	73	0	0	0	1683	594	148	534				
				0	174	0	1147	843	40			153	130	100	0				

➔ Total for:
* Page set
* Database
* All locks

Locking Report – “pitfalls”

- Sometimes a resource shows up twice:
 - Once with the name
 - Once with the DBID/OBID
 - It depends on whether or not OMPE has encountered the IFCID 105/107 when it builds the resource name I guess

- To avoid this use EXCLUDE(IFCID(105,107))
 - This results in not translations , but unfortunately only DBID/OBID (almost always in decimal) in the reports

- **Tip:**
You can use INCLUDE/EXCLUDE filters to look at only those plans, authids, resources you are interested in

- ➔ Reporting User's Guide has a section “Input for xxxx reports”, with info about which IFCIDs are required to create the report (eg. xxxx=locking)

Locking Trace

LOCKING TRACE

LEVEL(DETAIL)

- Nice feature is that it calculates the suspend time (in there resume record) – see next page

```

LOCATION: PRO6                                OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V5R1)                                PAGE: 1-3
GROUP: DSNPRO6                                LOCKING TRACE - DETAIL                                REQUESTED FROM: NOT SPECIFIED
MEMBER: P063                                    SCOPE: MEMBER                                        TO: NOT SPECIFIED
SUBSYSTEM: P063                                ACTUAL FROM: 07/22/12 02:16:00.97
DB2 VERSION: V10                                PAGE DATE: 07/22/12
PRIMAUTH CORRNAME CONNTYPE
ORIGAUTH CORRNMBR INSTANCE      EVENT TIMESTAMP      --- LOCK RESOURCE ---
PLANNAME CONNECT      RELATED TIMESTAMP EVENT   TYPE   NAME           EVENT SPECIFIC DATA
-----
SCH0ESP  INCD1VRO TSO          02:16:01.00324171 UNLOCK N/P      N/P      DURATION=MANUAL+1 STATE=S      XES PROP=Y
SCH0ESP  'BLANK' C9E7558EF6AA N/P          REQUEST                                RSN CODE= 0      RTNCD= 0      XES FORC=N
DYNUNLD  BATCH
ENDUSER  :SCH0ESP
WSNAME   :BATCH
TRANSACT:INCD1VRO

                                02:16:01.00341220 LOCK    DATAPAGE DB =DSNDB06      DURATION=MANUAL STATE=S      XES PROP=N
                                SUSPEND OB =SYSDBASE      ORIG.RSN=LOCAL CONTENTION      XES FORC=N
                                PAGE=X'00117A'
                                NMODIFY GLOBAL L-LOCK
                                PARENT =X'7F630690'
                                HASH =X'045CC97A'

SCH0ESP  DOC1VRO TSO          02:16:01.00341771 LOCK    DATAPAGE DB =DSNDB06      DURATION=MANUAL STATE=S      XES PROP=Y
SCH0ESP  'BLANK' C9E7558EF63C          REQUEST                                RSN CODE= 0      RTNCD= 0      XES FORC=N
DYNUNLD  BATCH
ENDUSER  :SCH0ESP
WSNAME   :BATCH
TRANSACT:DOC1VRO
    
```

➔ Multiple tran in the trace

Locking Trace -2

```

LOCATION: PRO6                                OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V5R1)                                PAGE: 1-3
      GROUP: DSNPRO6                                LOCKING TRACE - DETAIL
      MEMBER: P063
      SUBSYSTEM: P063
DB2 VERSION: V10                                SCOPE: MEMBER
PRIMAUTH CORRNAME CONNTYPE
ORIGAUTH CORRNUMBR INSTANCE      EVENT TIMESTAMP      --- L O C K   R E S O U R C E ---
PLANNAME CONNECT      RELATED TIMESTAMP EVENT      TYPE      NAME      EVENT SPECIFIC DATA
-----
...
SCH0ESP  INCD1VRO TSO              02:16:01.00343990 LOCK      DATAPAGE DB  =DSNDB06      SUSP.TIME =0.000028 LOCAL CONTENTION=N
SCH0ESP  'BLANK'  C9E7558EF6AA 02:16:01.00341220 RESUME    OB  =SYSDBASE      DURATION  =MANUAL   LATCH CONTENTION=N
DYNUNLD  BATCH                                PAGE=X'00117A'      STATE     =S         IRLM QUEUED REQ =N
ENDUSER  :SCH0ESP                                RESUME RSN=NORMAL   GLOBAL CONT.  =N
WSNAME   :BATCH                                YES PROP  =N         NOTIFY MSG SENT =N
TRANSACT:INCD1VRO                                YES FORC  =N
                                                RETAINED LOCK  =N
                                                NMODIFY GLOBAL L-LOCK
                                                PARENT  =X'7F630690'
                                                HASH    =X'045CC97A'

                                02:16:01.00344490 LOCK      DATAPAGE DB  =DSNDB06      DURATION=MANUAL STATE=S      YES PROP=N
                                REQUEST    OB  =SYSDBASE      RSN CODE=X'20' RTNCD= 4   YES FORC=N
                                PAGE=X'00117A'      NMODIFY GLOBAL L-LOCK
                                PARENT  =X'7F630690'
                                HASH    =X'045CC97A'
    
```

➡ Suspension time easy when many tran. present

➡ Lock request that was suspended (44) / resumed (45) is now acquired (21)

➡ Lock RC=4 RSN x'20' see IRLM msg&codes – return and reason code for LOCK request – “other holders exist”

Locking Trace - Deadlock

```

LOCATION: PRO6                      OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V5R1)                      PAGE: 1-189
GROUP: DSNPRO6                    LOCKING TRACE - LOCKOUT                      REQUESTED FROM: NOT SPECIFIED
MEMBER: P063                       TO: NOT SPECIFIED
SUBSYSTEM: P063                    ACTUAL FROM: 07/22/12 02:16:00.97
DB2 VERSION: V10                  SCOPE: MEMBER                               PAGE DATE: 07/22/12
PRIMAUTH 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   EVENT SPECIFIC DATA
-----
SCH0ESP MOCD1VR5 TSO            02:16:06.75201787 DEADLOCK
SCH0ESP 'BLANK' C9E755824638 N/P
DYNUNLD BATCH                    DATAPAGE DB =DSNDB06
ENDUSER :SCH0ESP                 OB =SYSDBASE
WSNAME :BATCH                    PAGE=X'001317'
TRANSACTION:MOCD1VR5
    
```

- ➔ 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

```

COUNTER = 1516    WAITERS = 2
TSTAMP =07/22/12 02:16:06.74
HASH =X'04C78B17'
----- BLOCKER is HOLDER --*VICTIM*--
LUW=UPS.P063DDF.C9E755824638
MEMBER =P063      CONNECT =BATCH
PLANNAME=DYNUNLD CORRID =MOCD1VR5
DURATION=MANUAL  PRIMAUTH=SCH0ESP
STATE =S         STMTINFO=N/P
ENDUSER =SCH0ESP
WSNAME =BATCH
TRANSACTION=MOCD1VR5
PROGRAM=DYNUNLD
COLLID =CD804AA
LOCATION=N/P
CONTOKEN=X'191200A8136F0174'
STMTID =X'0000000000000000'
----- WAITER -----
LUW=UPS.P063DDF.C9E75532B268
MEMBER =P063      CONNECT =UTILITY
PLANNAME=DSNUTIL CORRID =N2621YK1
DURATION=COMMIT  PRIMAUTH=SCH0ESP
REQUEST =CHANGE   WORTH = 98
STATE =X         STMTINFO=N/P
ENDUSER =SCH0ESP
WSNAME =UTILITY
TRANSACTION=N2621YK1
PROGRAM=...
COLLID =N/P
LOCATION=
CONTOKEN=X'0000000000000000'
STMTID =X'0000000000000000'
    
```

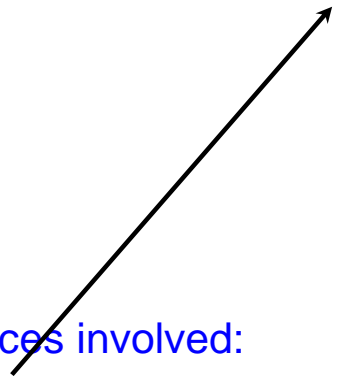
Locking Trace – Deadlock -2

```

.....
PRIMAUTH 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
-----
SCH0ESP  MOCD1VR5  TSO                                DRAIN CS  DB  =D264AA
SCH0ESP  'BLANK'    C9E755824638                                OB  =SESMTDT
DYNUNLD  BATCH
ENDUSER  :SCH0ESP
WSNAME   :BATCH
TRANSACT:MOCD1VR5

                                HASH      =X'00003D80'
                                ----- BLOCKER is HOLDER -----
                                LUW=UPS.P063DDF.C9E75532B268
                                MEMBER =P063          CONNECT =UTILITY
                                PLANNAME=DSNUTIL    CORRID  =N2621YK1
                                DURATION=ALLOCATN  PRIMAUTH=SCH0ESP
                                STATE   =X          STMTINFO=DYNAMIC
                                ENDUSER  =SCH0ESP
                                WSNAME   =UTILITY
                                TRANSAC=N2621YK1
                                PROGRAM=...
                                COLLID  =N/P
                                LOCATION=
                                CONTOKEN=X'0000000000000000'
                                STMTID  =X'0000000000000000'
                                ----- WAITER -----*VICTIM*--
                                LUW=UPS.P063DDF.C9E755824638
                                MEMBER =P063          CONNECT =BATCH
                                PLANNAME=DYNUNLD    CORRID  =MOCD1VR5
                                DURATION=MANUAL     PRIMAUTH=SCH0ESP
                                REQUEST  =LOCK      WORTH   = 18
                                STATE   =S          STMTINFO=DYNAMIC
                                ENDUSER  =SCH0ESP
                                WSNAME   =BATCH
                                TRANSAC=MOCD1VR5
                                PROGRAM=DYNUNLD
                                COLLID  =CD804AA
                                LOCATION=N/P
                                CONTOKEN=X'191200A8136F0174'
                                STMTID  =X'0000000000000000'
    
```

- Two resources involved:
 - * drain lock
 - * catalog data page (prev page)
- Two tran involved:
 - * Batch job (dsntiaul) C9E755824638
 - * Utility C9E75532B268



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/row 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 handle max 99999 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 unexpected abends
 - S0C4 in sort
 - Sometimes more //SORTWKxx helps
 - S878 , S80A because
 - Sometimes playing with the REGION parm helps

SQL Activity Report Set - Top Down Approach ...

- As these reports are very processing intensive
 - Try to limit the scope as much as possible
- Unless you know where the problem is,
Start at higher level and zoom in
 - SQLACTIVITY REPORT
 - SUMMARIZEDBY(PROGRAM)
 - SUMMARIZEBY (STMTNO)
 - SQLACTIVITY TRACE
 - SUMMARIZEBY(CURSORS)
 - SUMMARIZEBY(OCCURRENCE)

SQLACTIVITY – Report – By STMTNO

LOCATION: PD01		OMEGAMON XE FOR DB2 PERFORMANCE EXPERT		SQLACTIVITY	
GROUP: DSNPD01		SQL ACTIVITY - REPORT		REPORT	
MEMBER: PD1P		ORDER: CONNTYPE		SUMMARIZEBY (STMTNO)	
SUBSYSTEM: PD1P		SUMMARIZED BY STMTNO		ORDER(CONNTYPE)	
DB2 VERSION: V9					
CONNTYPE: CICS		THREAD TOTAL: 5180		START AET: N/P	
				STOP AET: N/P	
EVENT	COUNT	TOT.ELAPS AET/EVENT	TOTAL TCB TCB/EVENT	DETAIL	
PACKAGE				PD01.ROUTCICC.KRFAN31A.X'19098FF11E7F342E'	
				KRFA000078	
				ACQUIRE(USE)	REOPT(N) RELEASE(COMMIT) ISO(CS) DYNAMICRULES(BIND)
				PREPARE(NODEFER)	KEEPDYNAMIC(NO) PROTOCOL(DRDA) OPTHINT(N/P)
# 4312	23726	0.203633 0.000009	0.123670 0.000005	OPEN	CURSOR: FAVALSC5 ISO(CS) REOPT(NO) KEEP UPD LOCKS: NOSCROLL(NO) .SENSITIVE(UNS) .TABLE(UNS).....
# 4321	44960	0.548565 0.000012	0.350704 0.000008	FETCH	CURSOR: FAVALSC5 SENSITIVE(N/P) ORIENTATION(NEXT)
# 4355	23726	0.140698 0.000006	0.069302 0.000003	CLOSE	CURSOR: FAVALSC5
# 4592	642	0.051042 0.000080	0.038962 0.000061	OPEN	CURSOR: FAVALSC6 ISO(CS) REOPT(NO) KEEP UPD LOCKS: NOSCROLL(NO) .SENSITIVE(UNS) .TABLE(UNS).....
# 4601	3887	0.032982 0.000008	0.019882 0.000005	FETCH	CURSOR: FAVALSC6 SENSITIVE(N/P) ORIENTATION(NEXT)
# 4635	642	0.003840 0.000006	0.001983 0.000003	CLOSE	CURSOR: FAVALSC6

GLOBAL
 TIMEZONE (-2:00)
 FROM(08/21/12,14:07:00.00)
 TO(08/21/12,14:07:30.00)
 PAGESIZE(999)
 SQLACTIVITY
 TRACE
 SUMMARIZEBY(OCCURRENCE)
 LIMIT(999)

SQLACTIVITY – Trace – by OCCURR

```

LOCATION: PD01                                OMEGAMON XE FOR DB2 PERFORMANCE EXPERT (V5R11)
GROUP: DSNPD01                               SQL ACTIVITY - TRACE
MEMBER: PD1P
SUBSYSTEM: PD1P
DB2 VERSION: V9

PRIMAUTH: PEETERM                            CONNECT : CICS5PAH5
ORIGAUTH: PEETERM                            PLANNAME: KROKICP
ENDUSER : 'BLANK'                            WSNAME : 'BLANK'
CORRNAME: 70KG                               CONNTYPE: CICS
CORRNMBR: POOL                               THRDTYPE: ALLIED
TRANSACT: 'BLANK'
ACE ADDRESS: X'16CACD20'

TRACE # 1.1
DB2 LUWID: BECCGK00.PD1P.X'CA0D5BF18DEF'
CICS LUWID: BECCGK00.CICSPNN2.X'0D5BF16EC2B1'

START TIME: 08/21/12 14:07:02.31  START ELAPSED: N/A          START REASON: IN PROGRESS
STOP TIME : 08/21/12 14:07:02.38  STOP ELAPSED : N/P          STOP REASON : TERMINATE THREAD

NL    EVENT          TIMESTAMP    ELAP.TIME  TCB    TIME          DETAIL
-----
...
FETCH          14:07:02.35    0.000007   0.000005  STMT#    3715  CURSOR: FAMODHC1          SQLST:02000 SQLCO: 100
                SENSITIVE(UNS)  ORIENTATION(NEXT)
CLOSE          14:07:02.35    0.000005   0.000003  STMT#    3767  CURSOR: FAMODHC1          SQLST:00000 SQLCO: 0

PACKAGE
PD01.ROUTCICC.KRFAN31A.X'19098FF11E7F342E'
KRFA000078
ACQUIRE(USE)      REOPT(N)  RELEASE(COMMIT)      ISO(CS)  DYNAMICRULES(BIND)
PREPARE(NODEFER)  KEEP(DYNAMIC(NO)  PROTOCOL(DRDA)      OPTHINT(N/P)
OPEN            14:07:02.35    0.000008   0.000006  STMT#    4312  CURSOR: FAVALSC5          ISO(CS) SQLST:00000 SQLCO: 0
                REOPTIMIZED(NO)  KEEP UPDATE LOCKS(NO)  SCROLL(NO)  SENSITIVE(UNS)  TABLE(UNS)
FETCH          14:07:02.35    0.000047   0.000045  STMT#    4321  CURSOR: FAVALSC5          SQLST:02000 SQLCO: 100
                SENSITIVE(UNS)  ORIENTATION(NEXT)
CLOSE          14:07:02.35    0.000005   0.000003  STMT#    4355  CURSOR: FAVALSC5          SQLST:00000 SQLCO: 0

PACKAGE
PD01.ROUTCICC.KRFAN16A.X'18EF262E18DB0DA2'
KRFA000075
ACQUIRE(USE)      REOPT(N)  RELEASE(COMMIT)      ISO(CS)  DYNAMICRULES(BIND)
PREPARE(NODEFER)  KEEP(DYNAMIC(NO)  PROTOCOL(DRDA)      OPTHINT(N/P)
SELECT         14:07:02.35    0.000086   0.000079  STMT#    1817  ISO(CS) SQLST:00000 SQLCO: 0
    
```

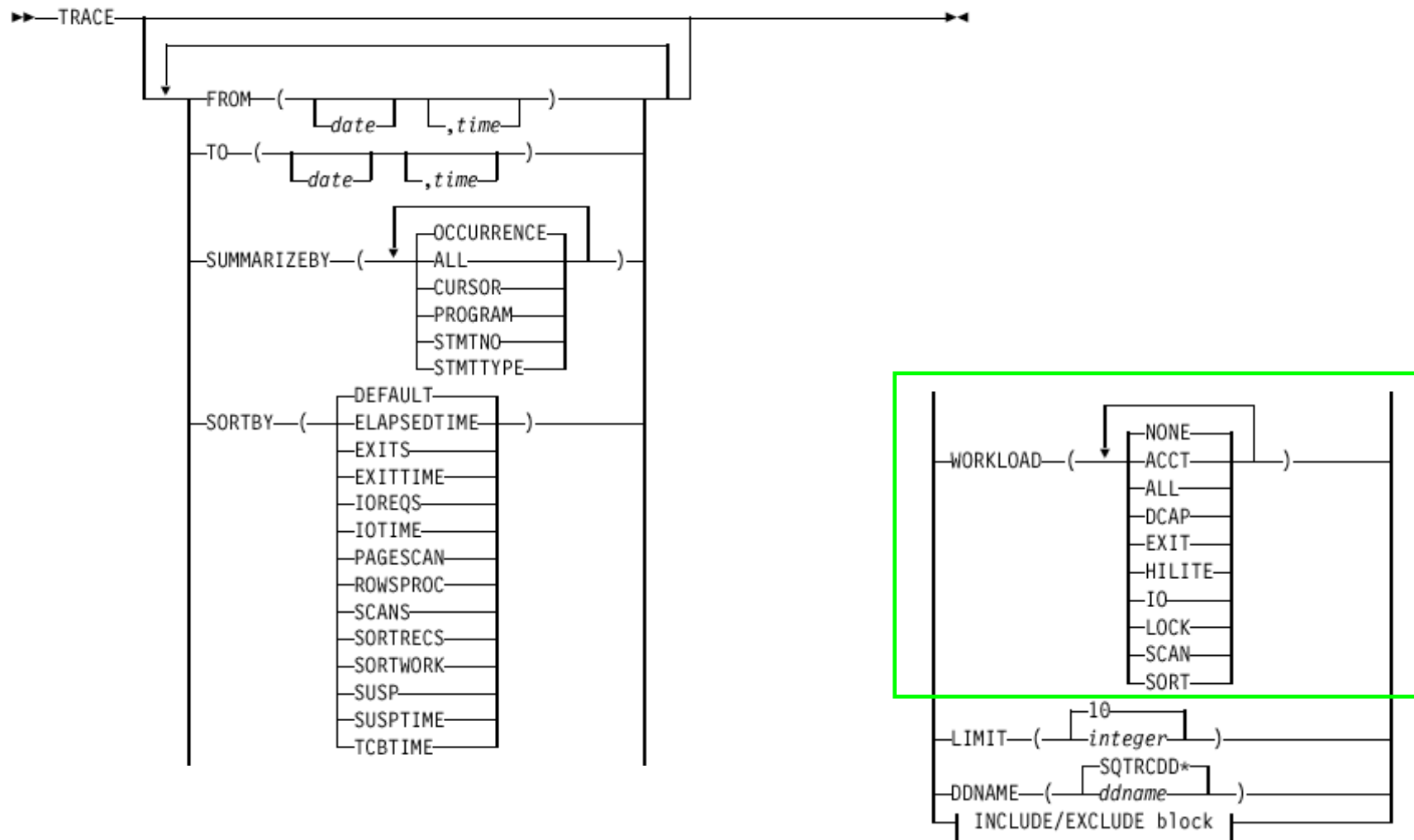
SQL Activity Report Set ...

➔ **SQLACTIVITY**
TRACE
SUMMARIZEBY(CURSORS)
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					
PRMAUTH: 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	AET/OCCUR
				FETCH	TCB/OCCUR
				OPEN	
TELE2	2	0.002606	0.001558	STMTTYPE	COUNT
		0.001303	0.000779	CLOSE	AET/OCCUR
				FETCH	TCB/OCCUR
				OPEN	
TELE3	3	0.002489	0.001452	STMTTYPE	COUNT
		0.000830	0.000484	CLOSE	AET/OCCUR
				FETCH	TCB/OCCUR
				OPEN	
# 541	1	0.000288	0.000142	UPDATE	ISO(CS) REOPT(NO) KEEP UPD LOCKS: N/A
		0.000288	0.000142		

SQLACTIVITY REPORT / TRACE ...



SQL Activity Trace with workload blocks

```

OPEN                16:01:06.50      0.001180  0.000297  STMT#      1873  CURSOR: C1                ISO(CS) SQLST:00000  SQLCO:      0
                                REOPTIMIZED(NO)  KEEP UPDATE LOCKS(NO)  SCROLL(NO)  SENSITIVE(UNS)  TABLE(UNS)

--- WORKLOAD HILITE ---
SCANS      :      1  RECS/SORT:  1.00  I/O REQS:   N/P  SUSPENDS   :   N/P  EXITS      :   N/P  AMS          :   N/P
ROWSPROC:   1  WORK/SORT:  1.00  AET/I/O   :   N/P  AET/SUSP   :   N/P  AET/EXIT   :   N/P  AET/AMS     :   N/P
PAGESCAN:   2  PASS/SORT:  0.00  DATAAPT:  N/P  RIDS UNUS:  N/P  CHECKCON   :   N/P  DEGREE REDUCTION : N/P
LOB_PAGSCAN: 0          LOB_UPD_PAGE :      0

--- SCAN ACTIVITY ---
-----ROWS-----  --QUALIFIED AT--  -----ROWS-----  --MASS-  --PAGES-  -----RI-----
DATABASE  PAGESET  SCANS  PROCESS  EXAMINE  STAGE 1  STAGE 2  INSERTS  UPDATES  DELETES  DELETES  SCANNED  SCANS  DELETES
MEMBER    TYPE
DMSYSWLD WLDS001    1      1      1      1      1      0      0      0      1      2      0      0
SDE1     SEQD

--- SORT ACTIVITY - QW0095/96 ---
MEMBER      : SDE1      MAX RETURN CODE :      0  WORKFILES   :   1.00  RECORDS     :   1.00
TOTAL SORTS :      1  INITIAL WORKFILES :   1.00  RECORD SIZE :  23.00  SORT TYPE   :   ESA-REC
SORT KEYS   :   1.00  SORT COLUMNS   :   3.00  KEY SIZE    :  10.00  MERGE PASSES :   N/C
AET/SORT    : 0.001150  DATA SIZE      :  13.00  ROWS DELETED:   N/C
PARTITIONING:      NO  PARTITION TYPE  :   NONE  W-FILES PART:   N/C  PARTIT & SORTING:      NO

--- SORT ACTIVITY - QW0028 ---
NO. OF WORKFILES :      1  TOTAL MULTIPLE DS :      0  MULTIPLE DISTINCT SORTS :      0
REQUESTED WORKFILES :      0  ACTUAL WORKFILES :      0  RECORDS IN WORKFILE :      0
PARTITION PARALLEL :      0  RECORDS LAST MERGE :      0  PARTITIONING ONE RECORD :      0
PRE-SORTED RECORDS :      0  RECORDS MDS GROUPBY:      0  CURRENT MERGE PASS :      0
TOTAL MDS GROUPS :      0  RECORDS MDS GROUPS :      0  MAX REQUESTED :      0
AVG REQUESTED :      N/C  MAX NOT ACQUIRED :      0  AVG NOT ACQUIRED :      N/C

--- HOST VARIABLES ---
LOCATION : SYSDB2E          COLLID : JEN          PROGRAM : DEPTSEL          PRECOMP_TIME : 05/23/05 14:31:31.89
STMT_NO : 2459          FORMAT : 0 - COMPRESSED  NO.SQlda ENTRIES : 1

.....
ENTRY_NO. : 1          NAME :          NULL_INDICATOR : NO  SQLTYPE : 452
DATA_TYPE : FIXED-LENGTH CHARACTER STRING  DATA_LENGTH : 8
PRECISION : N/A  SCALE : N/A  ADDR_HOST_VAR : X'0012E438'  ADDR_IND_VAR : X'0012E850'
DATA      : FIMBMRPB
    
```

SQL Activity Trace with workload blocks ...

```

PREPARE          16:01:06.50    0.003611    0.001729  STMT#      1551  CURSOR: C1          SQLST:00000 SQLCO:    0
                TEXT: SELECT MAX(WL_APP_VERSION) , WL_CRTD_TS FROM DMSYSWLD.WLDTVRN GROUP BY
                WL_CRTD_TS ORDER BY WL_CRTD_TS DESC..
                ATTR: DSNHATTR WITH RETURN..

----- MINIBIND -----
QUERYNO   : 1551      PLANNAME    : DSNREXX      COST          : 1627      PARALLELISM_DISABLED : N/A
QBLOCKNO  : 1        COLLID     : DSDYNAMICSQ LCACHE  PROGRAM     : DSNREXX   CONSISTENCY_TOKEN   : 3B3B471F00000083
APPLNAME  : N/P      WHEN_OPTIMIZE : DEFAULT     OPT_HINT_IDENT: N/P      OPTIMIZE_HINTS_USED  : NO
UNITS     : 0        MILLI_SEC  : 0          COST_CATEGORY : N/P      PARENT_Q_BLOCKNO    : 0
BIND_TIME : 06/16/05 17:01:06.50  VERSION    : N/P
MEMBER    : SDE1     STATEMENT_TYPE: SELECT      TIMESTAMP     : 2005/06/16 17:01:06.50

-----
PLANNO    : 1        METHOD      : FIRST TABLE ACCESSED  SORTN_UNIQ   : NO        SORTC_UNIQ   : NO
DATABASE  : DMSYSWLD  NEXTSTEP   : NOT APPLICABLE         SORTN_JOIN   : NO        SORTC_JOIN   : NO
OBJECT    : 61       ACESSTYPE : TABLE SPACE SCAN (R) SORTN_ORDBYLIST : NO        SORTC_ORDERBY : NO
CREATOR   : DMSYSWLD  PAGE_RANGE : NO                     SORTN_GRPBYLIST : NO       SORTC_GROUPBY : NO
TNAME     : WLDTVRN  JOIN_TYPE  : NO                     SORTN_PGROUP_ID : 0        SORTC_PGROUP_ID : 0
CORRELATION_NAME: N/P  MERGE_JOIN_COLS : 0                   ACCESS_DEGREE  : 0        JOIN_DEGREE   : 0
TSLOCKMODE : IS      PARALLELISM_MODE: NO                 ACCESS_PGROUP_ID : 0       JOIN_PGROUP_ID : 0
COLUMN_FN_EVAL : N/A   INDEX_NUMBER  : 0                     PREFETCH       : SEQ      DIRECT_ROW_ACC : NO
PAGES_FOR_TABLE : 501  TAB_CARDINALITY : 10000                STARJOIN       : NO
TABLE_TYPE : TABLE (T)

-----
PLANNO    : 2        METHOD      : EXTRA SORT NEEDED      SORTN_UNIQ   : NO        SORTC_UNIQ   : NO
DATABASE  : 0        NEXTSTEP   : NOT APPLICABLE         SORTN_JOIN   : YES       SORTC_JOIN   : NO
OBJECT    : 0        ACESSTYPE : TABLE SPACE SCAN (W) SORTN_ORDBYLIST : NO       SORTC_ORDERBY : NO
CREATOR   :          PAGE_RANGE : NO                     SORTN_GRPBYLIST : NO       SORTC_GROUPBY : YES
TNAME     : 'BLANK'  JOIN_TYPE  : NO                     SORTN_PGROUP_ID : 0        SORTC_PGROUP_ID : 0
CORRELATION_NAME: N/P  MERGE_JOIN_COLS : 0                   ACCESS_DEGREE  : 0        JOIN_DEGREE   : 0
TSLOCKMODE :          PARALLELISM_MODE: NO                 ACCESS_PGROUP_ID : 0       JOIN_PGROUP_ID : 0
COLUMN_FN_EVAL : S    INDEX_NUMBER  : 0                     PREFETCH       : NO       DIRECT_ROW_ACC : NO
PAGES_FOR_TABLE : 0   TAB_CARDINALITY : 0                     STARJOIN       : NO
TABLE_TYPE : X'00'
    
```

MINIBIND
for
PREPARE

SQL Activity Trace with nested (level) activities

```

...
CLOSE                16:01:07.12    0.000017  0.000017 STMT#          2201 CURSOR: C1                SQLST:00000 SQLCO:    0

1 CALL                16:01:07.12    9.303514                STMT#    0 PROCEDURE: DPTDEL                SQLSTATE: 00000 SQLCODE:    0
SCHEDULE TIME:      0.001187 SCHEDULE TCB: 24.510190 SCHEMA : DMSYSWLD

PACKAGE              SYSDB2E.DMSYSWLD.DPTDEL.X'1797259A0463F578'
ACQUIRE(USE)        REOPT(N)  RELEASE(COMMIT)      ISO(CS)  DYNAMICRULES(RUN)
PREPARE(NODEFER)    KEEP(DYNAMIC(NO)  PROTOCOL(DRDA)      OPTHINT(N/P)

2 CALL                16:01:07.12    0.015642                STMT#    0 PROCEDURE: DPTSEL                SQLSTATE: 00000 SQLCODE:    0
SCHEDULE TIME:      N/P          SCHEDULE TCB: N/P          SCHEMA : DMSYSWLD

PACKAGE              SYSDB2E.DMSYSWLD.DPTSEL.X'1797256406039B3C'
ACQUIRE(USE)        REOPT(N)  RELEASE(COMMIT)      ISO(CS)  DYNAMICRULES(RUN)
PREPARE(NODEFER)    KEEP(DYNAMIC(NO)  PROTOCOL(DRDA)      OPTHINT(N/P)

2 SELECT              16:01:07.12    0.001539  0.000201 STMT#          227                ISO(CS) SQLST:00000 SQLCO:    0
REOPTIMIZED(NO)    KEEP UPDATE LOCKS(N/A)

--- WORKLOAD HILITE ---
SCANS      :    1 RECS/SORT:  N/P I/O REQS:    2 SUSPENDS   :    N/P EXITS      :    N/P AMS          :    N/P
ROWSPROC:  1 WORK/SORT:  N/P AET/I/O :  0.000684 AET/SUSP   :    N/P AET/EXIT  :    N/P AET/AMS       :    N/P
PAGESCAN:  2 PASS/SORT:  N/P DATAAPT:  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----- --MASS-- --PAGES-- -----RI-----
DATABASE PAGESET  SCANS  PROCESS EXAMINE  STAGE 1  STAGE 2  INSERTS  UPDATES  DELETES  DELETES  SCANNED  SCANS  DELETES
MEMBER   TYPE
DMSYSWLD 4          1          1          0          0          1          0          0          0          1          2          0          0
SDE1     INDX

--- I/O ACTIVITY ---
DATABASE PAGESET  - I/O REQUEST - ----- READ REQUEST (WITH OR WITHOUT I/O) ----- ----- WRITE REQUEST -----
MEMBER   BP      TOTAL    AET    TOTAL  TYPE  AET/WITH  %WITH PAGE/WITH  %WITHOUT  TOTAL  TYPE  CAST    AET  PAGE/WRIT
DMSYSWLD WLDXDPT1
SDE1     BP4          2  0.0007          2  SYNCH  0.000684  100.00  1.00  0.00

2 DESCRIBE            16:01:07.13                STMT#          341                SQLST:00000 SQLCO:    0

2 SELECT              16:01:07.13    0.011678  0.002066 STMT#          256                ISO(CS) SQLST:00000 SQLCO:    0
REOPTIMIZED(NO)    KEEP UPDATE LOCKS(N/A)

--- WORKLOAD HILITE ---
SCANS      :    1 RECS/SORT:  N/P I/O REQS:    2 SUSPENDS   :    N/P EXITS      :    N/P AMS          :    N/P
ROWSPROC:  1987 WORK/SORT:  N/P AET/I/O :  0.000739 AET/SUSP   :    N/P AET/EXIT  :    N/P AET/AMS       :    N/P
PAGESCAN:  53 PASS/SORT:  N/P DATAAPT:  N/P RIDS UNUSED:  N/P CHECKCON  :    N/P DEGREE REDUCTION :    N/P
LOB_PAGSCAN:    0          LOB_UPD_PAGE :    0
    
```

SQL Activity Report Set 'pitfalls'

- SQLACTIVITY TRACE ..
 - Processes only 10 threads by default
 - LIMIT(10) is the default -> ALWAYS specify LIMIT(xxxx)

- INCLUDE(PROGRAM(yyy))
 - Not supported – no filtering on just those packages you are interested in (you can put in GLOBAL but is ignored)

SQL Activity Trace - SQLCODE & host variables

SQL Activity Trace with INCLUDE(SQLCODE(xxxx)), for example:

SQLACTIVITY TRACE INCLUDE(SQLCODE(-805,-204,495)) or
 SQLACTIVITY TRACE INCLUDE(SQLCODE(LT(0)))

SQL Activity Trace showing "Input Host Variables"

SQLACTIVITY TRACE
 WORKLOAD(..., VARS, ...)
 EXEC

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

Workload
Host
Variables

```

SELECT          15:42:34.72    0.000171          STMT#      2459          ISO(CS) SQLST:00000 SQLCO:  0
                REOPTIMIZED(NO)  KEEP UPDATE LOCKS(N/A)

----- HOST VARIABLES -----
LOCATION : SYSDB2E          COLLID : FIJ1          PROGRAM : FIMDPH0          PRECOMP_TIME : 10/23/11 14:31:31.89
STMT_NO  : 2459          FORMAT : 0 - COMPRESSED  NO.SQlda ENTRIES : 3
-----
ENTRY_NO. : 1          NAME :                NULL_INDICATOR : NO  SQLTYPE : 452
DATA_TYPE : FIXED-LENGTH CHARACTER STRING  DATA_LENGTH : 8
PRECISION : N/A  SCALE : N/A  ADDR_HOST_VAR : X'0012E438'  ADDR_IND_VAR : X'0012E850'
DATA      : FIMBMRPB
-----
ENTRY_NO. : 2          NAME :                NULL_INDICATOR : NO  SQLTYPE : 500
DATA_TYPE : SMALL INTEGER  DATA_LENGTH : 2
PRECISION : N/A  SCALE : N/A  ADDR_HOST_VAR : X'0012E440'  ADDR_IND_VAR : X'0012E850'
DATA      : Y183241
-----
ENTRY_NO. : 3          NAME :                NULL_INDICATOR : NO  SQLTYPE : 452
DATA_TYPE : FIXED-LENGTH CHARACTER STRING  DATA_LENGTH : 1
PRECISION : N/A  SCALE : N/A  ADDR_HOST_VAR : X'0012E442'  ADDR_IND_VAR : X'0012E850'
DATA      : E
    
```

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



Record Trace Report Set

- Instance number
- ACE just a number (real address at the end of the trace)
- Some fields just have field name
 - ▶ Usually serviceability fields
 - ▶ see DSNWMSGGS 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

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	NETWORKID: 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'						

RETRACE TRACE LEVEL(DUMP)

- Just dumps the raw trace record in hex
- Handy in case a field is present in the trace record but not formatted by OMPE
- Assemble the appropriate DSNDQxxx macro to find the offset

```

PRIMAUTH CONNECT  INSTANCE      END_USER      WS_NAME      TRANSACT
ORIGAUTH CORRNAME  CONNTYPE     RECORD TIME  DESTNO ACE IFC  DESCRIPTION  DATA
PLANNAME CORRNMBR          TCB CPU TIME          ID
-----
JEN      TSO      C46174183F57 'BLANK'      'BLANK'      'BLANK'
JEN      JEN      TSO      18:03:37.88826602  95262  1  45 LOCK      <-- NETWORKID: DEIBMIPS LUNAME: IPVAMDE1 LUWSEQ: 1
DSNESPRR 'BLANK'          0.00329489          RESUME
!-----
!0000 02600000 C4D7D4A1 00000260 E2E8E2C4 C2F2C540 40404040 40404040 C4C2F2C5 ! ..DPM$...-SYSDB2E DB2E
!0020 40404040 E2C4C5F1 E2C4C5F1 40404040 C4617418 3FA0A062 D4000174 1E000100 ! SDE1SDE1 D/.....M.....
!0040 00000000 00000000 40000000 C4618181 79E0A062 D1C5D540 40404040 40404040 ! .....D/aa`Ö..JEN
!0060 40404040 40404040 E3E2D640 40404040 00010100 00000000 00000000 00000000 ! TSO .....
!0080 00010000 025C0000 00000014 002D0281 1F51FD50 E2C4C5F1 C4617418 3FA0A062 ! .....*......a...&SDE1D/.....
!00A0 00988F40 0001741E 00006500 E2E8E2C4 C2F2C540 40404040 40404040 C4C5C9C2 ! .q. ....SYSDB2E DEIB
!00C0 D4C9D7E2 C9D7E5C1 D4C4C5F1 C4617418 3F570001 00000000 00020000 00000000 ! MIPSIPVAMDE1D/.....
!00E0 00000000 D1C5D540 40404040 D1C5D540 40404040 40404040 E3E2D640 40404040 ! ....JEN JEN TSO
!0100 C4E2D5C5 E2D7D9D9 D1C5D540 40404040 00000001 00000000 00000000 00000000 ! DSNEsprrJEN .....
!0120 00000000 00000000 00000000 40404040 40404040 40404040 40404040 40404040 ! .....
!0140 40404040 40404040 40404040 40404040 40404040 40404040 40404040 40404040 ! .....
!0160 40404040 40404040 40404040 40400000 00000000 00000000 00000000 00000000 ! .....
!0180 00CDEE34 00050000 00000000 00000000 00000000 00000000 00000000 00000000 ! .....
!01A0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 E2C4C5F1 ! .....SDE1
!01C0 40404040 C4C2F2C5 40404040 0000025C 00030001 00000000 00000000 00000000 ! DB2E ...*.....
!01E0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 ! .....
!0200 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 ! .....
!0220 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 ! .....
!0240 00000000 00000000 00000000 00000000 00000000 00000000 00000000 D508C000 ! .....N.ä.
!-----

```

Other reports

- IOACITIVITY – Can report on
 - ACTLOG
 - ARCLOG and BSDS
 - Buffer Pool (database I/O)
 - EDM Pool
 - Cross Invalidation

⇒ IOACTIVITY
REPORT
LEVEL(SUMMARY,BUFFER)
ORDER(DATABASE-PAGESET)

- AUDIT
- EXPLAIN
- UTILITY

- BPA (Buffer Pool Analyzer) reporting

- Exception processing

DB2 Performance Reporting

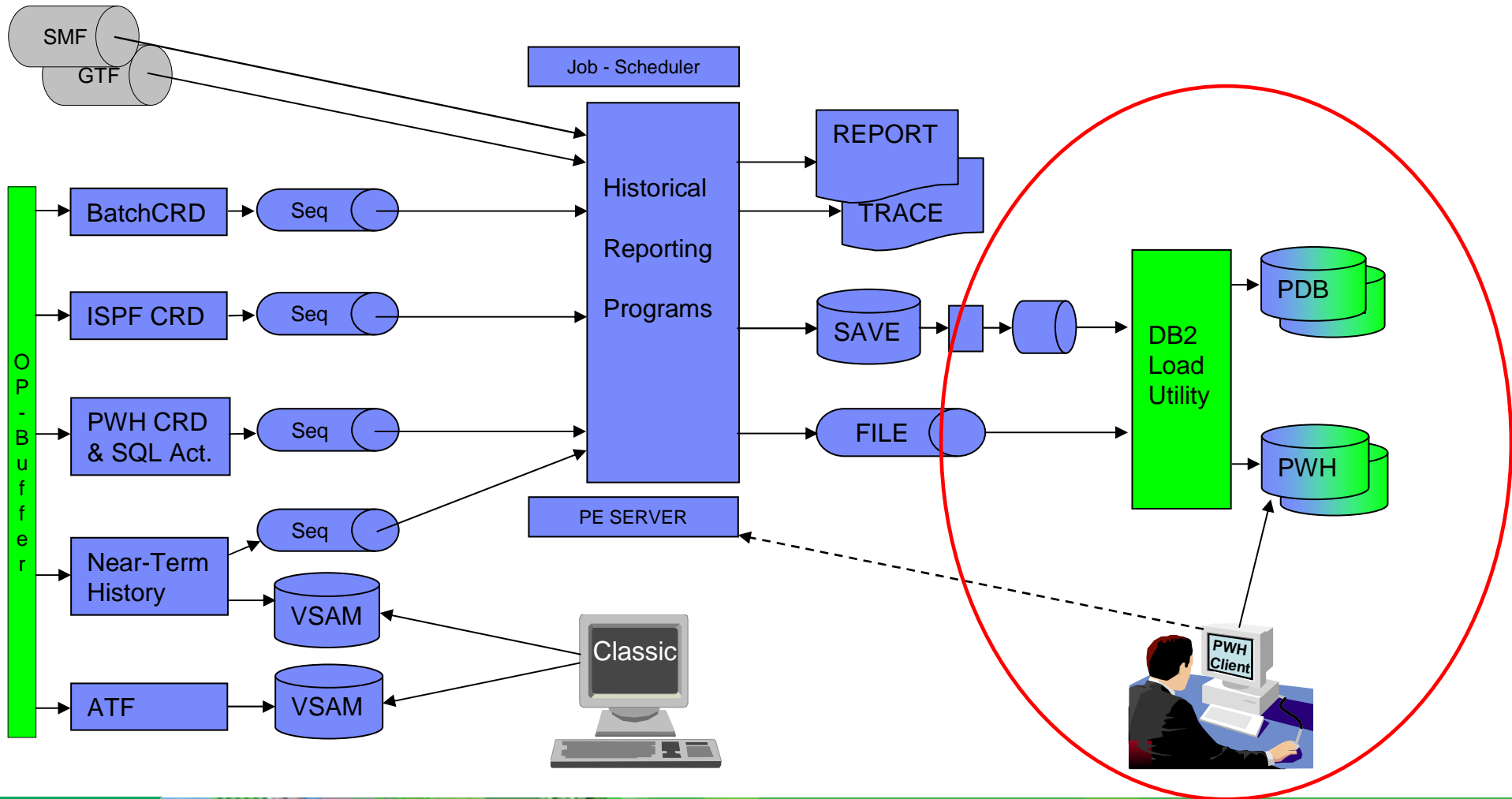
- Instrumentation interface and trace classes
- Data Collection
- Working with Batch Reporting
 - ▶ Report sets ...
- **Performance Database**

Historical Processing Options

DB2 Trace collection

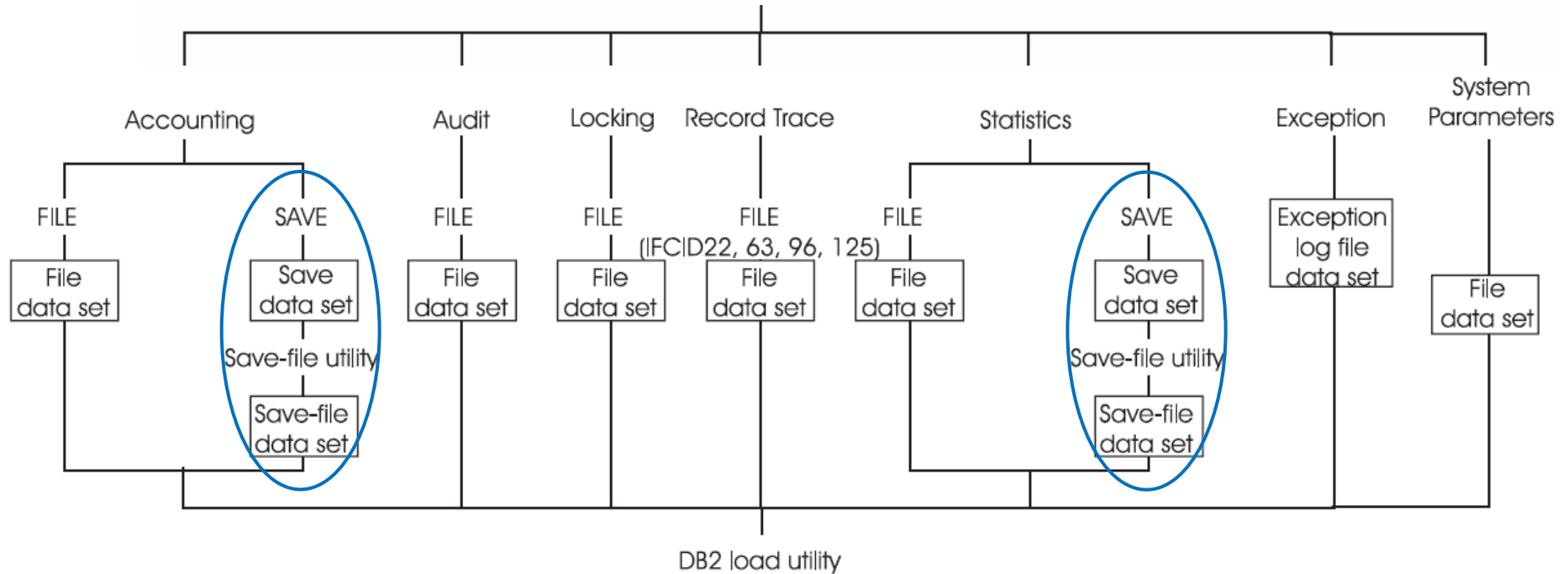
Processing / Reporting

Performance DB archiving



Performance DB tables

DB2
(SMF / GTF / OPx)



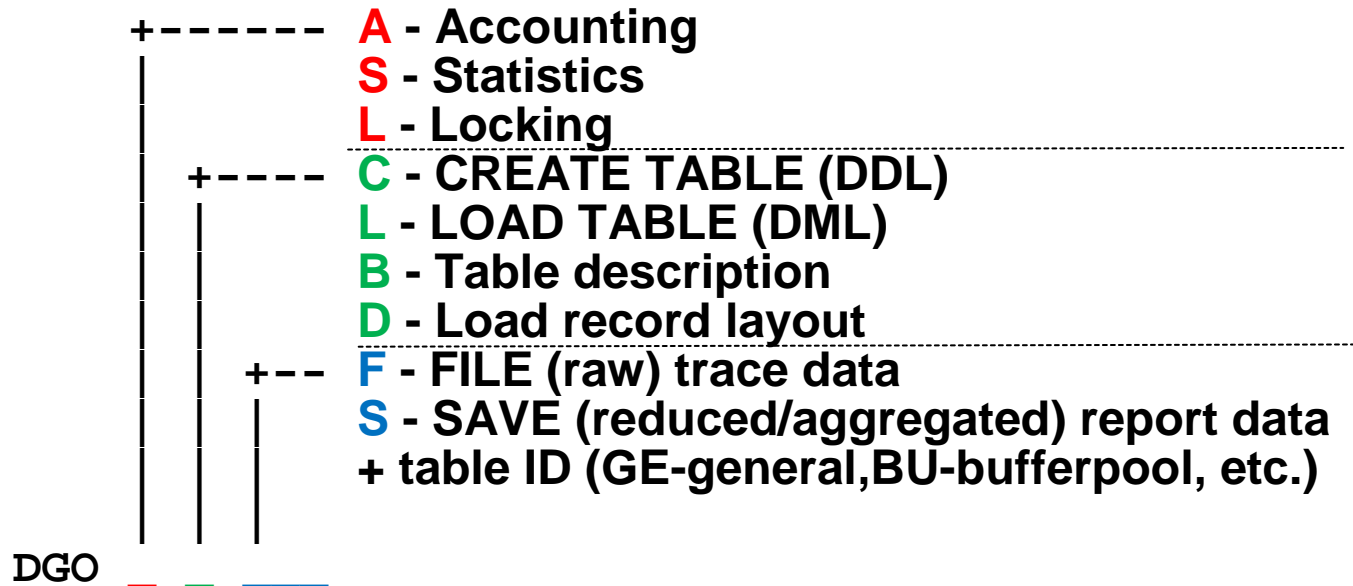
FILE data is like TRACE report
SAVE data is kind of REPORT report

SAVE data are VSAM records which needs to be converted to a seq. dataset (SAVE-FILE) before used by DB2 Load utility (=> RKO2SAMP)

DB2 tables of OMEGAMON XE for DB2 PE/PM Performance DB or Performance Warehouse

Performance Warehouse DB2 tables

DDL and DML members in RKO2SAMP for PDB



e.g. DGOACSGE - Accounting-CREATE TABLE-SAVE-general data
 DGOLLFIL - Locking-LOAD TABLE-File data
 DGOSLBUF - Statistics-LOAD TABLE-buffer pool data

Accordingly separate table names reflect the usage for SAVE and FILE data
 e.g. DB2PMFACCT_XXX <> DB2PMSACCT_XXX

Refer also to Reporting User's Guide Chapter 21 - The Performance Database and the Performance Warehouse

References

- Home:

- ▶ <http://www-01.ibm.com/software/tivoli/products/omegamon-xe-db2-peex-zos/>

- Manuals:

- ▶ Infocenter at :

- ▶ http://pic.dhe.ibm.com/infocenter/tivihelp/v15r1/index.jsp?topic=%2Fcom.ibm.omegamon.xe.pe_db2.doc_5.1.1%2Fko2welcome_pe.htm

- ▶ IBM Tivoli OMEGAMON XE for DB2 Performance Expert on z/OS -
IBM Tivoli OMEGAMON XE for DB2 Performance Monitor on z/OS Version 5.1.1

- ▶ Report Command Reference, SH12-6964-00

- ▶ Report Reference, SH12-6963-00

- ▶ Reporting User's Guide, SH12-6969-00

- Redbooks:

- ▶ 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)

End of this episode – unless there are any questions

