



IBM Software Group

# WELCOME IBM DB2 Performance Monitoring Clinic

**DB2.** Data Management Software

Hosted by:  
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Business Unit Executive



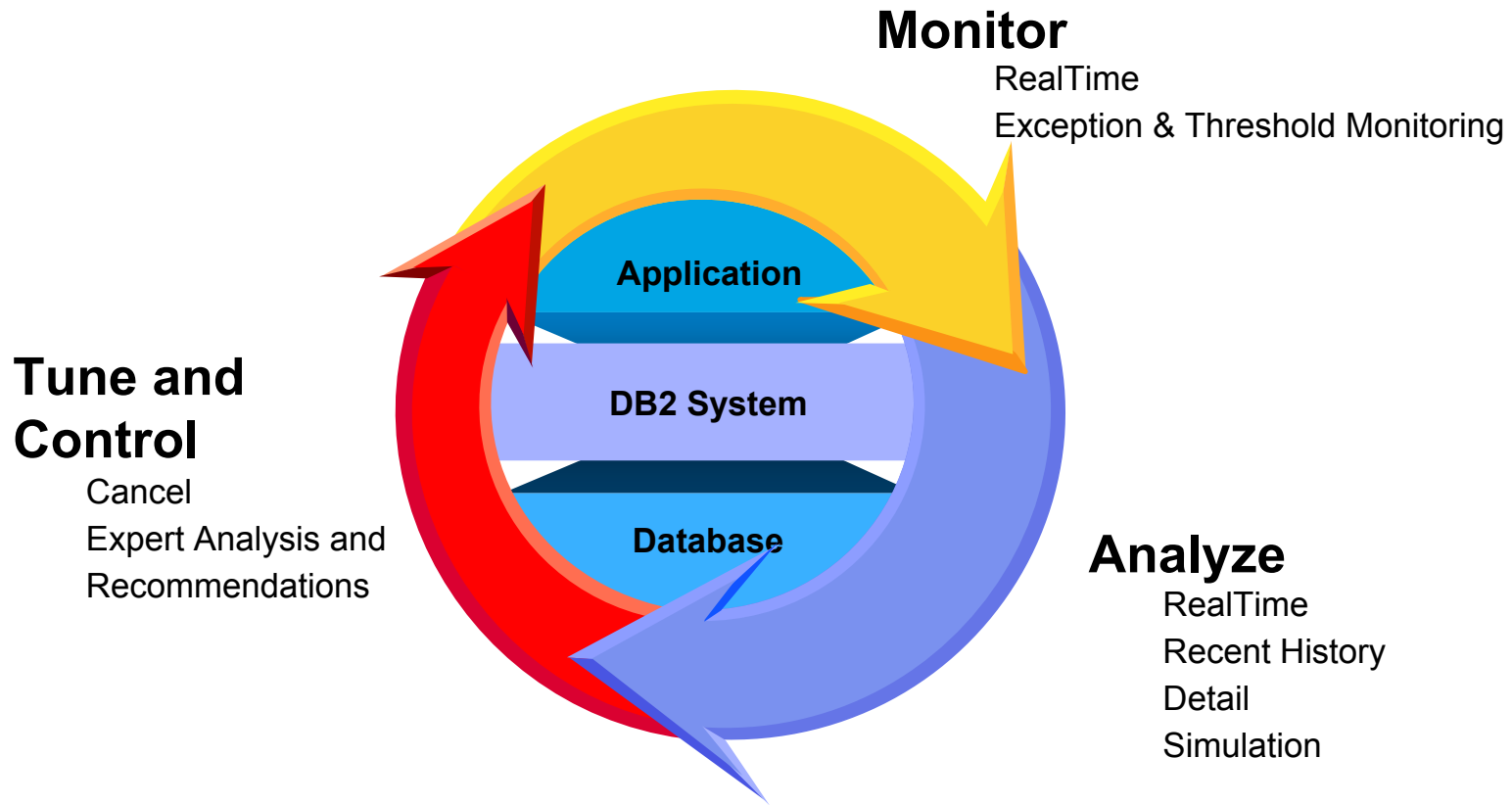


# Topics

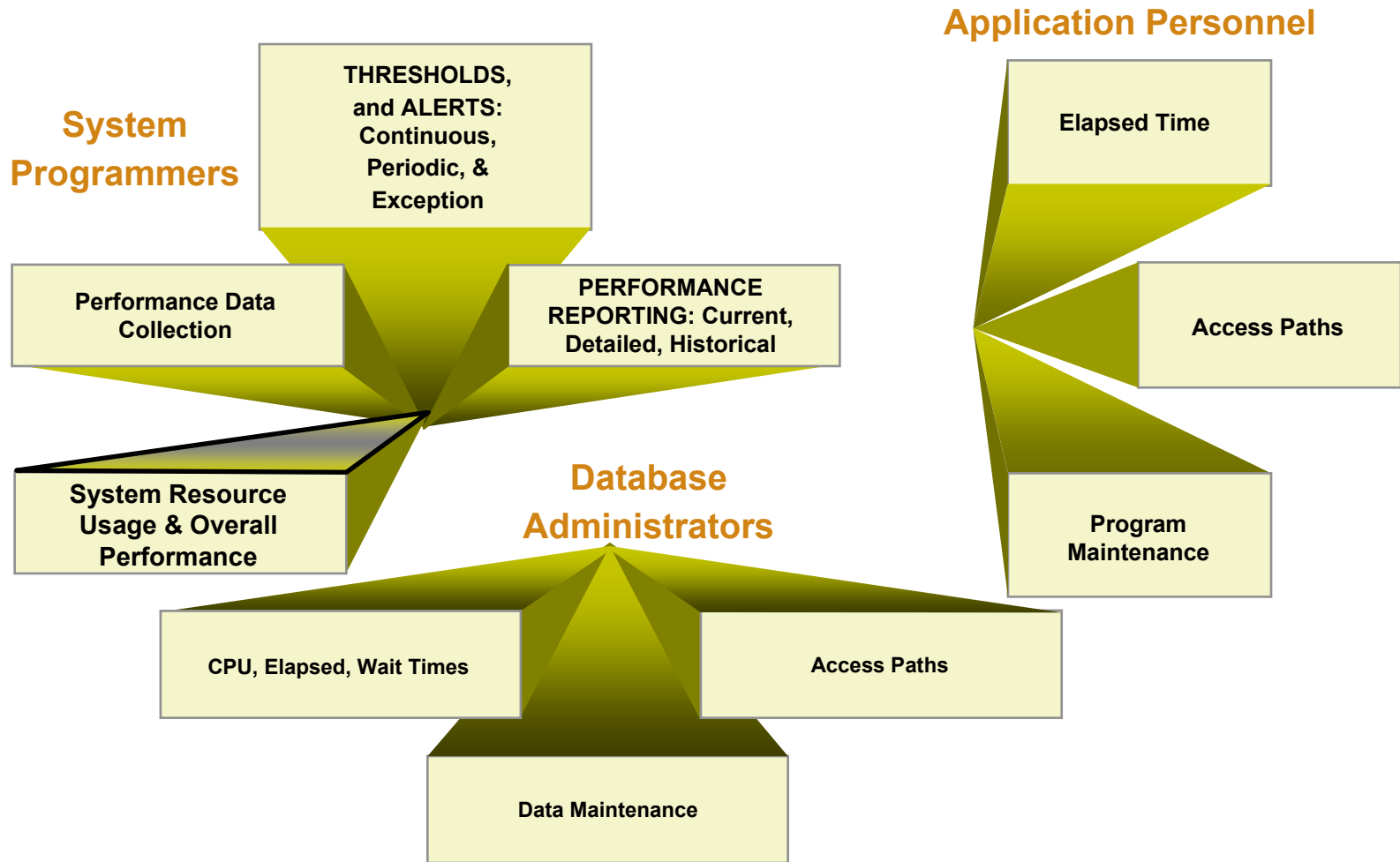
- Introduction to DB2 monitoring
- DB2 instrumentation and terminology
- DB2 application monitoring
- DB2 subsystem monitoring
- DB2 Connect monitoring
- Summary / Observations
- References

# Performance Management

*Goal: To Monitor, Analyze, Tune, and Control DB2 Systems and Applications to obtain Optimal Performance and Lowest Cost*



# When it Comes to Performance: Who Cares About What?



## So who can influence DB2 Performance?

- Everyone....
  - Application developer
  - Database administrator
  - DB2 system support staff
  - OS/390 or z/OS systems support
  
  - and yes...also the USER!

# What determines DB2 performance and throughput?

- Assuming valid user input....
  - Number and type of SQL calls
  - Database design
  - DB2 configuration (DB2 startup or z-parms)
    - ▶ Buffers, EDM pool, RID pool, Work database
    - ▶ Bind parameters
  - System resources
    - ▶ CPU (LPAR)
    - ▶ Real and Virtual Memory
    - ▶ I/O subsystem

## So how do you know if you have a problem

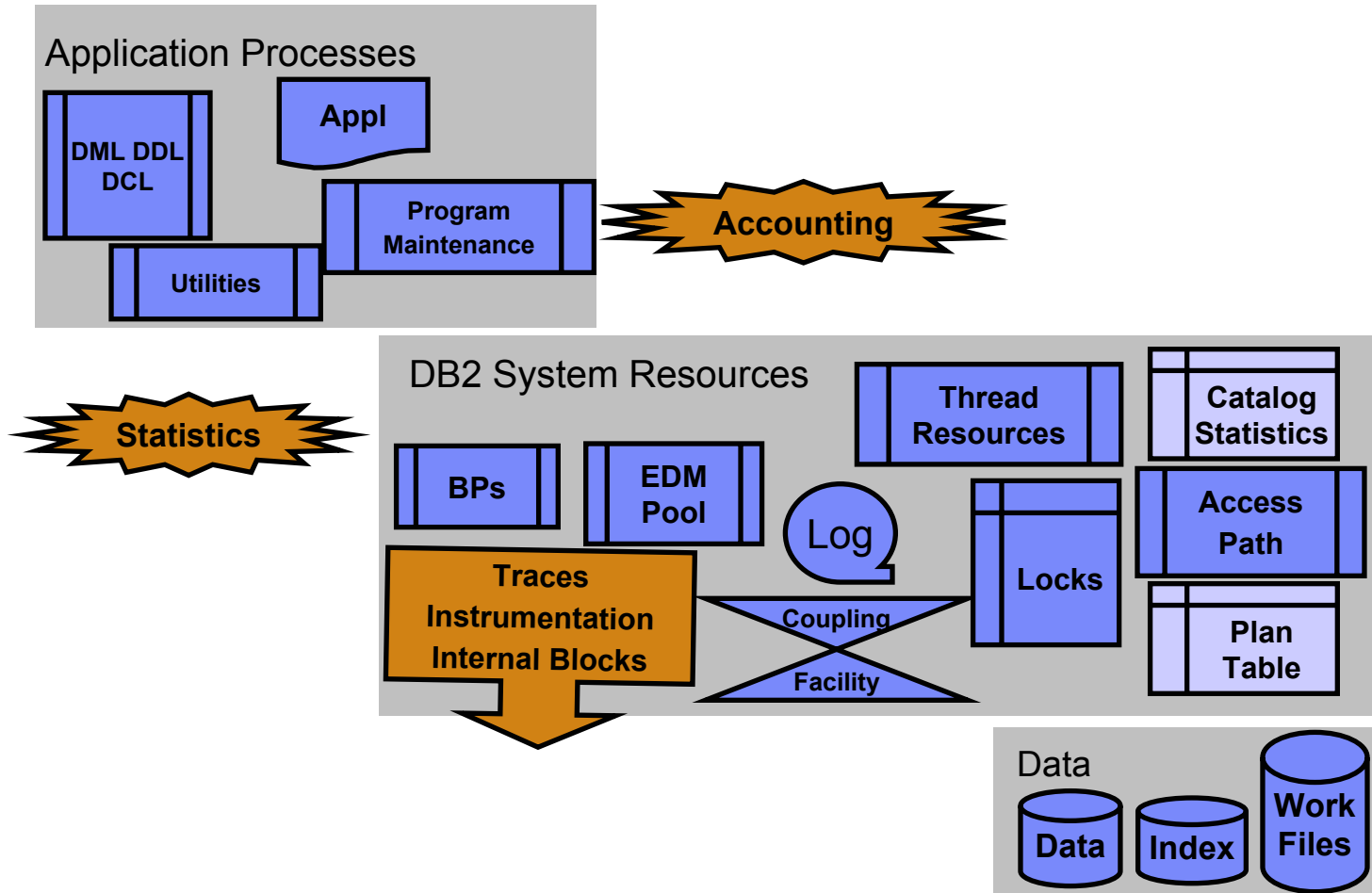
- Do you have service-level goals for DB2 performance?
  - System-wide objective?
  - Workload dependent?
  - Key / critical business applications
  - Batch, transaction, query



# Does your DB2 Monitoring process include...?

- Ongoing - routine collection and review of performance data
  - Establish baseline for performance
  - Query historical data for trends / exceptions
  - Analysis of trace data
  - Analysis of performance reports
- Periodic - when you know or suspect something has changed
  - Workload changes
    - ▶ Prototype / stress testing for new applications
    - ▶ Changes in application or database design
    - ▶ Change in number of users or data volume
  - Capacity planning
    - ▶ Hardware upgrades
    - ▶ New software releases
    - ▶ Calibrate "charge-back" algorithms
- Exceptions - the phone rings....
  - Performance unacceptable to user
  - Exception condition met
  - Alert threshold exceeded

# What DB2 resources should you monitor?



## Performance data available to monitor the DB2 application and subsystem

- Trace types
  - Accounting
  - Statistics
  - Monitor
  - Performance
  - Audit
  - Global
  - Multiple trace classes per trace type
  - IFCID as basic unit of reporting
    - ▶ Instrumentation Facility Component Identifier

# DB2 Trace Records

- **Accounting & Statistics** Records
  - Relatively inexpensive to collect
  - Most useful for initial analysis
    - ▶ Accounting report (not trace) by connection type or plan, and
    - ▶ Statistics report (not trace) for the same period
  - Should always be the first one to look at in any DB2 performance problem determination
  - Statistics Records are written as SMF 100 records
  - Accounting Records are written as SMF 101 records
- Performance Trace Records
  - Could become very expensive depending on the class / IFCIDs
  - Performance Records are written as SMF 102 records

# DB2 Instrumentation

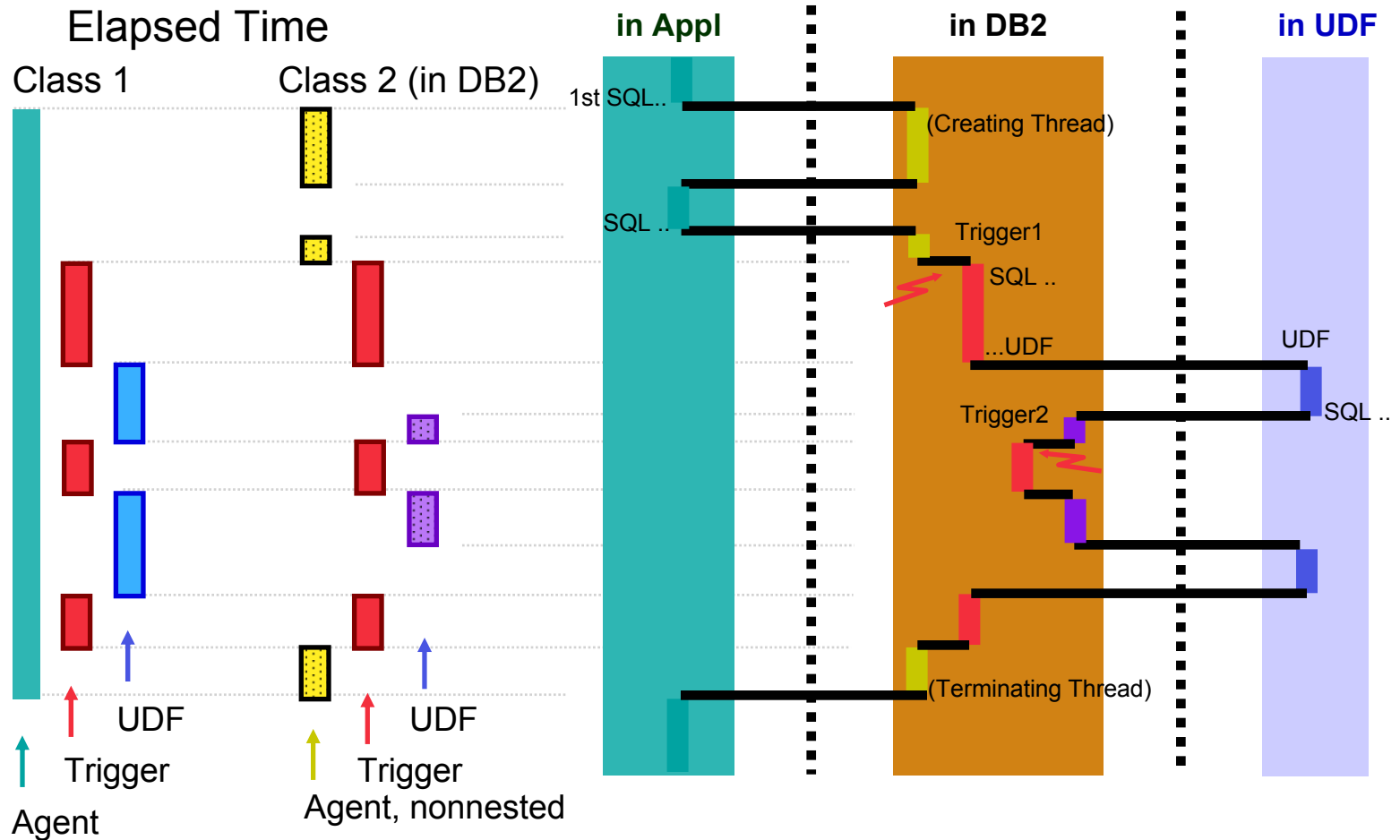
- How to Start, Modify, Stop traces
  - ▶ START TRACE(STAT) CLASS(1,3,4)
  - ▶ START TRACE(ACCTG) CLASS(1,2,3)
  - ▶ .....
  - ▶ MODIFY TRA(S) CLASS(1,3,4) TNO(1)
  - ▶ STOP TRA(A) TNO(2)
- Recommended traces to start
  - Accounting Class 1, (2), 3, (7), (8)
  - Statistic Class 1, 3, 4, (5)
  - Zparms : SMFACCT, SMFSTAT, STATTIME, SYNCHVAL
- DB2 Trace and 'typical' CPU overhead
  - DB2 accounting
    - ▶ Class 1: less than 5% CPU overhead
    - ▶ Class 2: 1 to 10% CPU overhead (higher % for Fetch intensive applications)
    - ▶ Class 3: less than 1% CPU overhead (could be higher if Latch contentions are higher)
    - ▶ Class 7 and 8: less than 1% CPU overhead
  - Monitor trace: similar to accounting
  - Statistics : negligible

## DB2 Instrumentation

- Trace destination can be SMF or GTF or OPx
  - SMF is default for Accounting and Statistics Traces
  - GTF is default for Performance Trace
  - Can be overridden by DEST parameter
  - OPx buffers used by Online Monitors
- Trace gathering can be filtered using Planname, AuthID and Location
- Performance Trace can be started for Performance Classes or individual IFCIDs
  - Ex : -STA TRA(P) C(3,6,7)
  - -STA TRA(P) C(3,6,7) IFCID(198)
  - -STA TRA(P) C(30) IFCID(44,45,226,227)
  - DEST(SMF) PLAN(MYPLAN)
  - Performance Classes 30 to 32 are User Trace Classes
- Performance trace can also be started and limited to a number of trace entries using DSN1SDMP utility
- IFCID details are documented in DSNxxx.SDSNSAMP(DSNWMSGs)

# DB2 Thread Level (Accounting) And Application Tuning

# DB2 - Class 1 and Class 2 Times





# DB2 Accounting Times Terminology

- Class 1
  - Application and DB2 time from connect to DB2 (thread creation) till disconnect (thread termination)
  - Both Class 1 Elapsed time and Class 1 CPU time are reported at the Plan level.
- Class 2
  - Time spent within DB2
  - Both Class 2 Elapsed time and Class 2 CPU time are reported at the Plan level.
- Class 3
  - Thread Suspension time, e.g. for Synchronous I/O, Lock / Latch Suspension, Service Class Switch suspension time etc... at the Plan level
- Class 7
  - Similar to Class 2, but on Package/DBRM level.
  - Both class 7 Elapsed time and Class 7 CPU time are reported.
- Class 8
  - Similar to Class 3, but on Package/DBRM level.

## Accounting Class 1 and 2 ....

- **IMS, TSO, CAF, Batch**
  - Class 1 : Application + DB2 time
  - Class 2 : DB2 time only
- **CICS**
  - Application CPU time captured in CICS
  - Class 1 : DB2 + task switch time
  - Class 2 : DB2 time only
- For **thread reuse**, Class 1 can be much higher than Class 2 time because the time from commit to the first SQL call of next transaction to reuse the thread is also included.
- **Class 2 elapsed time** = Class 2 CPU + Class 3 wait + Not Accounted time
- **Not Accounted time** typically represents time beyond DB2 control such as paging, swapping, waiting for busy CPU etc.

# Accounting Class 3 Suspension Time

CLASS 3 SUSPENSIONS	AVERAGE TIME	AV.EVENT
-----	-----	-----
LOCK/LATCH(DB2+IRLM)	0.000706	0.73
SYNCHRON. I/O	0.172023	34.94
DATABASE I/O	0.163672	33.94
LOG WRITE I/O	0.008352	1.00
OTHER READ I/O	0.014806	1.49
OTHER WRTE I/O	0.000000	0.00
SER_TASK SWITCH	0.017373	2.00
UPDATE COMMIT	0.016777	1.00
OPEN/CLOSE	0.000000	0.00
SYSLGRNG REC	0.000000	0.00
EXT/DEL/DEF	0.000000	0.00
OTHER SERVICE	0.000596	1.00
ARC.LOG(QUIES)	0.000000	0.00
ARC.LOG READ	0.000000	0.00
STOR.PRC SCHED	0.000000	0.00
UDF SCHEDULE	0.000000	0.00
DRAIN LOCK	0.000000	0.00
CLAIM RELEASE	0.000000	0.00
PAGE LATCH	0.000054	0.00
NOTIFY MSGS	0.000000	0.00
GLOBAL CONTENTION	0.000000	0.00
COMMIT PH1 WRITE I/O	0.000000	0.00
ASYNCH IXL REQUESTS	0.000238	0.01
TOTAL CLASS 3	0.205200	39.17

# Elapsed Time Monitoring and Tuning

- Major Contributors to Elapsed Time
  - Database Synch I/O
    - ▶ Reduce by Bufferpool tuning
  - Log Synch I/O
    - ▶ Reduce by Log tuning - faster DASD
  - Service Task Switch time
    - ▶ New counters provide detailed breakdown

## Service Task Switch Wait

- **Service Task Switch** (Synchronous Execution Unit Switch) happens when a DB2 System task needs to perform work on behalf of the Allied TCB (Application) to invoke functions under a **different TCB or SRB** in the same address space or in a different address space.
- Starting with V6 this counter is broken up into following contributions:

```
SER.TASK SWTCH
Update Commit
OPEN/CLOSE
SYSLGRNG REC
EXT/DEL/DEF
OTHER SERVICE
```

... (includes commit logging)

... **OPEN / CLOSE data set, HSM recall**

... **SysLog Range Recording**

... **Data Space Manager Services**

... **remaining contributions** (Pre-format)

↙ Connect to GBP (data sharing only)

Load Valid/Edit proc

-DIS DATABASE command processing ...

## Asynchronous Pre-formatting in V7

# CPU Time Monitoring and Tuning

- Major Contributors to CPU Time
  - DB2 access paths
  - Number and type of SQL statements executed
  - Number of columns returned
  - Degree of filtering by SQL predicates
    - ▶ # of index and data pages accessed to return data
  - Bind options
    - ▶ Acquire / Release

# CPU Time Monitoring and Tuning....

- Major Contributors to CPU Time (cont.)
  - Placement of variable length data in a row
  - Application programming techniques used
    - ▶ Singleton SQL vs Cursor processing
    - ▶ Do - While or Begin/End program constructs rather duplicating same SQL call(s)

## How do you know if you have a problem?

- Ongoing - routine collection and review of DB2 performance data
  - Definition, generation, & scheduling of customized DB2 performance reports
    - ▶ Identify the Top 10 or N number of Plans that execute most frequently and consume high DB2 (Class 2) CPU time
    - ▶ Identify the Top 10 or N number of Plans that execute most frequently and have high DB2 Class 2 Elapsed time
  - Create and maintain historical performance data for trend analysis
  - Create, execute, & schedule rules-of-thumb checks based on service-level objectives
  - Define & execute queries to analyze performance data to identify exception conditions



## How do you know if you have a problem?

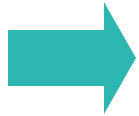
- **Periodic - validate application assumptions**
  - Collect and review performance data to
    - ▶ Determine "affordability" of applications
    - ▶ Estimate response-time and batch window to meet user requirements
    - ▶ Determine hardware requirements or impact of hardware changes
    - ▶ Determine benefits or impact of software maintenance or release changes

# How do you know if you have a problem?

- Exception - instances of specific events or user specified thresholds exceeded
  - Event monitoring
    - ▶ Timeouts or deadlocks
    - ▶ EDM Pool full
    - ▶ Coupling facility rebuild
    - ▶ Authorization failure
    - ▶ .....
  - Thresholds reached
    - ▶ Elapsed, CPU, or wait time per Plan
    - ▶ Getpages, buffer updates per Plan
    - ▶ .....

# Buffer Pool Analysis and Tuning

- Monitor and tune bufferpools to reduce or avoid excessive I/O
  - Bufferpool Hit Ratio (application and system)
  - Random vs sequential use of DB2 buffers
  - Backed by real storage (Number of page-ins for read/write > 0)
  - Determine read / write ratios
  - Object (tablespace / index) usage analysis
  - Determine appropriate bufferpool thresholds



Goal: Determine optimal bufferpool size, object replacement, and threshold settings

# DB2 System Level (Statistics based) Tuning

# System Tuning on CPU Time

Address space CPU time in a peak 10 minute  
Statistics interval

CPU TIMES	TCB TIME	SRB TIME	TOTAL TIME	/COMMIT
-----	-----	-----	-----	-----
MSTR ADDRESS SPACE	0.280035	55.461024	55.741059	0.000491
DBM1 ADDRESS SPACE	0.015709	2:10.997199	2:11.012908	0.001154
IRLM	0.000647	2.590147	2.590794	0.000023
DDF ADDRESS SPACE	N/P	N/P	N/P	N/P
TOTAL	0.296391	3:09.048369	3:09.344760	0.001668

- All TCB and IRLM SRB times should be low relative to MSTR/DBM1 SRB times.
  - If not, needs further investigation.

# Major DB2 Address Space CPU Consumers

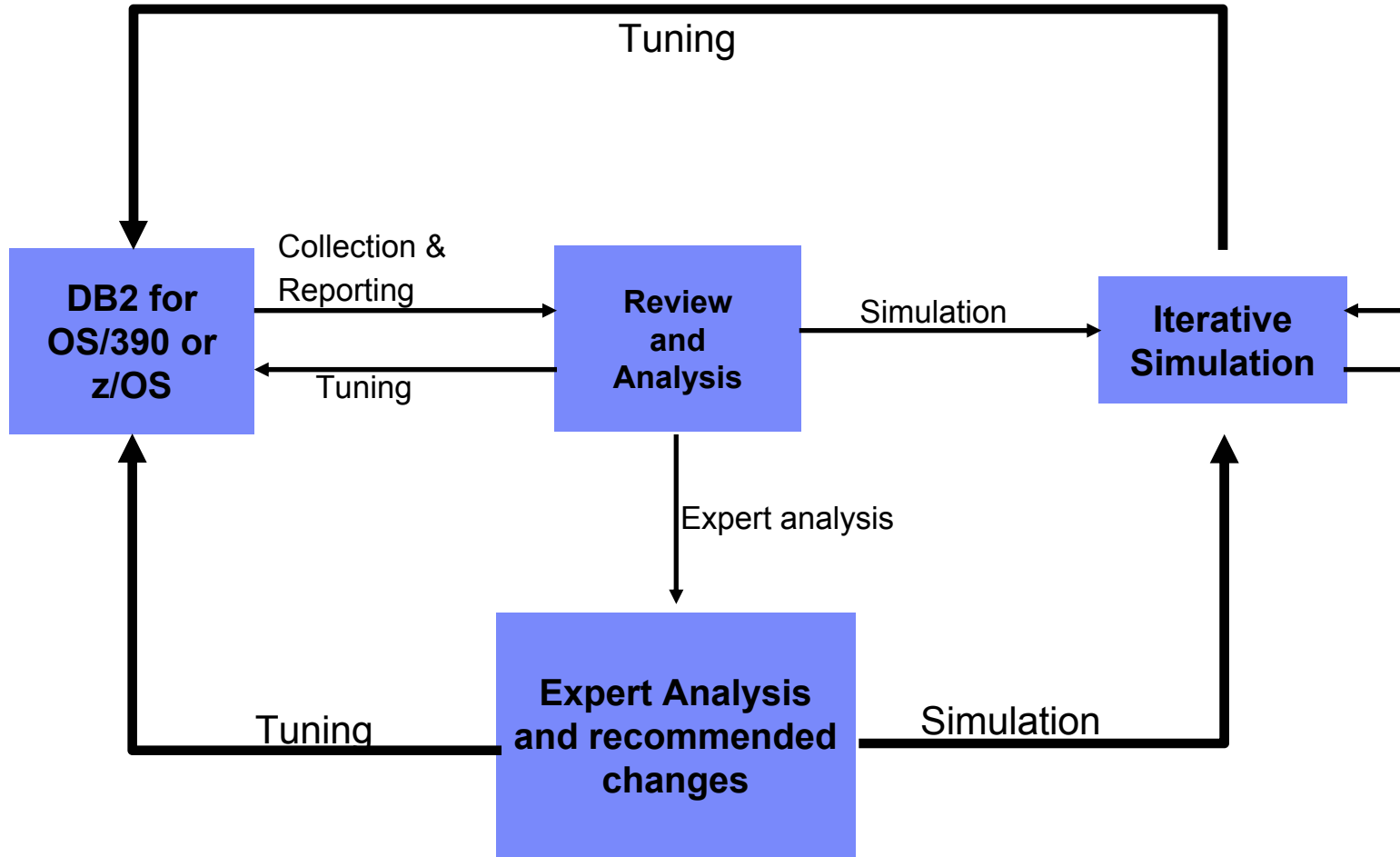
- Major MSTR SRB time
  - Physical log write, thread deallocation, update commit including GBP write and page P-lock unlock
  
- Major DBM1 SRB time
  - Deferred write, prefetch read, Castout, async GBP write, P-lock negotiation, Notify exit, GBP checkpoint, Delete Name (pageset close or pseudo-close to convert to non-GBP-dependency)
  
- Major DBM1 TCB time - Dataset open/close
  
- Major IRLM SRB time
  - Local IRLM latch contention, IRLM and XES global contention, async XES request, P-lock negotiation

Activities unique to data sharing are underlined.

## DB2 statistics data for Bufferpools

- Monitor Buffer Pool Hit Ratio for Random Reads
- Monitor Deferred Write Thresholds
- Critical Counters
  - *Prefetch Disabled - No Buffer*
    - ▶ Minimize to zero by increasing VP
  - *Data Manager Critical Threshold*
    - ▶ Minimize to zero by increasing VP
  - *Page-In for Read / Write*
    - ▶ Check MVS paging - if short on CS reduce VP
  - *Synch Reads*
    - ▶ Minimize if possible by increasing VP

# Buffer Pool Monitoring and Tuning Approach





## EDM Pool Monitoring and Tuning

- Monitor EDM Pool statistics for
  - *FAILS DUE TO POOL FULL*
  - *REQ NOT FOUND IN EDMPOOL*
  - *PREP\_STMT\_HIT\_RATIO*
- Monitor DBM1 virtual storage use - access impact of EDM Pool size
- Tune EDM pool size
  - Bind option Acquire Use
  - Bind option Release Commit for all but most frequently executed Plans/Packages
  - Compact DBD by Reorg and Modify if many Drop Table in Segmented Tablespace

## System-Wide statistics of interest

- DB2 Logging rate
  - *LOG RATE FOR 1 LOG (MB/Sec)*
  - If Log data rate near max
    - ▶ Use faster Log DASD (ESS + Striping)
    - ▶ Reduce Log data size
    - ▶ Variable length record, Data Compression
- DB2 Output Log Buffer Unavailable
  - If *Output Log Buffer Unavailable* Increase Log Output Buffer
  - Log Buffers in MSTR address space
  - Ensure availability of enough CS to avoid paging

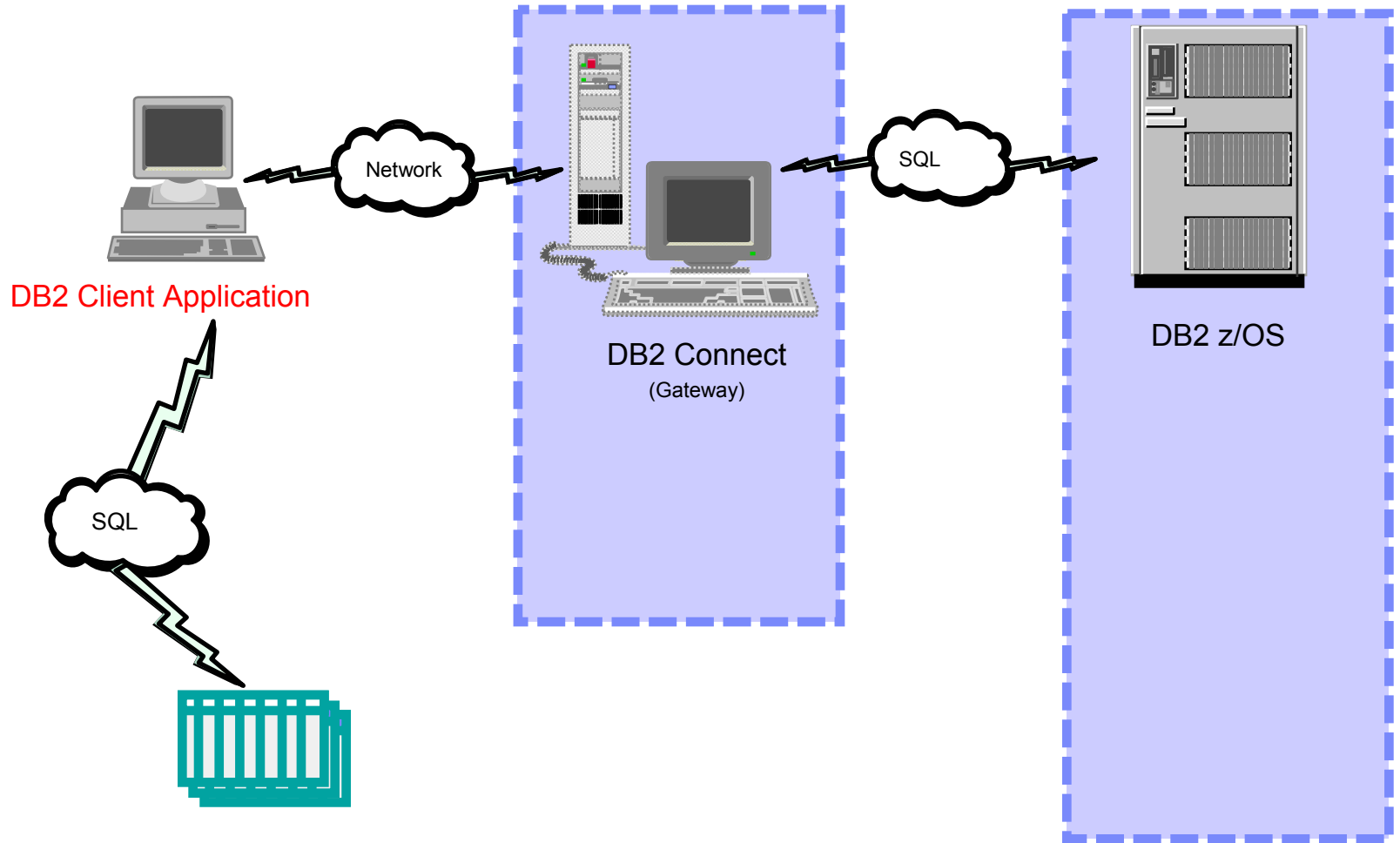
## System-Wide statistics of interest

- DB2 Checkpoint Frequency
  - Impacts pages written per write I/O
  - All updated pages on deferred write queue scheduled for write
  - Use LOGLOAD or CHKTIME option of SET LOG command to dynamically change or LOGLOAD startup z-param
- DB2 Timeouts / Deadlocks
  - Reflects problems with lock contention
  - Impacts application availability / stability
    - ▶ Influenced by application commit frequency
    - ▶ Influenced by order of application access
    - ▶ Influenced by BIND options

# Monitoring and Tuning for Data Sharing

- Group Bufferpools
  - GBP *Write Engine Not Available* (< 1 to 5% of pages async written)
  - *Castout Engine Not Available* (< 1 to 5% of pages castout)
  - Optimize data page and directory entry ratio
- Locking issues
  - Global Contention
  - False Contention
  - Sizing coupling facility lock structures
- Coupling facility structure failures
  - Rebuild of GBP or lock structures

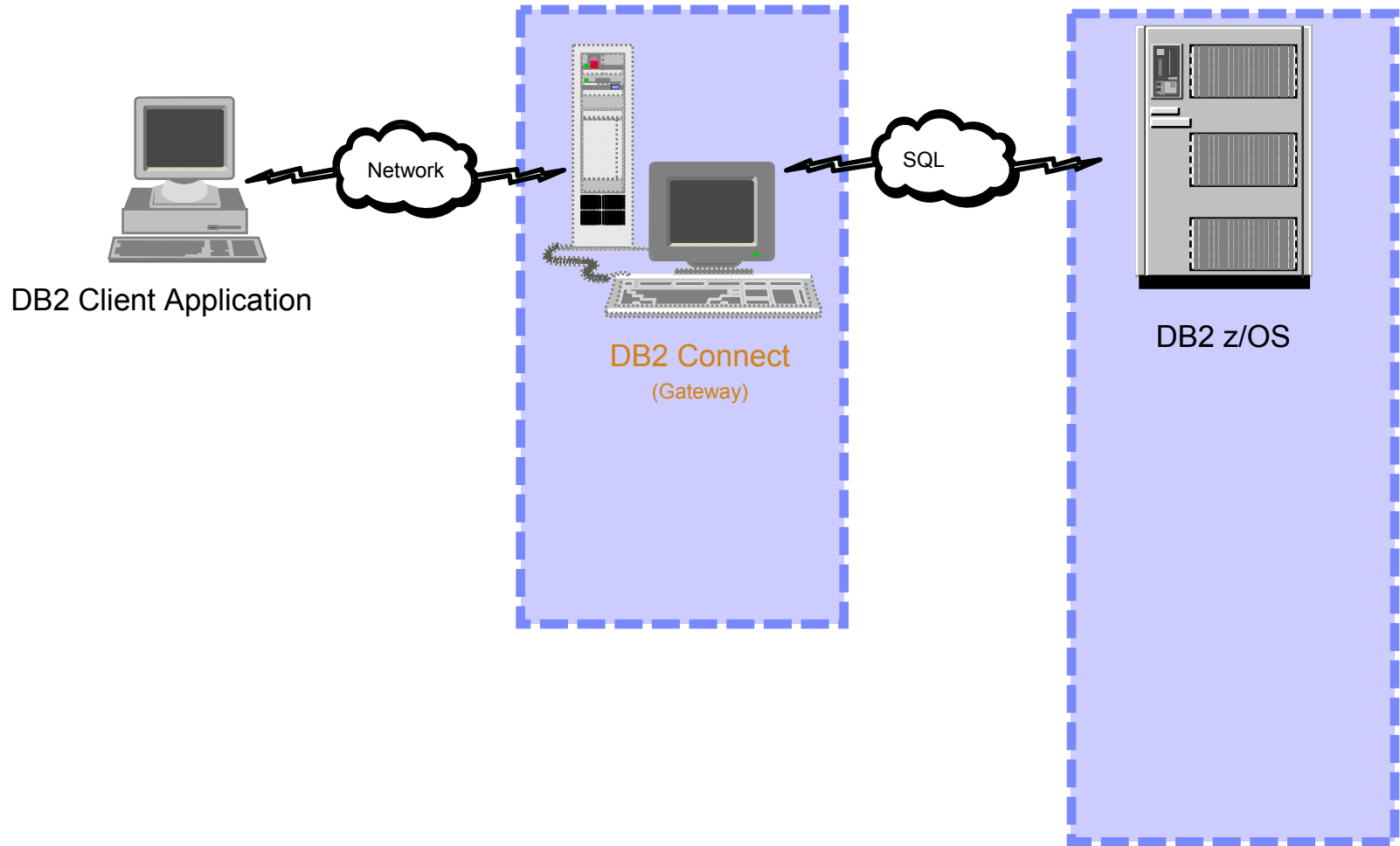
# What about DB2 on the client platform?



## What about DB2 on a client platform?

- Application architecture may also include DB2 distributed data access
  - DB2 for Linux, Unix or Windows
    - ▶ Elapsed time
    - ▶ CPU
    - ▶ Waits/Delays
  - Monitoring and tuning information often analyzed by same staff responsible for DB2 for z/OS

# What about the DB2 Connect gateway?



## DB2 Connect Performance information available includes:

- DB2 Connect statistics details
  - Gateway information for a specific connected DB2 server
- DB2 Connect thread details
  - Gateway information for a specific application thread
- DB2 Connect summary information
  - Gateway information independent of specific connected DB2 server



## DB2 Connect - a DB2 server view

- DB2 Connect statistics details
  - Current connections to the DB2 server
  - Connections waiting on host reply
  - Connections waiting on client to send request
  - SQL statement time as seen by gateway
    - ▶ Time in DB2 Connect
    - ▶ Time on host
    - ▶ Time in network connection

## DB2 Connect - an application view

- DB2 Connect application (thread) details
  - Overall transaction data
    - ▶ Number of SQL statements attempted
    - ▶ Inbound bytes sent
    - ▶ Outbound bytes received
    - ▶ Total host response time
    - ▶ Application idle time
    - ▶ .....

## DB2 Connect - consolidated view across DB2 servers

- DB2 Connect gateway summary information
  - DB2 Connect gateway information
    - ▶ IP address
    - ▶ Node name
    - ▶ Version
  - Package statistics
    - ▶ Size distribution of messages (eg. # 512k, 1024k, 2048, etc msgs sent/recd)
    - ▶ Network time distribution (eg. 2ms, 4 ms, 8 ms...)

## Summary - Observations...

- Leverage your efforts - make the easy to implement changes first
  - Tune the z/OS environment first
    - ▶ Workload management (WLM) policy
    - ▶ I/O subsystem
  - Change the data design
    - ▶ Create views
    - ▶ Add / remove / modify indexes
  - Modify application code
    - ▶ Tune SQL calls
    - ▶ Implement data purge/archive

## Summary - Observations...

- A wealth of DB2 application, database, and system information is available
- Comprehensive DB2 tuning requires an end to end monitoring strategy
- Leverage your efforts to get optimal return for your tuning investment



Monitoring tool(s) are key to implementing your tuning strategy

# References

- Capacity Planning for DB2 for OS/390 (SG24-2244)
- DB2 UDB for OS/390 and z/OS V7 Administration Guide, Part 5: Performance Monitoring and Tuning (SC26-9931-03)
- DB2 for OS/390 V5 Application Design Guidelines for High Performance (SG24-2233)
- DB2 for z/OS and OS/390 Tools for Performance Management (SG24-6508)
- IBM Redbooks Website : [www.redbooks.ibm.com](http://www.redbooks.ibm.com)

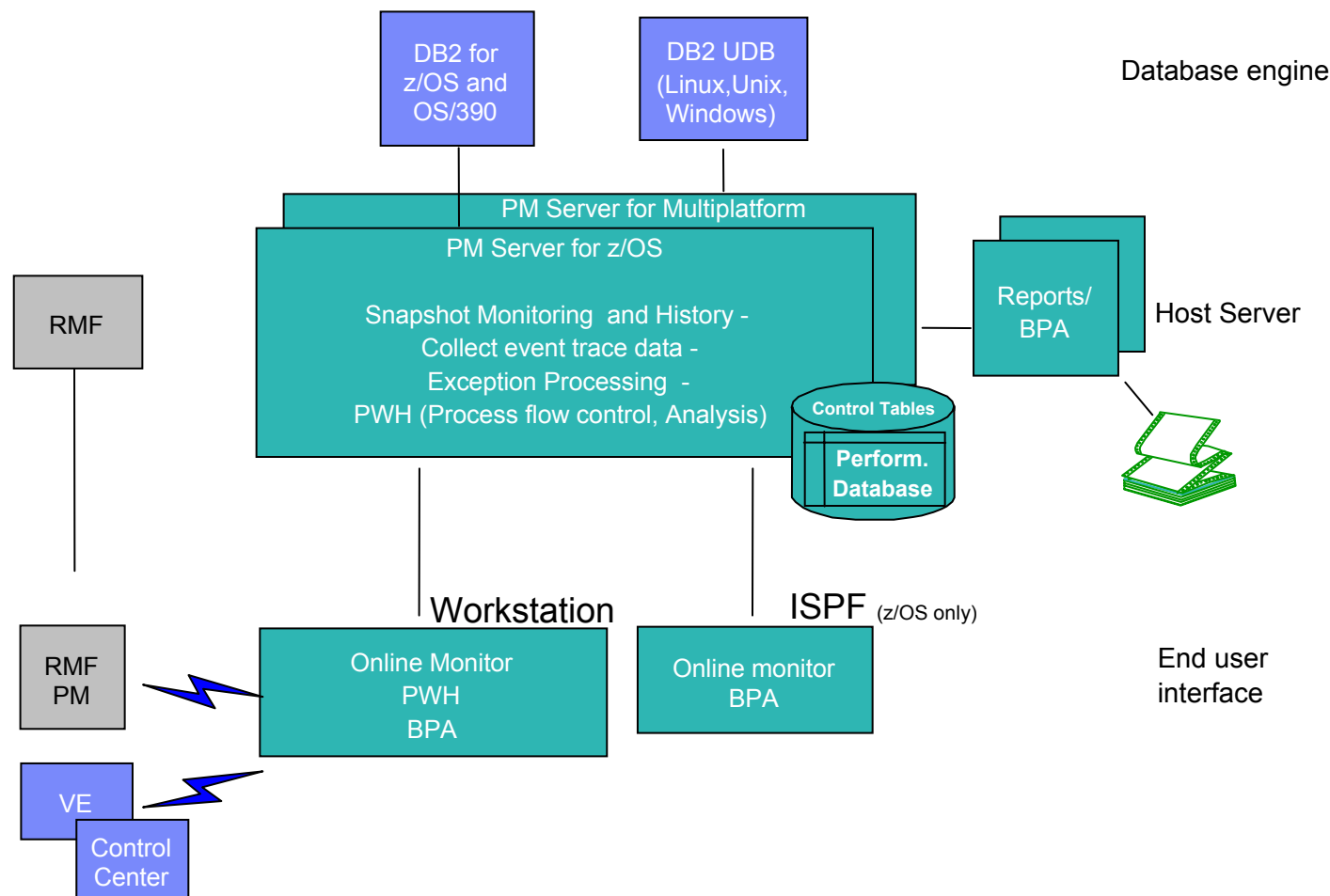


# Topics

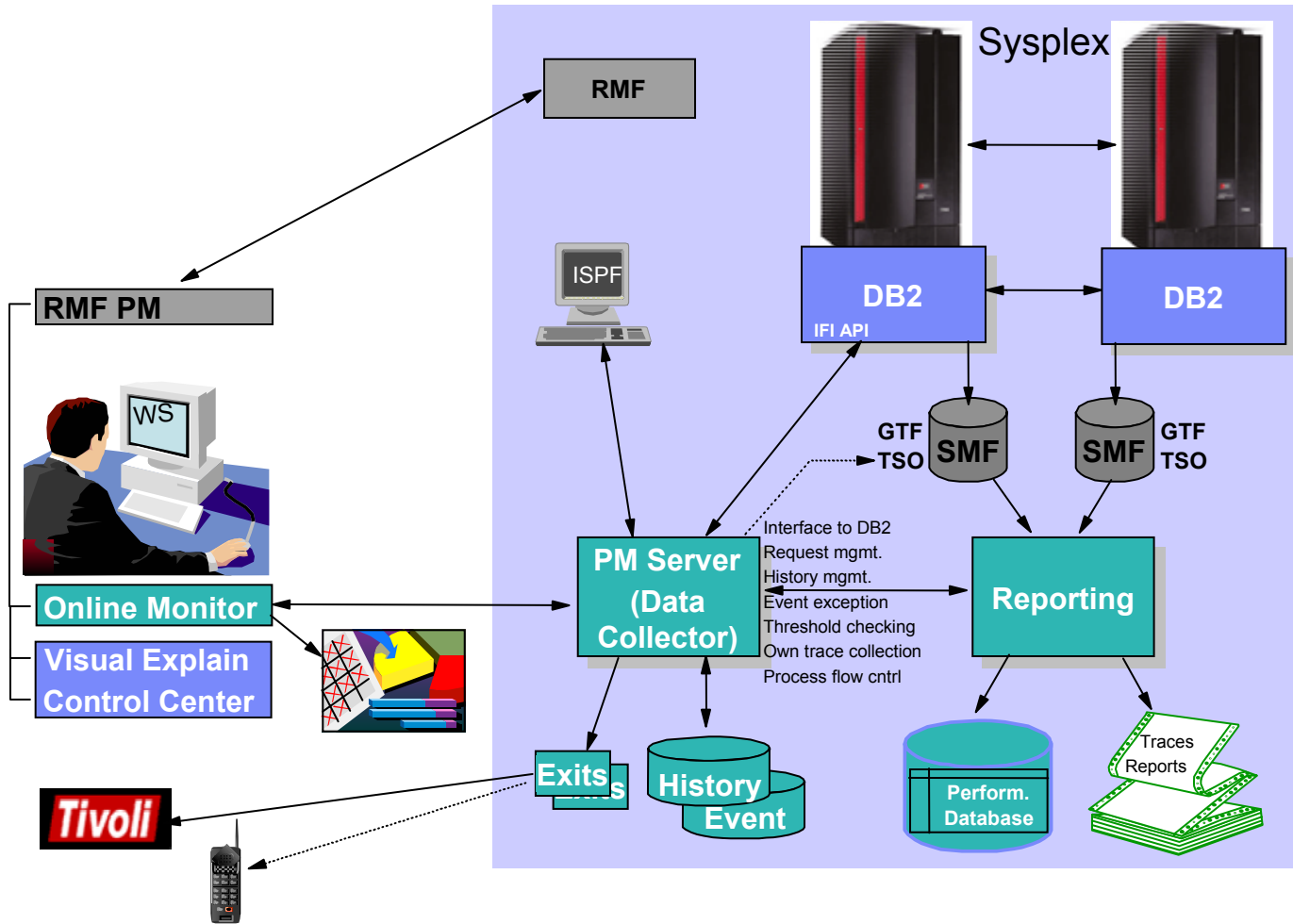
- DB2 Performance Expert for z/OS Architecture
- Application Monitoring
- Subsystem Monitoring
- DB2 Connect Monitoring
- DB2 Buffer Pool Analyzer
- Performance Warehouse
- Batch Reporting



# DB2 Performance Expert Product Structure



# DB2PE for z/OS Architecture (monitoring & reporting)



## Extended Graphical Views and Navigation

- View DB2 Systems across your Enterprise
- Data Sharing Controls
- Structure and arrange your DB2 systems according to your priorities
- Extended design gives you a quick overview of the performance of the DB2 systems you are monitoring

# Main System Overview Screen (DB2 for z/OS)

**Monitored Objects**

- Multiplatforms
  - Instances
    - DB2
  - z/OS
    - Subsystems
      - DSN8

**Subsystem Information**

DB2 System DSNB  
 System Name DEMOMVS  
 DB2 V7  
 Server V8  
 User ID DBA064  
 Logon [Logon](#)  
 Exception N/A  
 Trace Status N/A  
 Description Demo System ...

**platform dependent functions**

- DB2 Commands
- Thread Summary
- Statistics Details
- System Health
- Threads in Lock Conflicts
- Locking Conflicts
- System Parameters
- Performance Warehouse
- Trace Activation

**mult. Platform**

ID	Exception	Trace Stat...	Session	Operating ...	System N...	DB2	Server	Host	Port	Description
0	N/A	N/A	0	Unknown						
4	N/A	N/A	0	ZOS	DEMOMVS	V7	V8	demomvs...	6561	Demo Syst...

# Improved navigation - less windows using tabs

Full navigation between different functions and panels.

Drill down on details panels lists use tabs.

Navigation between tabs and main panel.

General	
Buffer pool	BP0
Buffer pool virtual buffer pool pages in use (%)	0.7
Buffer pool hit ratio (%)	96.3
Current active buffers	14
Buffer pool full	0
Virtual storage unavailable	0

# GUI Options and Controls

Refresh

History control

Filter / Customize

Autorefresh

Select display of Dyn. Stmt cache content

Users	Status	Insert	Executions	Sync. Read	Getpage	Elapsed Time/Exec.
0	Active	2002/02/21 19:46:27	2	1969	8422	9.70650
0	Active	2002/02/19 16:55:52	3	28	5412	8.22754
0	Active	2002/02/19 16:55:14	4	32	7216	0:00:10
0	Active	2002/02/19 16:55:17	4	29	7216	0:00:10
0	Active	2002/02/19 16:55:08	3	19	5412	8.29368
0	Active	2002/02/19 16:55:11	4	24	7216	0:00:11
0	Active	2002/02/19 16:55:02	3	21	5412	8.14888
0	Active	2002/02/19 16:55:05	3	24	5412	8.47531
0	Active	2002/02/19 16:55:00	3	24	5412	8.18317

# Data Sharing Control

Member or group scope selection

Members shown in table view

System Parameters View Tools Help

Show Data for: **DSND** (dropdown menu with options: DSND, SGD1, SGD3)

2002/02/24 17:08:36 | 0:00:06 | 2002/02/24 17:08:00

**Archive Log Parameters (DSNTIPA)**

Performance Counters	SGD3	SGD1
<b>Allocation unit</b>	<b>CYL</b>	<b>CYL</b>
Primary quantity (in allocation units)	48	48
Secondary quantity (in allocation units)	2	2
Catalog archive data sets	YES	YES
COPY device type or unit	DASD	DASD
COPY2 device type or unit	N/P	N/P
Archive log block size (bytes)	24576	24576
Tape unit deallocation period (mm:ss)		
Maximum number of data sets recorded in BSDS	1000	1000
Archive copy 1 mass storage group name	N/P	N/P
Archive copy 2 mass storage group name	N/P	N/P
Issue WTOR before mount for archive volume	YES	YES
Retention period (days)	99	99
Quiesce period (seconds)	5	5
Compact data	NO	NO

# Application Monitoring

- View all connected threads
- View details of a selected thread
- Sort threads
- Cancel threads
- Create and view SQL activity traces



# Application Monitoring – Thread Summary

DSNB - Thread Summary

Thread Summary Selected View Tools Help

Thread Details  
SQL Activity Tracing  
Cancel Thread 2 4:19:30 AM

0:00:06

11/14/02 4:20:24 AM

Primary Authorization	Member	Plan	Program Name	Elapsed Class 1	Elapsed Class 2	Total Class 3	CPU Class 1	CPU Class 2
DB2PE	N/P	DB2...	DGO@PC1 ...	4d 1:42:23	0:14:12	0:01:22	0:16:54	0:12:08
DB2PE	N/P	FPE...	DGO@SDOB ...	4d 1:42:23	0:00:10	0:00:10	0.32657	0.30616
DB2PE	N/P	FPE...	DGO@DB2I ...	4d 1:42:23	0:00:46	0.10087	0:00:34	0:00:10
DB2PE	N/P	N/P	N/P	4d 1:42:24	0.43839	0.17117	1.07142	0.24779
DNET018	N/P	ADB...	ADBMAIN	2:59:27	0.95330	0.19010	0.04290	0.02597
DBA064	N/P	FPE...	N/P	6:31:291	0.04986	0.02033	0.00499	0.00418
DBA248	N/P	FPE...	N/P	5:05:06	0.15412	0.09582	0.00502	0.00464
DBA560	N/P	FPE...	N/P	1d 6:42:27	0.35136	0.22233	0.01028	0.00928
DBA061	N/P	FPE...	N/P	1d 22:48:26	0.02529	0.00818	0.00231	0.00206

Cancels current thread

# Application Monitoring – Thread Detail

**DSNB - Thread Detail (Primary Authorization: DBA064)**

Thread Details View Tools Help

11/14/02 4:20:30 AM 0:00:06

11/14/02 4:20:40 AM

**Overview**

**Locking activity**

Timeouts	0
Deadlocks	0
Suspensions	0
Lock escalations	0
Max page locks held	0

**SQL activity**

Commits	0
Rollbacks	0
Changes and commits	0.0
DML	0
DCL	0
DDL	0

**Times**

Elapsed class 1	0:00:22
Elapsed class 2	0.05740
Total class 3	0.02343

**Identification**

Primary authorization	DBA064
Plan name	FPEPLAN

## DB2 Subsystem Monitoring

- View important statistics and ratios of a DB2 subsystem in various levels of detail and processing modes
- View statistics information
- View SQL statements in the dynamic SQL cache
- View buffer pool statistics

# System Overview - Extended View

The screenshot displays the 'DB2 Performance Expert - System Overview' window. On the left, a tree view under 'Monitored Objects' shows a hierarchy: 'All DB2 Systems' > 'z/OS' > 'Subsystems' > 'Data Sharing Groups' > 'DB2 Connect / Gateways' > 'My Folders' > 'Demo Systems' > 'D721'. A blue arrow points to the 'D721' folder. Below this, a table lists system details:

Group	User ID	Exception	Session	Operating Sy...	Trace Status	System N...	DB2	Server
	JEN	N/A	0	ZOS	N/A	PMO5	V7	V8
		N/A	0	Unknown	N/A	pmo5	Unknown	Unknown

The main area shows performance charts for 'D721' and 'SGI2'. The 'D721' section includes 'SQL Activity DML' (stacked bar chart) and 'BPO read operations' (line chart). The 'SGI2' section includes 'SQL Activity DML' (stacked bar chart), 'Locking' (stacked bar chart), and 'BP Read GetPage Request' (line chart). Annotations in blue text state: 'Display for logged on systems' and 'Event exceptions in logged on systems'. A right-hand pane shows 'Top 20 Event Exc' with a red entry: 'Timeout - SGI2 - 11/11'.

Customizable grouping of your system also if located on different platforms

# System Overview - data view definition and setup

The screenshot displays the 'SGI2 - System Health' interface. On the left, a tree view shows 'Data Groups' with 'System Overview' expanded to 'Data Views', where 'SQL' and 'Locking' are listed. A red circle highlights this area. A blue arrow points from a text box to the 'SQL' item. Another blue arrow points from a second text box to the 'SQL Activity DML Properties' dialog box.

**Define the data views for System Overview panel.**

**Define the properties (refresh at System Overview will be fixed every 20 seconds)**

The 'New Data View' dialog box is open, showing the '2. Counters' tab. The 'Data view name' field is empty, and the 'Data view category' is set to 'Log Manager'. The 'SQL Activity DML Properties' dialog box is also open, showing the '2. Counters' tab. The 'Counter selection' list includes 'Total DML', 'Select', 'Insert', 'Update', 'Delete', and 'Prepare'. The 'Select', 'Insert', and 'Update' checkboxes are checked.

# Graphs at detail panels

- Overview
- EDM Pool**
- Buffer Management
- Locking
- Open/Close
- Bind
- Plan / Package / Routine
- Log Manager
- Subsystem
- SQL Activity DML
- Dynamic SQL Statemen
- Query Parallelism
- RID List
- CPU Times
- Miscellaneous
- Nested SQL Activity
- Distributed Data
- Data Sharing Locking
- DB2 Connect Server

### EDM Pool

Pages in EDM pool	1 596	DBD requests	1 404 658
Held by DBDS	74	DBD not in EDM pool	221
Held by CTS	3	DBD hit ratio (%)	100.0
Held by SKCTS	10	CT requests	387
Held by SKPTS	480	CT not in EDM pool	35
Held by PTS	4	CT hit ratio (%)	91.0
Free Pages	1 025	PT requests	1 132 236
Pages in use (%)	35.8	PT not in EDM pool	4 211
Non stealable pages in use (%)	0.44	PT hit ratio (%)	99.6
Failures due to EDM pool full	0	Pages for Dynamic SQL Cache	74
		Pages in EDM pool dataspace	0
		Free pages in dataspace free chain	0
		Failures due to dataspace full	0

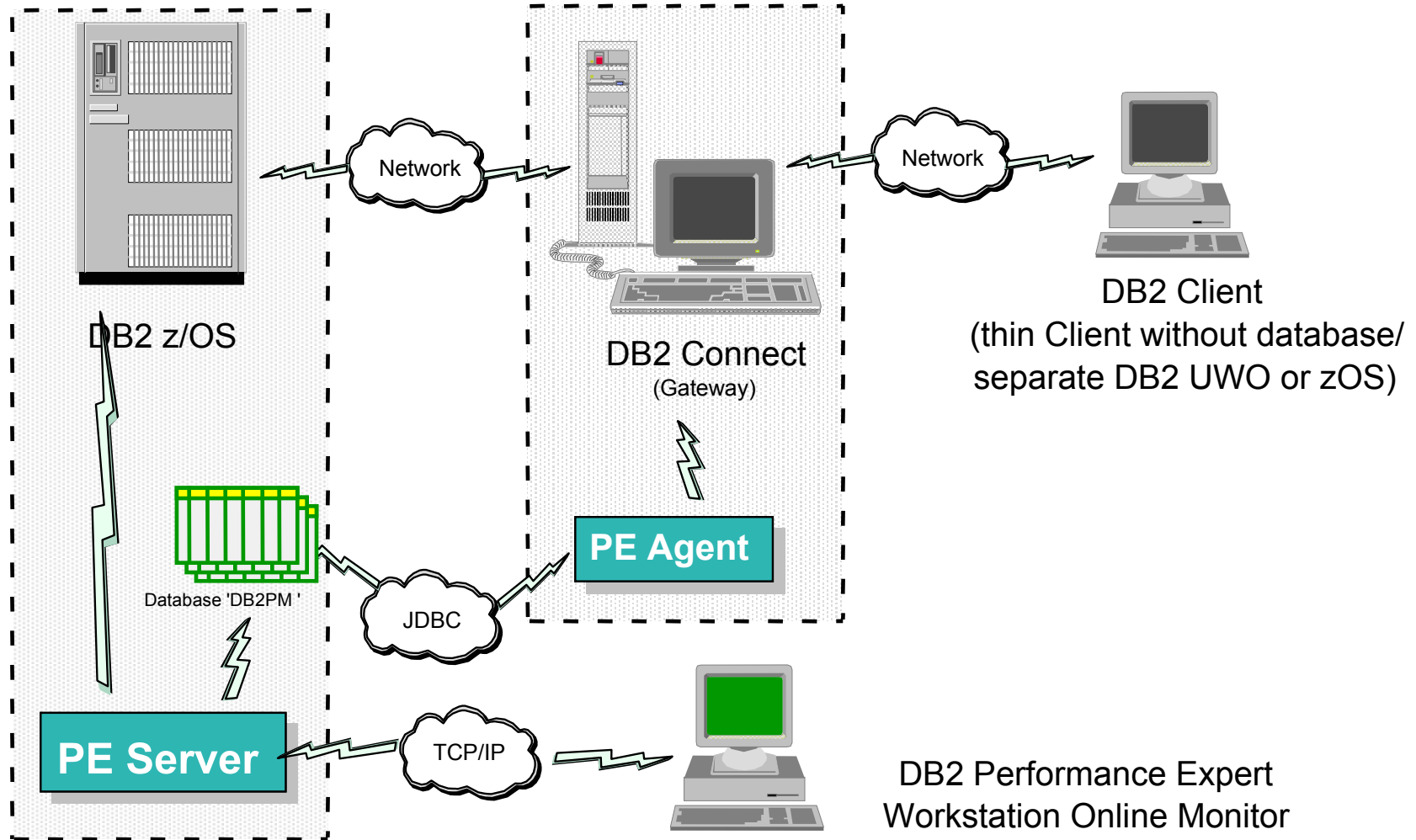
#### Page distribution in EDM pool

Free pages:	64.2%
Held by SKCTS:	0.6%
Held by CTS:	0.2%
Held by DBDS:	4.6%
Held by SKPTS:	30.1%
Held by PTS:	0.3%

## DB2 Connect Monitoring

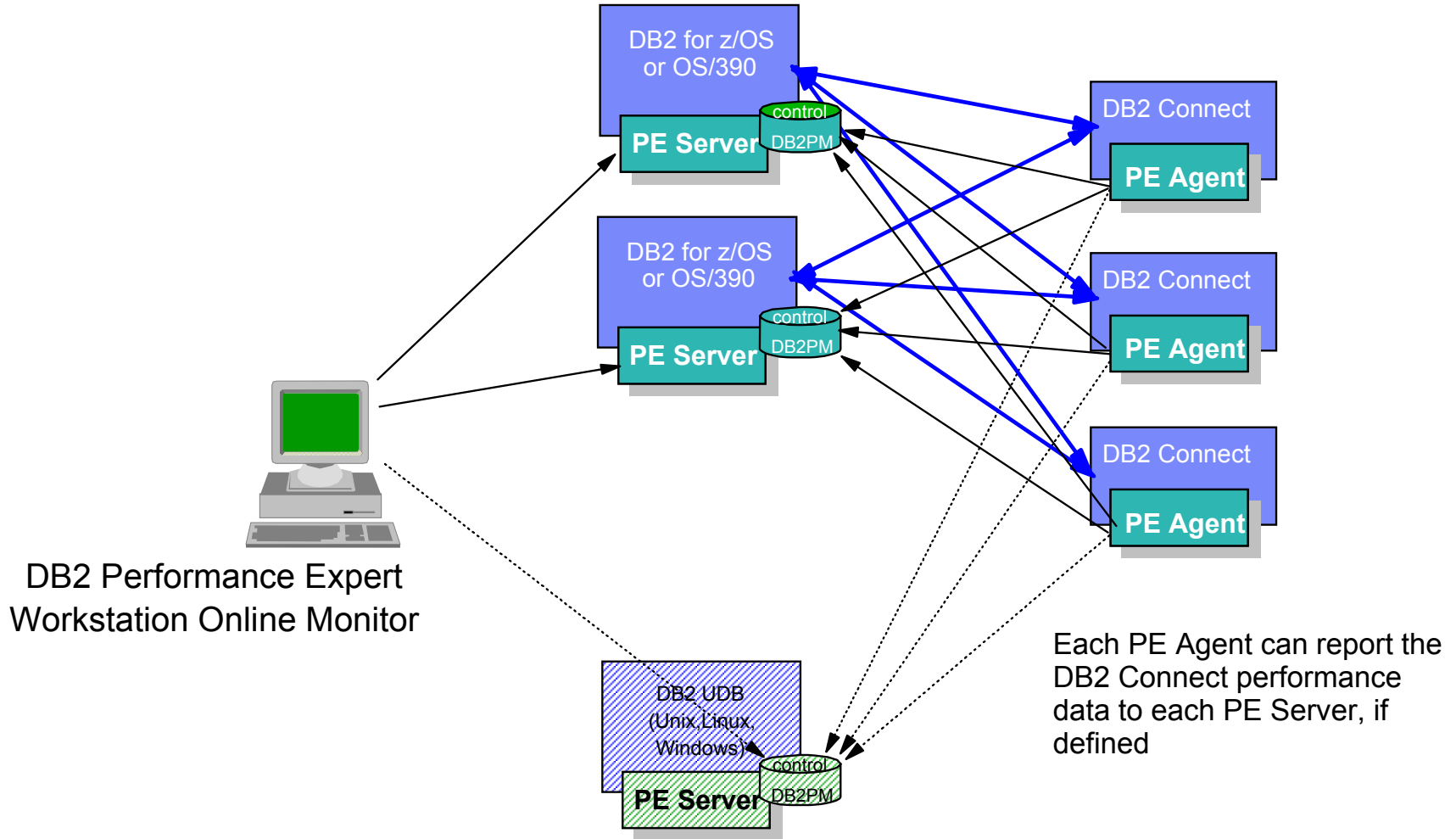
- Different views to the DB2 Connect data
  - Select Statistics Details (of a selected DB2 subsystem)
    - ▶ Show DB2 Connect/Gateway information connected to the selected DB2 subsystem
  - Select Thread Summary + Details
    - ▶ Show DB2 Connect DCS applications information connected to the selected DB2 subsystem
  - Select DB2 Connect / Gateways
    - ▶ Show DB2 Connect/Gateway information independent on any selected DB2 subsystem

# DB2 Connect Monitoring

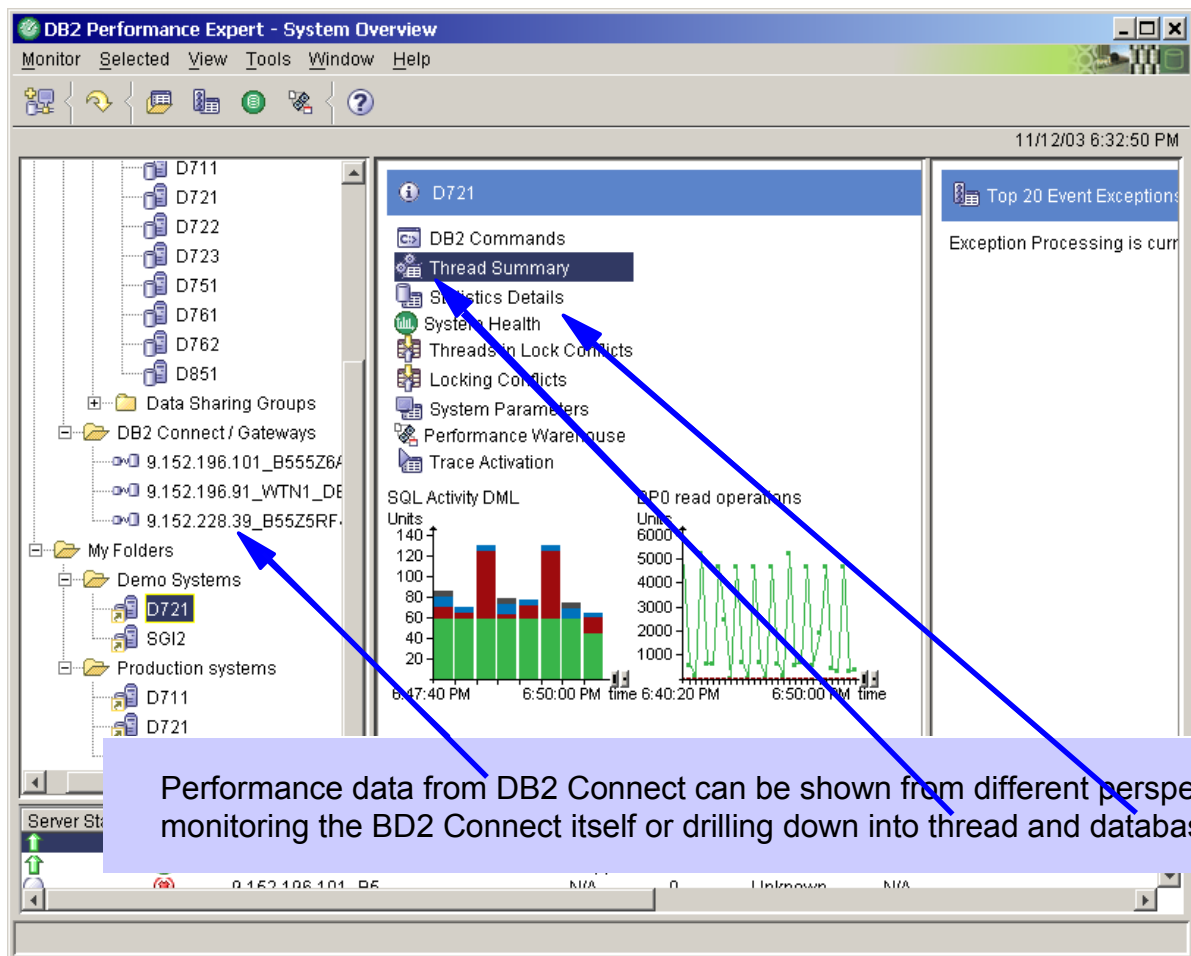




# DB2 Connect Monitoring

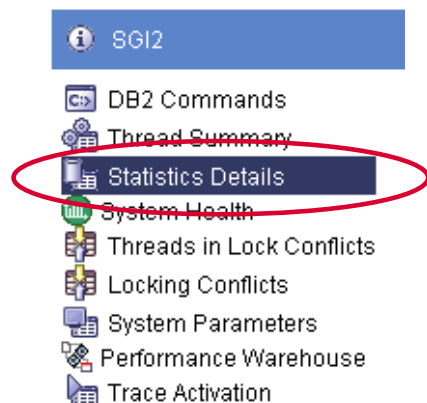


# DB2 Connect Monitoring - Display of data from different places



# DB2 Connect Monitoring – Statistics Detail

Show DB2 Connect/Gateway information connected to the selected DB2 subsystem



**D721 - Statistic Details**

Statistics Details View Tools Window Help

11/12/03 6:32:39 PM Zoom + - 0:00:20

11/12/03 5:22:36 PM 11/12/03 6:34:39 PM

**DB2 Connect Server**

Name	IP address	Node name	Node Num...	Gateway Snapshot Time
saphir	9.152.195.19	N/P	0	11/12/03 6:36:37 PM
B55Z5RF4	9.152.228.39	N/P	0	11/12/03 6:33:05 PM
B555Z6AH	9.152.196.101	JENNINGE	0	11/12/03 6:34:46 PM

Overview  
EDM Pool  
+ Buffer Management  
Locking  
Open/Close  
+ Bind  
Plan / Package / Routine  
Log Manager  
Subsystem  
+ SQL Activity DML  
+ Dynamic SQL Statemen  
Query Parallelism  
RID List  
CPU Times  
+ Miscellaneous  
Nested SQL Activity  
+ Distributed Data  
+ Data Sharing Locking  
DB2 Connect Server

## DB2 Connect Monitoring - Statistics Details / DB2 Connect

DB2 Connect Server								
Name	IP address	Node name	Node Num...	Gateway Snapshot Time	Server ProductVersion ID	Server Instance ...	Time Zone Displace...	Server Version
saphir	9.152.195.19	N/P	0	11/12/03 6:36:37 PM	SQL07028	db2in71	3 600	5
B55Z5RF4	9.152.228.39	N/P	0	11/12/03 6:33:05 PM	SQL07028	DB2	3 600	5
B555Z6AH	9.152.196.101	JENNINGE	0	11/12/03 6:34:46 PM	SQL07026	DB2	3 600	5

Select and drill down into more details

Main DB2 Connect Server: 9.152.196.101-...

DB2 Connect/Gateway S

- Tasks List
- Performance
- Package statistics

### DB2 Connect/Gateway Statistics

DB2 Connect Information		Agents	
Name	B555Z6AH	Agents registered	
IP address	9.152.196.101	Agents waiting for token	
Node name	JENNINGE	Maximum agents registered	
Node Number	0	Maximum agents waiting	
Server ProductVersion ID	SQL07026	Committed private memory	1 5
Server Instance Name	DB2	Agents assigned from pool	
Server Version	5	Agents created due to empty pool	
Time Zone Displacement	3 600	Maximum coordinating agents	
Gateway Snapshot Time	11/12/03 6:34:46 PM	Stolen agents	
<b>Connections</b>		Connection switches	
Current connections	0	Total inactive DRDA agents	
		Idle agents	

# DB2 Connect Monitoring - Statistics Details / DB2 Connect

Main DB2 Connect Server: 9.152.196.101-...

DB2 Connect/G  
**Tasks List**  
 Performance  
 Package status

**Tasks List**

Process name	Process owner name	Gateway process ID	User process ti...	System process time	Overall process time	Memory us
javaw.exe	N/P	2 068	0.00002	0.00000	0.00002	N/P
nlnotes.exe	N/P	1 976	0.00001	0.00000	0.00001	N/P
WinMgmt.exe	N/P	1 120	0.00000	0.00000	0.00000	N/P
java.exe	N/P	2 132	0.00000	0.00000	0.00000	N/P
explorer.exe	N/P	1 552	0.00000	0.00000	0.00000	N/P
nupdate.exe	N/P	668	0.00000	0.00000	0.00000	N/P
svchost.exe	N/P	484	0.00000	0.00000	0.00000	N/P
nwrdaemr.exe	N/P	640	0.00000	0.00000	0.00000	N/P
pcswws.exe	N/P	1 508	0.00000	0.00000	0.00000	N/P
System.exe	N/P	8	0.00000	0.00000	0.00000	N/P
SMSS.exe	N/P	184	0.00000	0.00000	0.00000	N/P
CSRSS.exe	N/P	208	0.00000	0.00000	0.00000	N/P
WINLOGON.exe	N/P	228	0.00000	0.00000	0.00000	N/P
SERVICES.exe	N/P	256	0.00000	0.00000	0.00000	N/P
LSASS.exe	N/P	268	0.00000	0.00000	0.00000	N/P
ibmpmsvc.exe	N/P	364	0.00000	0.00000	0.00000	N/P
svchost.exe	N/P	104	0.00000	0.00000	0.00000	N/P
spoolsv.exe	N/P	536	0.00000	0.00000	0.00000	N/P
trcbboot.exe	N/P	564	0.00000	0.00000	0.00000	N/P
pcs_agnt.exe	N/P	596	0.00000	0.00000	0.00000	N/P
db2syscs.exe	N/P	652	0.00000	0.00000	0.00000	N/P
db2jds.exe	N/P	680	0.00000	0.00000	0.00000	N/P
db2licd.exe	N/P	696	0.00000	0.00000	0.00000	N/P
db2ccs.exe	N/P	708	0.00000	0.00000	0.00000	N/P

# DB2 Connect Monitoring - DB2 Connect / Gateway

The screenshot shows the DB2 Connect Monitoring application interface. The title bar reads "9.152.196.101\_B555Z6AH\_DB2 - Application Details". The main window is divided into several sections:

- Top Panel:** Includes a menu bar (DCS Databases, View, Tools, Window, Help), a toolbar with icons for refresh, print, and help, and a timeline showing the current time as 11/12/03 7:35:00 PM. A zoom control and a timer (0:00:20) are also present.
- Right Panel:** A file explorer view showing a folder named "DB2 Connect / Gateways" containing three sub-items: "9.152.196.101\_B555Z6AH\_DB2" (circled in red), "9.152.196.91\_WTIN1\_DB2", and "9.152.228.39\_B55Z5RF4\_DB2". Below it is a "My Folders" section.
- Left Panel:** A navigation pane with "Overview" selected, along with "Statement information" and "Package statistics".
- Main Content Area:** Titled "Overview", it displays a table of application details and a list of transaction data.

Application Details	
Application handle (agent ID)	40
Application name	db2bp.exe
Application ID	*LOCAL.DB2.031112173605
Authorization ID	JEN
Code page used by application	1 252
Client process ID	2 236
Client operating platform	NT/WIN2000
Client communication protocol	LOCAL
Host coded character set ID	500
Configuration name of client	JENNINGE
Client product/version ID	SQL07026
Inbound communication address	*LOCAL.DB2
DCS application status	UOWWAITINBOUND
Application status change time	11/12/03 7:25:53 PM
User login ID	JEN
Sequence number	0001

Overall transaction data	
Transaction ID	
Number of open cursors	
Application idle time	
Last reset timestamp	
DB2 connect first connect	
Elapsed time DB2CONN execution	
Total host response time	
Unit of work completion status	
Previous UOW completion timestamp	
Unit of work start timestamp	
Unit of work stop timestamp	
Most recent UOW elapsed time	
Number of SQL stmt attempted	
Failed statements operations	
Commit statements attempted	

# DB2 Connect Monitoring - Thread Details / DB2 Connect

Overview	
<b>Application information</b>	
Application handle (agent ID)	40
Application name	db2bp.exe
Application ID	*LOCAL.DB2.031112173605
Authorization ID	JEN
Code page used by application	1 252
Client process ID	2 236
Client operating platform	NTWIN2000
Client communication protocol	LOCAL
Host coded character set ID	500
Configuration name of client	JENNINGE
Client product/version ID	SQL07026
Inbound communication address	*LOCAL.DB2
DCS application status	UOWWAITINBOUND
Application status change time	11/12/03 6:40:53 PM
User login ID	JEN
Sequence number	0001
Database alias at the gateway	D721
DCS database name	DCS1367
Outbound application ID	G998C465.N704.031112173606
Outbound sequence number	0000
Outbound communication address	9.164.156.222 5721
Outbound communication protocol	TCP/IP
<b>Overall transaction data</b>	
Transaction ID	N/P
Number of open cursors	0
Application idle time	0.00185
Last reset timestamp	N/P
DB2 connect first connect	11/12/03 6:36:05 PM
Elapsed time DB2CONN execution	0.00382
Total host response time	1.00323
Unit of work completion status	ROLLBACK
Previous UOW completion timestamp	11/12/03 6:36:23 PM
Unit of work start timestamp	11/12/03 6:40:06 PM
Unit of work stop timestamp	11/12/03 6:40:53 PM
Most recent UOW elapsed time	0:00:47
Number of SQL stmt attempted	58
Failed statements operations	0
Commit statements attempted	2
Rollback statements attempted	1
Rows selected	44
Number of transmissions	20
Total Stmt Exec elapsed time	0.43596
Total inbound bytes sent	0
Inbound bytes received	2 718

# Connect Monitoring - Thread Details / DB2 Connect

Main DB2 Connect Server: \*LOCAL.DB2.031...

- Overview
- Statement information**
- Package statistics

### Statement information

SQL statements		Times	
Section number	201	Statement start timestamp	11/12/
Query cost estimate	0	Statement stop timestamp	11/12/
Query number of rows estimate	0	Time spent on gateway processing	
Statement operation	SELECT	Host response time	
Number of successful fetches	15 595	Most recent stmt elapsed time	
Blocking cursor	0	Stmt elapsed execution time	
Outbound blocking cursor	0	Local: system CPU time	
Application creator	NULLID	Local: user CPU time	
Package name	SQLC2D04		
Stmt trans: No of transmissions	2		
Stmt trans: No of statements	15		

SQL statement text



# DB2 Connect Monitoring - Thread Details / DB2 Connect

Main DB2 Connect Server: \*LOCAL.DB2.031...

- Overview
- Statement information
- Package statistics**

### Package statistics

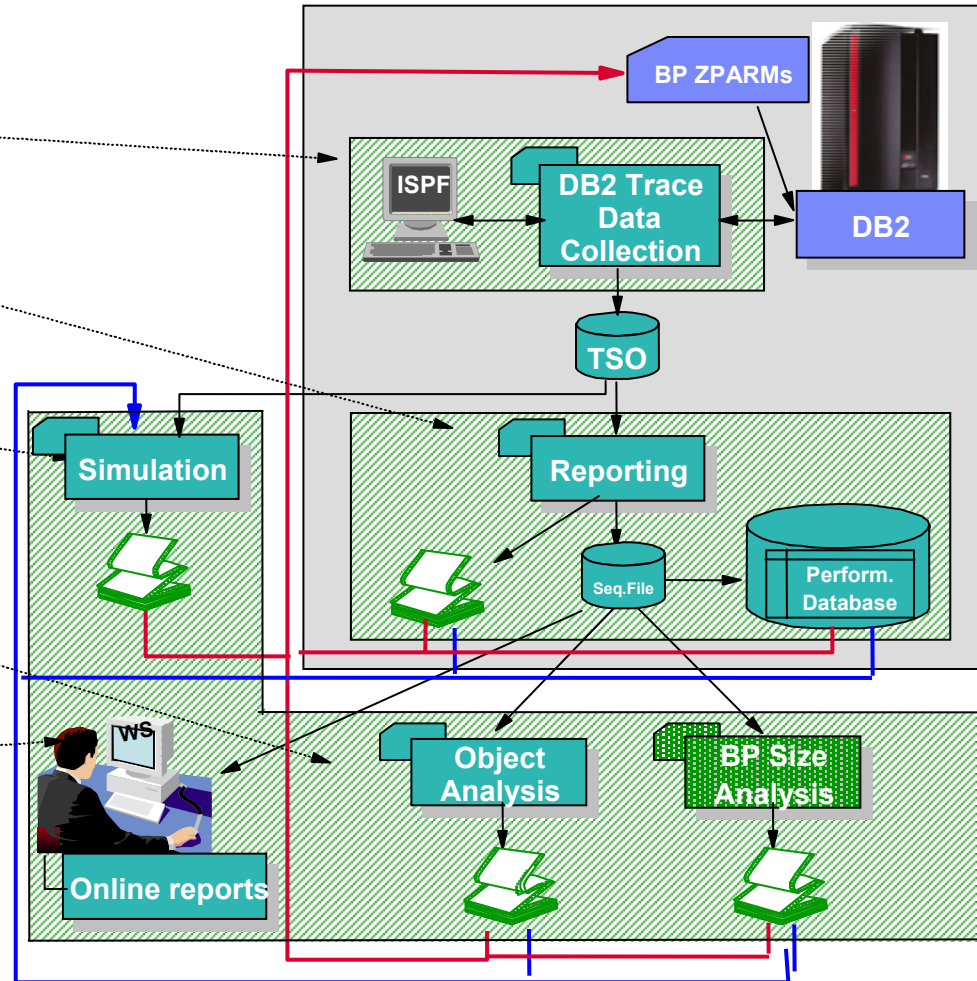
	sent	received	sent top	rcvd top	sent bot	rcvd bot			
Outbound data	1 406	22 213	160	8 075	10	54			
	<b>128</b>	<b>256</b>	<b>512</b>	<b>1024</b>	<b>2048</b>	<b>4096</b>	<b>8192</b>	<b>16384</b>	
Sent data	11	4	0	0	0	0	0	0	
Received data	7	2	1	0	3	0	2		
	<b>2 ms</b>	<b>4 ms</b>	<b>8 ms</b>	<b>16 ms</b>	<b>32 ms</b>	<b>GT32 ms</b>			
Network time	0	0	0	2	6	7			

## DB2 Buffer Pool Analyzer

- Easy monitoring of the performance of buffer pools and group buffer pools to detect bottlenecks, trends, and unused resources
- Fast adaptation of buffer pool parameters to changing DB2 usage conditions
- Optimize use of buffer pools by aligning buffer pool size and object placement to available resources
- Non-disruptive simulation of buffer pool behavior to test the impact of changes before they are applied
- Long-term analysis of factual performance for improved prediction of future performance and resource needs

# DB2PE for z/OS Architecture (Buffer Pool Analyzer)

- Data Collection
- Reporting
- Simulation
- Expert Analysis
- GUI



# Buffer Pool Analyzer

- Multiple Levels of Data Collection Available
  - Over Specified Period
  - Short Intervals
  - Sampling over Long Interval
  - Summary/Detail
- Modes of Data Collection via IFI
  - ISPF online
  - Batch mode
- Expert Analysis with Recommendations
  - Object Placement
  - Buffer Pool Sizing and Thresholds
- Simulation of Changes
  - Buffer Pool Sizes and Thresholds
  - Object Placement
  - Iterative Simulation over a Range
- Comprehensive Reports for Printing or Browsing, options include:
  - Sorted by various identifiers (e.g. BP, Plan, Object, ID)
  - Sorted by activity counters (e.g. GP, sync prefetch)
  - Top Reports
  - Filtered (e.g. specific BP, plan)
  - Highlight report to point only on critical performance counters
  - Group Buffer Pool
- Load Data into DB2 Table for Additional Analysis
- Batch Reports or Display Reports and Simulation Results with Graphical User Interface
  - Pie Charts
  - Graphs
  - Tables/Spreadsheet
  - Long Term Trend Analysis

# Buffer Pool Analyzer – Sample Report

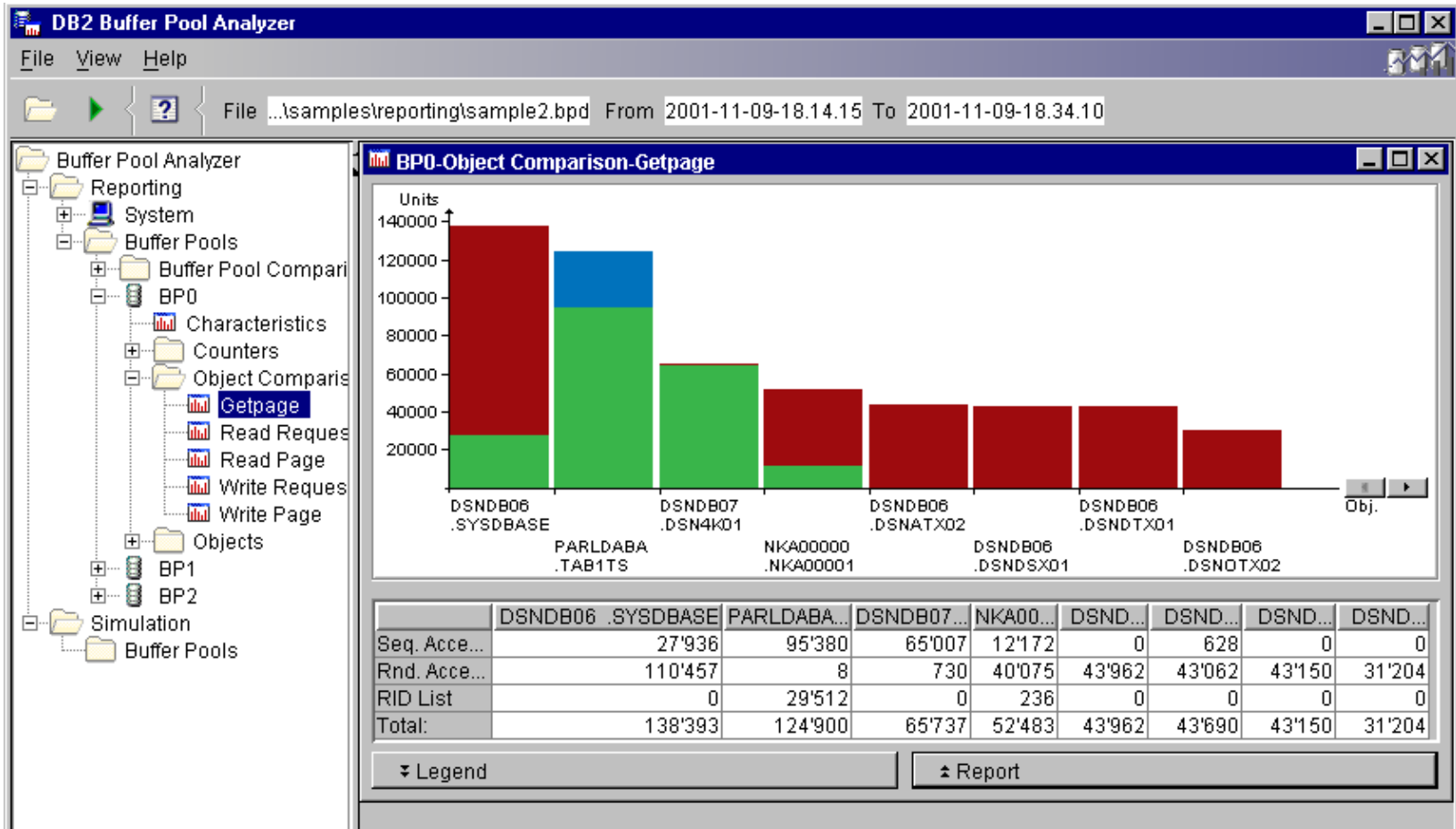
```

DB2 PERFORMANCE EXPERT (V2) - BUFFER POOL ACTIVITY REPORT      PAGE: 1-10
ORDER: BPID-QPAGESET
SORTBY: ASYNCPAGE TOP: 13 LEVEL: SUMMARY
GROUP: N/P LOCATION: DB2F DB2 VERSION: V6
MEMBER: N/P REQUESTED FROM: NOT SPECIFIED TO: NOT SPECIFIED
SUBSYSTEM: DB2F INTERVAL FROM: 06/28/02 17:20:25 TO: 06/28/02 19:00:52

===== Buffer Pool Statistics (highlights) =====
BUFFER POOL ID          BP0          BP1          BP2          BP3          BP4
-----
Buffers allocated      10000      14000      10000      12000      3000
Paral.query req.reduced  0          192*      197*      4*          1*
System hit ratio      99.54      99.94      92.41      92.25      99.98
Application hit ratio  99.76      100.00     95.57      96.81      99.99
Getpage request      169811     177741     103034     1796199     181816
Synchron.read sequent.  4          0          8          214         0
Page-ins required     139*      0          1433*     179*      38*
Write
Write eng not available  42*      591*      17*      5022*      3*
Hiperpool
Buffers allocated      20000      0          20000     24000      6000
Hit ratio              12.13      n/c        35.21     47.66      n/c
=====
BUFFER POOL ID          BP5          BP6          BP32K
-----
Reached threshold
Current active buffer  118*      0          4*
System hit ratio      99.56      n/c        99.58
Application hit ratio  99.73      n/c        99.58
Getpage request      50028      0          5909
Synchron.read sequent.  0          0          0
Page-ins required     101*      0          17*
Write
Write eng not available  16*      0          3*
Hiperpool
Buffers allocated      10000     2000
Hit ratio              0.00      n/c
=====
    
```

The highlight report pages indicates those critical counters which are unequal zero

# BPA – Most Used Objects Graph



# BPA – Simulation Report

Opening the simulation result will show the reports in your preferred browser.

[Misses for optimum split of Buffer Pools](#)  
[Summary of misses for all Buffer Pools](#)  
[Details of misses for single Buffer Pool](#)  
[Details of misses for Buffer Pool BP0](#)  
[Details of misses for Buffer Pool BP1](#)  
[Details of misses for Buffer Pool BP2](#)  
[Details of misses for Buffer Pool BP3](#)

[Open this report in a new browser window.](#)

**Misses as a function of buffer pool size for optimum split of buffer pool size.**

Total Pages	Single Buffer Pool		Split Buffer Pool's		Optimum Sizes for Split Buffer Pools			
	abs. Misses	Miss Ratio.	abs. Misses	Miss Ratio.	BP0 Size	BP1 Size	BP2 Size	BP3 Size
500	61982	8.5	40667	5.5	100	200	100	100
600	58358	8.0	37872	5.2	100	300	100	100
700	55960	7.6	36187	4.9	100	400	100	100
800	54215	7.4	33655	4.6	100	500	100	100
900	52614	7.2	32076	4.4	200	500	100	100
1500	36631	5.0	26857	3.7	800	500	100	100
1600	34057	4.6	26264	3.6	900	500	100	100
1700	33079	4.5	25666	3.5	1000	500	100	100

# BPA – Object Placement Utility

```

DB2 Buffer Pool Analyzer (V1) - Object Placement Utility

Run date: 11/03/01 15:21:45                               Page:
7
Group:      N/P                Location:  PMO2D721                DB2 Version:
V71
Member:     N/P                Subsystem: D721

                                DB2 commands and ALTER statements
                                -----

-STOP DATABASE(DSNDB07) SPACENAM(DSN4K01)
ALTER TABLESPACE DSNDB07.DSN4K01 BUFFERPOOL BP1;
-START DATABASE(DSNDB07) SPACENAM(DSN4K01)

-STOP DATABASE(NKA00000) SPACENAM(IXSP0000)
ALTER TABLESPACE NKA00000.IXSP0000 BUFFERPOOL BP3;
-START DATABASE(NKA00000) SPACENAM(IXSP0000)

-STOP DATABASE(NKA00000) SPACENAM(IXSQ0000)
ALTER TABLESPACE NKA00000.IXSQ0000 BUFFERPOOL BP3;
-START DATABASE(NKA00000) SPACENAM(IXSQ0000)

-STOP DATABASE(NKA00000) SPACENAM(NKA00001)
ALTER TABLESPACE NKA00000.NKA00001 BUFFERPOOL BP5;
-START DATABASE(NKA00000) SPACENAM(NKA00001)

-STOP DATABASE(PARLDABA) SPACENAM(TAB1TS)
ALTER TABLESPACE PARLDABA.TAB1TS BUFFERPOOL BP5;
-START DATABASE(PARLDABA) SPACENAM(TAB1TS)

-STOP DATABASE(PARLDABA) SPACENAM(XTAB2)
ALTER TABLESPACE PARLDABA.XTAB2 BUFFERPOOL BP2;
-START DATABASE(PARLDABA) SPACENAM(XTAB2)

-STOP DATABASE(WTNTTEST) SPACENAM(WTNMNTS1)
ALTER TABLESPACE WTNTTEST.WTNMNTS1 BUFFERPOOL BP3;
-START DATABASE(WTNTTEST) SPACENAM(WTNMNTS1)

```



# Buffer Pool Analyzer - Long term trend analysis

**Buffer Pool Analysis - Long-Term Analysis**

Use this function to perform a long term analysis.

2. Choose a subsystem and select an analysis type.

DB2 Subsystem

Subsystem to analyze: D711

z/OS

- D711
  - E:\BPA Trend\D711\14. Aug\10.34-10.37.bpd
  - E:\BPA Trend\D711\14. Aug\12.25-12.27.bpd
  - E:\BPA Trend\D711\14. Aug\12.38-12.41.bpd
  - E:\BPA Trend\D711\14. Aug\14.01-14.03.bpd

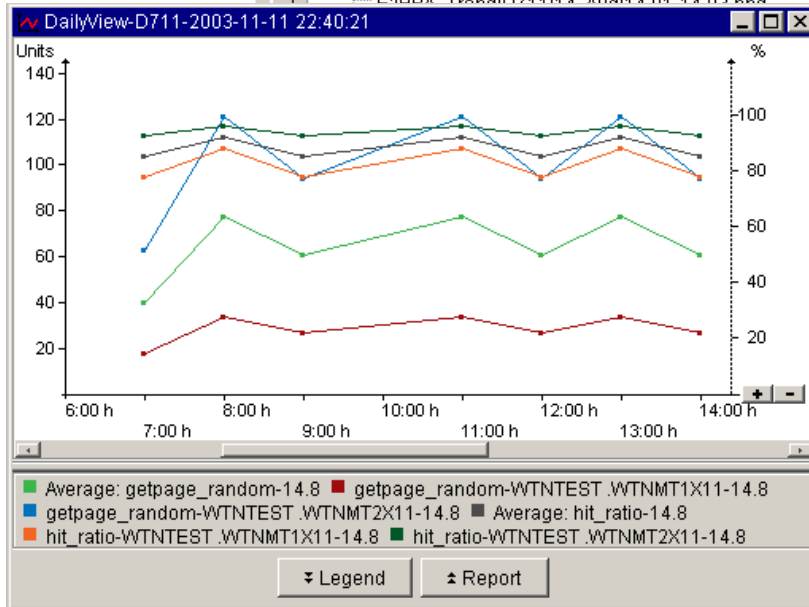
Analysis Type

- Weekly view by day
- Daily view by hour**
- View of a period of time
- Bar chart
- Pie chart: displays 1 counter and n objects
- Pie chart: displays n counters and 1 object

Description

Use this analysis type to show how the counter values from one or more trace periods change within a day and to compare several days. The values of one or more counters are shown per hour for a period of one day. If you choose data from several days, the values are overlaid.

Back    Next >    Cancel    Help



## Performance Warehouse

- Performance Warehouse provides a process-oriented view of performance-analysis tasks.
- Automate tasks that previously required user interaction, such as loading DB2 data into a performance database or generating reports.

# Performance Warehouse - Analysis

Starting analysis with the ROT selected you need to select the set performance data (by time period and several filters (optional)) stored in your performance database.

The screenshot shows the 'Rules of Thumb Analysis' dialog box in the DB2 Performance Warehouse. The left pane displays a tree view of performance data, with 'My own ROT' selected. A context menu is open over it, showing options like Copy, Create, Delete, Rename, Cancel, Details, File Browser, Properties, and Analyze. The main pane shows filtering criteria for the analysis.

**Filtering qualifiers for this analysis**

Time ranges

Inserted by user	Trace start time stamp	Trace stop time stamp
NICK	2000-04-17 22:39:45.80...	2000-04-17 22:45:59.0
NICK	2000-04-17 22:39:45.80...	2000-04-17 22:45:59.0
NICK	2001-01-09 23:10:36.24...	2001-01-12 23:00:31.0
HECK	2000-04-17 22:39:45.80...	2000-04-17 22:45:59.0
NICK	1995-11-01 07:00:00.00...	1995-11-03 07:00:00.0
NICK	1995-11-01 07:00:00.00...	1995-11-03 07:00:00.0

Interval start: 2002-02-25\_21:56:57

Interval end : 2002-02-25\_21:56:57

Filter columns

Column	Comparison	Value
LOCAL_LOCATION	=	
GROUP_NAME	=	
SUBSYSTEM_ID	=	
MEMBER_NAME	=	

Buttons: OK, Cancel, Help

# Performance Warehouse – Analysis Results

Depending on the selected ROT and the performance data you may get a result matrix, select row and column to get more specific information

Rules of Thumb Analysis Result

Result View Help

jdbc:db2:D621 - My own ROT - DB2PM.Statistics.Buf 'All' view for ro

Filter Result matrix Row details Column details

Attention values for rules of thumb sorted by time stamps

INTERVAL_TSTAMP	DM threshold	Merge pass degrad	No_prefetch_no_buf	Page_in for read	Page_in for write	Prefetch disabled	Synch re
2001-01-10 23:05:0...	OK	-	OK	problem	OK	OK	-
2001-01-10 23:05:0...	OK	OK	OK	OK	OK	OK	warning
2001-01-10 23:05:0...	OK	-	OK	problem	OK	OK	-
2001-01-10 23:05:0...	OK	OK	OK	OK	OK	OK	warning
2001-01-10 23:05:3...	OK	OK	OK	problem	problem	OK	problem
2001-01-10 23:05:3...	OK	-	-	problem	OK	-	-
2001-01-10 23:05:3...	OK	OK	OK	problem	problem	OK	problem
2001-01-10 23:05:3...	OK	-	-	problem	OK	-	-
2001-01-10 23:09:5...	OK	-	OK	warning	OK	OK	warning
2001-01-10 23:09:5...	OK	-	-	-	-	-	-

# Collect Report Data - now incorporated into PWH process

Different views to the PWH processes

Collect trace data step can now be added to a process.

Position	Name	Description	Modified
1	Collect Report Data		2003-11-11 15:11:50.613331
2	Report		2003-11-11 16:07:18.339448

**CRD Step Properties**

General Options

Option categories: Output dataset, Data sharing group, **Data**, Qualification, Stop, Trace

Current data option:

Data categories:

- Accounting
- Audit
- I/O Activity
- Locking
- Record Trace
- SQL Activity
- Statistics
- System Parameters
- Utility Activity

Show:

- IFCIDs of selected data categories
- Selected IFCIDs only
- IFCIDs of [ ]

IFCID	Description
3	Accounting data
239	Accounting program overflow data

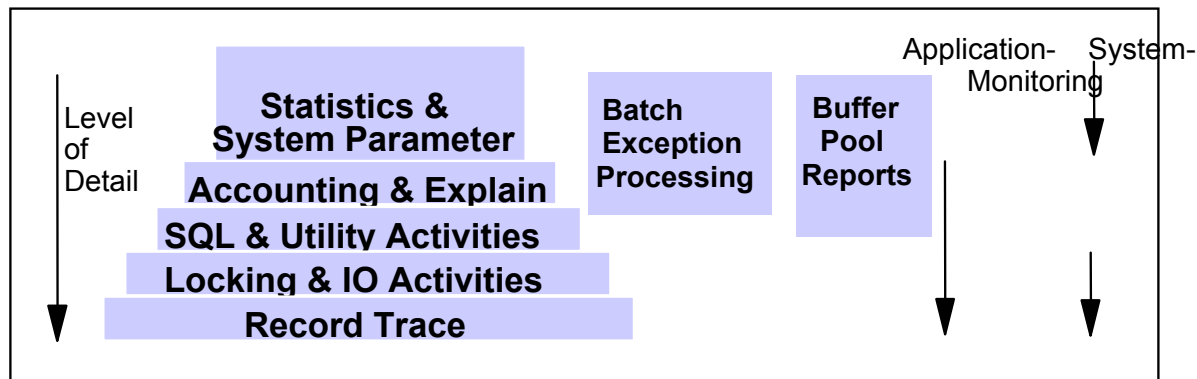
OK Apply Cancel Help

## Batch Reporting

- Historical information about DB2 system and application performance.
- System-wide performance data shows information about topics like CPU times, buffer pool usage, locking, log and I/O activity.
- Application data shows how individual programs are behaving in DB2.

# Batch Reporting

- Report facility which
- Takes SMF, GTF or TSO data sets (collected by DB2 Performance Expert Collect Report Data) as input
- Generates a variety of customizable reports and traces:



- Invocation via MVS JCL or via workstation GUI (Statistics & Accounting Report)
- Result shown in browser window
- Integrated into monitoring (SQL activity tracing)
- Reduction of trace information for loading into the Performance DB

# GUI – Batch Reporting

Functions to control the generation and browsing of a report are provided together with the Performance Warehouse functions

The screenshot shows a 'Process Execution Details' window with a tree view containing 'Step Execution', 'REPORT', and 'Output Data Set'. Below it, a Netscape browser window displays a text-based report titled 'DB2 PERFORMANCE MONITOR (V7) STATISTICS REPORT - SHORT'. The report includes system information, highlights, CPU times, and SQL activity.

```

LOCATION: SYSDSNS                      DB2 PERFORMANCE MONITOR (V7)
GROUP: DSN5                          STATISTICS REPORT - SHORT
MEMBER: SG51
SUBSYSTEM: SG51
DB2 VERSION: V6                      SCOPE: MEMBER

----- HIGHLIGHTS -----
INTERVAL START: 05/18/00 16:05:21.64  INTERVAL ELAPSED: 41:24.51488  INCREMENTAL BINDS
INTERVAL END   : 05/18/00 16:46:46.16  OUTAGE ELAPSED   : 0.000000    AUTH SUCC.W/OUT C
SAMPLING START: 05/18/00 16:05:21.64  TOTAL THREADS   : 1.00          BUFF.UPDT/PAGES W
SAMPLING END   : 05/18/00 16:46:46.16  TOTAL COMMITS   : 4.00          PAGES WRITTEN/WRI

CPU TIMES                                TCB TIME                SRB TIME                TOTAL TIME             OPEN/
-----                                -
SYSTEM SERVICES ADDRESS SPACE          4.139495                0.387440                4.526936              OPEN
DATABASE SERVICES ADDRESS SPACE        0.049166                0.424890                0.474056              OPEN
IRLM                                    0.000289                1.080948                1.081237              IN US
DFD ADDRESS SPACE                      0.016357                0.008907                0.025263

SQL DML  QUANTITY  SQL DCL  QUANTITY  SQL DDL  QUANTITY  LOCKING ACTIVITY
-----  -
SELECT   8.00      LOCK TABLE  0.00      CREATES   0.00      DEADLOCKS
INSERT   0.00      GRANT       0.00      DROPS     0.00      TIMEOUTS
    
```



## DB2 Performance Expert for z/OS Summary

- Monitors, analyzes and tunes the performance of IBM DB2 Universal Database and DB2 applications
- Features an enhanced end-user interface with new graphical data views
- Includes a performance warehouse for storing performance data and analysis tools
- Enables you to quickly and easily identify performance bottlenecks using pre-defined rules of thumb

## References

- IBM Database Tools on the web:

<http://www.ibm.com/software/data/db2imstools/>

- DB2 Performance Expert for z/OS Manuals:

<http://www.ibm.com/software/data/db2imstools/db2tools-library.html>

- Redbooks:

<http://publib-b.boulder.ibm.com/cgi-in/searchsite.cgi?query=DM+Tools>

DB2 Performance Expert for z/OS, SG24-6867-00

DB2 for z/OS and OS/390 Tools for Performance Management,  
SG24-6508-00

## Questions and Answers!

We will now be conducting a Q & A session.

Please press \*1 so the operator can open your line to ask a question.

- IBM would like to offer more of these training sessions. Please send feedback to [dbowling@us.ibm.com](mailto:dbowling@us.ibm.com) or reply to the email questionnaire that will be sent to you in the next few days.
- If there are other members of your team that could benefit from hearing this presentation, please have them dial in and listen to the upcoming replay that will be available early next week.

# Thank you for your time!

For more information about the DB2 an IMS Tools, please visit our website at :  
[www.ibm.com/software/data/db2imstools/](http://www.ibm.com/software/data/db2imstools/)

- **Lab Outreach program – DB2 Lab coming to a city near you:**

- Seattle                      March 15 - IMS  
▪                                      March 16 - DB2
- Chicago                      March 16 - IMS  
▪                                      March 17 - DB2
- Dallas                        March 17 - IMS  
▪                                      March 18 - DB2
- NYC                            March 18 – IMS  
    March 19 - DB2

- **Upcoming Webcasts:**

March 04: Leverage zSeries Hardware & Software Automation Capability to Improve System, Data and Application productivity