



*Data Management*

# DB2 and Oracle – An Architectural Comparison

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# Executive's Message



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# DB2 and Oracle - An Architectural Comparison

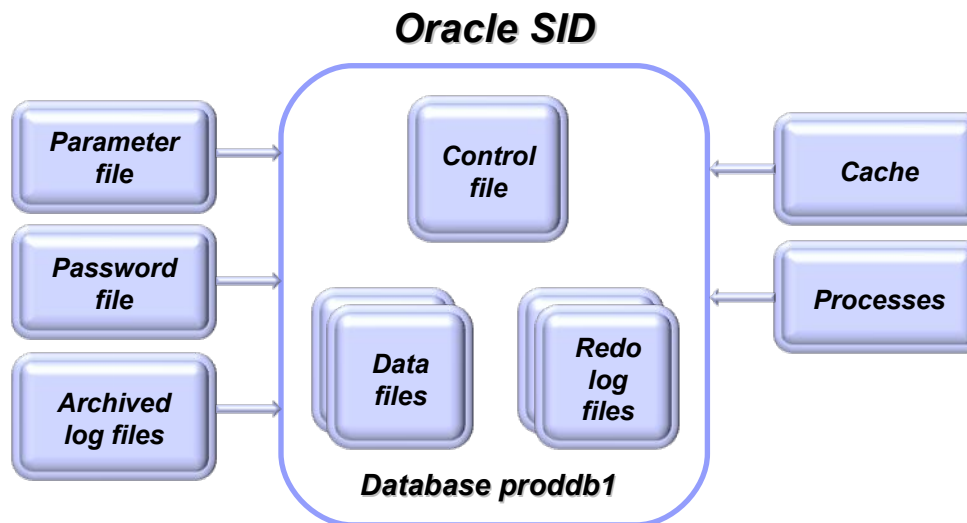
## Chat with the lab agenda

- **Server architecture comparison**
  - *Instance and database compared*
  - *Process vs. thread and EDUs*
- **Memory architecture comparison**
  - *Oracle SGA & PGA vs. DB2 instance memory*
  - *Database and application memory*
- **Parameters, registry and environment variables**
- **Database storage model comparison**
  - *Table space types and layouts*
  - *Compression approaches*
- **Basic database administration comparison**
  - *Create database comparison*
  - *Starting and stopping instances and databases*
  - *The dictionary vs. the system catalog*
- **Performance capability differences**
- **Oracle compatibility**



# Server Architecture

## The Oracle unique system ID (SID)



- **An Oracle SID in a non-RAC (Real Application Clusters) environment can**
  - ▶ Access one & only one database at a time
- **Oracle terms "instance" & "database" often used interchangeably by DBAs & users, however:**
  - ▶ "Instance" is logical (or temporal) and related to memory and processes
  - ▶ "Database" is persistent and related to files

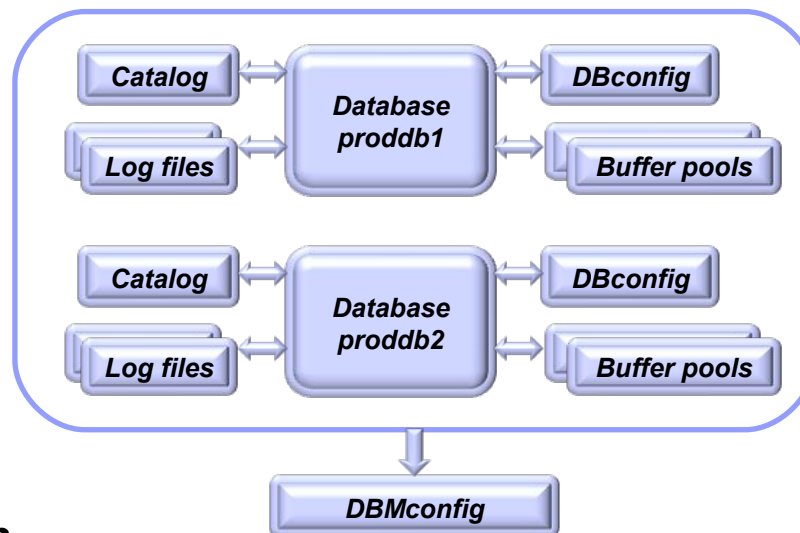
```
SET ORACLE_SID = inst1
SQLPLUS> connect / as sysdba
SQLPLUS> startup
```

Create and manage  
databases without having to  
create more instances

# Server Architecture

## The DB2 instance (AKA database manager)

### DB2 Instance



```
SET db2instance = inst1
db2start
```

- **A DB2 instance can**
  - ▶ Access more than one database at a time
    - Most production databases however are managed by one instance
- **A DB2 instance and is a logical access to**
  - ▶ The databases logical & physical structures
- **In a DB2 instance**
  - ▶ Many Engine Dispatchable Units (EDUs) are shared by all databases
  - ▶ Instance configuration parameter (dbm cfg) affects all databases in that instance
  - ▶ Database configuration (db cfg) parameters exist for each database
- **DB2 terms "instance" & "database" have very distinct meanings**





# Server Architecture

## Oracle processes list (not exhaustive)

Level	Process	Purpose
Required	<b>Server</b>	<b>Server processes</b> - Either dedicated or shared, performs requests for the client
	<b>SMON</b>	<b>System monitor</b> - Space maintenance & crash recovery agent
	<b>PMON</b>	<b>Process monitor</b> - Cleans up failed user processes and frees of resources of these processes
	<b>CKPT</b>	<b>Check point</b> - Flushes modified data from the buffer cache to the disk and updates the control file and data files by doing a header update (DBWn actually does the data file write)
	<b>DBWn *</b>	<b>Database writer</b> - Writes the dirty buffers from the database buffer cache to the data files on disk
	<b>LGWR</b>	<b>Log Writer</b> - Performs sequential writes from the redo log buffer to the redo log files on disk
Optional	<b>MMAN</b>	<b>Memory Manager</b> - SGA & PGA memory broker
	<b>MMOM</b>	<b>Manageability Monitor</b> - AWR problem detection and self tuning
	<b>MMNL</b>	<b>Manageability Monitor Light</b> - Transfer statistics AWR collects to disk
	<b>RECO</b>	<b>Resolve for distributed databases</b> - (DISTRIBUTED_TRANSACTIONS mode)
	<b>ARCn *</b>	<b>Archive log monitor</b> - Writes redo logs to archive areas (in ARCHIVE LOG mode)
	<b>SNPn *</b>	<b>Snapshot &amp; job scheduler</b>
	<b>Dnnn * &amp; Snnn *</b>	<b>Dispatchers</b> - shared server processing agent
	<b>CTWR</b>	<b>Change Tracking Writer</b> - RMAN support
	<b>CJQ0, J000</b>	<b>Job Coordinator &amp; Scheduler</b> - assigns jobs to the job queue processes
	<b>DBRM</b>	<b>Resource Manager</b>
	<b>DIA0</b>	<b>Diagnosability Process Zero</b> - hand detection and deadlock resolution
	<b>DIAG</b>	<b>Diagnostic Dumps</b>
	<b>SMCO</b>	<b>Space Management Coordinator</b> - proactive space allocation and reclamation
	<b>ASM</b>	<b>Automatic Storage Management</b> - related processes are ASMB, ARB, RBAL
	<b>EMNC</b>	<b>Event Monitor</b> - event management coordination
<b>FBDA</b>	<b>Flashback Data Archive</b>	
<b>DMON</b>	<b>Data Guard Broker</b>	

\* Can be many



Thread-based EDUs are more efficient in context switching, file descriptor usage and memory savings.

# Server Architecture

## DB2 Engine Dispatchable Unit \* list (not exhaustive)

Level	EDU	Purpose	Similar to in Oracle...
Instance PROCESS	db2sysc	<b>Main System controller</b>	Server
	db2wdog	<b>Watchdog</b> - UNIX systems only, handles abnormal termination	PMON & SMON
	db2fmp	<b>Fenced process</b> – executes stored procedures and user defined functions	
	db2acd	<b>Autonomic computing</b> – for health monitor and automatic maintenance	MMOM & MMNL
	db2vend	<b>Vendor code executor</b> – UNIX systems only	
Instance THREAD	db2resync	<b>Re-sync agent</b> - scans the global re-sync list	RECO
	db2cart	<b>Invokes user exits to archive or retrieve log files</b> (Archive Log)	ACRn
	db2fmd	<b>Fault Monitor</b> – keeps instances and monitoring up	
	db2ipccm	<b>Inter-process listener</b> - handles local client programs	Listener
	db2tcpcm, & others **	<b>TCP/IP remote communication listener, &amp; other listeners</b> (depending upon which protocols are specified in the DB2COMM variable)	Listener
	db2disp	<b>Client connection concentrator dispatcher</b>	Dnnn & Snnn
	db2wlm	<b>Workload Manager</b> – collects Workload Manager statistics	DBRM
Database THREAD	db2loggr	<b>Log reader</b> - manipulates log files to handle transaction processing & recovery	PMON
	db2loggw	<b>Log writer</b> – flushes logs from log buffer to transaction logs on disk	LGWR
	db2stmm	<b>Self-tuning memory manager</b>	MMAN
	db2uext2	<b>Archive log monitor</b>	ARCN
	db2pfchr**	<b>Buffer pool pre-fetcher</b>	
	db2pclnr**	<b>Buffer pool page cleaner</b>	DBWn & CKPT
	db2taskd	<b>Background database tasks</b>	SNPn
	db2logts	<b>Table space tracking</b> – logs which table spaces are in which logs	CTWR
	db2hadrp/s	<b>High Availability and Disaster Recovery primary and secondary server threads</b>	DMON
Application	db2agent **	Various agent threads	Server

\* The DB2 concept of an EDU is not new, but with DB2 9.5 it changed from a process based model to a thread based model for UNIX

\*\* Can be many





# Server Architecture

## DB2 listing EDUs (processes and threads)

### db2pd -edus

```

$ db2pd -edus ← List all EDUs in an instance

>>>> List of all EDUs for database partition 0 <<<<

db2sysc PID: 27688 ← Instance Process EDU
db2wdog PID: 27676
db2acd PID: 27716

EDU ID      TID          Kernel TID   EDU Name
-----
60          183282690400 30300        db2pfchr (TESTDB) ← Database Thread EDU
59          183278496096 30299        db2pfchr (TESTDB)
58          183291079008 30298        db2pfchr (TESTDB)
57          183295273312 30297        db2pclnr (TESTDB)
56          183286884704 30296        db2pclnr (TESTDB)
55          183299467616 30295        db2pclnr (TESTDB)
54          183307856224 30293        db2dlock (TESTDB)
53          183320439136 30292        db2lfr (TESTDB)
52          183303661920 30291        db2loggr (TESTDB)
51          183316244832 30290        db2loggr (TESTDB)
50          183257524576 28156        db2evmli (DB2DETAILDEA
49          183261718880 28153        db2taskd (TESTDB)
46          183274301792 28150        db2wlmd (TESTDB)
26          183312050528 27943        db2stmm (TESTDB)
17          183324633440 27827        db2agent (TESTDB)
16          183328827744 27714        db2resync ← Instance Thread EDU
15          183333022048 27697        db2ipccm
14          183337216352 27696        db2licc
13          183341410656 27695        db2thcln
12          183345604960 27694        db2alarm
11          1833558442   27688        db2sysc
    
```

**Oracle note:**

On the OS use: `ps -ef | grep [SID]`  
 or  
 in SQL\*Plus use: `v$bgprocess`

```

$ ps -fu lpham

UID      PID  PPID  C  STIME TTY          TIME CMD
lpham    25996 25946  0  12:19 pts/12      00:00:00 -ksh
lpham    26567 26552  0  12:19 pts/12      00:00:00 ksh
lpham    27688 27676  0  12:21 pts/12      00:01:46 db2sysc ← DB2 Instance Process EDU
lpham    27716 27676  0  12:21 pts/12      00:00:00 db2acd
lpham    27995 27994  0  12:24 pts/13      00:00:00 -ksh
lpham    29321 26567  0  12:30 pts/12      00:00:00 ps -fu lpham
    
```

```

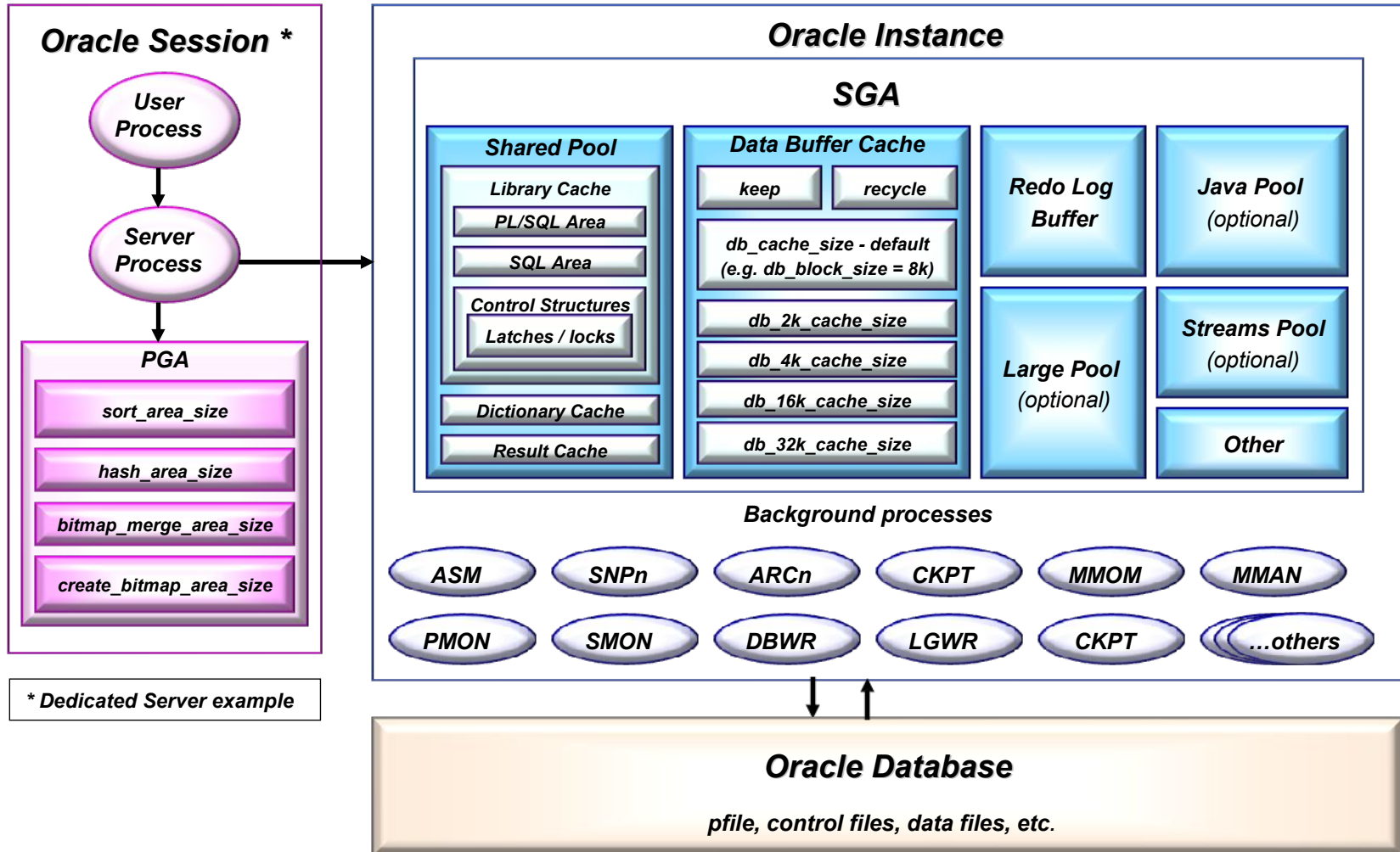
$ ps -lfp 27688 (try ps -m -o THREAD -p 27688 on AIX)

F S UID      PID  PPID  LWP  C  NLWP  PRI  NI  ADDR  SZ  WCHAN  STIME
5 S lpham    27688 27676 27688  0  21  76  0  - 264903 msgrcv 12:21
1 S lpham    27688 27676 27694  0  21  75  0  - 264903 schedu 12:21
1 S lpham    27688 27676 27695  0  21  76  0  - 264903 semtim 12:21
1 S lpham    27688 27676 27696  0  21  79  0  - 264903 schedu 12:21
    
```



# Memory Architecture (with background processes)

## Oracle Linux/UNIX example



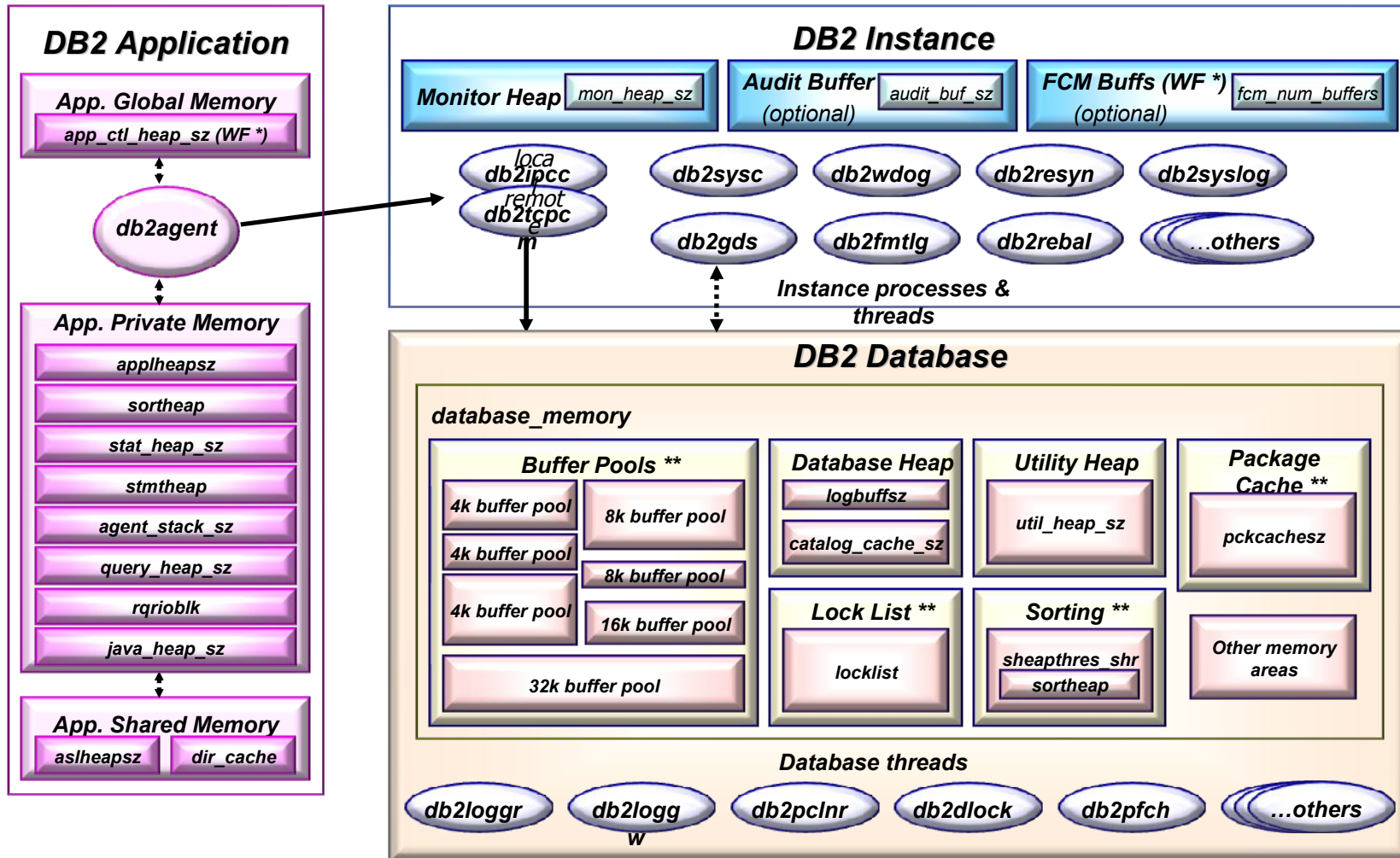
\* Dedicated Server example



Buffer pools are more configurable and the automatic memory management is more flexible.

# Memory Architecture (with background EDUs)

## DB2 Linux/UNIX example



\* Warehousing Feature that uses Database Partitioning

\*\* Can be controlled by DB2 Self-Tuning Memory Manager



Setup and use of instance and database parameters is simplified.

# Parameter Configuration Comparison

Oracle Parameter Fact	DB2 Parameter Fact
Oracle 11g has nearly 300 parameters.	DB2 9.7 has nearly 120 DB and 90 DBM parameters.
Oracle requires a PFILE at database creation.	DB2 generates parameters on its own during instance and database creation.
Oracle DBAs use either templates or pre-created PFILES to create a database.	DB2 DBAs use AUTOCONFIGURE to influence parameters generated at database creation.
Oracle DBAs need to convert their PFILE to SPFILE * at some point or they will not have server parameter file functionality.	DB2 DBAs do no conversion later. The DB and DBM have that functionality by default.
Oracle DBAs need to know those parameters that are "static" as they can only be changed with SCOPE=SPFILE. (Then an instance restart is needed to make this take affect.)	DB2 DBAs do not concern themselves with "scope" as they can change any parameter any time. (Those parameters that require an instance restart or a database reactivation will display a message stating this.)
Oracle DBAs check for scope change by looking in two dynamic views: <ul style="list-style-type: none"> <li>• v\$parameter (current instance setting)</li> <li>• v\$spparameter (spfile values)</li> </ul>	DB2 DBAs see parameters that have not been changed ("deferred value") in the current instance and database by using two administrative views: <ul style="list-style-type: none"> <li>• sysibmadm.dbcfg</li> <li>• sysibmadm.dbmcf</li> </ul>

\* The SPFILE concept, that is, a binary file that contains and controls parameters, is new to Oracle as of version 9.

DB2 however has used this approach all along since version 1.





One configuration at the instance or server level applies to all users in the system without resorting to individual .profile settings

# Registry and Environment Variables Comparison

- **DB2 registry variables**

- ▶ Manage DB2 customization without the need for many OS environment variables – simplify your .profiles
- ▶ Allow for changes to DB2 without a system reboot
- ▶ Use db2set or use the Configuration Assistant to manage
- ▶ DB2 uses only 2 specific environment variables (OS controlled): db2path, db2instance

Variable example	Function
db2adminserver	Specifies which instance runs the admin. server
db2comm	Started communications manager
db2include	Path to include in SQL searches
db2instance (e)	Current instance
db2instdef	Default instance
db2owner	Instance owning machine
db2slogon	Enables secure logon
db2path (e)	Directory where product is installed
db2system	Server name id

- **Oracle environment variables**

Variable example	Function
ora_cwd	Current Oracle directory
ora_sid_pfile	Path to init.ora file
oracle_home	Environment where products run
oracle_sid	Default Instance (SID)
oracle_base	Root of the Oracle directory tree
nls_lang	Language, character & territory set
rdbms_archive	Location of backup database files
rdbms_control	Location of backup database control files
sqlpath	Location of SQL scripts



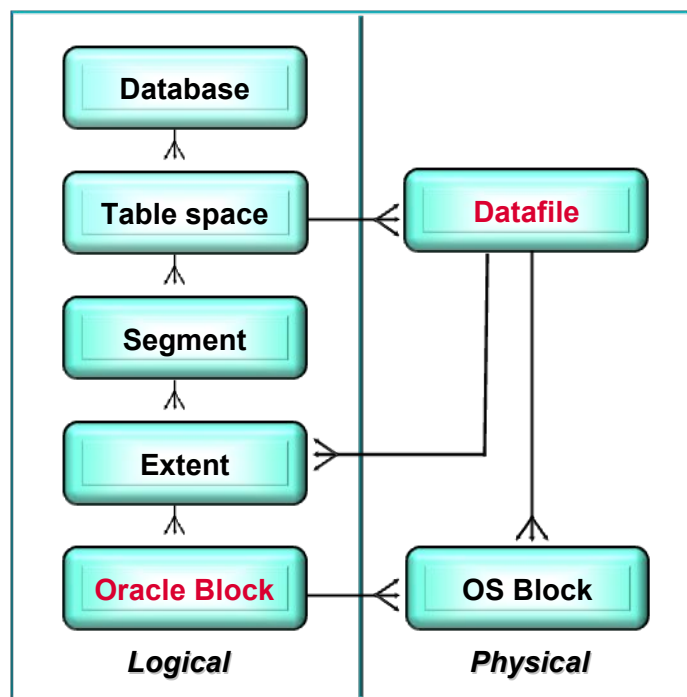


# Database Storage Model

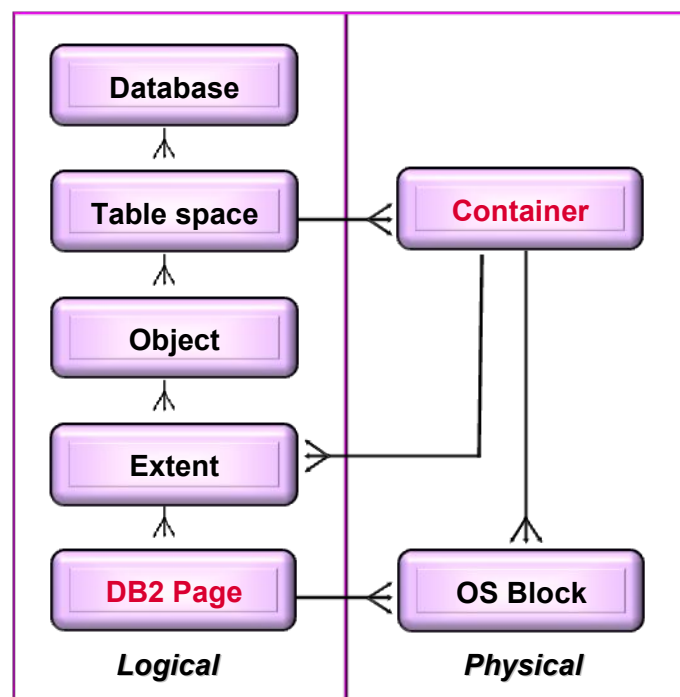
## Storage structure hierarchy differences

- **Oracle & DB2 share a very similar physical database storage model**
  - ▶ Below shows the slight differences in concept & semantics

### Oracle Storage Structure Hierarchy



### DB2 Storage Structure Hierarchy



# Database Storage Model

## Table space types

### Oracle Table Space Types

- System & sysaux
- Non-System
  - ▶ Temporary
    - Dictionary Managed
    - Locally Managed (default)
  - ▶ Permanent
    - Bigfile
    - Smallfile (default)
    - Dictionary Managed
    - Locally Managed (default)
  - ▶ Undo

#### Oracle table space storage settings

- INITIAL
- NEXT
- MINEXTENTS
- MAXEXTENTS
- PCTINCREASE
- FREELIST/GROUPS

### DB2 Table Space Types

- Database Managed (DMS) \*
  - ▶ Regular
  - ▶ Temporary (system & user)
  - ▶ Large
- System Managed (SMS) \*
  - ▶ Regular
  - ▶ Temporary (system & user)

#### DB2 table space storage settings

- PAGESIZE
- EXTENTSIZE
- PREFETCHSIZE
- OVERHEAD
- TRANSFERRATE
- BUFFERPOOL

SMS table spaces don't require coalesce and table space options are straightforward.

DB2 also has always used the "locally managed" technique for table spaces since version 1.

\* DMS & SMS are used under the covers of an automatic storage table space



DB2 compresses more objects with less administration, like temporary tables and XML XDAs.

# Database Storage Model

## DB2 row compression overview

- **Dictionary based - symbol table for compressing/decompressing data records**
  - ▶ Lempel-Ziv (LZ) based algorithm (static dictionary based)
  - ▶ Dictionary per table stored within the permanent table object
- **Data resides compressed on pages**
  - ▶ On table space disk - significant I/O bandwidth savings
  - ▶ In buffer pools - memory savings & improvement in performance
  - ▶ In recovery log disk and archive log tape - savings in and space for backups
- **Compression done during insert, update, import or load**
  - ▶ Does not compress rows where no storage saving is realized for that row
  - ▶ Dictionary is built “on the fly” with Automatic Dictionary Creation (ADC) – just use keywords **COMPRESS YES**
  - ▶ Indexes, XML XDA and inline CLOBs can be compressed as well as data using the same keywords
  - ▶ Temporary tables are also compressed by default if compression is licensed for your database
- **CPU processing does have a cost though**
  - ▶ Rows must be decompressed before being processed for evaluation

Name	Dept	Salary	City	ST	Zip
Burt	smpo	20000	Dallas	TX	75063
Vik	smpo	30000	Dallas	TX	75063

Burt	smpo	20000	Dallas	TX	75063	Vik	smpo	30000	Dallas	TX	75063	Etc...
------	------	-------	--------	----	-------	-----	------	-------	--------	----	-------	--------

Burt	(01)	20000	(02)	Vik	(01)	30000	(02)	Etc...
------	------	-------	------	-----	------	-------	------	--------

12-bit symbol **Dictionary**

(01)	smpo
(02)	Dallas, TX, 75063
...	Etc ...



DB2 has better level, opportunity and scope of compression for data

# Database Storage Model

## DB2 vs. Oracle data compression: the TPC-H benchmark

### LEVEL of compression – domain higher for DB2

- DB2 compresses data at the entire table or table partition level
  - ▶ Example: your name randomly falls 1,000,000 times in a DB2 table, but if your name fell only once per page or extent, you would still get it compressed nearly 1,000,000 times
- Oracle compresses data at the block level
  - ▶ Example: your name randomly falls 1,000,000 times in an Oracle table, but if your name fell only once per block, NO COMPRESSION would result!

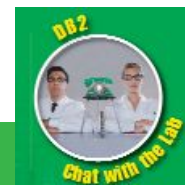
### OPPORTUNITY for compression – DB2 looks for more

- DB2 looks not only across multiple columns, but even on partial columns
  - ▶ Example: your Greek name ends in “opolous” like many of your fellow Greeks, that string “opolous” could be compressed thousands of times along with the ending of many other Greek names.
- Oracle only looks at entire columns for compression
  - ▶ Example: your Greek name ends in “opolous”, but is rare and only appears a few times in the database. It will NOT be compressed at all.

### SCOPE of compressed objects:

- DB2 compresses data, all types of indexes, temporary tables, XML objects, replicated objects
- Oracle compresses data and only one type of index

TPC-H Table	Compression Ratio	
	Oracle	DB2
LINEITEM	38%	58% (1.5x better)
ORDERS	18%	60% (3x better)



# Database Storage Model

## DB2 vs. Oracle index compression

DB2 has more compression algorithms for indexes which are automatically chosen for you resulting in better index compression with ease of use.

- **DB2: automatically chooses an appropriate index algorithm:**
  - ▶ RID list compression
    - Instead of storing RIDs explicitly, only the first is stored and the others are referenced as an offset of that RID.
  - ▶ Variable slot directory
    - The slot directory is not fixed and is dynamically adjusted to fit as many index keys as it needs to so each two byte entry in the slot directory corresponds to a different index key on the page.
  - ▶ Prefix compression
    - Keys are stored in sorted order and adjacent values of prefixes are stored only once.
- ▶ All the above automatically used by DB2 when you simply set compression on for a table
- **Oracle: only uses one algorithm and requires more work**
  - ▶ Prefix compression - ONLY
  - ▶ Requires DBA work to implement:
    - Select candidate indexes for prefix compression
    - Run script to analyze candidate indexes
    - Select those indexes that will achieve best compression savings
    - Run script to compress targeted indexes

<00 00 00 04, 00 00>,
<00 00 00 04, 00 01>,
<00 00 00 04, 00 02>,

→

<00 00 00 04, 00 00>,
<1>,
<1>,

AA 01 Burt
AA 02 Shen

→

AA
01 Burt
02 Shen

('a', 'a', 'a'),
('a', 'a', 'b'),
('a', 'a', 'c'),

→

('a', 'a', 'a'),
(, 'b'),
(, 'c'),





Easy database creation at the line command level with less to do. This is typical of many DB2 administration commands.

# Database Administration

## Manual creation of a database step by step

Oracle	DB2
#1. Set environment variables: ORACLE_SID, ORACLE_BASE, ORACLE_HOME	Set registry variables: DB2INST, DB2INSTPROF (DB2PATH is set during install)
#2. Create password file (using orapwd)	N/A – DB2 uses external authentication, no need to do this
#3. Create pfile	N/A – DB2 invokes autoconfigure automatically
#4. STARTUP NOMOUNT	DB2START (to start the instance)
#5. CREATE DATABASE...	CREATE DATABASE...
#6. Build data dictionary views (using catalog.sql)	N/A – DB2 CREATE DATABASE does this
#7. Build PL/SQL packages (using catproc.sql)	N/A – DB2 CREATE DATABASE does this
#8. Update tnsnames.ora with SID (or use other Oracle Net method)	Optional – CATALOG DATABASE in another instance



# Database Administration

Starting / stopping instances, databases and applications comparison \*

Oracle	DB2
STARTUP	<ol style="list-style-type: none"> <li>1. DB2START (or START DBM)</li> <li>2. ACTIVATE DATABASE (or CONNECT TO DATABASE)</li> </ol>
STARTUP NOMOUNT	DB2START
<ol style="list-style-type: none"> <li>1. ALTER DATABASE MOUNT</li> <li>2. ALTER DATABASE OPEN</li> </ol>	ACTIVATE DATABASE
SHUTDOWN (or SHUTDOWN NORMAL)	DB2STOP (or STOP DBM)
SHUTDOWN TRANSACTIONAL	<ol style="list-style-type: none"> <li>1. QUIESCE INSTANCE DEFER</li> <li>2. DB2STOP</li> </ol>
SHUTDOWN IMMEDIATE	DB2STOP FORCE
SHUTDOWN ABORT	DB2_KILL
ALTER SYSTEM QUIESCE RESTRICTED	QUIESCE DATABASE [IMMEDIATE / DEFER]
ALTER SYSTEM KILL SESSION [SID, SERIAL]	FORCE APPLICATION [ALL / HANDLENAME]

\* These are rough equivalents only to give you a basic idea of DB2 capability



DB2 has its own catalog but it can contain many of the common Oracle dictionary views too.

# Database Administration

## Oracle “dictionary” vs. DB2 “system catalog”

- Oracle Dictionary vs. DB2 System Catalog contents \*

### Oracle Data Dictionary Contents

SYS.xxxx\$ - Base Tables

SYS.GV\_\$ or GV\$ - Administrative views

SYS.V\_\$ or V\$ - Administrative views

ALL\_%

DBA\_%

USER\_%

- System Views

*Oracle 11g can have up to 1,600 entries in the dictionary*

```
SELECT column-name FROM user_tables;
```

```
SELECT column-name FROM user_views;
```

### DB2 System Catalog Contents

SYSIBM - Base tables

SYSCAT - Read-only views, defined for catalog base tables

SYSSTAT - Updateable views

SYSIBMADM - Administrative views (similar to V\$\_)

All Oracle dictionary views \*

*DB2 9.7 has 415 entries in the catalog*

```
SELECT column-name FROM syscat.tables
WHERE OWNER=user AND
TYPE='T';
```

```
SELECT column-name FROM syscat.tables
WHERE OWNER=user AND
TYPE='V';
```

\* Registry variable DB2\_COMPATIBILITY\_VECTOR=ORA set before creation of a DB2 database will create an additional 125 Oracle dictionary views under SYSIBMADM. These include DICT\*, ALL\*, DBA\*, USER\*, etc.

DB2 is clearly more capable in these performance features

# Performance Capability Differences Comparison

DB2	Oracle
<p style="text-align: center;"><b>Scan Sharing</b></p> <p>Multiple scanners coordinate the shared use of buffer pool pages. When a scan of a large set of data is started, subsequent queries can “jump on” that scan at any point to share the benefit of the data being scanned and jump off when finished. This reduces the need for multiple passes of data for different queries that are not identical but require the same data for their result set.</p>	<p style="text-align: center;"><b>Cursor Sharing</b></p> <p>Can work similarly to DB2 scan sharing, but the caveat is that the queries sharing the cursor have to be <i>identical</i>, otherwise independent scans are invoked.</p>
<p style="text-align: center;"><b>Plan Lockdown</b></p> <p>DB2 uses compiled packages for static access paths kept in the catalog and are always created by default for any stored procedure or UDF, COBOL environments or even Java using IBM’s pureQuery. These packages can also be versioned.</p>	<p style="text-align: center;"><b>No packaged code</b></p> <p>SQL Profiling and Stored Outlines give some of the functionality of a DB2 package, but require manual creation and maintenance and do not have the scope and power of the default DB2 package.</p>
<p style="text-align: center;"><b>Query Parallelism</b></p> <p>DB2 has unrestricted parallel DML. Parallelism used in all utilities, cascades, referential integrity (RI), triggers, LOB processing, etc.</p>	<p style="text-align: center;"><b>Restricted parallel DML</b></p> <p>Has restrictions on delete cascade, RI, triggers &amp; LOBS. Mostly runs its parallel DML on partitioned tables.</p>





# Performance Capability Differences

## Optimizer issues

The DB2 optimizer has been “cost based” from its inception. Oracle introduced it in v7.

DB2	Oracle
<p><b>Optimizer influencing done in many ways</b></p> <ul style="list-style-type: none"> <li>• Query optimization class</li> <li>• Subcommands               <ul style="list-style-type: none"> <li>▶ OPTIMIZE FOR n ROWS</li> <li>▶ FETCH FIRST n ROWS ONLY</li> </ul> </li> <li>• Registry variables</li> <li>• Volatile cardinality</li> <li>• Informational constraints</li> <li>• Selectivity clause</li> <li>• Optimization profiles</li> <li>• Optimizer guidelines</li> </ul> <p>DB2 was cost based from its inception: version 1</p>	<p><b>Optimizer influencing mostly through</b></p> <ul style="list-style-type: none"> <li>• Hints</li> <li>• Environment variables</li> </ul> <p>Cost based introduced since version 7 Rules based not supported since 10g</p>
<p><b>Dynamic bitmap indexing</b></p> <p>Engine determines when these are needed and builds them in memory “on the fly”. Eliminates all need for DBA maintenance and interventions.</p>	<p><b>Static bitmap indexing</b></p> <p>DBA needs to determine when to build them and maintain them. Maintained statically like all other indexes.</p>
<p><b>Buffer pool per table space</b></p> <p>Each table space can have its own memory area dedicated to it which allows for more flexibility in memory allocation. The optimizer also uses OVERHEAD and TRANSFER RATE in the table space settings.</p>	<p><b>Cache (buffer pool) per block size</b></p> <p>Memory allocation can be separated by objects of the same block size only.</p>



DB2 can run the Oracle SQL and PL/SQL dialect, but Oracle only understands its own.

# Oracle Compatibility

## DB2 runs your applications with little or no change

- **DB2 SQL compatibility:**
  - ▶ Runs an average of 99% of your Oracle SQL for most applications
  - ▶ Avoid changing your application code
- **DB2 PL/SQL compatibility:**
  - ▶ Runs 97% of your Oracle PL/SQL statements natively
  - ▶ DB2 understands, compiles and executes your home grown:
    - Packages
    - Procedures
    - Functions
    - Triggers
  - **DB2 SQL\*Plus compatibility:**
    - ▶ Runs most of your SQL\*Plus scripts without change
      - **DB2 has adopted many other Oracle functionality equivalents like:**
    - ▶ Reader don't block writers and writers don't block readers concurrency
    - ▶ Flexible data type casting
    - ▶ Oracle dictionary views
    - ▶ NUMBER, VARCHAR2 and Oracle style DATE



# Next Steps

- **Proof of Technology: “DB2 9.7 Administration for the Experienced Oracle DBA”**
  - ▶ Two day free of charge, high level, broad scope event by the author of this “Chat with Lab”
  - ▶ Ask your IBM sales rep or technical specialist about having one in your area
- **DB2 education professional training courses**
  - ▶ Deep level of training with a focused scope
  - ▶ Cost based IBM training
  - ▶ [http://download.boulder.ibm.com/ibmdl/pub/software/data/sw-library/education/curriculum-documents/DB2LUW\\_2008.pdf](http://download.boulder.ibm.com/ibmdl/pub/software/data/sw-library/education/curriculum-documents/DB2LUW_2008.pdf)
  - ▶ <http://www-304.ibm.com/jct03001c/services/learning/ites.wss/us/en?pageType=page&c=a0000512>
- **DB2 Workshop for Oracle Professionals (with free certification testing)**
  - ▶ Two day free of charge workshop to extend your current experience to DB2
  - ▶ <http://www.ibm.com/db2workshop>
- **Self study courses**
  - ▶ Free of charge online courses on various DB2 subjects
  - ▶ <http://www-01.ibm.com/software/data/education/selfstudy.html#1>
  - ▶ <http://www-01.ibm.com/software/data/education/certification.html>
- **DB2 DBA fundamentals certification 730 prep**
  - ▶ [http://www.ibm.com/developerworks/offers/lp/db2cert/db2-cert730.html?S\\_TACT=105AGX19&S\\_CMP=db2certlp](http://www.ibm.com/developerworks/offers/lp/db2cert/db2-cert730.html?S_TACT=105AGX19&S_CMP=db2certlp)
- **DB2 Application development certification 733 prep**
  - ▶ [http://www.ibm.com/developerworks/offers/lp/db2cert/db2-cert733.html?S\\_TACT=105AGX11&S\\_CMP=sum](http://www.ibm.com/developerworks/offers/lp/db2cert/db2-cert733.html?S_TACT=105AGX11&S_CMP=sum)



# Questions?



Thank you!

[ibm.com/db2/labchats](http://ibm.com/db2/labchats)

Thank you for attending!



# DB2 and Oracle – An Architectural Comparison

Chat with the Lab by:

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