

# Oracle & DB2 Technical

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# Function Compare

# Version

## DB2

- Enterprise Data Warehouse
- Enterprise Edition
- Enterprise Developer Edition
- Workgroup Edition
- Express Edition
- Express - C Edition
- Personal Edition
- Everyplace Edition

## Oracle

- Oracle Data Warehouse
- Enterprise Edition
- Standard Edition
- Express Edition
- Lite Edition

# Key Features and Options

## DB2

- XML (MixEngine)
- NSE(Net Search Extender)
- Spatial Extender
- Geodetic
- Database Partition
- Table Partition
- HADR
- pureScale(Since 9.8)

## Oracle

- XML
- Text
- Spatial
- Table Partition
- Data Guard
- RAC

# Product Features

## DB2

- Language
- Command Line
- GUI
- Processes and Muti-Threads
- Self Tuning Memory Manager
- Data Compression
- Work Load Management
- Label Based Access Control

## Oracle

- Language
- Command Line
- GUI
- Processes
- Automatic Memory Management
- Advance Compression

# General Tools

## DB2

- **DB2 Change Management Expert**
- **DB2 High Performance Unload**
- **DB2 Performance Expert**
- **DB2 Recovery Expert**
- **DB2 Web Query Tool**

**All is need to pay !**

## Oracle

- **OEM**
- **Logminer**
- **SQL WorkSheet**
- **Wallet Manager**
- **Oracle Directory**

# Development Tools

## DB2

- IBM Data Studio
- Quest Central(3rd)
- Quest TOAD(3rd)
- Embarcadero RapidSQL(3rd)

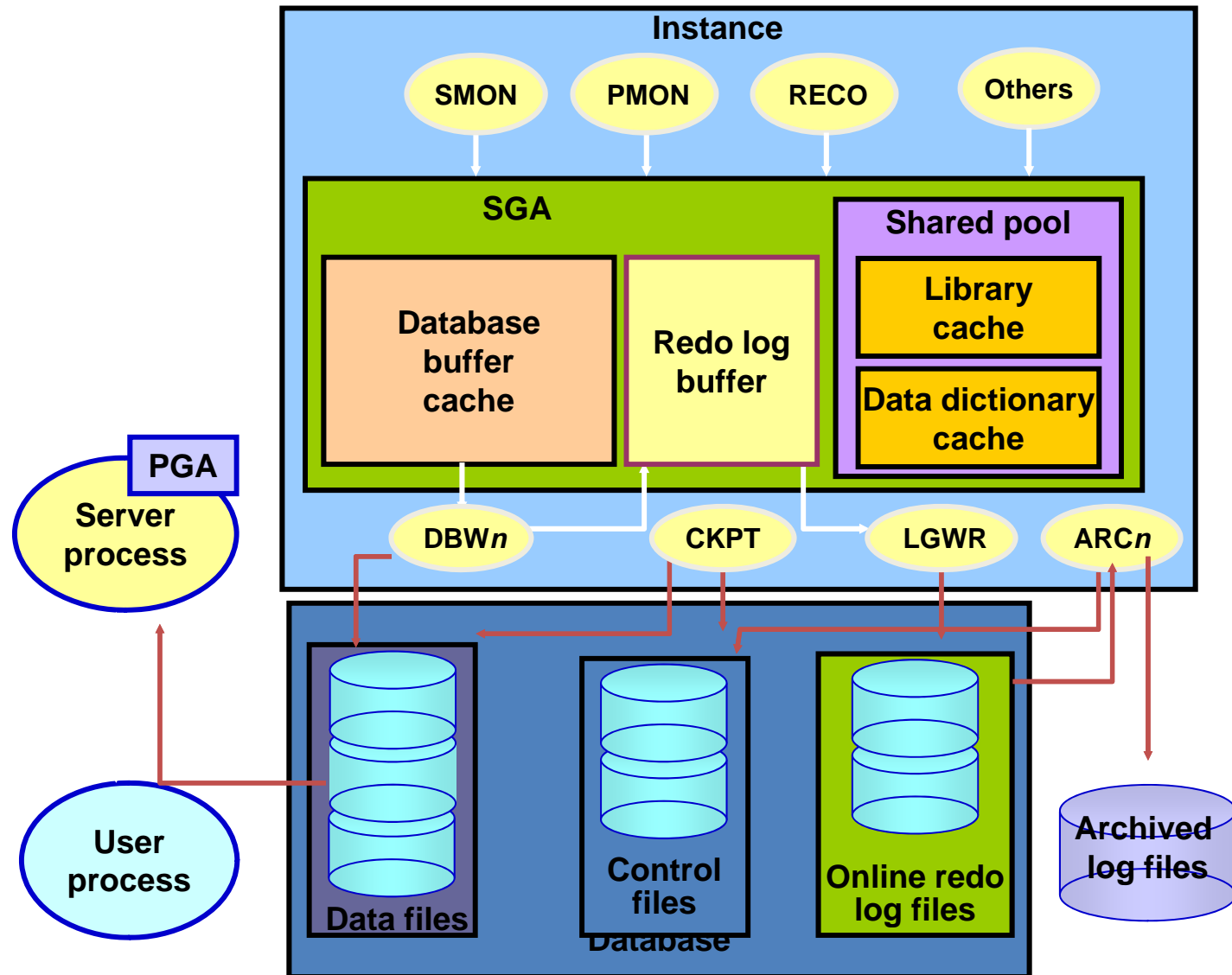
## Oracle

- Oracle Sql Developer
- PL/SQL Develop(3rd)
- Quest Central(3rd)
- Quest TOAD(3rd)
- Embarcadero RapidSQL(3rd)

# Architecture Compare

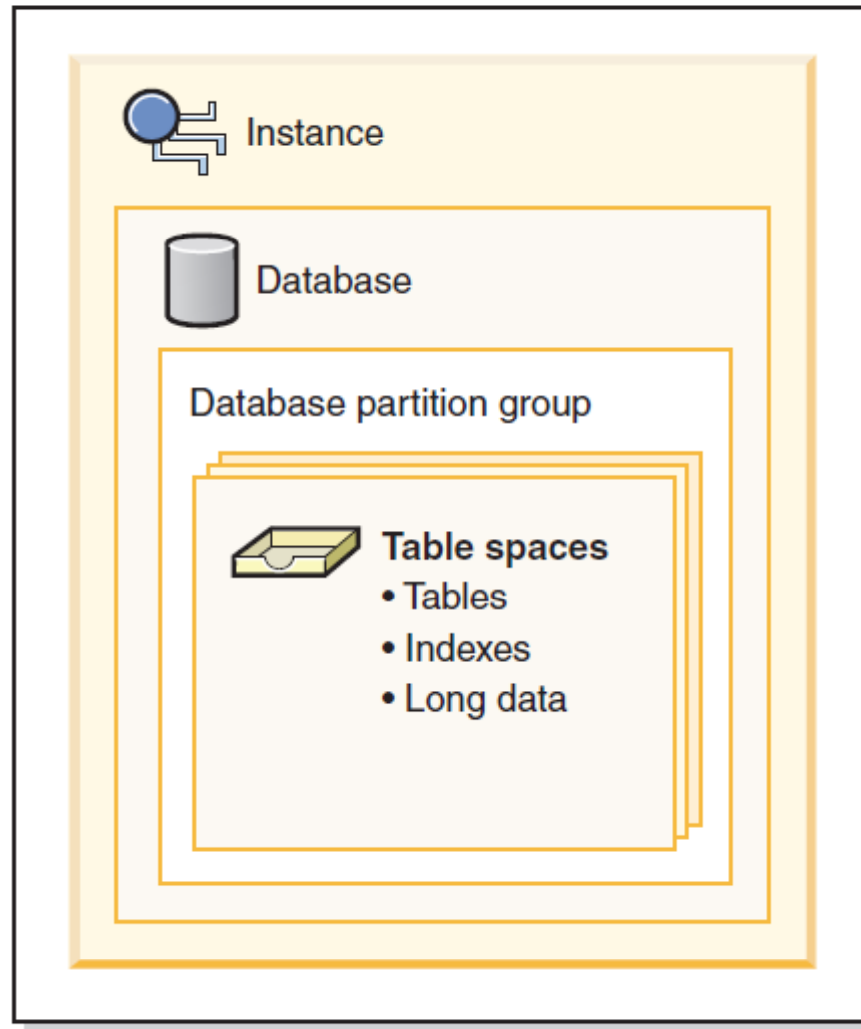


# Oracle Server Structure

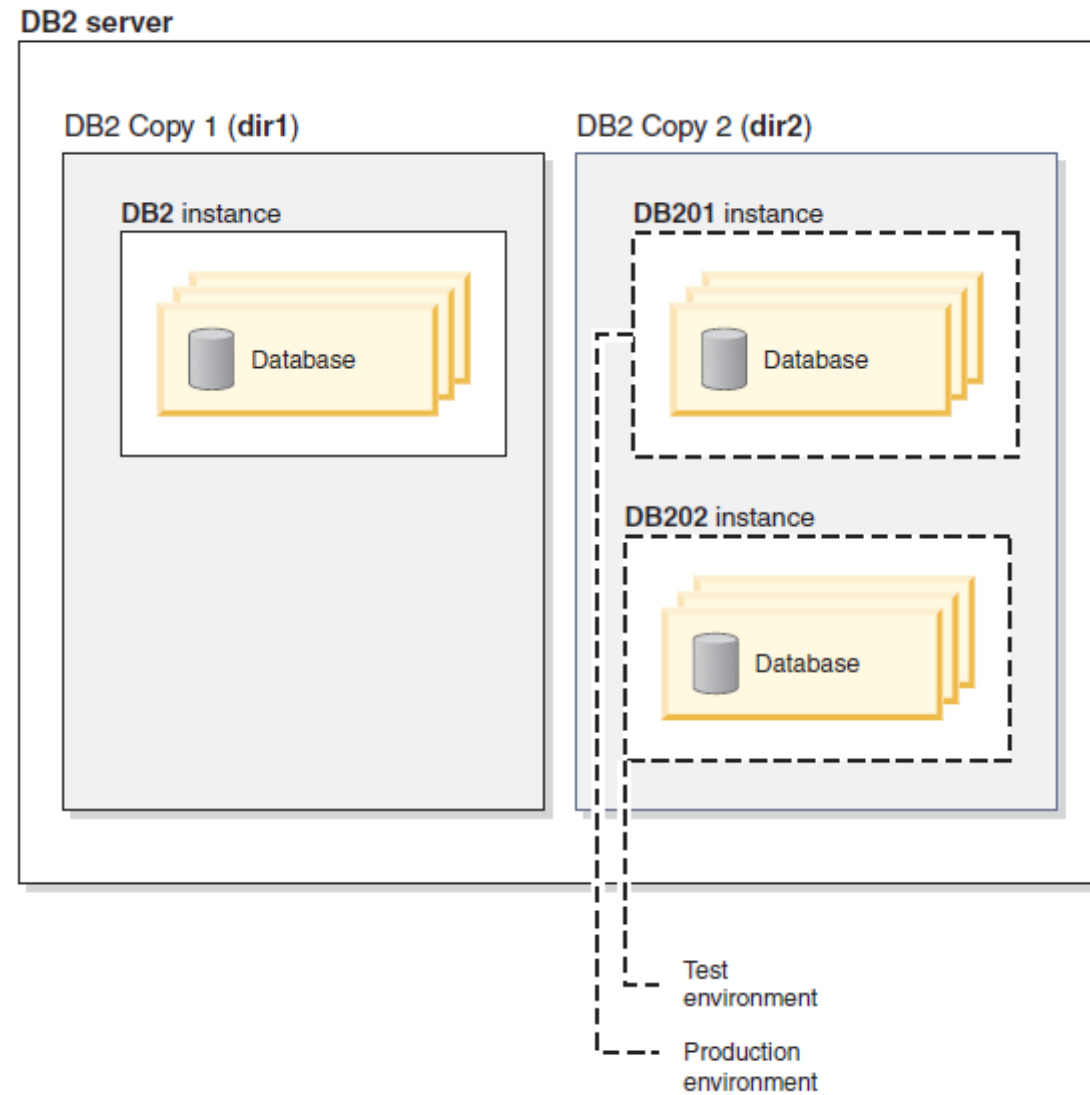


# DB2 Server Structure

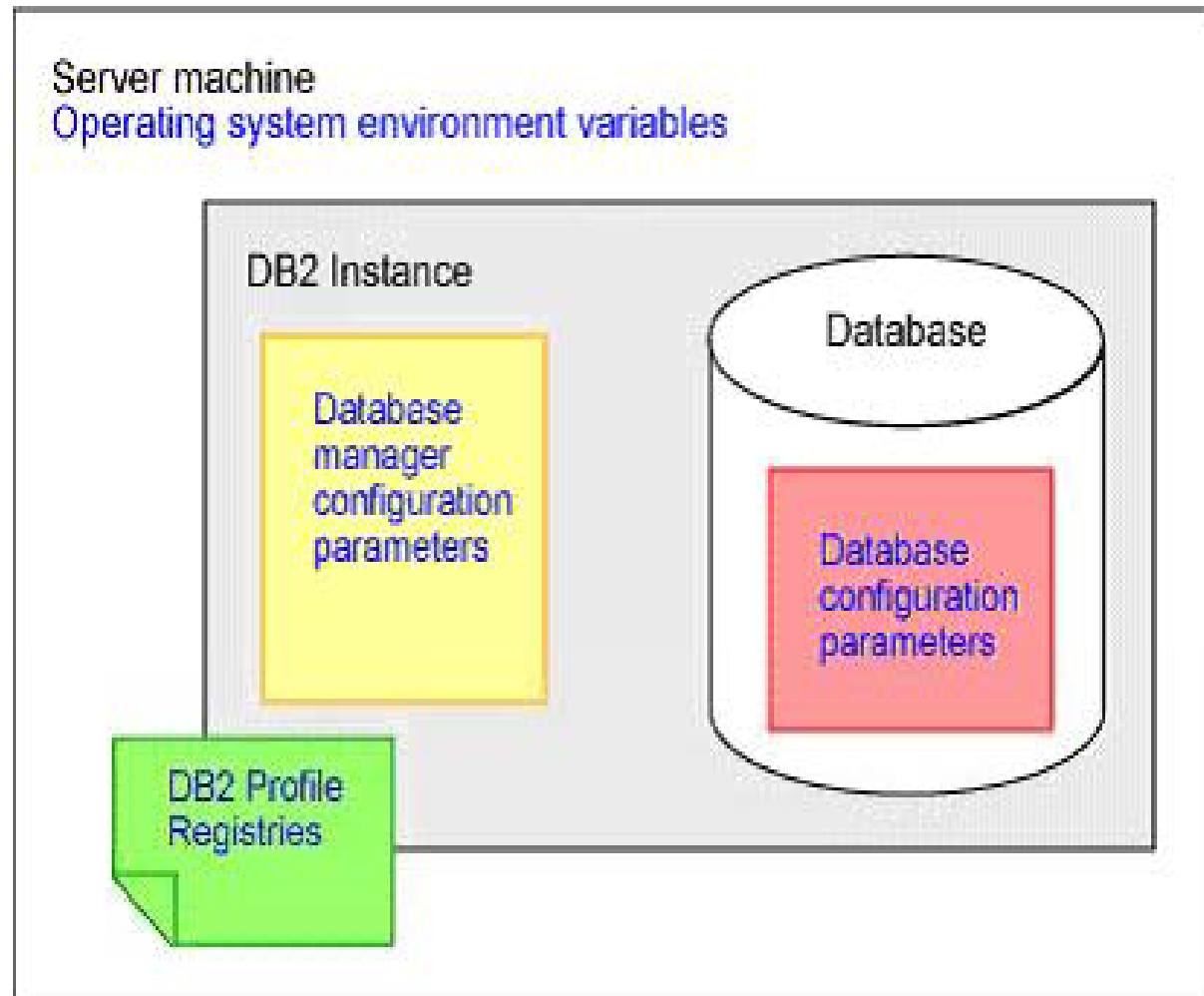
System



# DB2 Server Structure

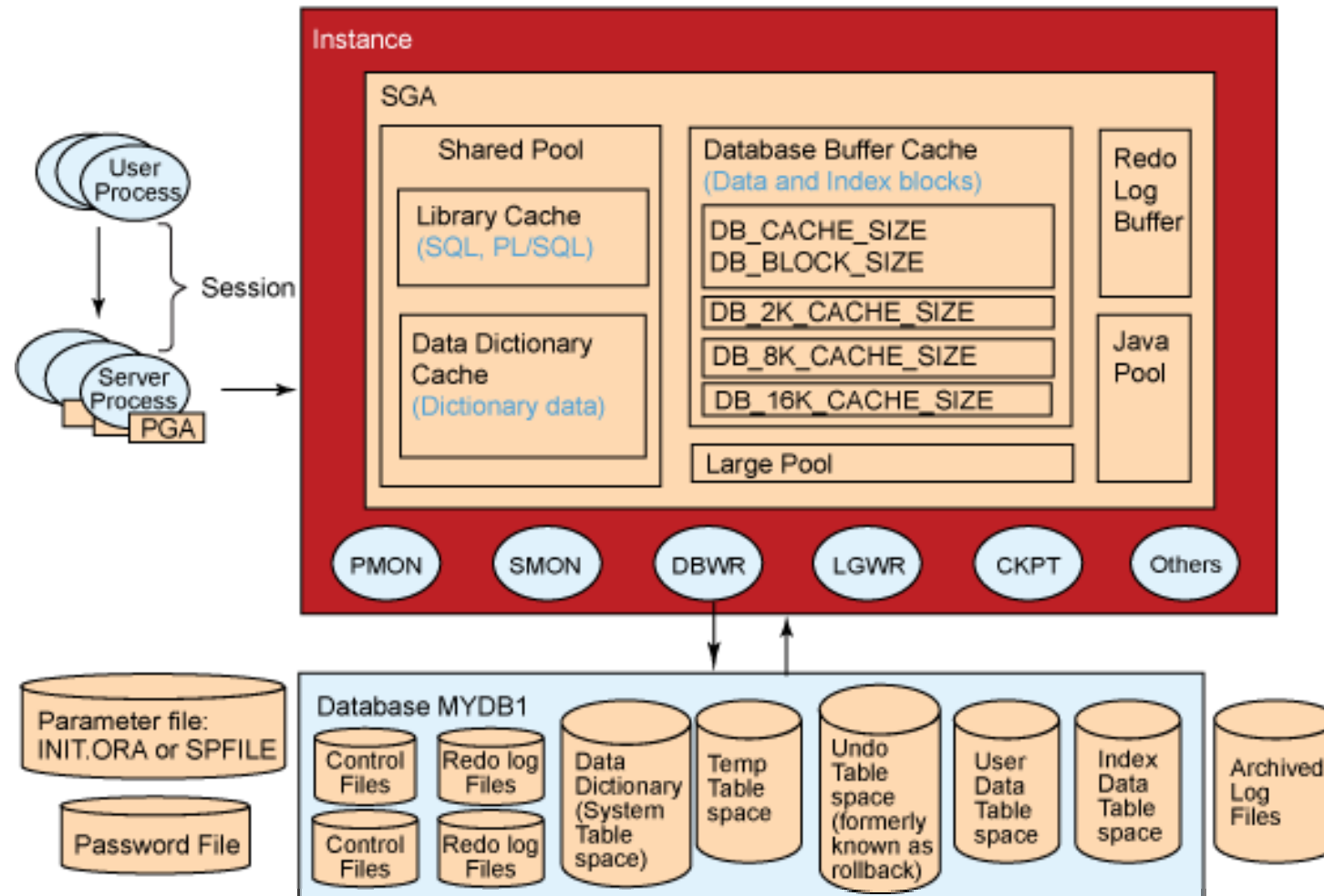


# DB2 Server Structure - Profile

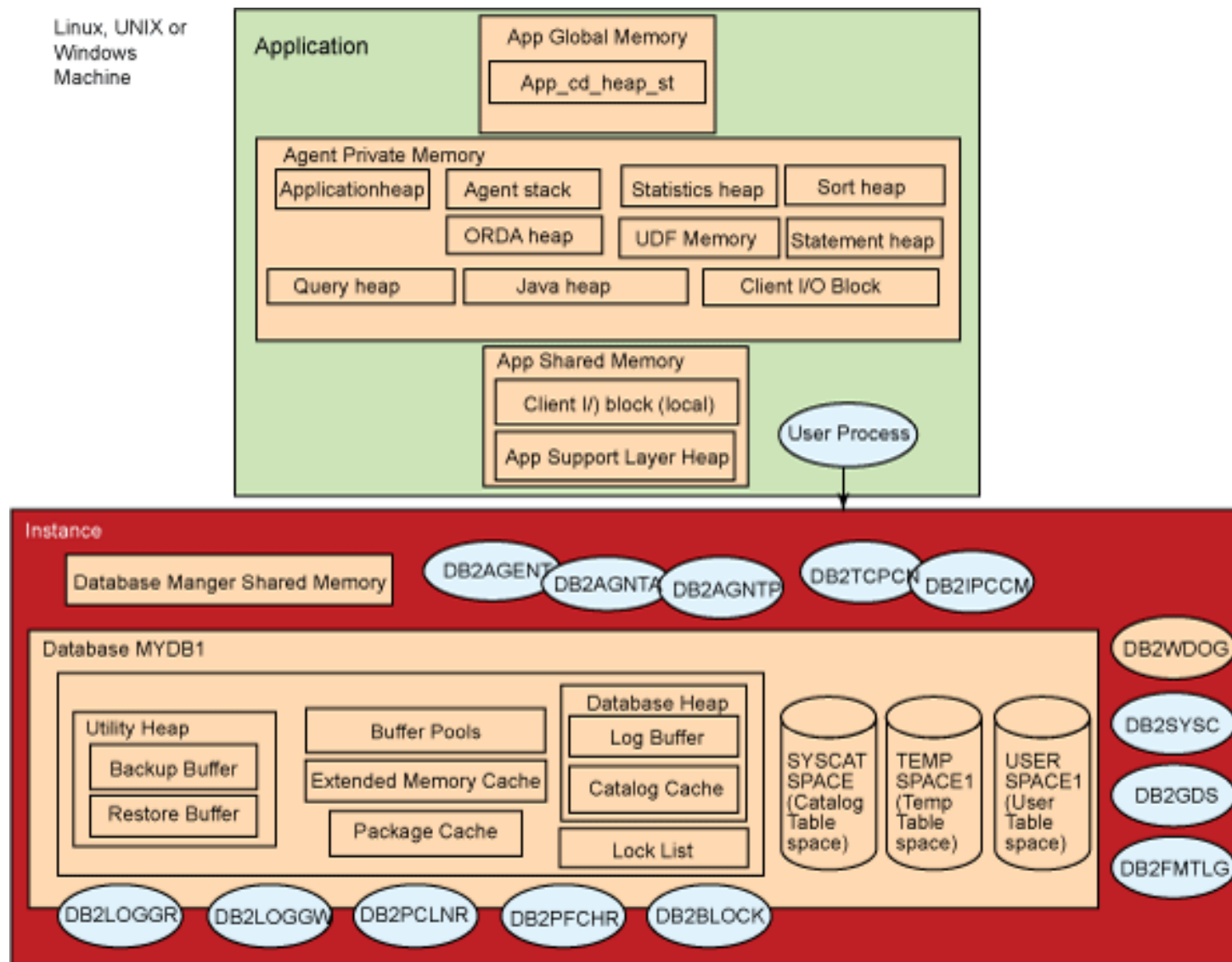


# Oracle Memory Structure

Linux/Unix/Windows Machine



# DB2 Memory Structure



# Modify Configure File

## DB2

- **Managed by database manager (dbm)**
  - UPDATE DBM CFG USING *parameter\_name new\_value*
- **Can not modified by manual**
- **Effective Dynamic**

## Oracle

- **Managed by binary file or text file**
  - spfile or initSID.ora
- **Can modified by manual**
- **Effective Dynamic**

# Modify Database Structure

## DB2

- A instance can include one or more database
  - UPDATE DBM CFG USING *parameter\_name new\_value*
- Base table and base view (Metadata) managed by data dictionary

## Oracle

- A instance only include one database
  - spfile or initSID.ora
- Every database is the isolate and close unit



# Database Objects

## DB2

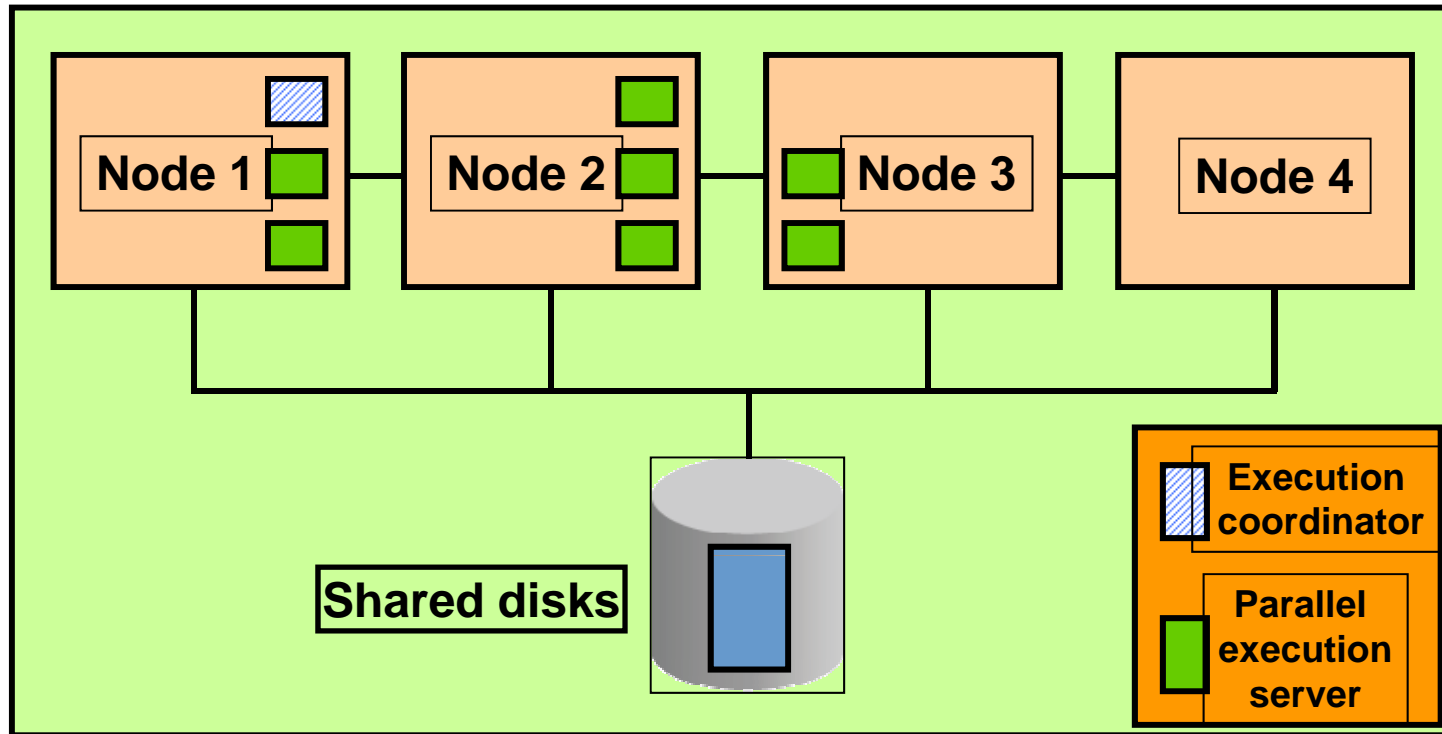
- Can specify the schema name implicit or create a new schema
- A schema is not need to match a user

## Oracle

- Can not specify the schema name implicit or create a new schema
- A schema is must to match a user

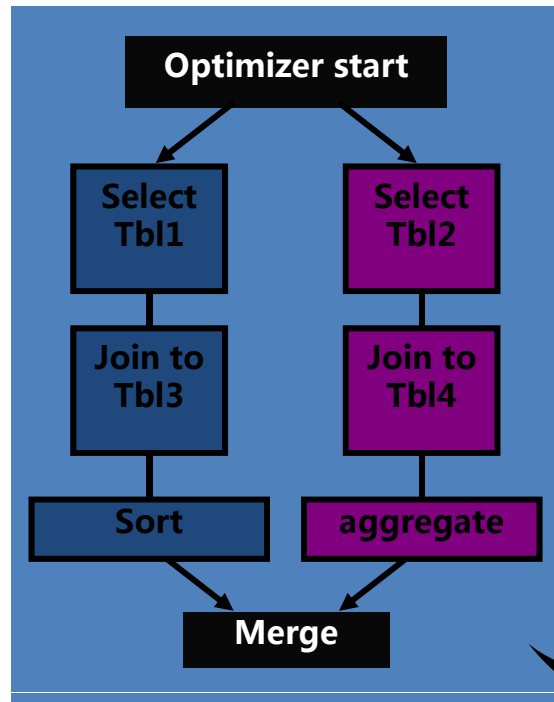
# Structure Compare

# Oracle Share Architecture



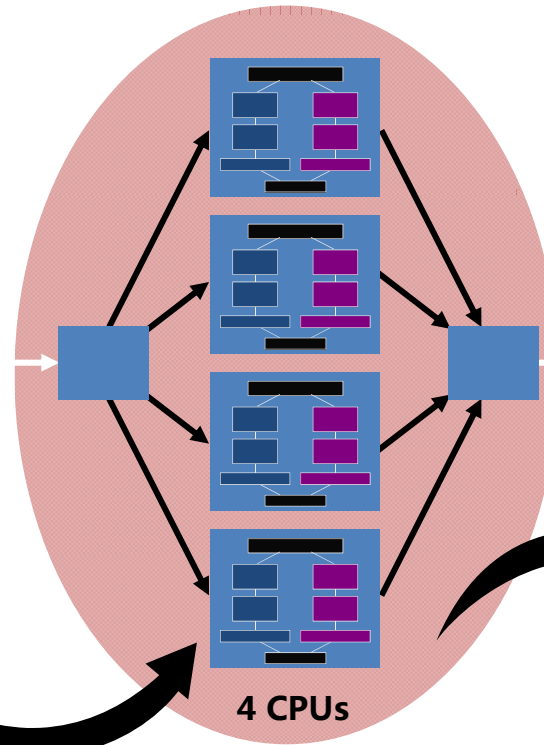
# DB2 Share-Nothing Architecture

流水线并行



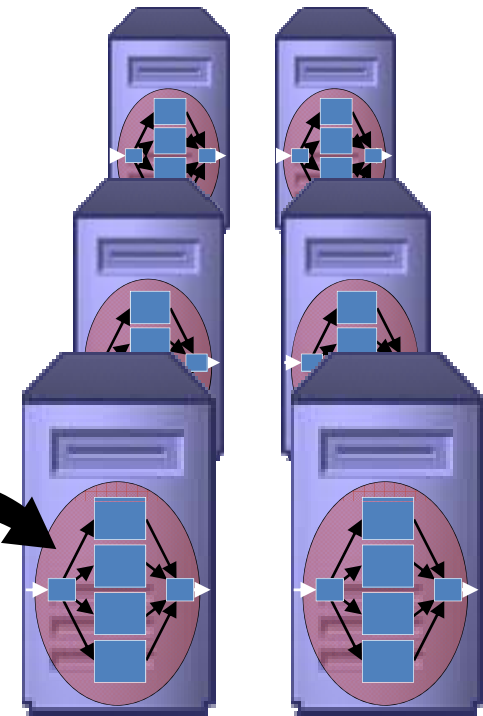
单一用户查询也能利用  
多个分解任务  
在1个CPU上执行

节点内并行



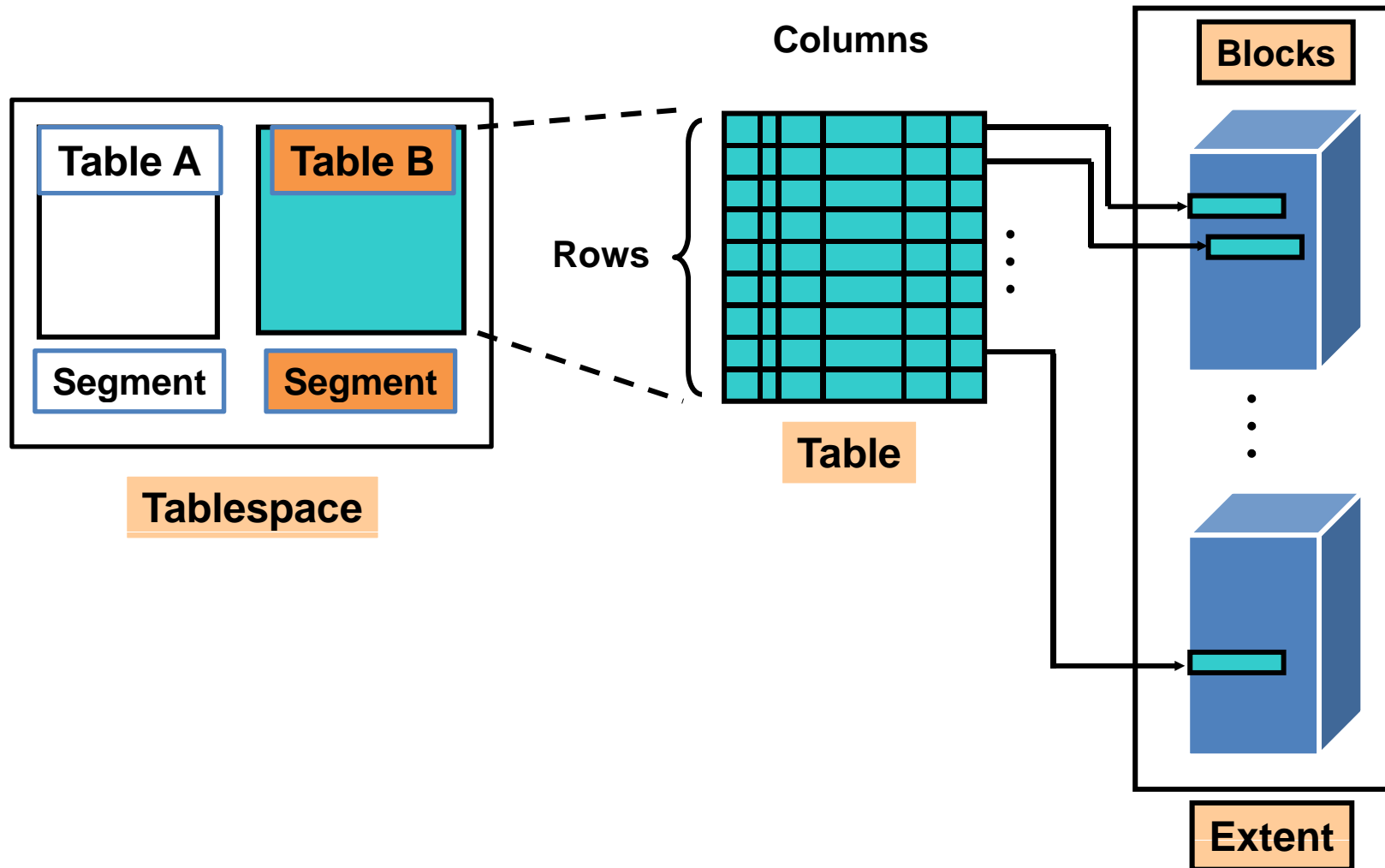
单一用户查询可以利用  
多个分解任务  
在SMP CPU上执行

节点间并行

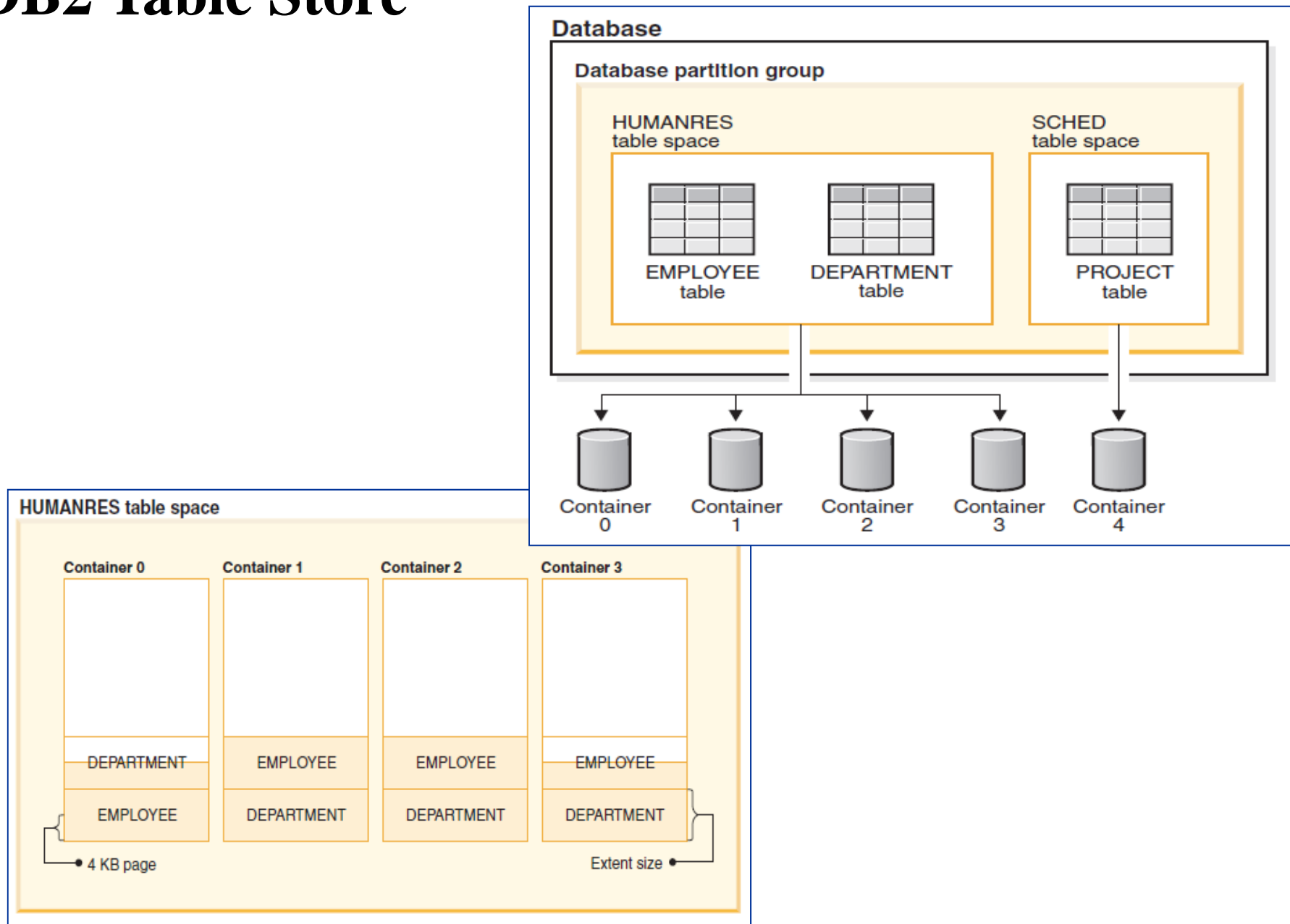


多个 SMP 服务器  
运行“单一映像”数据库

# Oracle Table Store



# DB2 Table Store



# Oracle Tablespace

- **DMT (Dictionary Managed)**

- Extents are managed in tablespace via dictionary
- Update the dictionary table when allocate or de-allocate
- Dictionary manage the free space

- **LMT (Local Managed)**

- Extents are managed in tablespace via bitmaps
- Manage the free space in the tablespace
- Record the free space with bitmap, every bit corresponding one block or a group block

# Oracle Tablespace

## ■ Permanent Tablespace

- Tablespace is DMT or LMT
- Store users data by default

## ■ Temporary Tablespace

- Oracle engine use it to sort
- Can store the System and Users temporary table
- Oracle can use ONE temporary tablespace at the same time

## ■ Undo Tablespace

- Store the objects of systems and users
- It used to maintain transaction (Rollback, Rollforward, Consistency)

## ■ Bigfile Tablespace

- Support the more large
- It only can use the LMT



# DB2 Tablespace

- **SMS (Management by System)**

- Container is the OS directory
- The space is allocated when it needs
- Can't add the new containers
- Can't split the Regular Data, Index, LOB into different tablespace

- **DMS (Management by Database)**

- Container is the OS file or RAW devices
- The space is pre-allocated
- Can add or drop container
- Can split the Regular Data, Index, LOB into different tablespace

# DB2 Tablespace

## ■ Regular Tablespace

- Tablespace is Regular by default when use SMS
- Store users data by default

## ■ System Temporary Tablespace

- DB2 engine use it to sort
- Can't store the user temporary table

## ■ Large Tablespace

- Tablespace is Large by default when use DMS
- It is the suggested mode
- It is used storing large data query

## ■ User Templerary Tablespace

- User defined Global Temporary tables (in-memory)
- Notice: the difference between System temporary tablespace and User temporary tablespace

# Oracle Automatic Storage

- **OMF (Oracle Managed Files)**

- Datafile name is created by Oracle
- The space is allocated by Oracle

- **ASM (Automatic Storage Management)**

- Managed by Oracle
- It is a cluster file system and based stripes not LVM
- Support online disk reconfigure and dynamic rebalancing

# DB2 Automatic Storage

## ■ Automatic Storage Type

- Only support DMS
- Tablespace can autoresize and auto increase
- Managed by Database
- Can't operation the container
- Can't use the re-directory

## ■ Path of Automatic Storage

- Config file is stored in the DBPATH
- Database is stored in the DBPATH or StoragePath

# Default Tablespace

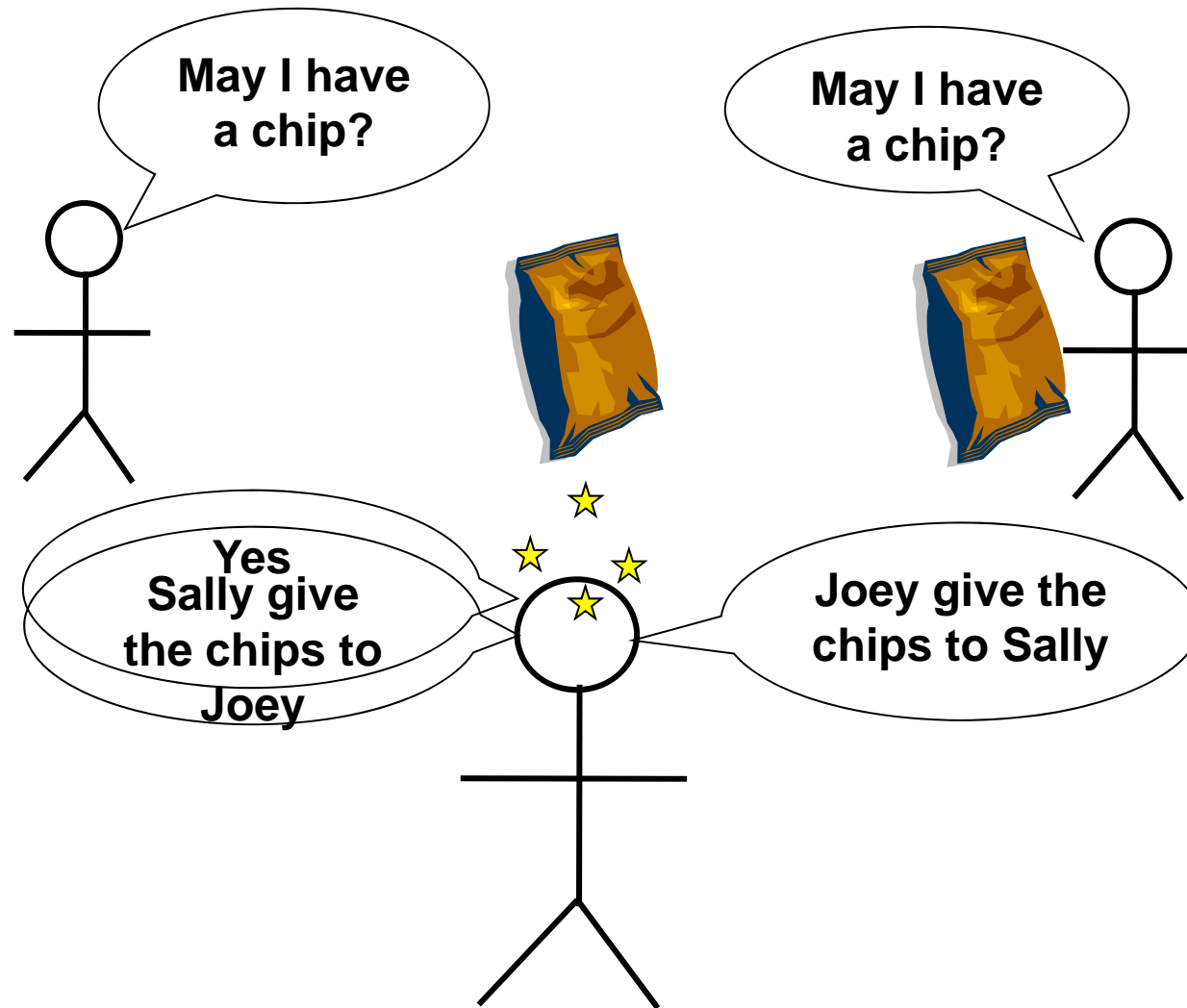
## Oracle

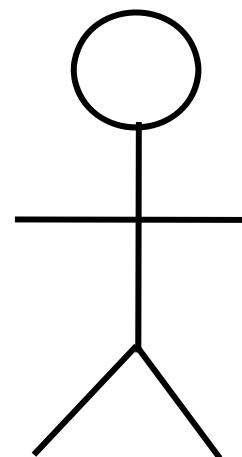
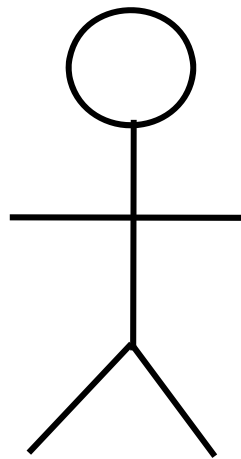
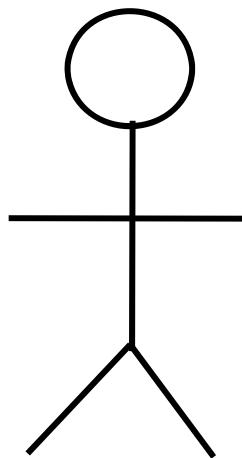
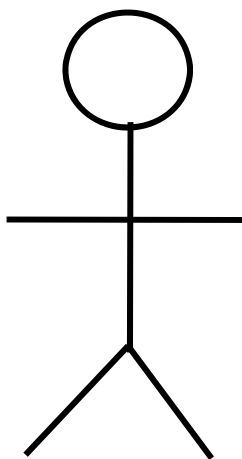
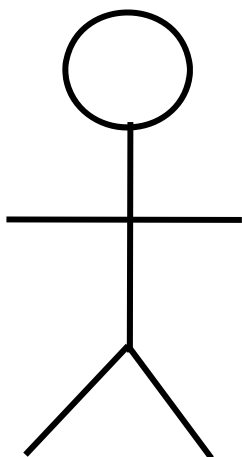
- **SYSTEM**
- **SYSAUX**
- **UNDOTBS1**
- **TEMP**
- **USERS**
- **EXAMPLE**

## DB2

- **SYSCATSPACE**
- **TEMPSPACE1**
- **USERSPACE1**

# **DB2 pureScale & Oracle RAC Tips**



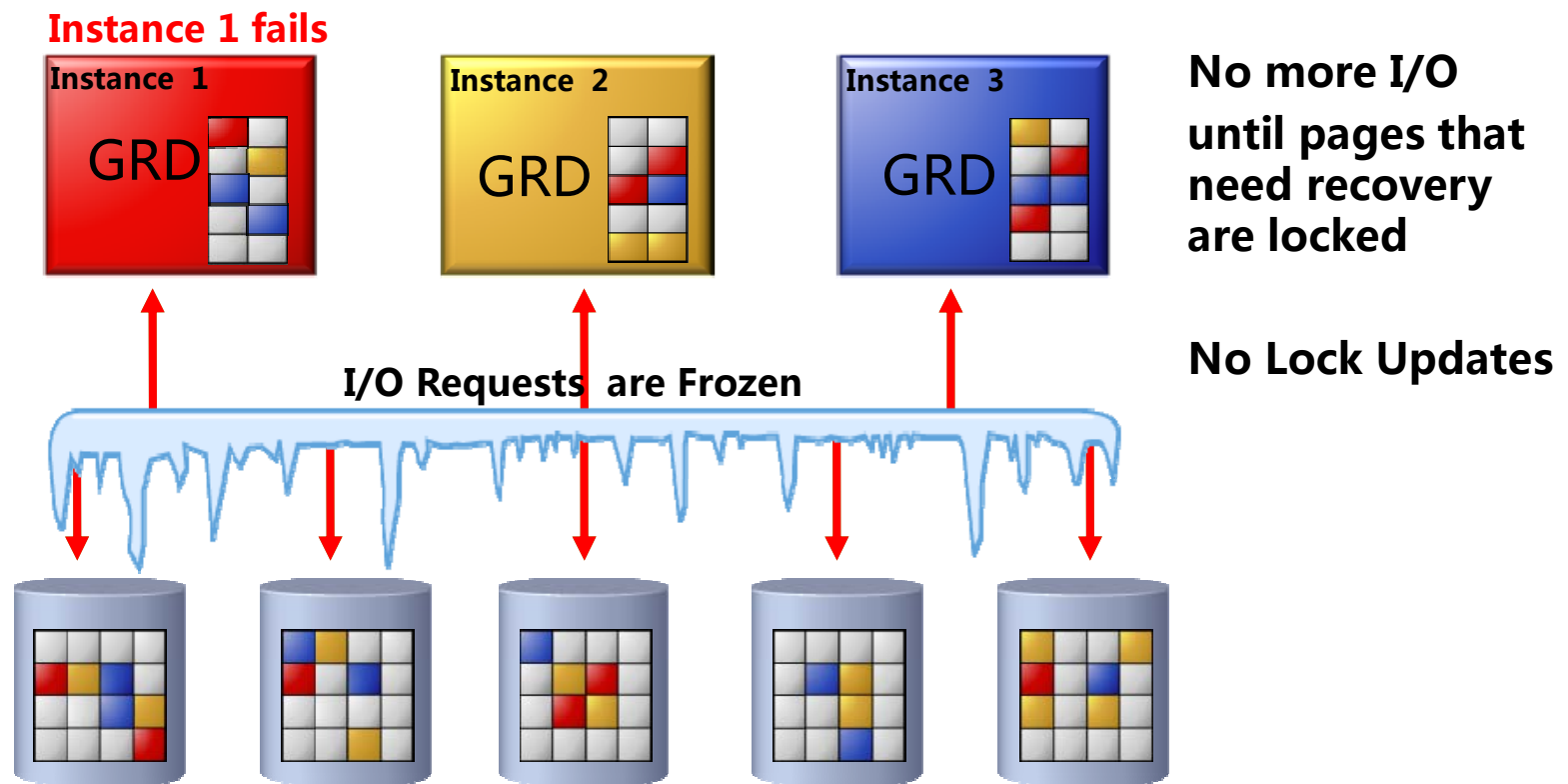


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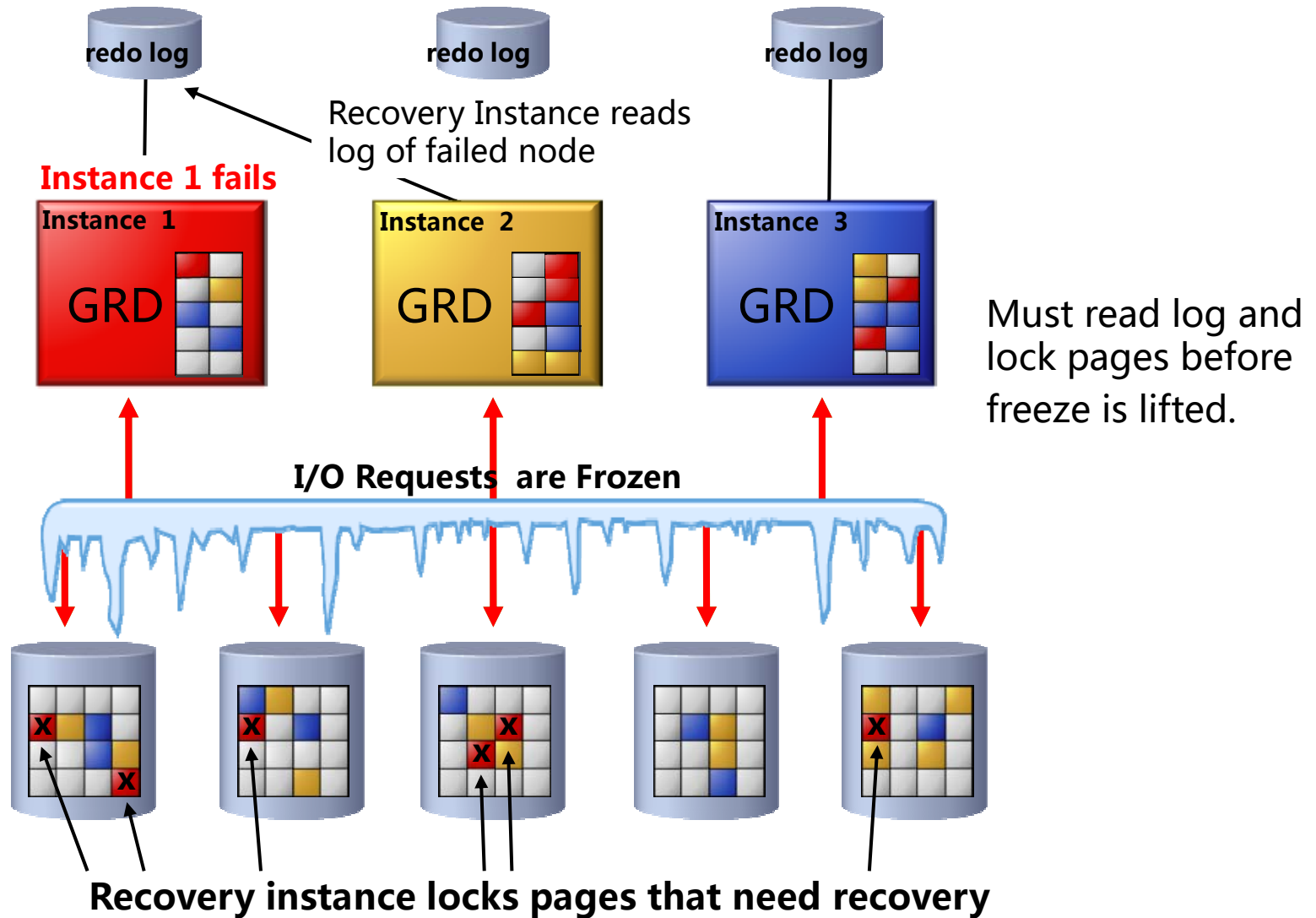


## Oracle RAC – Access to GRD and Disks are Frozen

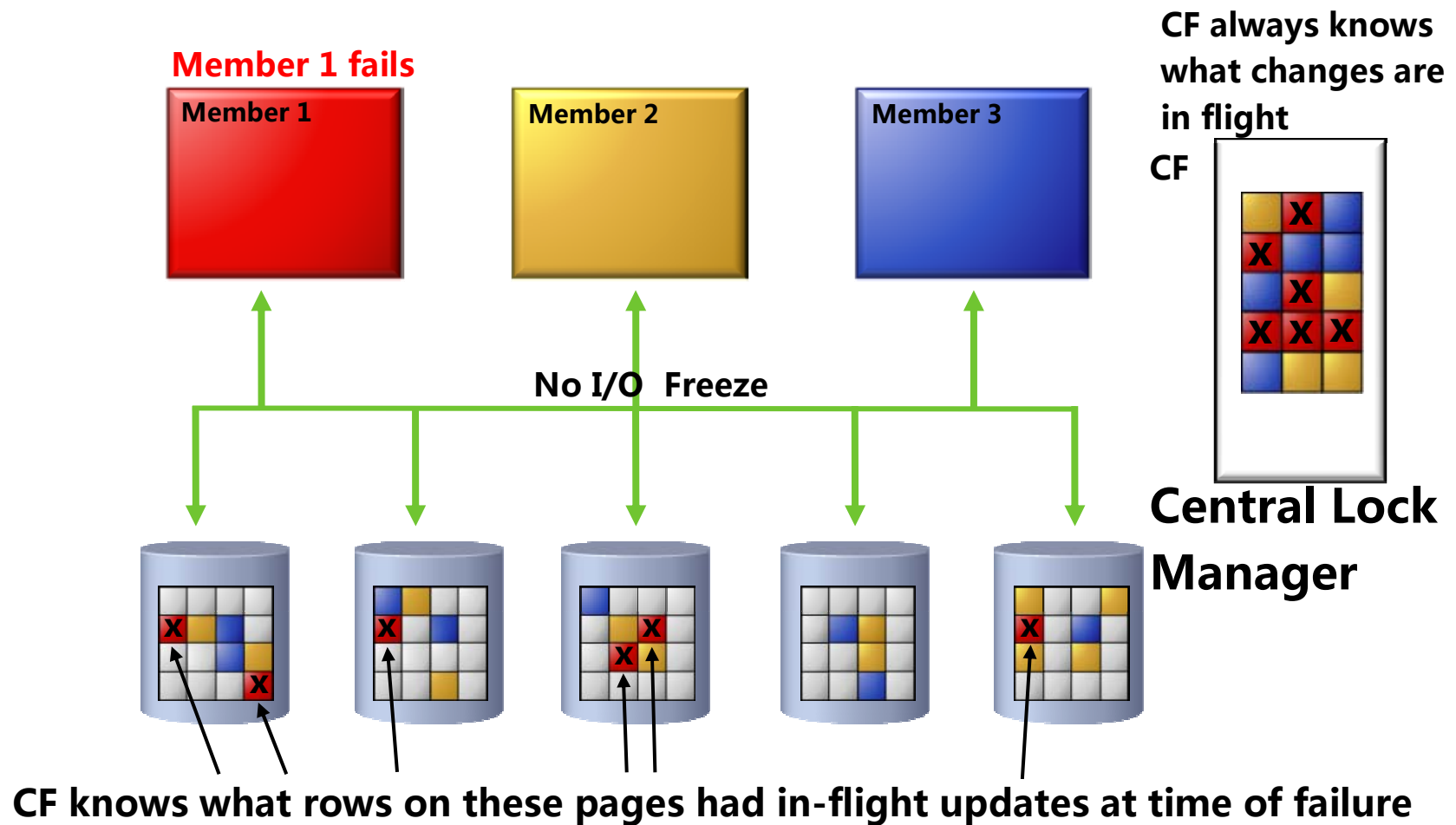
- Global Resource Directory (GRD) Redistribution



## With RAC – Pages that Need Recovery are Locked



## DB2 pureScale – No Freeze at All





**THANK YOU !**