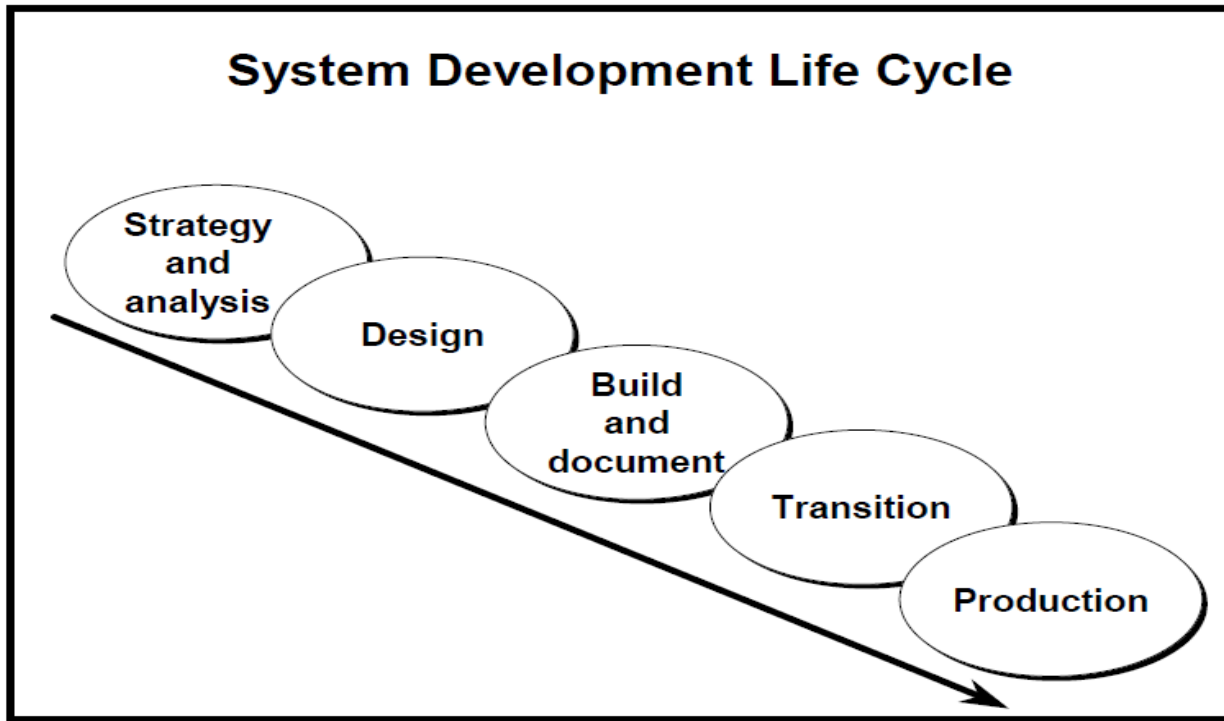




Introduction



- **Strategy and analysis**: study and analyze the business requirements.
- **Design** : design the database based on point 1
- **Build and document**: build the prototype system, write and execute commands to create the tables and objects, build user documentation.
- **Transition**: move the application to production, take acceptance form users and make modification if required.
- **Production**: roll out the system to users.



What is Data?

Pieces of information.

What is database?

It is organized collection of information.

What is DBMS?

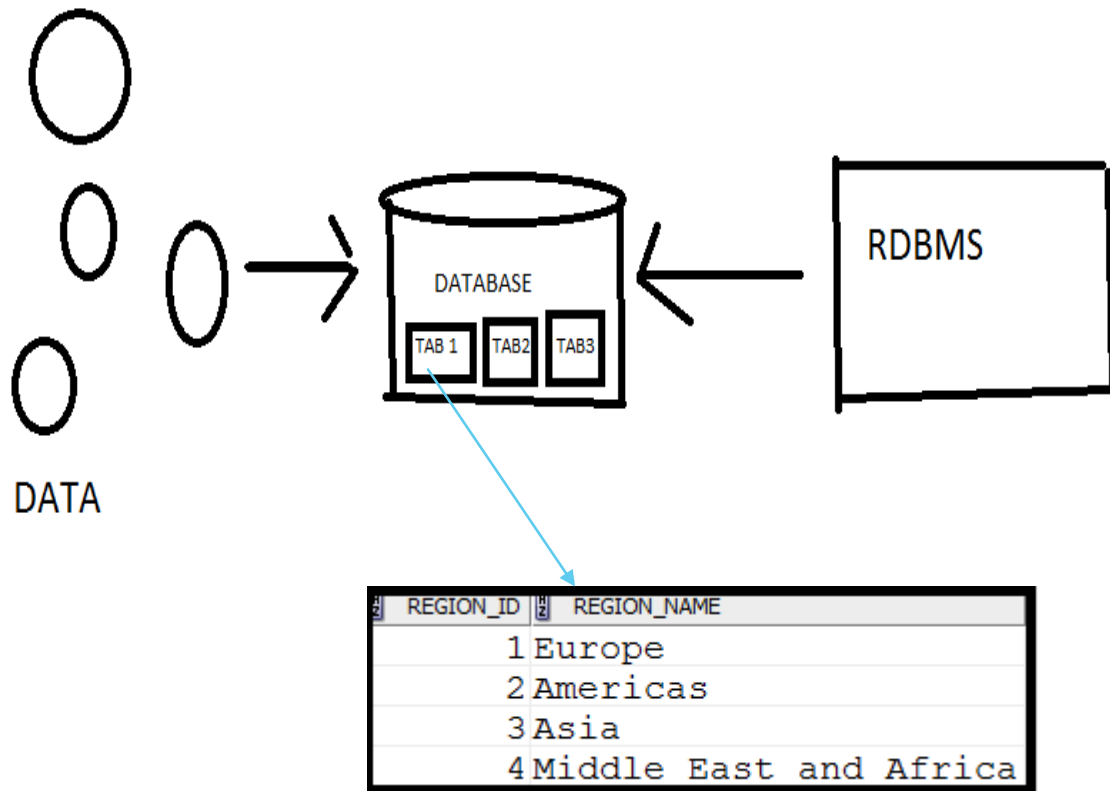
Database management system to store and retrieve and modify data in the database.

And because Oracle is relational database, then we have **RDBMS**
Relational database management system.

and also in oracle we have
ORDBMS ("Object-Relational Database Management System")

What is the table?

It is the basic storage of an RDBMS

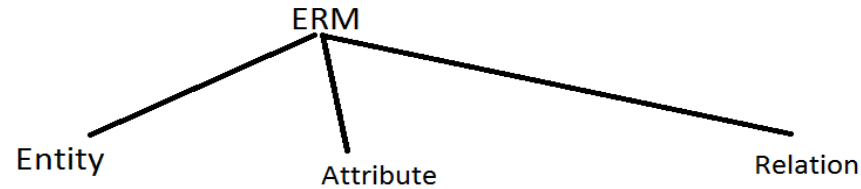




What is Data models?

Conceptual tools to describe data.

In database we have ERM (entity relation model)



Entity

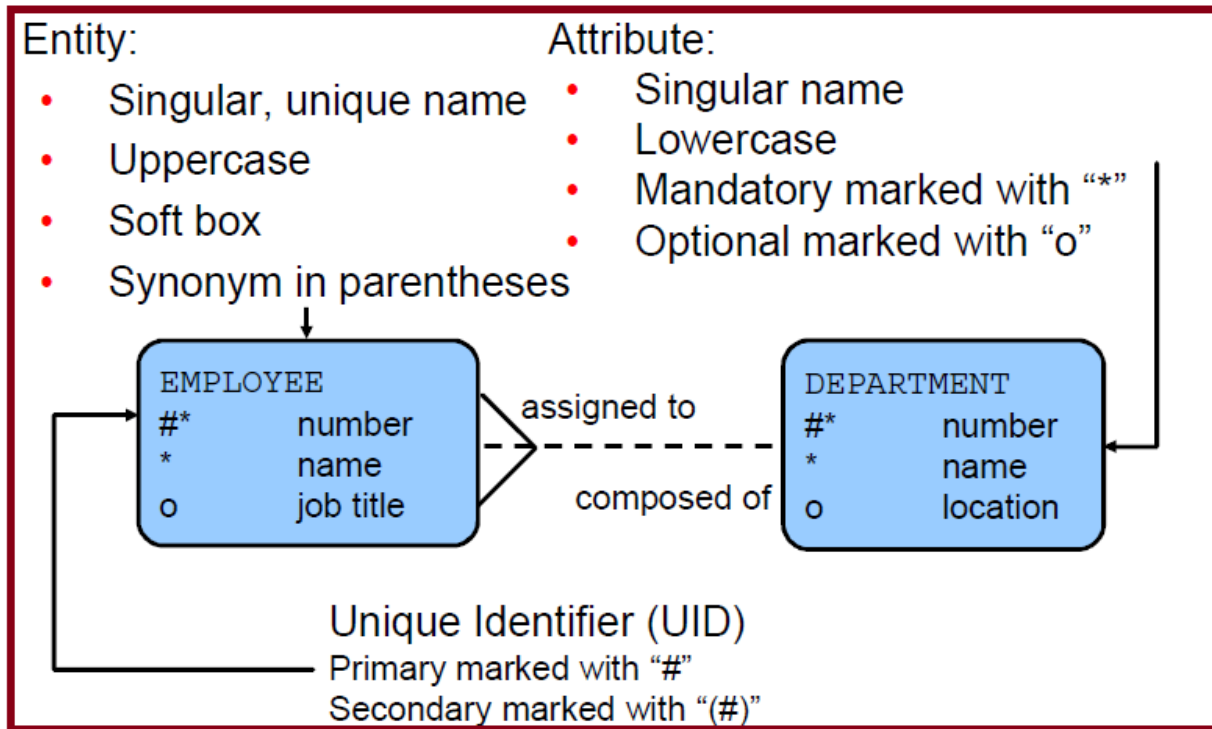
An entity can be a real-world object, that can be easily identifiable. For example, in a school database: students, teachers, classes, and courses offered can be considered as entities.

Attributes

Things that describe the Entity. (student name, age, birthday ...)

Relationship

The association among entities is called a relationship. For example, an employee **works_at** a department, a student **enrolls** in a course.



- Each row of data in a table can be uniquely identified by a primary key.
- You can logically relate data from multiple tables using foreign keys.

Table name: EMPLOYEES

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	DEPARTMENT_ID
100	Steven	King	90
101	Neena	Kochhar	90
102	Lex	De Haan	90
103	Alexander	Hunold	60
104	Bruce	Ernst	60
107	Diana	Lorentz	60
124	Kevin	Mourgos	50
141	Trenna	Rajs	50
142	Curtis	Davies	50

Primary key

Foreign key

Table name: DEPARTMENTS

DEPARTMENT_ID	DEPARTMENT_NAME	MANAGER_ID	LOCATION_ID
10	Administration	200	1700
20	Marketing	201	1800
50	Shipping	124	1500
60	IT	103	1400
80	Sales	149	2500
90	Executive	100	1700
110	Accounting	205	1700
190	Contracting	(null)	1700

Primary key

Guidelines for Primary Keys and Foreign Keys

- You cannot use duplicate values in a primary key.
- Primary keys generally cannot be changed.
- Foreign keys are based on data values and are purely logical (not physical) pointers.
- A foreign key value must match an existing primary key value or unique key value; otherwise, it must be null.
- A foreign key must reference either a primary key or a unique key column.

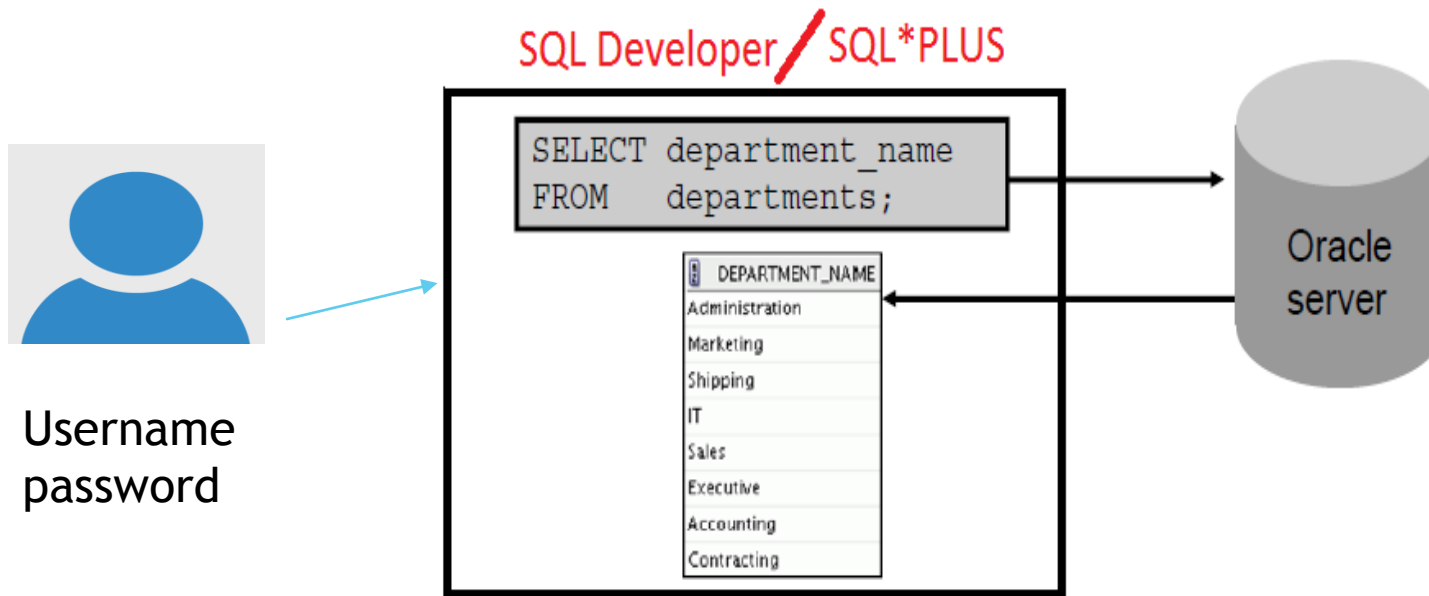
To access Oracle database you need SQL

SQL is structure query language to access database

To write SQL statements you need development environments

SQL*PLUS

Oracle SQL developer (the primary tool)



Types of SQL statements

SELECT
INSERT
UPDATE
DELETE
MERGE

Data manipulation language (DML)

CREATE
ALTER
DROP
RENAME
TRUNCATE
COMMENT

Data definition language (DDL)

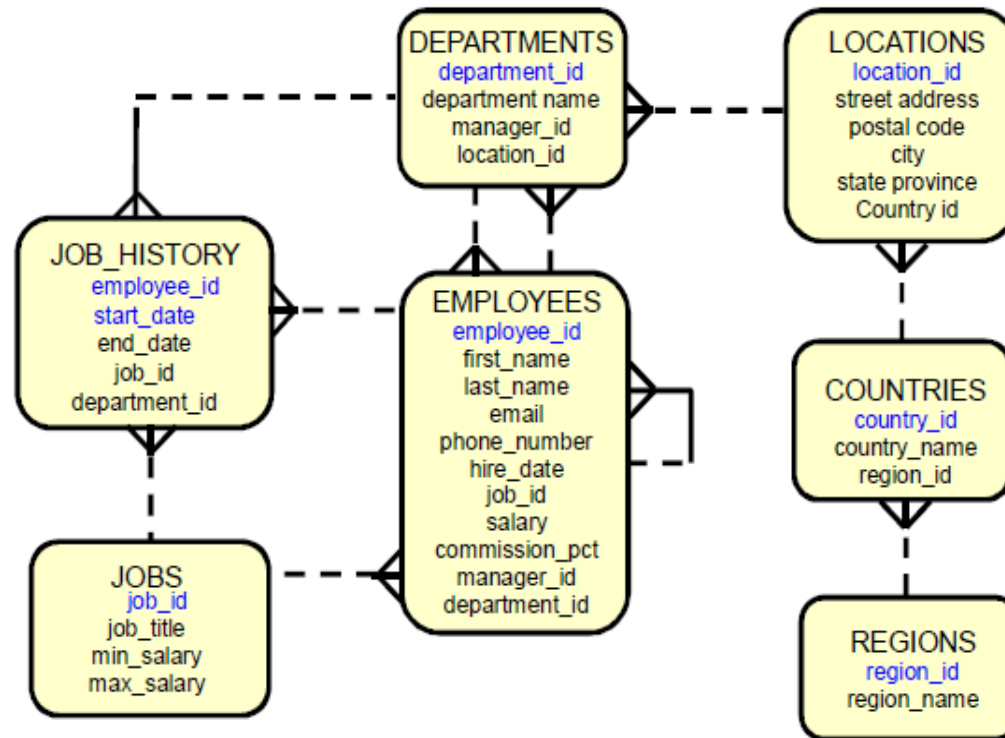
GRANT
REVOKE

Data control language (DCL)

COMMIT
ROLLBACK
SAVEPOINT

Transaction control

Human Resources (HR) Schema





Brief History of Oracle Database

- Founding of Oracle

In **1977**, Larry Ellison, Bob Miner, and Ed Oates started the consultancy Software Development Laboratories, which became Relational Software Inc. (RSI). In **1983**, RSI became Oracle Systems Corporation and then later Oracle Corporation.

In **1979**, RSI introduced Oracle V2 (Version 2) as the first commercially available [SQL](#)-based RDBMS

Oracle Version 3, released in **1983**, was the first relational database to run on mainframes, minicomputers, and PCs. The database was written in C, enabling the database to be ported to multiple platforms.

Version 4 introduced multiversion [read consistency](#). Version 5, released in **1985**, supported client/server computing and [distributed database](#) systems. Version 6 brought enhancements to disk I/O, row locking, scalability, and backup and recovery. Also, Version 6 introduced the first version of the [PL/SQL](#) language, a proprietary procedural extension to SQL.



Oracle7, released in 1992, introduced PL/SQL stored procedures and triggers.

Oracle8 was released in 1997 as the object-relational database, supporting many new data types. Additionally, Oracle8 supported partitioning of large tables.

Oracle8i Database, released in 1999, provided native support for internet protocols and server-side support for Java. Oracle8i was designed for internet computing, enabling the database to be deployed in a multitier environment.

Oracle9i Database introduced Oracle RAC in 2001, enabling multiple instances to access a single database simultaneously. Additionally, Oracle XML Database ([Oracle XML DB](#)) introduced the ability to store and query XML.

Oracle Database 10g introduced [grid computing](#) in 2003

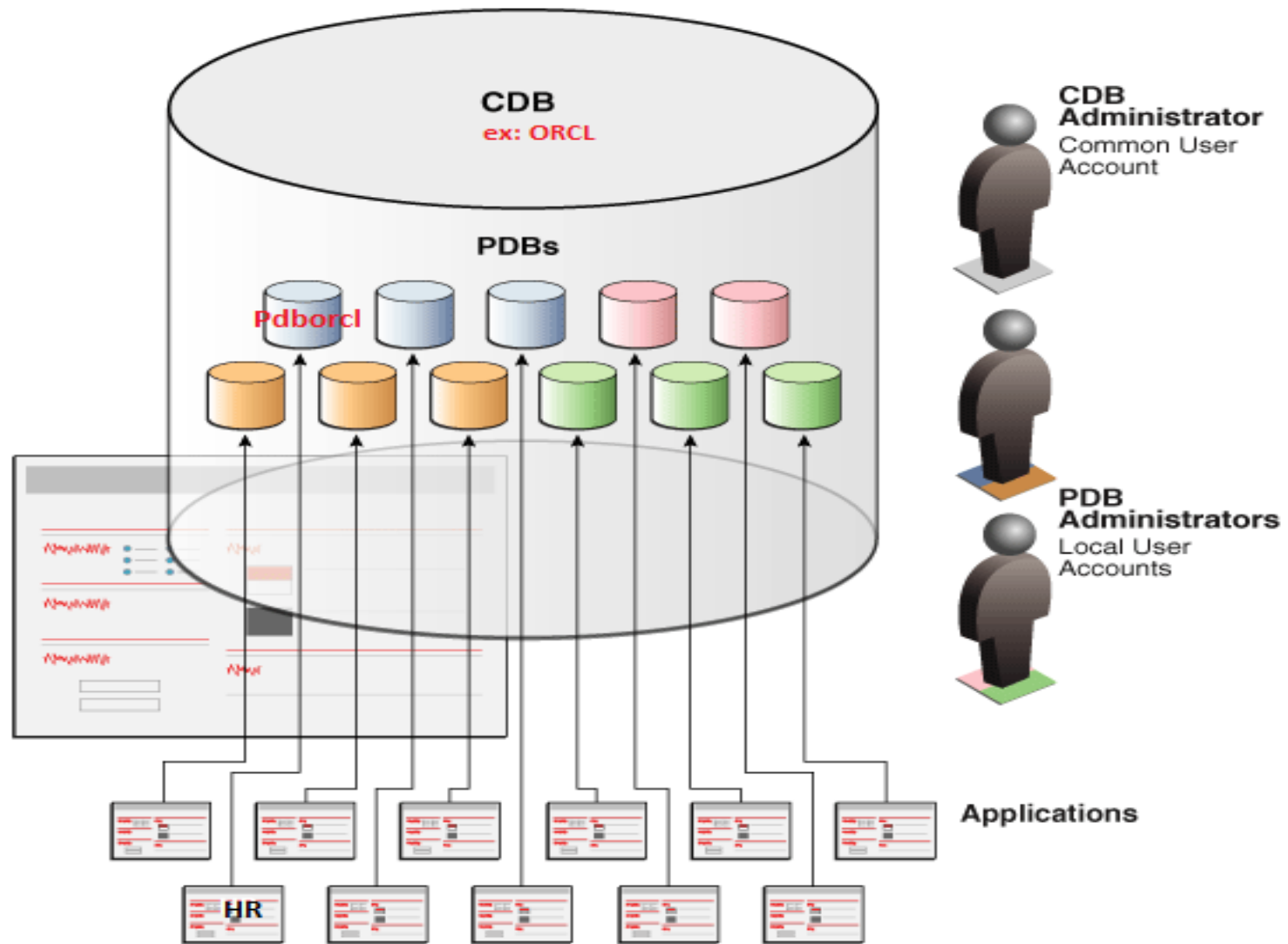
A computing architecture that coordinates large numbers of servers and storage to act as a single large computer

Oracle Database 11g, released in 2007, introduced a host of new features that enabled administrators and developers to adapt quickly to changing business requirements. The key to adaptability is simplifying the information infrastructure by consolidating information and using automation wherever possible.

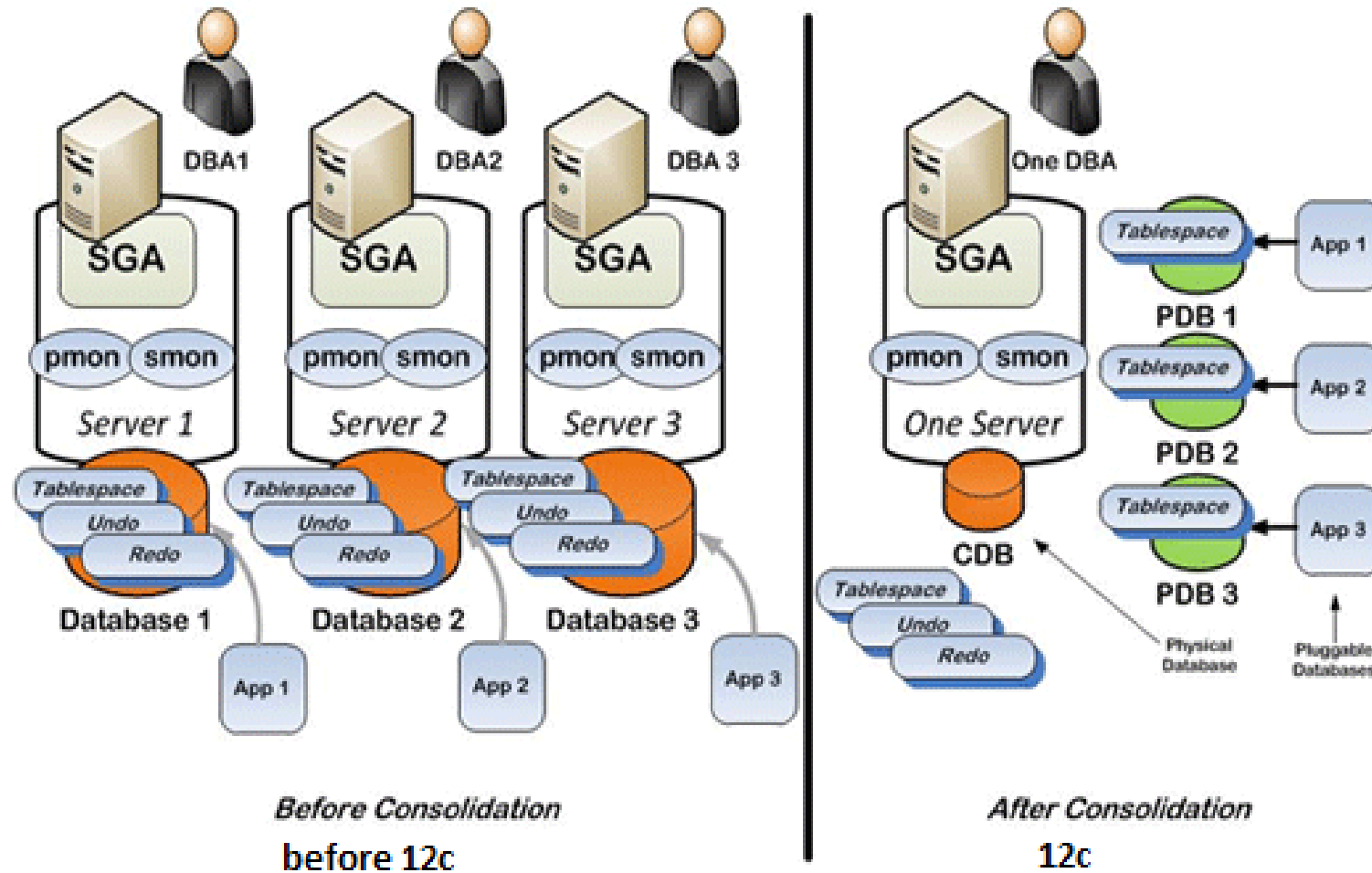


Oracle Database 12c, released in 2013, was designed for the Cloud, featuring a new Multitenant architecture, In-Memory column store, and support for JSON documents. Oracle Database 12c helps customers make more efficient use of their IT resources, while continuing to reduce costs and improve service levels for users.

Architecture for Database 12c



Comparison between 12c and before 12c (11g for example)





Thank You