

# ORACLE®



**PRESENTED BY: Mazhar K**

# History

- **1977:** Co-founded by *Larry Ellison* along with *Bob Miner & Ed Oates* - *Software Development Laboratories (SDL)*.
- **1979:** SDL changed to *Relational Software Inc. (RSI)*
- **1982:** renamed again to *Oracle Systems Corporation*
- Their flagship product, *Oracle database* was launched.
- **1986:** initial public offering (NYSE - ORCL)
- **1995:** *Oracle Systems Corporation* changed its name to *Oracle Corporation*.
- Develop & market database software technology, cloud engineered systems & enterprise software products.

# Major Acquisitions

- **2005:** PeopleSoft, JD Edwards; Oracle Fusion Applications
- **2006:** Siebel Systems (CRM)
- **2007:** Hyperion (EPM)
- **2008:** BEA Systems (EA&M)
- **2010:** Sun Microsystems (Servers, Storage, Networks, Java, MySQL)
- **2012:** Taleo (TMS)
- **2012:** Eloqua (MA platform)
- **2016:** NetSuite (Cloud/ SaaS based ERP)

# Product Portfolio

I broadly classify in 2 ways:

- **Oracle Cloud**

- SaaS - HCM
- IaaS
- PaaS
- SaaS - CX
- SaaS - EPM
- SaaS - ERP
- SaaS - SCM

- **Oracle Software/ Hardware**

- Database
- Applications
- Java
- Business Intelligence
- Middleware
- Enterprise Management
- O/S
- Systems
- Virtualization

The Oracle Database logo is centered on the page. It features the word "ORACLE" in a bold, red, sans-serif font with a registered trademark symbol (®) at the end. Below "ORACLE" is a thin horizontal black line. Underneath the line, the word "DATABASE" is written in a bold, black, sans-serif font. The background of the page is white with a blue and green wavy graphic at the top. There is also a faint, repeating pattern of the word "ORACLE" in a light blue color across the entire page.

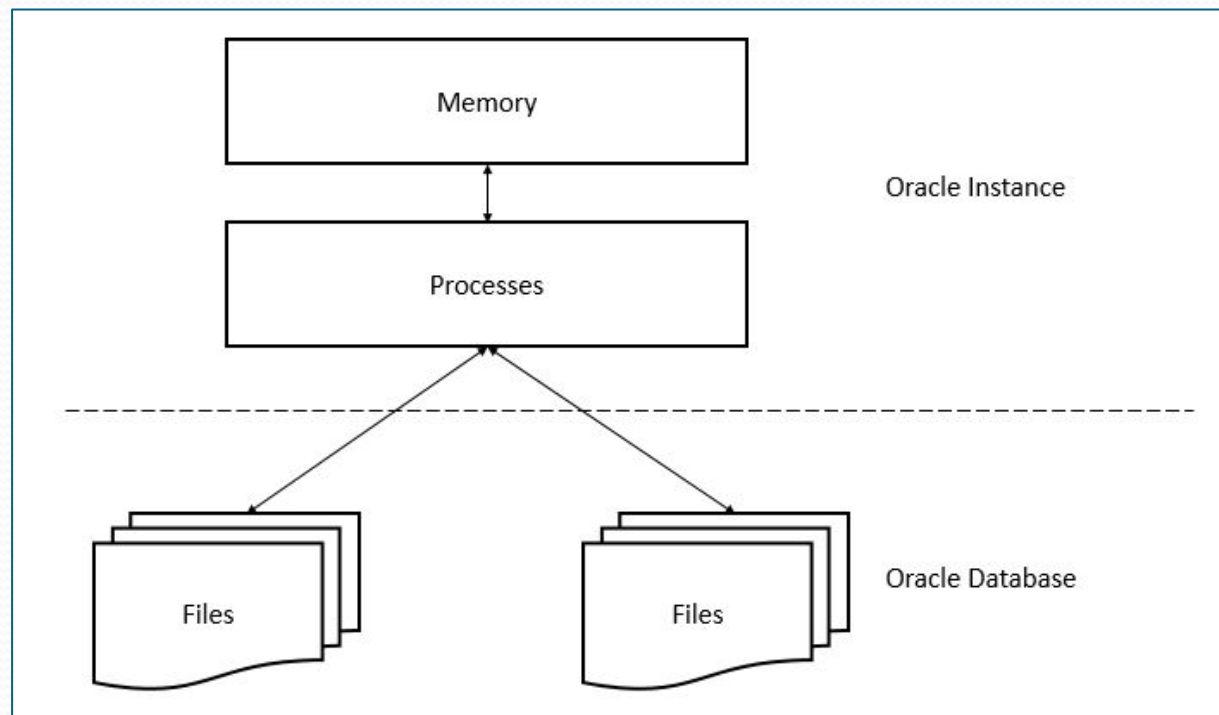
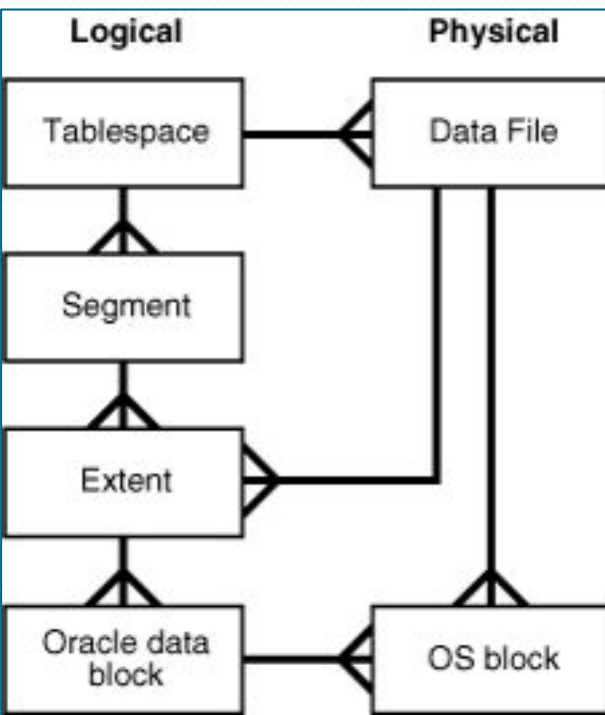
**ORACLE®**

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**DATABASE**

# Oracle Database

- An **Oracle Database** server consists of a **database** and at least one database instance.
- An Oracle database server includes two main parts: **files** (Oracle Database) and **memory** (Oracle Instance)
- Physical & logical storage structure.



# Database Releases/ Versions

Major Oracle versions, with their latest patch-sets are:

- Oracle 7: ... - 7.3.4.5
- Oracle 8: 8.0.3 - 8.0.6
- Oracle 8i: 8.1.5.0 - 8.1.7.4
- Oracle 9i (Release 1): 9.0.1.0 - 9.0.1.4
- Oracle 9i (R2): 9.2.0.1 - 9.2.0.8
- Oracle 10g (R1): 10.1.0.2 - 10.1.0.5
- Oracle 10g (R2): 10.2.0.1 - 10.2.0.5
- Oracle 11g (R1): 11.1.0.6 - 11.1.0.7
- Oracle 11g (R2): 11.2.0.1 - 11.2.0.4
- Oracle 12c (R1): 12.1.0.1 - 12.1.0.2.0
- Oracle 12c (R2): 12.2.0.1 - 12.2.0.1.0

# Oracle Basics

Oracle 12c environment..

- Querying data (What is the use of SELECT statement?)
  - ex: *SELECT*
- Sorting data
  - ex: *ORDER BY* (In order to get sorted records from a table, what is the keyword?)
- Filtering data
  - ex: *DISTINCT, WHERE, AND, OR*
- Joining tables (How do you join tables and what are its types?)
  - ex: *INNER JOIN, LEFT JOIN, RIGHT JOIN, CROSS JOIN*
- Grouping data (What is definition of GROUP BY?)
  - ex: *GROUP BY, HAVING*
- Subquery
  - ex: *Subquery, Correlated Subquery, EXISTS, NOT EXISTS*



# Oracle Basics ...contd

- Set Operators
  - ex: *UNION, INTERSECT, MINUS*
- Modifying data (DML)
  - ex: *INSERT, INSERT ALL, UPDATE, DELETE, MERGE*
- Data definition
  - ex: *CREATE TABLE, ALTER TABLE, DROP TABLE, DROP COLUMNS, TRUNCATE TABLE, RENAME TABLE*
- Oracle data types
  - ex: *NUMBER, FLOAT, CHAR, NCHAR, DATE, INTERVAL, TIMESTAMP*
- Constraints
  - ex: *Primary key, Foreign key, NOT NULL, UNIQUE, CHECK*

# SQL & PL/SQL

- PL/SQL - “*Procedural Language extensions to the Structured Query Language*”.
- Adds many procedural constructs to SQL language to overcome some limitations of SQL.
- Comprehensive programming language solution for building mission-critical applications on Oracle Databases.
- Standard and portable language for Oracle Database development.
- Embedded language & can **only** execute in an Oracle Database.
- High-performance and highly integrated database language.

# PL/SQL

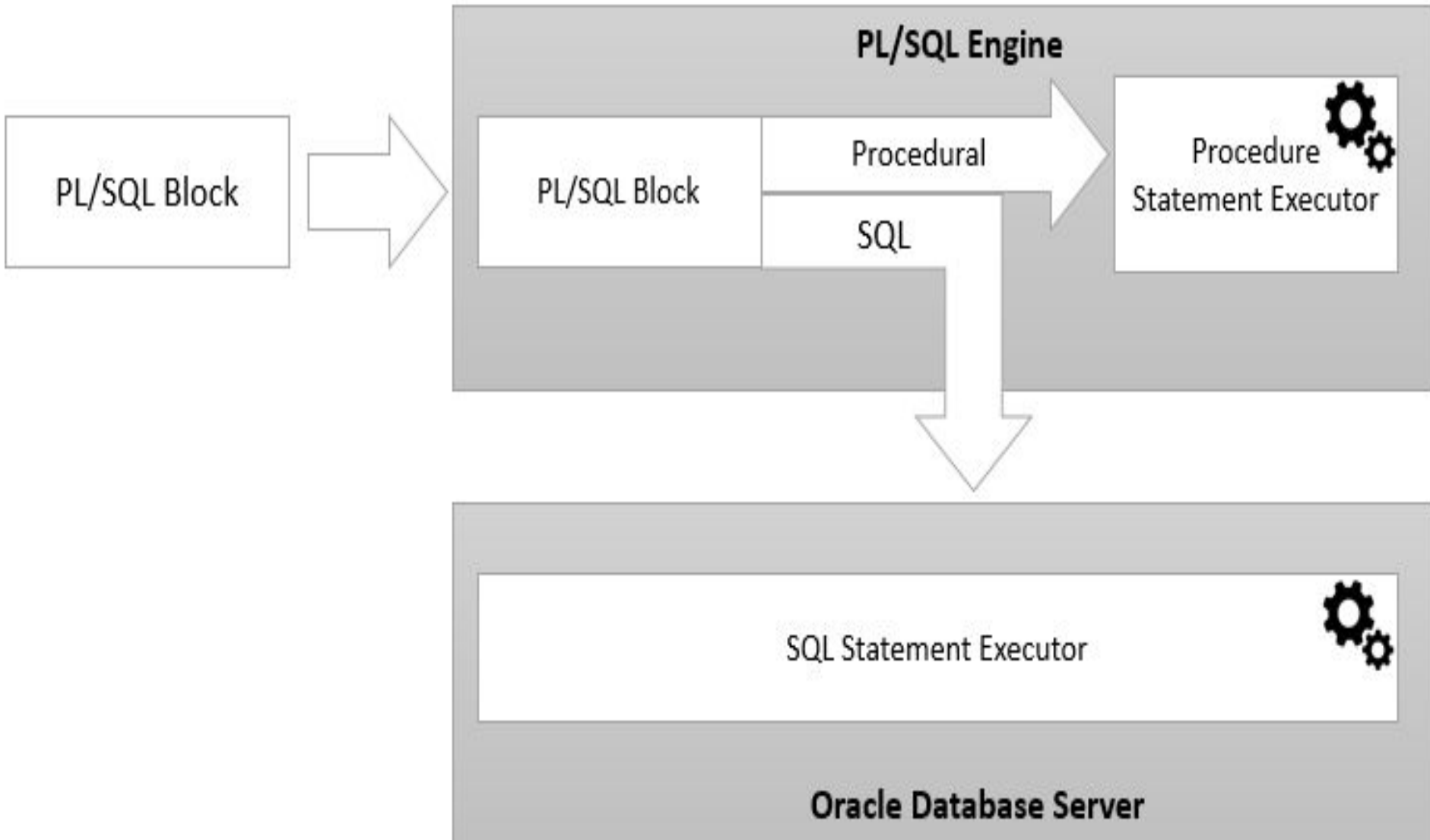
Basics of PL/SQL programming..

- Anonymous Block, Data types, Variables
  - ex: *SQL\*Plus and Oracle SQL Developer tools*
- Conditional control
  - ex: *IF, CASE, GOTO, NULL*
- Iterative processing with loops
  - ex: *LOOP, FOR LOOP, WHILE LOOP*
- Exception handlers
  - ex: *PL/SQL Exception*

# PL/SQL ...contd

- Cursor
  - ex: *SELECT INTO, Cursor, Cursor FOR LOOP*
- Program data
  - ex: *Record*
- Stored procedures and Functions
  - ex: *PL/SQL procedure & PL/SQL function*
- Packages
  - ex: *PL/SQL package specification, PL/SQL package body*
- Triggers
  - ex: *Oracle trigger*

# PL/SQL Architecture



# PL/SQL vs SQL

PL/SQL	SQL
Block of codes - entire program blocks	Single query - DML & DDL operations
Procedural (how)	Declarative (what)
Executes as a whole block	Executes as a single statement
Used to create applications	Used to maintain data
No interaction with database servers	Interacts with database servers
Extension of SQL; contains SQL code inside of it	Cannot contain PL/SQL code

# DBA vs Developer

<b>Oracle DBA</b>	<b>Oracle Developer</b>
Basically responsible for managing databases	One who has extensive knowledge of Oracle databases
Associated with the design, implementation, maintenance and repair of database	Generally works on delivering Apps/ products using Oracle technologies
Monitoring and Maintenance	Development (coding)
Streamlined	Wide range
Works in Production environment	Works in Dev & Testing environment
Inside & Outside of Database	SQL, PL/SQL, procedures, functions, triggers, etc

# DBA vs Apps DBA

A "DBA" typically is either

- Production DBA (looks after the day-to-day running of the database - backups, recovery, tuning, patching, software installation, security, etc.)
- Development DBA (helps in the design process, code review, tuning, deployment, etc.)

An "Apps DBA" also has a skilset to manage the installation, running of the suite of Oracle Applications products (financials, accounts, etc.)

- Typically an **Apps DBA** is a role more closely aligned to that of a Production DBA, with an additional focus on Oracle Applications software.



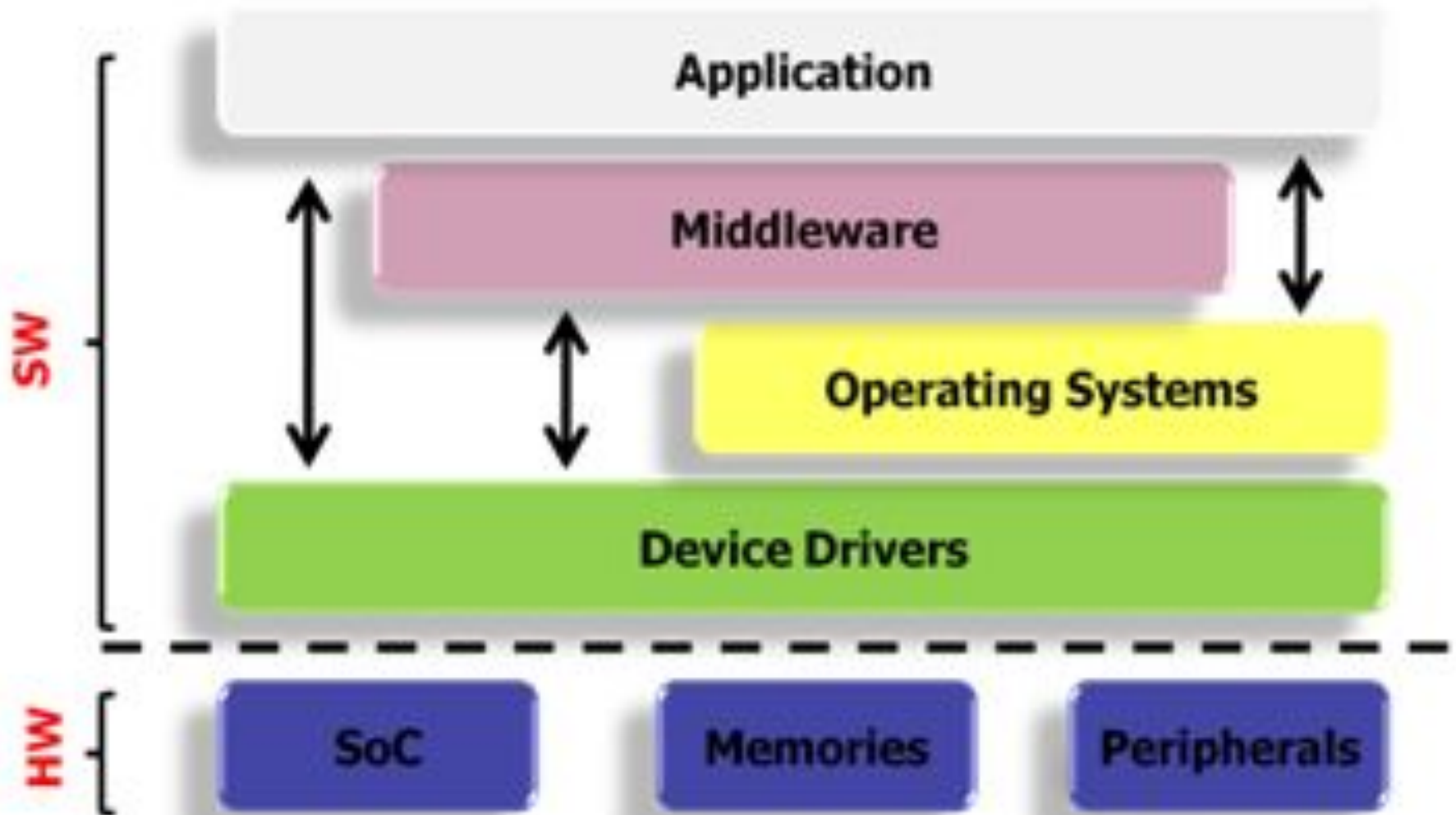
The logo features the word "ORACLE" in red, uppercase, sans-serif font with a registered trademark symbol. Below it is a thin horizontal line, followed by the words "FUSION MIDDLEWARE" in black, uppercase, sans-serif font. The entire logo is centered within a white rectangular box.

**ORACLE<sup>®</sup>**  
**FUSION MIDDLEWARE**

# Middleware

- Middleware is a solution that allows applications to communicate with one another.
- In other words, Middleware is the software that assists an application to interact or communicate with other applications, networks, hardware and/ or operating systems.
- Oracle Fusion Middleware is the digital business platform for the enterprise and the cloud.
- It enables enterprises to create and run agile, intelligent business applications while maximizing IT efficiency through full utilization of modern hardware and software architectures.

# Software vs Hardware



# Middleware

Various components:

- Cloud Application Foundation
  - Weblogic Server
  - Coherence
- Data Integration
  - Oracle Data Integrator (ODI)
  - GoldenGate
  - Enterprise Data Quality
- Oracle IT Architecture
  - Oracle Technical architecture

# Middleware ...contd

- Identity Management
  - Identity Manager
  - Access Manager
  - Directory Servers
  - Identity Analytics
  - Adaptive Access Manager
  - Enterprise Gateway
- MW Development Tools
  - ADF & MAF
  - Forms and Reports
- SOA & BPM
  - SOA Suite
  - SOA Governance
  - ESB
  - B2B
  - BPM
- WebCenter
  - WC Content
  - WC Portal
  - WC Sites

# Weblogic Server

- **Oracle WebLogic Server** is a Java EE application server currently developed by Oracle Corporation.
- Industry's best application server for building and deploying enterprise Java EE applications.
- Supporting new features for lowering cost of operations, improving performance, enhancing scalability and supporting the **Oracle Applications** portfolio.
- Oracle **WebLogic** Server forms part of Oracle **Fusion Middleware** portfolio and supports Oracle, DB2, Microsoft SQL Server, MySQL Enterprise and other JDBC-compliant databases.
- Similar examples: JBoss, WebSphere, Tomcat

# App vs Web Server

Application Server	Web Server
Exposes business logic to client apps through various protocols incl. HTML	Handles only HTTP protocol
Serves web & enterprise based applications (JSP, EJB, Servlets)	Serves and delivers web pages to client over HTTP protocol
To deliver various applications to another device	Keeping PHP, ASP, HTML etc files available for web browsers
distribution transactions and EJB's	Servlets and JSP
High resource utilization	Low

# Oracle Data Integrator

- **ODI** is a comprehensive data integration platform that covers all data integration requirements: from high-volume, high-performance batch loads, to integration processes, to SOA-enabled data services.
- **ODI** is an **Extract, load and transform (ELT)**, in contrast with the ETL tool produced by Oracle that offers a graphical environment to build, manage and maintain data integration processes in business intelligence systems.
- **ODI** is the most cost-effective solution available today



# Oracle GoldenGate

- **Oracle GoldenGate** is a comprehensive software package for real-time data integration and replication in heterogeneous IT environments.
- A platform that enables replication of transactional data from a single source or multiple sources to a single target or multiple targets in real time, with low overhead on existing OLTP systems.
- **What is Data Pump process in GoldenGate?**
  - **Data Pump** export/import: A command-line utility used to backup individual tables and schemas into flat files and import from flat files.
  - **Data Pump** extract: A process that takes and applies archived redo logs to a remote database.

# How GoldenGate works?

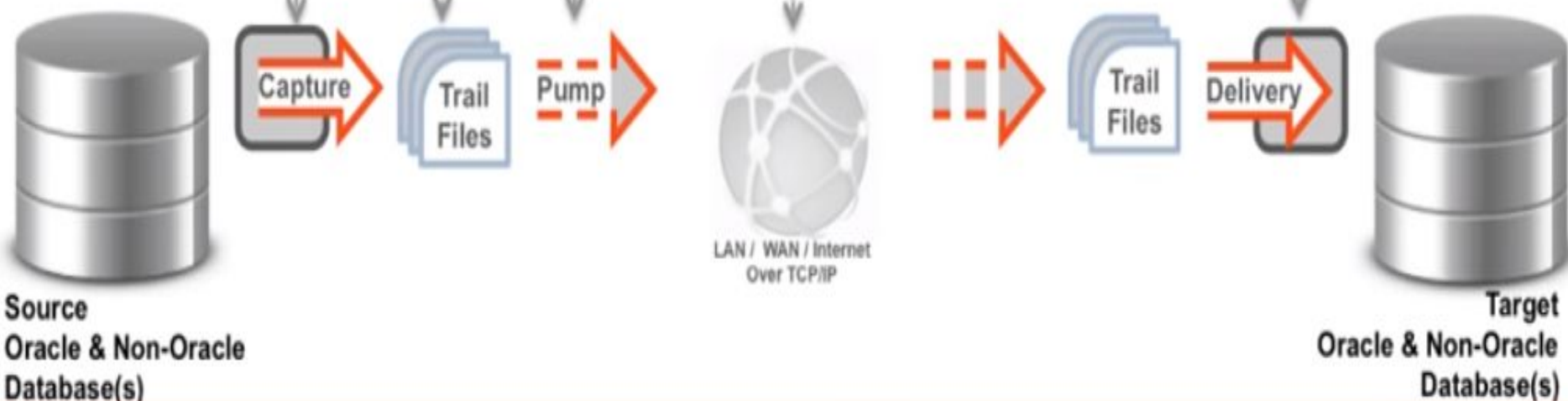
Capture: committed transactions are captured (and can be filtered) as they occur by reading the transaction logs. New with V.11.2.1, GoldenGate offers two options for capture for Oracle; Classic & Integrated Capture

Trail: stages and queues data for routing.

Pump: distributes data for routing to target(s).

Route: data is compressed, encrypted for routing to target(s).

Delivery: applies data with transaction integrity, transforming the data as required.



# GoldenGate Deployment Models

## Unidirectional

Query Offloading  
Zero-Downtime Migration



## Bi-Directional

Hot Standby or  
Active-Active for HA



## Peer-to-Peer

Load Balancing  
Multi-Master



## Broadcast

Data Distribution



## Integration/Consolidation

Data Warehouse



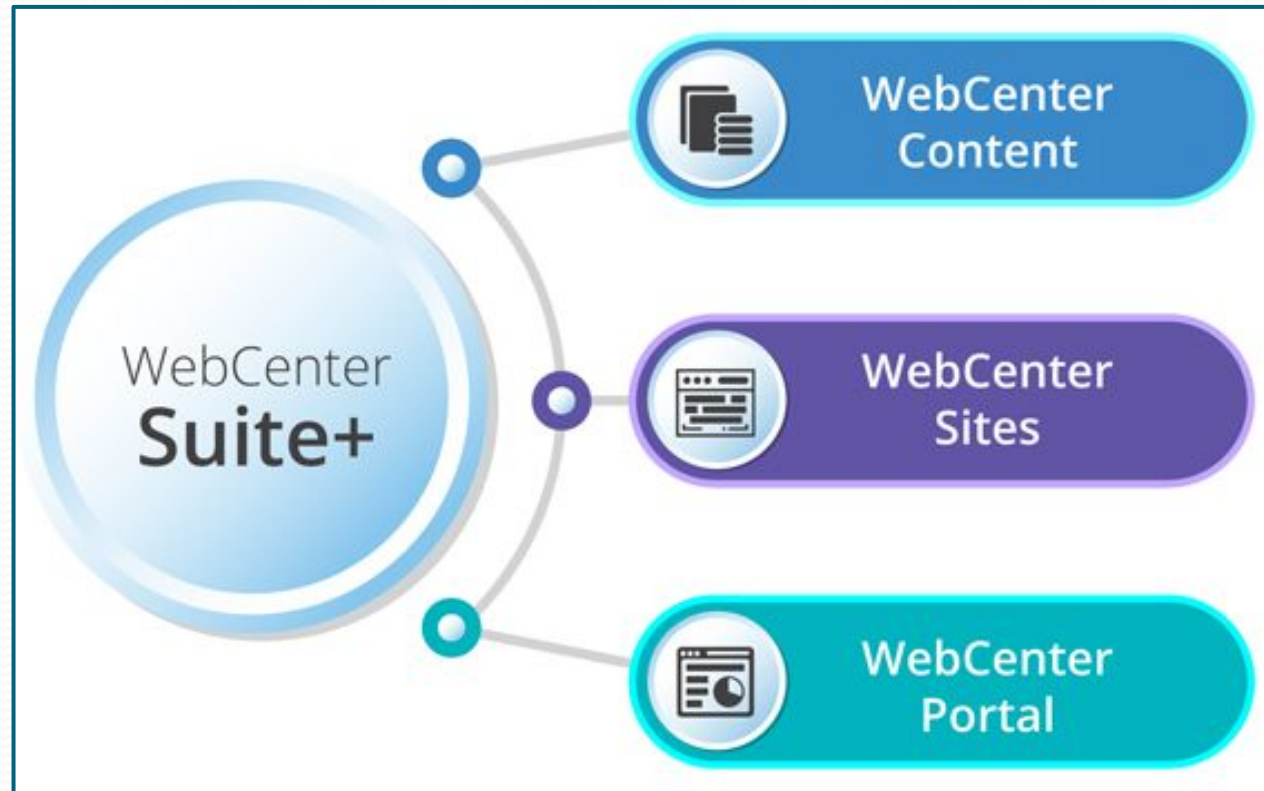
## Data Distribution

via Messaging



# WebCenter

- **WebCenter** is a User Engagement software products built on top of JSF based Oracle Application Development Framework (ADF)
- Three main products in the WebCenter Portfolio as per the below diagram.



# WebCenter ...contd

- For example,
  - Lots of customizations and flexibility, then a WebCenter App is a solution.
  - Require features that are specific to spaces like pages or events then you require WebCenter Spaces, especially the personal pages part.
  - Require different group spaces, you will still go for WebCenter Spaces

# WebCenter ...contd

- The runtime portal and Web 2.0 framework on which all Oracle WebCenter technology runs.
- **WebCenter Portal** enables businesses to deliver intuitive responsive and mobile-friendly UX for the enterprise portal solutions -- integration with the enterprise applications on-premise or in the Cloud.
- A unique platform for delivering omni-channel solutions that leverage Bootstrap themes.

# Middleware Development

- Tools used for:
  - application development
  - database development, and
  - business intelligence
- Support any development approach, technology platform, or operating system.
- Application Development Framework (**ADF**)
- Mobile Application Framework (**MAF**)
- Forms and Reports
- Ability to implement solutions based on Oracle Fusion technologies, with a focus on using Oracle **ADF** and **JDeveloper**

# ADF

- Oracle ADF is an end-to-end Java EE framework that simplifies application development.
- It supports rapid application development based on ready-to-use design patterns, metadata-driven and visual tools.
- It's based on MVC framework

<b>Model</b>	<b>View</b>	<b>Controller</b>
EJBs	Swing	JSF
Web Services	JSP	Struts
JavaBeans	Facelets	ADF Task Flows
Portlets	ADF Faces	
ADF Bus Comp		



# MAF

- Oracle MAF is a hybrid mobile framework that enables developers to rapidly develop single-source applications and deploy to:
  - Apple's iOS
  - Google's Android, and
  - Microsoft Windows 10
- Oracle MAF leverages Java, HTML5, CSS3 and JavaScript to deliver a complete MVC framework with declarative UI definition, device features integration and built-in security.
- Below link will help you understand with an example:
  - <https://youtu.be/GDtkb5khmq5>

# Forms & Reports

- **Oracle Forms** is a software product for creating screens that interact with an **Oracle** database.
- It has an IDE including an object navigator, property sheet and code editor that uses PL/SQL.
- **FMB** is a **file** extension used by **Oracle Forms** which is the IDE environment for **Oracle** applications.
- A **database report** is the formatted result of **database** queries and contains useful data for decision-making and analysis.
- A front-end interface that calls/ runs back-end database queries that are formatted for easy application usage.

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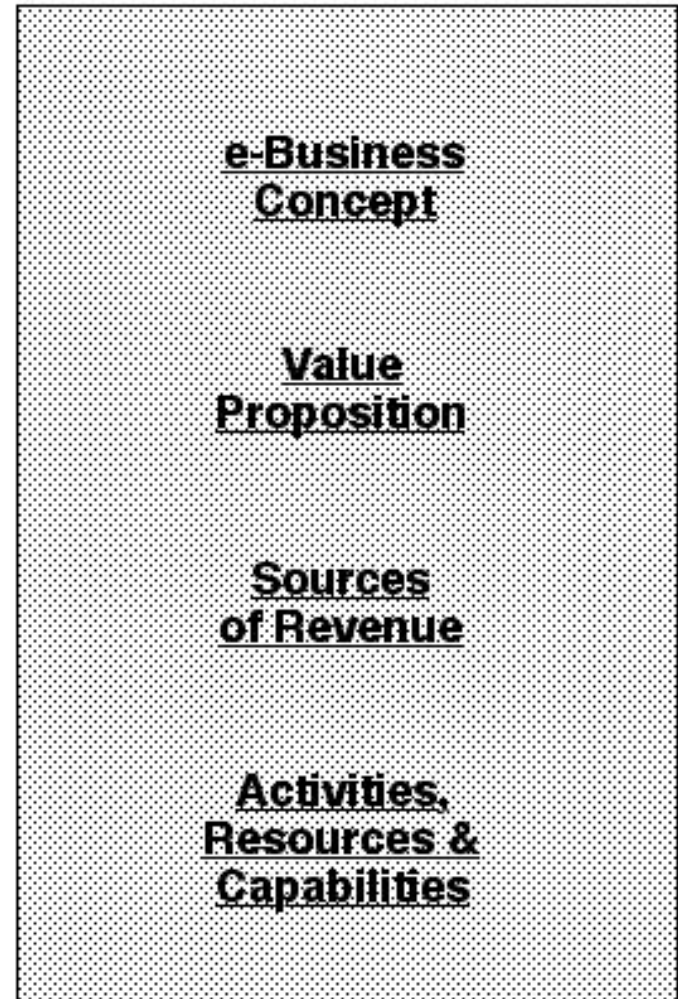
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**E-BUSINESS SUITE**

# Applications

- e-Business Suite
  - EBS CRM
  - EBS FM
  - EBS SCM/ Procurement
  - EBS e-commerce
  - EBS MDM
  - EBS Manufacturing
  - EBS Sales
  - EBS Tools & Tech
  - EBS Service
  - EBS PM
  - EBS PLM

## e-Business Model



# Applications ...contd

- Demantra
- CRM on demand
- Fusion Applications
- Hyperion
- JD Edwards
- Oracle Commerce
- PeopleSoft
- Siebel
- Oracle Transportation Management (OTM)
- User Productivity Kit (UPK)
- Oracle Policy Automation
- Governance, Risk and Compliance (GRC)

# e-Business Suite

Functional	Techno-Functional
Only focuses on the functional aspects of the Application	Functional + Technical (customizations/ configurations)
FM: GL, AP, AR, Assets, Cash Management, Payments, Inventory, Service, Projects, Purchasing, Contracts, iSupplier & iExpenses	Functional + technical aspects of EBS deployment, coding/ development, customizations, testing and user training
<b>BR.100</b> Define Applications Setup <b>MD.050</b> Create Application extensions functional design	<b>BR.100</b> Define Applications Setup <b>MD.050</b> Create Application extensions functional design <b>MD.070</b> Create Application extensions technical design <b>MD.120</b> Create Installation routines
PTP, OTC, GL Records	Forms/ Reports, Workflow, PL/SQL, SQL*Plus, UNIX shell Script

# PeopleSoft

- **PSFT** provided **HRMS**, **FMS**, **SCM**, **CRM** and **EPM** software, as well as software for manufacturing, and student administration.
- **PSFT FMS** and **SCM** are part of the same package, commonly known as **FSCM**.
- **PSFT CS** is a separate package developed as a student information system for colleges and universities.
- **PSFT 9.2** is the current version in use & **9.3** to be released soon.
- **PeopleTools 8.56** is the latest version in use
- **PeopleCode & App Engine** along with design & development
- App designer, SQR, integration broker, data mover, PS query, and BI Publisher

# Fusion Applications

- Oracle Fusion and Oracle Cloud - are they same?
- Oracle Fusion - Middleware & Applications
- **OFA** consists of applications distributed across various product families including FM, HCM, CRM SCM, Procurement, Governance, and Project portfolio.
- Cloud coming to play - Oracle Fusion Applications as a service.
- Oracle Cloud not only have Applications (SaaS), but also has database and platform (PaaS) and Infrastructure (IaaS). Oracle Cloud encompasses all SaaS, PaaS and IaaS offerings.
- Oracle ERP Cloud & HCM Cloud as examples of SaaS offerings.



# Siebel

Siebel	Salesforce
multi-faceted application	multi-tenant application
Expensive per user per month	Only costs \$65-75 per user per month but without integrations
E-Commerce, E-Support, loyalty programs and partner relationship management (PRM) capabilities	Capabilities as per customers need & not by default (Apex, VisualForce)
Siebel 8.1, 8.2	Salesforce Classic, Salesforce Lightning
JavaScript	Apex (Java, C#)

# Oracle UPK

- Oracle UPK easy-to-use and comprehensive content development, deployment, and maintenance platform for increasing project, program, and **user productivity**.
- Oracle UPK drives user productivity and mitigates risk through all phases of the project lifecycle.
- Drives user adoption and productivity
- Maximize ROI and Mitigate Risk
- Streamline implementation

