Top 10 Features in Oracle Database for Developers

Over the years*****

Oracle 10g (had R1 and R2)
'g' stands for grid, released in 2003

➢ Automatic Storage Management (ASM): Simplifies the layout of data files, control files, and log files to optimize performance.

➢ Flashback Technology: Allows for point-in-time recovery and querying of data, providing a safety net against user errors and data corruptions.

➢ Data Pump: A faster, more flexible data movement utility compared to the traditional export/import tools.

➢ Regular Expression Support: Enhances searching capabilities within the database using complex pattern matching.

➢ SQL Model Clause: Introduces a new way to define multidimensional arrays and perform complex calculations.

➢ Recycle Bin: Permits the retrieval of dropped tables and their dependent objects until they are purged from the recycle bin.

➢ Automated Database Diagnostic Monitor (ADDM): Provides automated performance diagnostics and tuning recommendations.

➢ Grid Computing: Facilitates resource sharing and dynamic resource allocation across a grid of servers.

➢ Oracle Real Application Clusters (RAC): Enhances the scalability and availability of user applications.

➢ Server Manageability: Includes features like Automatic Workload Repository (AWR), Server-Generated Alerts, and Advisors for SQL Tuning.

Oracle 11g (had R1 and R2)
'g' stands for grid, released in 2007

➢ Enhancements to Regular Expression Built-in SQL Functions: New functions like REGEXP_COUNT and enhancements to REGEXP_INSTR and REGEXP_SUBSTR.

➢ SIMPLE_INTEGER Datatype: A subtype of PLS_INTEGER that can increase the speed of integer arithmetic in natively compiled code.

➢ Sequences in PL/SQL Expressions: Allowed the use of sequences directly in PL/SQL expressions.

➢ Dynamic SQL Enhancements: Improvements in dynamic SQL capabilities for more flexible code.

➢ Generalized Invocation: Enhanced subprogram invocation with named and mixed notation.

➢ PL/SQL Native Compiler: Direct generation of native code from PL/SQL source code.

➢ New PL/SQL Compiler Warning (PLS-00436): Helps identify potential issues during compilation.

➢ Restriction in FORALL Statements Removed: More flexibility in writing bulk operations.

➢ Automatic Subprogram Inlining: Improves performance by automatically inlining subprograms.

➢ Trigger Enhancements: New capabilities for database triggers.

Oracle 12c (had R1 and R2)
'c' stands for cloud, released in 2013

➤ Increased Column Size Limits: The VARCHAR2, NVARCHAR2, and RAW data types allow for a larger number of characters than previous versions.

➤ JSON Support in the Database: Enhanced capabilities to store, process, and retrieve JSON data within the database.

➤ Lateral Clause for Inline Views: Allows the inclusion of columns from a subquery in the FROM clause.

➤ CROSS APPLY and OUTER APPLY Clauses: Enables joining a table to a row source returned by a subquery.

➤ New Optimization – Partial Join Evaluation: Improves performance by evaluating joins only when necessary.

➤ Cascading Truncate: Allows truncation of a parent table and its related child tables.

➤ Pluggable Databases: Facilitates the management of multiple databases as a single entity.

➤ Invisible Columns: Allows columns to be marked as invisible to applications and queries unless explicitly referenced.

➤ IDENTITY Columns: Simplifies the process of creating auto-incrementing columns for primary keys.

➤ Session Sequences: Provides session-specific sequences that do not require coordination across sessions.

Oracle 18c
'c' stands for cloud, released in 2018

This was an Innovation Release

Oracle 19c
'c' stands for cloud, released in 2019

➢ Automatic Indexing: AI-driven index management that optimizes performance without manual intervention.

➢ Active Data Guard DML Redirection: Allows DML operations on standby databases, redirecting changes to the primary database.

➢ SQL Quarantine: Prevents execution of resource-intensive SQL statements to maintain system performance.

➢ Database In-Memory: Enhancements to in-memory capabilities for faster analytics and reporting.

➢ Data Guard Multi-Instance Redo Apply: Supports the In-Memory Column Store in RAC databases, improving performance.

➢ Private Temporary Tables: Enables session-specific temporary tables that are dropped after the session or transaction ends.

➢ Hybrid Partitioned Tables: Facilitates partitioning across on-premise and cloud storage, optimizing costs and performance.

➢ Real-Time Statistics: Provides up-to-date statistics for the optimizer during DML operations.

➢ JSON Data Guide: Improves handling and querying of JSON data within the database.

➢ Blockchain Tables: Offers tamper-resistant and immutable tables for secure operations.

Oracle 21c
'c' stands for cloud, released in 2021

This was an Innovation Release

Oracle 23c
'c' stands for cloud, released in 2023

➢ Wide Tables: Now supports up to 4,096 columns in a table, which can simplify application design for certain workloads.

➢ Transparent Application Continuity: Protects applications from outages at various layers, ensuring zero downtime for database clients.

➢ Automatic Transaction Rollback: Assigns priorities to transactions and automatically rolls back lower-priority transactions if they block higher-priority ones beyond a set timeout.

➢ Aliases in GROUP BY Clause: Introduces the ability to use aliases in the GROUP BY clause of a SELECT statement.

➢ FROM Clause - Now Optional: Simplifies SQL queries by making the FROM clause optional where applicable.

➢ Boolean for SQL: Adds native Boolean data type support for SQL, enhancing logical operations within the database.

➢ IF [NOT] EXISTS DDL Clause: Provides a new DDL clause to check the existence of database objects before attempting to create or drop them.

➢ New Table Value Constructor: Allows the creation of table values within a SELECT statement, improving data manipulation capabilities.

➢ Multivalue INSERTs: Enables inserting multiple values with a single INSERT statement, increasing efficiency for batch operations.

➢ RETURNING Clause of UPDATE and MERGE Statement: Enhances the RETURNING clause to provide more flexibility in retrieving data after DML operations.

History of Oracle at a glance

History of Oracle Database Versions

Source: https://ittutorial.org/
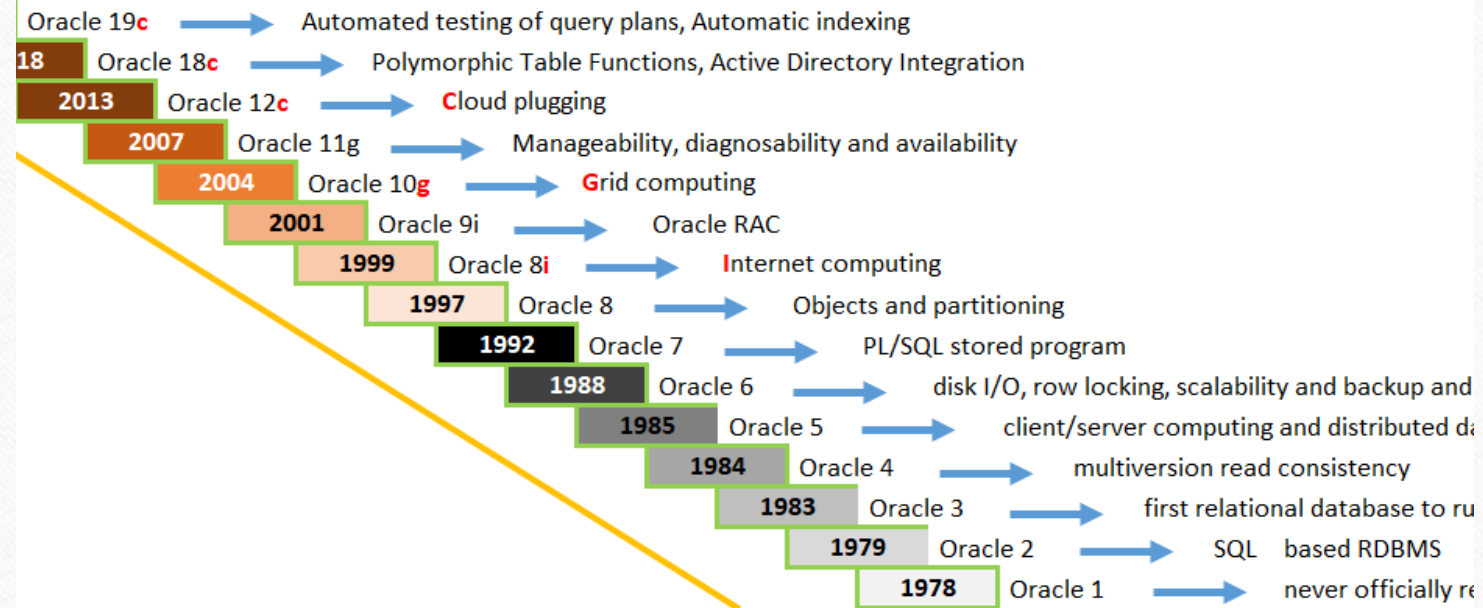
Sources

Search Engine

Oracle Database Documentation

Oracle Base

Thanks

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