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ORACLE DATABASE 12c

ORACLE®

Oracle Database 12*c*

Product Family

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Database Editions

Oracle Database 12c is available in choice of on-premises editions that can easily scale from small to large single servers and clusters of servers. In addition, several Oracle Database 12c Enterprise Edition only options are available for specific business and IT requirements. This paper provides a high-level introduction to all on-premises Oracle Database 12*c* options, Industry-specific Data Models, Enterprise Data Management tools, Engineered Systems and products. There are two on-premises editions of Oracle Database 12c:

» **Oracle Database 12***c* **Standard Edition 2** delivers unprecedented ease-of-use, power, and price/performance for database applications on servers that have a maximum capacity of two sockets.

» **Oracle Database 12c Enterprise Edition** is available on single and clustered servers with no socket limitation. It provides efficient, reliable and secure data management for mission-critical transactional applications, query-intensive big data warehouses, and mixed workloads.

Both on-premises editions of Oracle Database 12*c* are built using the same code base, are available on a choice of operating systems and include a common set of application development tools and programming interfaces. Customers can start out with Standard Edition 2, and as business grows or depending on changing requirements, easily upgrade to Enterprise Edition. It's simple to upgrade; no application changes are required to get the performance, scalability, reliability, security and manageability for which Oracle is renowned.

Oracle Cloud also offers customers a wide range Database Services that are 100% compatible with on-premises editions. Please refer to cloud.oracle.com/database for a complete list of Database Services available on Oracle Cloud.

Note: Please refer to Oracle Database Licensing Information for more detailed information.

Enterprise Edition Options

Both editions of Oracle Database 12*c* have a common set features and functionality to meet the varying requirements of today's business applications. Additionally, Oracle Database 12*c* Enterprise Edition offers a range of options for more demanding large-scale, cloud computing, online transaction processing, big data, and other mission-critical business applications. The following sub-sections highlight all the options available for Oracle Database 12c Enterprise Edition.

Oracle Active Data Guard

Oracle Active Data Guard enables read-only access to a physical standby database for queries, reporting, web-based access, etc., while continuously applying changes received from a production database. Oracle Active Data Guard now includes Global Data Services, Far Sync, Fast Sync, Real-time cascading, and DML on Global Temporary Tables. No changes to the production database are lost during testing. Oracle Active Data Guard also enables the use of fast incremental backups when offloading backups to a standby database.

Oracle Advanced Analytics

Oracle Advanced Analytics empowers data and business analysts to extract knowledge, discover new insights and make predictions—working directly with large data volumes in Oracle Database. It provides a comprehensive advanced analytics platform through a combination of powerful in-database algorithms and open source R algorithms. Analytic capabilities are accessible via SQL and R languages, and through the SQL Developer extension or open-source R clients. Together, these features enhance Oracle Database 12*c* with a range of analytical functionality for data mining, text mining and predictive analytics, summary and descriptive statistics, exploratory data analysis and graphics, comparative statistics, correlations and other advanced numerical computations.

Oracle Advanced Compression

Oracle Advanced Compression helps manage growing amounts of data in a cost effective manner. Oracle Database 12c introduces a new Heat Map feature that monitors data access, providing deep insight into how data is accessed by applications and users. In addition, a new Automatic Data Optimization feature uses simple policies to trigger automatic movement of tables, partitions, and entire tablespaces across different storage and compression tiers over time. Oracle Advanced Compression compresses any type of data, including structured and unstructured data, as well as network traffic and data backups. As a result, Oracle Advanced Compression and related Information Life Cycle Management capabilities enable efficient use of storage resources to lower costs.

Oracle Advanced Security

Oracle Advanced Security helps customers protect sensitive information and comply with various privacy and compliance regulations including breach notification laws and the Payment Card Industry Data Security Standard (PCI-DSS) by enabling encryption inside the database that is transparent to applications and enabling redaction of sensitive data before it leaves the database. Transparent Data Encryption provides encryption of data stored in the database, exported from the database using DataPump, or disk-based backups using Oracle RMAN. Data Redaction is with the release of Oracle Database 12*c* and provides the ability to redact sensitive information such as credit card data and social security numbers displayed by queries and applications.

Oracle Database In-Memory

Oracle Database In-Memory transparently extends the power of Oracle Database 12c to enable organizations to discover business insights in real-time while simultaneously improving transactional performance. Oracle Database In-Memory delivers leading-edge in-memory performance without the need to restrict functionality or accept compromises, complexity and risk. Deploying Oracle Database In-Memory with virtually any existing Oracle Database compatible application is as easy as flipping a switch--no application changes are required. It is fully integrated with Oracle Database's scale-up, scale-out, storage tiering, availability and security technologies making it the most industrial-strength offering in the industry.

Oracle Database Vault

Oracle Database Vault helps customers increase the security of existing applications and address regulatory mandates that call for separation-of-duties, least privilege and other preventive controls to ensure data integrity and data privacy. It proactively protects application data stored in Oracle Database from being accessed by privileged database users. Oracle Database Vault controls who, when, and where database and application data can be accessed—helping protect businesses against the most common security threats that target privileged user accounts or attempt to bypass application security. Enforcing separation of duties, even among administrators, Oracle Database Vault additionally serves as a powerful preventive control to help comply with today's stringent compliance and privacy requirements.

Oracle TimesTen Application-Tier Database Cache

Oracle TimesTen Application-Tier Database Cache (TimesTen Cache) can improve application transaction response times and throughput by caching performance-critical subsets of an Oracle Database in the application tier. The TimesTen Cache option of Oracle Database 12c brings 'hot' data closer to applications by processing SQL transactions at memory speed and off-loading the data processing to middle tier resources. With Oracle Database 12c, the ability to transparently deploy TimesTen Cache with existing Oracle database applications becomes much easier – with common data types, SQL and PL/SQL support, and native support for the Oracle Call Interface (OCI), JDBC, ODP.NET, and ODBC.

Oracle Label Security

Oracle Label Security adds extensive protection for sensitive information. This option employs labeling concepts used by government, defense, and commercial organizations to protect sensitive information and provide data separation. It delivers multilevel security capabilities to protect access to data right down to individual rows in tables and addresses the real world data security and privacy problems faced by government and commercial entities worldwide. Oracle Label Security can be combined with Virtual Private Database, Secure Application Roles, and Oracle Database Vault to provide powerful solutions for protecting personally identifiable information.

Oracle Multitenant

Oracle Multitenant introduces a new architecture in Oracle Database 12c that delivers the highest level of database consolidation, without changes to existing applications. Oracle Multitenant addresses historical DBA pain points: provisioning, patching, and consolidation. This new architecture makes it easy to create a container database and simply plug-in multiple databases working seamlessly with existing Oracle Database functionality as Real Application Clusters and Active Data Guard. In addition, Oracle Multitenant helps reduce IT costs and provide the ability to manage many databases as one, while retaining the isolation of separate databases, without requiring any changes to applications or access rights.

Oracle On-line Analytical Processing

Oracle OLAP delivers advanced multidimensional analytic capabilities within Oracle Database 12*c*. It's designed to provide excellent query performance, fast incremental updates of data sets, efficient management of summary data, and rich analytic content. The Oracle OLAP option is a full-featured on-line analytical processing (OLAP) server embedded within the Oracle Database. It can be used to improve SQL-based business intelligence tools and applications by improving query performance and enriching them with analytic content. As an OLAP solution that is deeply embedded in Oracle Database 12*c*, Oracle OLAP enables centralized management of data and business rules in a secure, scalable and enterprise-ready platform.

Oracle Partitioning

Oracle Partitioning enhances the data management environment for OLTP, data marts, and data warehouse applications by adding significant manageability, availability, and performance capabilities to large underlying database tables and indexes. It permits large tables to be broken into individually managed smaller pieces, while retaining a single application-level view of the data. A comprehensive variety of partitioning methods are supported including, the ability to allow very large tables (and their associated indexes) to be partitioned into smaller, more manageable units, providing a "divide and conquer" approach to very large database management. Partitioning also improves performance, as the optimizer will prune queries to only use the relevant partitions of a table or index in a lookup. Oracle Partitioning can also manage the lifecycle of information, eliminating the need to continually buy high-end storage confining data growth to a scalable, low-end storage solution.

Oracle Real Application Clusters

Oracle Real Application Clusters (Oracle RAC) harnesses the processing power of multiple, interconnected servers on a cluster. It enables access to a single database from multiple servers on a cluster, insulating both applications and database users from server failures, while providing performance that scales out on-demand at low cost. Oracle RAC is a vital component for delivering agile database services on the Cloud. Oracle Database 12*c* along with Automated Storage Management (ASM) and Oracle Clusterware, further helps virtualize storage, database servers, and all the other aspects related to deploying and managing database services in a Cloud environment.

Oracle RAC One Node

Oracle RAC One Node is the one-node version of Oracle Real Application Clusters. It enables customers to take advantage of clustering in an active-passive configuration. Oracle RAC One Node makes the database highly available in the presence of computer hardware failures, software failures, or planned software maintenance events. In the event of failures, the database instance is restarted on another server in the cluster and the client connections are moved to the new instance. Oracle RAC One Node can also be online upgraded to full active-active Oracle RAC configuration in order to scale to multiple servers.

Oracle Real Application Testing

Agile businesses want to be able to quickly adopt new technologies, whether it's operating systems, servers, or software, to help them stay ahead of the competition. However, change often introduces a period of instability into mission-critical IT systems. Oracle Real Application Testing enables organizations to quickly adopt new technologies while eliminating the risks associated with change. It combines a workload capture and replay feature with an SQL performance analyzer to help test changes against real-life workloads, for fine-tuning before moving into production.

Oracle Spatial and Graph

Oracle Spatial and Graph provides advanced features for spatial data management and analysis as well as graphs for physical, network, and social and linked data applications. Its geospatial data features are designed to support the most complex requirements found in Geographic Information Systems (GIS), enterprise applications and location services applications. Oracle Spatial and Graph extends the Locator spatial query and analysis features in Oracle Database 12*c* with more advanced spatial analysis and processing capabilities. It provides support for two graph data models: Network Data Model graph (NDM), and RDF Semantic Graph. NDM is used to model and analyze physical and logical networks used in industries such as transportation, logistics, and utilities. RDF Semantic Graph supports the World WideWeb Consortium (W3C) Resource Description Framework (RDF) standards. It provides RDF data management querying and inferencing that are commonly used in a variety of applications ranging from semantic data integration, to social network analysis and linked open data applications.

Oracle Data Models

Oracle also provides a range of standards-based, pre-built data warehouse database schemas with associated analytic models and dashboards for specific industries. Oracle Data Models help customers jump-start the design and implementation of enterprise information management strategies and quickly to achieve a positive return on investment in data warehousing and business intelligence projects. Oracle Data Models are available for the following Industries.

Airline Data Model

The Oracle Airline Data Model is a standards-based, prebuilt data warehouse database schema for the Airline Industry, complete with associated analytic models and dashboards. Leveraging Oracle's strong airline domain expertise, and Oracle's deep expertise in data warehousing, the Oracle Airline Data Model provides a foundation schema that is modern, relevant, topical, and addresses the key passenger data management needs of low cost carriers and traditional airlines.

Communications Data Model

The Oracle Communications Data Model combines market-leading communications application knowledge with the performance of Oracle's database and business intelligence platforms. It can be used in any application environment, is easily extendable and helps customers implement their data warehousing and business intelligence projects with a predictable implementation effort.

Retail Data Model

The Oracle Retail Data Model is a prebuilt, retail data warehouse solution designed to help retailers maximize their return on investment for business intelligence projects. Using built-in predictive analytics, retailers now have the data analysis capabilities to deliver relevant, timely, and actionable retail-specific insights.

Utilities Data Model

The Oracle Utilities Data Model is a pre-built, standards-based data warehouse solution, and can be used in any applications environment and is easily extensible. It enables Utility Organizations to establish a foundation for business and operational analytics across the enterprise, allowing users to leverage a common analytics infrastructure and pre-defined cross-domain relationships, which drive unprecedented levels of intelligence and discovery.

Enterprise Management for Oracle Database 12*c*

Oracle Enterprise Manager provides an integrated set of management tools (known as 'packs') for managing Oracle Database 12*c* and previous releases, with a unique top-down application management approach. With self-managing capabilities, Oracle eliminates many time-consuming, error-prone administrative tasks, allowing database administrators to focus on strategic business objectives instead of performance and availability fire drills.

Oracle Cloud Management Pack for Oracle Database

The Oracle Cloud Management Pack for Oracle Database helps to set up a Database Cloud and operate Database as a Service models. Some of the features provided by this pack include:

- » Self-service database provisioning on physical infrastructure
- » Support for both single instance and Real Application Clusters configurations
- » Policy-driven resource management, such as scale out and scale back of compute power
- » Metering and chargeback based on fixed cost and utilization metrics
- » Programmatic access to the Self-Service Portal

Oracle Data Masking and Subsetting Pack

Oracle Data Masking and Subsetting Pack for Oracle Enterprise Manager helps organizations comply with data privacy and protection mandates that restrict the use of actual customer data. With Oracle Data Masking and Subsetting Pack, sensitive information such as credit card or social security numbers can be replaced with realistic values, allowing production data to be safely used for nonproduction purposes.

Oracle Database Lifecycle Management Pack for Oracle Database

The Database Lifecycle Management Pack is a comprehensive solution that helps database, system and application administrators automate the processes required to manage the Oracle Database Lifecycle. It eliminates manual and time consuming tasks related to discovery, initial provisioning, patching, configuration management, ongoing change management and Disaster protection automation. In addition the Database Lifecycle Management pack provides compliance frameworks for reporting and management of industry and regulatory compliance standards.

Oracle Diagnostic Pack

The Oracle Diagnostic Pack provides automatic performance diagnostic and advanced system monitoring functionality. The Diagnostic Pack includes the following features: Automatic Workload Repository; Automatic Database Diagnostic Monitor (ADDM); Performance monitoring (database and host); Event notifications: notification methods, rules, and schedules; and Event history and metric history (database and host).

Oracle Tuning Pack

The Oracle Tuning Pack provides database administrators with expert performance management for the Oracle environment, including SQL tuning and storage optimizations. It includes the following features:

- » SQL Access Advisor
- » SQL Tuning Advisor
- » SQL Tuning Sets
- » Reorganize objects

Engineered Systems for Oracle Database 12*c*

Oracle engineers systems for Oracle Database 12*c* that help customers deploy databases faster with less risk, and manage them more efficiently. Extreme performance is the hallmark of Oracle's engineered systems and the ultimate embodiment of Oracle's drive to simplify IT.

Oracle Big Data Appliance

Oracle Big Data Appliance is an engineered system optimized for acquiring, organizing, and loading unstructured data into Oracle Database 12*c*. It combines optimized hardware components with new software solutions to deliver customers a complete big data solution. It includes Oracle Big Data SQL, the SQL-based software that seamlessly integrates data across Hadoop, NoSQL, and Oracle Database 12*c*.

Oracle Database Appliance

Oracle Database Appliance is a new way to take advantage of the world's most popular database—Oracle Database 12*c*—in a single, easy-to-deploy and manage clustered system. It's a complete package of software, server, storage, and networking that's engineered for simplicity; saving time and money by simplifying deployment, maintenance, and support of database workloads.

Oracle Exadata

Oracle Exadata Database Machine is engineered to be the highest performance and most available platform for running Oracle Database 12*c*. Built using industry standard hardware and intelligent database and storage software Exadata Database Machine delivers extreme performance for all types of database workloads including Online Transaction Processing (OLTP), Data Warehousing (DW) and consolidation of mixed workloads. Simple and fast to implement, the Exadata Database Machine is ready to tackle customer's large mission critical database applications

Oracle SuperCluster

Oracle SuperCluster is ideal for consolidating databases, applications, and private cloud deployments. It comprises integrated server, storage, networking, and software that provide maximum end-to-end database and application performance.

Oracle Zero Data Loss Recovery Appliance

Oracle Zero Data Loss Recovery Appliance is designed specifically for Oracle Database protection. This massively scalable appliance delivers unparalleled data protection, efficiency and scalability. It offers end-to-end data protection for Oracle databases to help customers standardize their Oracle Database backup and recovery processes, eliminate data loss and maintain business availability.

Related Database Products

Oracle also provides a number of related products that may be used with Oracle Database 12*c* and other software components of the Data Center.

Oracle Audit Vault and Database Firewall

Oracle Audit Vault and Database Firewall monitors Oracle and non-Oracle database traffic to detect and block threats, as well as improves compliance reporting by consolidating audit data from databases, operating systems, directories, and other sources.

Oracle Big Data Connectors

Oracle Big Data Connectors is a suite of software designed to integrate Apache Hadoop with Oracle software including Oracle Database, Oracle Endeca Information Discovery and Oracle Data Integrator.

Oracle Key Vault

Oracle Key Vault provides secure, centralized management of encryption keys and credential files in the data center, including Oracle wallet files, Java KeyStores, Kerberos keytab files, SSH key files, and SSL certificate files.

Oracle NoSQL Database

Oracle NoSQL Database is a scalable, distributed NoSQL database, designed to provide highly reliable, flexible and available data management across a configurable set of storage nodes. Oracle NoSQL Database Basic Edition is included as part of Oracle Database 12*c* Enterprise Edition.

Oracle Programmer

Oracle Programmer provides a programmatic interface for developers who build enterprise applications that access and manipulate Oracle Database. It includes embedded SQL-style interfaces: Pro*C/C++, Pro*COBOL, Pro*Fortran, SQL*Module for Ada, SQLJ; and Utilities to generate host-language bindings from database schemas: Object Type Translator and JPub.

Oracle Secure Backup

Oracle Secure Backup is a centralized tape backup management solution providing high performance, heterogeneous data protection in distributed UNIX, Linux, Windows, and Network Attached Storage (NAS) environments. Protecting file-system and Oracle Database data, Oracle Secure Backup provides a complete tape backup solution for your IT environment. In addition to tape backup, Oracle Secure Backup delivers an integrated Oracle Database backup to third-party cloud (Internet) storage, through the Oracle Secure Backup Cloud Module.

Conclusion

The Oracle Database 12*c* family offers customers a choice of editions and options on a choice of platforms, including Engineered Systems and Cloud Services, that address today's demanding business and IT challenges. Oracle Database 12*c* provides a standards-based common foundation to successfully deliver more information with higher quality of service in a secure, reliable and cost efficient manner for all sizes of organizations.

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Hardware and Software, Engineered to Work Together

Oracle Database 12*c* Product Family
March 2017
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ORACLE DATABASE APPLIANCE X6-2S/X6-2M