Oracle Database 11*g* Product Family

An Oracle White Paper

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INTRODUCTION

Oracle Database 11*g* is available in a choice of editions tailored to meet the business and IT needs of needs of all sizes of organizations. Oracle also offers several optional database products that enhance the capabilities of Oracle Database 11*g* for specific application requirements. This paper outlines the features and options available for each edition of the Oracle database.

- Oracle Database 11*g* Standard Edition One (SE1) delivers unprecedented ease-of-use, power, and price/performance for workgroup, departmental, and web applications on single servers with maximum capacity of two sockets
- Oracle Database 11*g* Standard Edition (SE) is available on single or clustered servers with a maximum capacity of four sockets in total. It includes Oracle Real Application Clusters as a standard feature at no additional cost
- Oracle Database 11*g* Enterprise Edition (EE) provides efficient, reliable, secure data management for mission-critical on-line transaction processing applications, query-intensive data warehouses, and content management and Web2.0 applications. It's available on single and clustered servers with no socket limitation.
- Oracle Database 11*g* Personal Edition (PE) supports single user development and deployment that require full compatibility with Oracle Database Standard Edition One, Oracle Database Standard Edition, and Oracle Database Enterprise Edition.
- Oracle Database Express Edition (XE) is an entry-level, small-footprint database based on the enterprise code base that's free to develop, deploy, and distribute; fast to download; and simple to administer. Oracle Database XE can be installed on any size host machine with any number of CPUs (one database per machine), but XE will only store up to 4GB of user data, use up to 1GB of memory, and use one CPU on the host machine. XE can be easily upgraded to SE or EE when necessary without costly and complex migrations. The features currently available in XE are listed in the Oracle Database 10g product family white paper.

All four editions of Oracle Database 11g are built using the same reliable database engine architecture and are completely compatible with each other. They are also available on a choice of operating systems and include a common set of application development tools and programming interfaces. Using Oracle Database 11g you can start out with Standard Edition One, and as business grows, you can easily upgrade to Standard Edition or Enterprise Edition depending on what best meets your needs. One of the benefits of Oracle is that it's so easy to upgrade -- just install the next edition's software -- you make *no* changes to your database or applications, and you get the additional reliability, scalability, for which Oracle is renowned.

ADVANCED OPTIONS TO MEET DEMANDING REQUIREMENTS

Each edition of Oracle Database 11g has features and functionality to meet the varying requirements of today's business applications. Additionally, Oracle offers a range of Enterprise Edition Options to meet your most demanding requirements for mission-critical transaction processing, data warehousing, and content management applications.

Active Data Guard

Oracle Active Data Guard—an option for Oracle Database 11*g* Enterprise Edition—enhances Quality of Service by offloading resource-intensive activities from a production database to one or more synchronized standby databases. Oracle Active Data Guard enables read-only access to a physical standby database for queries, sorting, reporting, web-based access, etc., while continuously applying changes received from the production database. Oracle Active Data Guard also enables the use of fast incremental backups when offloading backups to a standby database, and can provide additional benefits of high availability and disaster protection against planned or unplanned outages at the production site.

Advanced Compression

Oracle Advanced Compression—with Oracle Database 11*g* Enterprise Edition—helps you manage your growing amounts of data (that on average are tripling every couple of years) in a cost effective manner. Oracle Advanced Compression compresses any type of data, including structured and unstructured data such as documents, images, and multimedia, as well as network traffic and data in the process of being backed up. As a result, Oracle Advanced Compression helps you use resources more efficiently and lower storage costs.

Advanced Security

Oracle Advanced Security provides transparent data encryption of data stored in the database and network encryption for data traveling across the network. In addition it provides a complete suite of strong authentication services to the Oracle Database. Network encryption is implemented using industry-standard data encryption and data integrity algorithms. This option provides a choice of algorithms and cipher strengths for deployment. Strong authentication services support a comprehensive suite of industry-standard third-party authentication options. The authentication options include single sign-on services to the Oracle Database by interoperating with existing authentication frameworks and two-factor authentication choices such as smart cards and token cards.

Database Vault

Oracle Database Vault controls the who, when, and where of data and applications that can be accessed—protecting your business against the most common security threat: malicious internal users. 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. It achieves this by controlling access to application and database data, even by super-users and other highly privileged users. It also enforces multi factor authorization via flexible business rules and tracks who is accessing what and when via out-of-the-box security reports.

Oracle Data Mining

Oracle Data Mining enables customers to produce actionable predictive information and build integrated business intelligence applications. Using data mining functionality embedded in Oracle Database 11*g*, customers can find patterns and insights hidden in their data. Application developers can quickly automate the discovery and distribution of new business intelligence—predictions, patterns and discoveries—throughout their organization.

In-Memory Database Cache

Oracle In-Memory Database Cache enables you to improve application transaction response times and throughput by caching performance-critical subsets of an Oracle Database in the application tier. Automatic data synchronization between the cache and the Oracle Database ensures data consistency. By bringing data closer to the application and processing queries in an in-memory database, your applications are able to access, capture, or update information many times faster. The In-Memory Database Cache option of Oracle Database Enterprise Edition is based on Oracle TimesTen In-Memory Database.

Label Security

Oracle Label Security adds extensive protection for sensitive information. 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 OLAP

The OLAP option is a full-featured on-line analytical processing (OLA) server embedded within the Oracle Database. The OLAP option 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 the Oracle Database, the OLAP option allows centralized management of data and business rules in a secure, scalable and enterprise-ready platform.

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. Oracle Partitioning 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.

Real Application Clusters

Oracle Real Application Clusters (RAC) harnesses the processing power of multiple, interconnected servers on a cluster. It provides unlimited scalability and high availability for any packaged or custom application by exploiting clustered hardware configurations, with the simplicity and ease of use of a single system image. Oracle Real Application Clusters allows 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 Real Application Clusters is a vital component of grid computing that allows multiple servers to access a single database at one time. Oracle Database 11g also includes Automated Storage Management (ASM) and Oracle Clusterware. Combining the use of ASM and Oracle Clusterware virtualizes storage, database servers, application servers, holistic management, and all the other aspects related to deploying and managing a virtualized IT environment.

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. Real Application Testing—with Oracle Database 11*g* Enterprise Edition—allows businesses to quickly adopt new technologies while eliminating the risks associated with change. Real Application Testing combines a workload capture and replay feature with an SQL performance analyzer to help you test changes against real-life workloads, then helps you fine-tune them before putting them into production.

Oracle Spatial

Oracle Spatial allows users and application developers to seamlessly integrate their spatial data into enterprise applications. Oracle Spatial facilitates analysis based on the spatial relationships of associated data, like the proximity of store locations to customers within a given distance and sales revenue per territory. Oracle Spatial manages spatial data in an industry-standard database, resulting in application integration that takes place at the data server. This enables vendor tools and applications to access spatial data directly from the Oracle Database, providing interoperability and minimizing costs.

Total Recall

Oracle Total Recall provides the ability to transparently track and archive historical changes to all data stored in an Oracle database. History data is stored in a secure and highly optimized storage and can be accessed in a seamless manner using Flashback Queries. With Total Recall, you can enable history tracking on tables instantaneously and retain the history data any length of time. In addition, Total Recall provides for easier manageability by automating purge of historical data based on specified retention policy. History tracking is non-intrusive and transparent to applications.

Oracle Warehouse Builder Enterprise ETL Option

The Enterprise ETL (Extract, Transform and Load) option enables large scale, complex ETL deployments. Developers can incorporate advanced functionality such as retaining history for dimensions, reusing mapping code, performing interactive lineage and impact analysis and defining custom types of objects in the repository. It also enables the rapid movement of large amounts of data and the construction of advanced process flows.

Oracle Warehouse Builder Data Quality Option

The Data Quality option enables you to convert raw data into quality information. Developers and data librarians can gain insight into their data and identify previously unknown data quality problems. Subsequently, developers can define rules and generate mappings that correct the data. Based on the data rules, developers can also create data auditors to ensure the quality of incoming data on a repeated basis.

Oracle Warehouse Builder Connectors

Warehouse Builder Connectors for eBusiness Suite, Peoplesoft and SAP applications provides seamless access to the metadata within these applications. This helps customers build mappings and process flows that target Oracle E-Business Suite, Peoplesoft and SAP applications and move data into their Oracle Data Warehouse.

Oracle Content Database Suite

Oracle Content Database Suite leverages the power of the Oracle Database and Fusion Architecture to cost-effectively bring the benefits of managing

unstructured content such as Office documents, document images, and rich media to all users across the enterprise. Content Database Suite delivers powerful file, document, and business process management capabilities through both out-of-the-box applications and a services-oriented architecture.

DATABASE MANAGEMENT PACKS

Oracle provides an integrated management solution for managing Oracle database with a unique top-down application management approach. With new self-managing capabilities, Oracle eliminates time-consuming, error-prone administrative tasks, so database administrators can focus on strategic business objectives instead of performance and availability fire drills.

Change Management Pack

The Oracle Change Management Pack enables database administrators to make complex changes to schema objects safely, track changes to schemas and databases over time, make copies of schemas or objects, and compare and synchronize schemas and databases. With Oracle Change Management, you can also propagate object definitions to one or more sites, clone schema objects with a subset of the data, and plan schema changes over the life of the database and its applications.

Configuration Management Pack

The Oracle Configuration Management Pack enables database administrators to track hardware and software configuration information for host computers and databases managed by Enterprise Manager. That information can then be browsed, searched, compared, exported, and tracked historically. The pack also offers policy management and patch management capabilities based on the configuration information. Finally, to facilitate deployments, cloning functionality for both the Oracle software as well as any associated databases is also provided A key benefit is provided with the ability to compare the configuration of two databases, for faster problem resolution.

Data Masking Pack

The Oracle Data Masking Pack allows organizations to share production data in test environments with application developers or software testers without violating privacy or confidentiality policies. The Data Masking Pack, a member of Enterprise Manager family of database manageability solutions, helps DBAs and information security administrators replace sensitive data with realistic but scrubbed data based on masking rules.

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
- Event history and metric history (database and host)
- Blackouts

Provisioning Pack

The Oracle Provisioning Pack automates deployment of software, applications and patches. This pack provides for bare metal provisioning of operating systems and software images, including automated patching for Oracle products and the operating system, a Critical Patch Facility, database, Real Application Clusters, application provisioning, and one-click single instance to RAC conversions.

Tuning Pack

The Oracle Tuning Pack provides database administrators with expert performance management for the Oracle environment, including SQL tuning and storage optimizations. In order to use the Tuning Pack, you must also have the Diagnostic Pack. The Tuning Pack includes the following features:

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

RELATED PRODUCTS

Audit Vault

Oracle Audit Vault is an enterprise-class audit consolidation and management solution that enables organizations to simplify compliance reporting, proactively detect threats, reduce costs, and secure audit data.

Faced with numerous regulatory mandates and increasing concerns about insider threats, organizations are utilizing database audit data as an important security measure, enforcing the trust-but-verify principle. Oracle Audit Vault delivers an in-depth and comprehensive view of audit data pulled from the database, helps to ensure the integrity of this information, and can reduce the cost of compliance

by making it easier for auditors and security personnel to manage and report on this data.

Oracle Secure Backup

Oracle Secure Backup, Oracle's new tape backup management software, delivers secure, high performance network tape backup for Oracle databases and file systems. It provides an integrated, easy-to-use backup solution that encrypts data to tape to safeguard against the misuse of sensitive data in the event that backup tapes are lost or stolen. Oracle Secure Backup provides optimized backup performance of Oracle Databases via tight integration with the database engine, as well as advanced backup functionality including automated tape rotation, known as “vaulting”.

Oracle Programmer

Oracle Programmer is a separate Oracle product that provides a programmatic interface to any edition of Oracle Database for application programmers. Programmer provides a rich set of interfaces for developers who build enterprise applications that access and manipulate Oracle Database. This product is licensed separately from the Oracle Database products. Oracle Programmer is a family of the following products:

- Three embedded SQL-style interfaces: precompilers, SQL*Module, and SQLJ
- Two utilities to generate host-language bindings from database schemas: Object Type Translator and JPub

TimesTen

Oracle TimesTen In-Memory Database is a memory-optimized relational database that empowers applications with the instant responsiveness and very high throughput required by today’s real-time enterprises and industries such as telecom, capital markets, and defense. Deployed in the application tier as a cache or embedded database, Oracle TimesTen In-Memory Database operates on databases that fit entirely in physical memory using standard SQL interfaces.

Oracle Berkeley DB

The Oracle Berkeley DB family of open source, embeddable databases provides developers with fast, reliable, local persistence with zero administration. Often deployed as "edge" databases, the Oracle Berkeley DB family provides very high performance, reliability, scalability, and availability for application use cases that do not require SQL.

Oracle Database Lite

Oracle Database Lite is an integrated and complete solution for rapid development and deployment of high-impact applications for mobile environments. Oracle Database Lite provides a small footprint, SQL-enabled

client database for local access to enterprise data by applications on the mobile device. In addition, it features the Mobile Server middleware component that supports scalable data synchronization and centralized management of mobile resources.

FEATURE AND OPTION PRODUCT AVAILABILITY

The following table outlines the database features and options associated with each edition of Oracle Database 11*g*.

Feature/Option	SE1	SE	EE	Notes
High Availability				
Oracle Data Guard – Redo Apply	N	N	Y	
Oracle Data Guard – SQL Apply	N	N	Y	
Oracle Data Guard—Snapshot Standby	N	N	Y	
Oracle Active Data Guard	N	N	Y	Enterprise Option (Active Data Guard)
Oracle Data Guard – Network Compression	N	N	Y	Enterprise Option (Advanced Compression Option)
Basic Standby Database (Manually managed)	Y	Y	Y	
Rolling Upgrades – Patch Set, Database and O/S	N	N	Y	
Fast-Start Fault Recovery	N	N	Y	
Online index rebuild	N	N	Y	
Online index-organised table reorgnization	N	N	Y	via ALTER TABLE MOVE ONLINE
Online table redefinition	N	N	Y	via DBMS_REDEFINITION
Online system changes – CPU, disk, memory	Y	Y	Y	
Flashback Query	Y	Y	Y	
Flashback Table	N	N	Y	
Flashback Database	N	N	Y	
Flashback Transaction	N	N	Y	
Flashback Transaction Query	N	N	Y	
Flashback Data Archive (“Total Recall”)	N	N	Y	Enterprise Option
Block-level media recovery	N	N	Y	
Online Backup and Recovery	Y	Y	Y	

Feature/Option	SE1	SE	EE	Notes
Incremental backup and recovery	Y	Y	Y	EE only: fast incremental backups available via block change tracking
Unused Block Compression in Backups	N	N	Y	
Parallel backup and recovery	N	N	Y	
Default RMAN Compression (BZIP2)	Y	Y	Y	
Fast RMAN Compression (ZLIB)	N	N	Y	Enterprise Option (Advanced Compression Option)
Point-in-time tablespace recovery	N	N	Y	
Trial recovery	N	N	Y	
Oracle Fail Safe	Y	Y	Y	Windows only
Data Recovery Advisor	Y	Y	Y	
Transparent Application Failover	Y	Y	Y	
Performance & Scalability				
Oracle Real Application Clusters	N	Y	Y	Enterprise Option, and included with SE
Oracle Clusterware	Y	Y	Y	
Automatic Workload Management	N	Y	Y	Requires RAC
Support for HP Oracle Exadata Storage Server	N	N	Y	
In-Memory Database Cache	N	N	Y	Enterprise Option
Security				
Oracle Advanced Security	N	N	Y	Enterprise Option
Oracle Label Security	N	N	Y	Enterprise Option
Encryption toolkit	Y	Y	Y	
Virtual Private Database	N	N	Y	
Fine grained auditing	N	N	Y	
Development Platform				
Java support	Y	Y	Y	

Feature/Option	SE1	SE	EE	Notes
Database Web Services	Y	Y	Y	
SQLJ	Y	Y	Y	Requires Oracle Programmer
JDBC drivers	Y	Y	Y	
Comprehensive XML support in the database	Y	Y	Y	Includes Binary XML, XML Object-Relational, XML Index, XML Repository
XQuery	Y	Y	Y	
Objects and extensibility	Y	Y	Y	
Regular Expressions	Y	Y	Y	
PL/SQL stored procedures and triggers	Y	Y	Y	
PL/SQL server pages	Y	Y	Y	
Java Server Pages	Y	Y	Y	
Java native compilation	Y	Y	Y	
PL/SQL native compilation	Y	Y	Y	
PL/SQL function result cache	N	N	Y	
Client Side Query Cache	N	N	Y	
Oracle Developer Tools for Visual Studio.Net	Y	Y	Y	Windows only
Microsoft Distributed Transaction Coordinator support	Y	Y	Y	Windows only
Active Directory integration	Y	Y	Y	Windows only
Native .NET Data Provider – ODP.NET	Y	Y	Y	Windows only
.NET Stored Procedures	Y	Y	Y	Windows only
64-bit Itanium support for Windows, Linux, and HP-UX	Y	Y	Y	
Globalization support	Y	Y	Y	
Application Express	Y	Y	Y	
SQL*Plus	Y	Y	Y	
SQL Developer	Y	Y	Y	

Feature/Option	SE1	SE	EE	Notes
Manageability				
Oracle Change Management Pack	N	N	Y	Enterprise Option
Oracle Configuration Management Pack	N	N	Y	Enterprise Option
Oracle Diagnostic Pack	N	N	Y	Enterprise Option
Oracle Tuning Pack	N	N	Y	Enterprise Option
Fast, Lightweight Server Install	Y	Y	Y	
Easy Client Install	Y	Y	Y	
Oracle Enterprise Manager - Database Control, automatic configuration	Y	Y	Y	
Automatic memory management	Y	Y	Y	
Automatic Storage Management	Y	Y	Y	
Automatic undo management	Y	Y	Y	
Automatic statistics management	Y	Y	Y	
Server managed backup and recovery (rman)	Y	Y	Y	
Automatic Backup/Recovery to Flash Recovery Area, including out of the box configuration	Y	Y	Y	
Duplexed backup sets	N	N	Y	
Server-generated Alerts	Y	Y	Y	
End-to-End Application Tracing	Y	Y	Y	
Database Resource Manager	N	N	Y	
SQL Plan Management	N	N	Y	
Resumable Space Allocation	Y	Y	Y	
VLDB, Data Warehousing, Business Intelligence				
Oracle Partitioning	N	N	Y	Enterprise Option
Oracle OLAP	N	N	Y	Enterprise Option
Oracle Data Mining	N	N	Y	Enterprise Option
Direct Load Data Compression	N	N	Y	

Feature/Option	SE1	SE	EE	Notes
OLTP Compression	N	N	Y	Enterprise Option (Advanced Compression Option)
SQL Analytic functions	Y	Y	Y	
Bitmapped index and bitmapped join index	N	N	Y	
Function-based index	Y	Y	Y	
Parallel Query/DML	N	N	Y	
Parallel statistics gathering	N	N	Y	
Parallel index build/scans	N	N	Y	
Parallel Data Pump Export/Import	N	N	Y	SE: Non-parallel data pump only
Data Pump Compression	N	N	Y	Enterprise Option (Advanced Compression Option)
Export Transportable tablespaces, including cross-platform	N	N	Y	
Import Transportable Tablespace	Y	Y	Y	
Star query transformation	Y	Y	Y	SE: B-tree indexes only
Sample scan	Y	Y	Y	
Summary Management – Materialized View creation and refresh	Y	Y	Y	
Summary management – Materialized View Query Rewrite	N	N	Y	
Direct Path Load API	Y	Y	Y	
External tables	Y	Y	Y	
SQL Model	Y	Y	Y	
Synchronous Change Data Capture	Y	Y	Y	
Asynchronous Change Data Capture	N	N	Y	
Query Result Cache	N	N	Y	

Integration				
Oracle Streams	Y	Y	Y	SE/SE1: no asynchronous capture from log files (online redo or archived).
Oracle Streams Advanced Queuing	Y	Y	Y	
Messaging Gateway	N	N	Y	
Basic Replication	Y	Y	Y	Read only and updateable materialized views. Also single master for updateable MVs and multi-tier MVs.
Advanced Replication	N	N	Y	Multi-master replication
Distributed queries/transactions	Y	Y	Y	
Job Scheduler	Y	Y	Y	
External procedures	Y	Y	Y	
Generic connectivity	Y	Y	Y	
Transparent Gateways	Y	Y	Y	Licensed separately for SE/EE
Networking				
Connection pooling	Y	Y	Y	
Oracle Connection Manager	N	N	Y	
Infiniband Support	N	N	Y	
Content Management				
Oracle Spatial	N	N	Y	Enterprise Option
Semantic Technologies (RDF/OWL)	N	N	Y	Requires Spatial, Advanced Compression and Partitioning Options
Oracle Locator	Y	Y	Y	
Oracle Workspace Manager	Y	Y	Y	
Medical Imaging (DICOM)	Y	Y	Y	
MultiMedia	Y	Y	Y	

Oracle Text	Y	Y	Y	
SecureFiles	Y	Y	Y	Compression, deduplication are part of an Enterprise Option (Advanced Compression Option). Encryption is part of an Enterprise Option (Advanced Security Option)
Additional Database Features				
Database event triggers	Y	Y	Y	
Drop column	Y	Y	Y	
Rename column, constraint	Y	Y	Y	
Virtual columns	Y	Y	Y	
Invisible Indexes	Y	Y	Y	
Index-organized table	Y	Y	Y	
Instead-of triggers	Y	Y	Y	
LOB (large object) support	Y	Y	Y	
LogMiner	Y	Y	Y	
Multiple block size support	Y	Y	Y	
Temporary table	Y	Y	Y	

Oracle reserves the right to make changes to the contents of this paper at a later date.

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