Oracle Database 10*g* Product Family

An Oracle White Paper

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ORACLE

INTRODUCTION

Oracle Database 10*g* is available in five editions, each suitable for different development and deployment scenarios. Oracle also offers several optional database products that enhance the capabilities of Oracle Database 10*g* for specific application requirements. This paper will outline the capabilities and features available for each edition of the Oracle database. The first four listed are available with full support:

- Oracle Database 10*g* Standard Edition One (SE1) delivers unprecedented ease-of-use, power, and price/performance for workgroup, department-level, and internet/intranet applications. From single-server environments for small businesses to highly distributed branch environments, Oracle Database 10*g* Standard Edition One includes all the facilities necessary to build business-critical applications. Standard Edition One is limited to a maximum capacity of two processors.
- Oracle Database 10*g* Standard Edition (SE) delivers the unprecedented ease of use, power, and performance of Standard Edition One, with support for larger machines and clustering of services with Real Application Clusters. It can be licensed on single servers with a maximum capacity of four processors, or on a cluster of servers supporting up to a maximum of four processors.
- Oracle Database 10*g* Enterprise Edition (EE) provides efficient, reliable, secure data management for mission-critical applications such as high volume on-line transaction processing (OLTP) environments, query-intensive data warehouses, and demanding Internet applications. Oracle Database Enterprise Edition provides the tools and functionality to meet the availability and scalability requirements of today's mission-critical applications for the enterprise. It contains all of the components of the Oracle Database, and can be further enhanced with the purchase of the options and packs described later in this paper. Enterprise Edition supports all sizes of computers and is not limited to a maximum processor count
- Oracle Database 10*g* Personal Edition supports single user development and deployment that requires full compatibility with Oracle Database Standard Edition One, Oracle Database Standard Edition, and Oracle Database

Enterprise Edition. By bringing the award-winning functionality of Oracle Database 10*g* to the personal workstation, Oracle offers a database that combines the power of the world's most popular database with the ease of use and simplicity you would expect in a desktop product. It may be run on any number of processors, but is restricted to a single user.

- Oracle Database 10*g* Express Edition (Oracle Database XE) is a new entry-level edition of the world's most capable database that is quick to download, simple to install and manage, and is free to develop, deploy, and distribute. Oracle Database XE makes it easy to upgrade to the other editions of Oracle, without costly and complex migrations. Oracle Database XE can be installed on any size machine with any number of CPUs, but this free edition of the world's leading database will store up to 4GB of user data, use up to 1GB of memory, and use only one CPU on the host machine. Support is exclusively provided by an online forum.

All editions include a common set of application development features including SQL with object-relational capabilities, which include programmatic interfaces for writing stored procedures and triggers. Applications written for any of these editions of Oracle Database will run on the others, although Oracle Database 10*g* Enterprise Edition provides additional performance, scalability, availability and security functions that are generally transparent to application developers. The APIs supported with Oracle Database 10*g* Enterprise Edition are generally also supported with all the other editions, with exceptions related to the functionality associated with optional products only available with Oracle Database 10*g* Personal Edition and Oracle Database 10*g* Enterprise Edition such as Oracle OLAP or Oracle Data Mining.

These Oracle Database 10*g* products are all built using the same robust and reliable database engine architecture. Oracle Database 10*g* Standard Edition, Oracle Database 10*g* Personal Edition and Oracle Database XE are all 100 percent compatible with Oracle Database 10*g* Enterprise Edition on many different platforms.

As your business grows over time, you can easily upgrade from the Express Edition to the Standard Edition and then to the Enterprise Edition as your business requires more scalability and functionality. 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, availability, scalability, that Oracle is known for in it's Enterprise Edition. .

ADVANCED OPTIONS TO MEET DEMANDING REQUIREMENTS

Each of these five Oracle RDBMS editions have features and functionality to meet the varying requirements of today's applications. Additionally, Oracle offers optional products that contain sophisticated technology to meet your most

demanding requirements for development and deployment of mission-critical OLTP, data warehouse, and Internet application environments.

Oracle Real Application Clusters

Oracle Real Application Clusters (RAC) is a computing environment that harnesses the processing power of multiple, interconnected computers using clustering technology. Oracle Real Application Clusters 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 nodes of a clustered system configuration, to insulate both applications and database users from hardware and software failures, while providing performance that scales with the hardware environment.

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. Oracle Partitioning permits large tables to be broken into individually managed smaller pieces, while retaining a single application-level view of the data. Range, hash, list, and composite (range combined with hash, and range combined with list), partitioning methods are supported.

Oracle Advanced Security

Oracle Advanced Security (ASO) 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.

Oracle Database Vault

Oracle Database Vault lets you control who, when, and where data and applications 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.

- Improves ability to meet compliance requirements like Sarbanes-Oxley and other regulations that mandate control of access to, and release of, sensitive information
- Controls access to application and database data, even by super-users and other highly privileged users
- Enforces multi factor authorization via flexible business rules
- Shows who is accessing what and when via over three dozen out-of-the-box security reports

Oracle Label Security

Oracle Label Security provides sophisticated and flexible security based on row labels for fine-grained access control. Oracle Label Security employs labeling concepts used by government, defense and commercial organizations to protect sensitive information and provide data separation and includes a powerful tool to manage policies, labels, and user label authorizations.

Oracle OLAP

Oracle OLAP is a scalable, high-performance calculation engine with fully integrated management and administration for delivering analytic applications. Fully integrated within the database, Oracle OLAP provides a complete set of analytical functions. Predictive analysis can be used to forecast market trends, predict product manufacturing requirements, and build enterprise budgeting and financial analysis systems, for example. Using complex, multidimensional queries and calculations, information such as market shares and net present value can be derived. The Java OLAP API provides efficient object-oriented access for building applications that require complex analytical queries.

Oracle Data Mining

Oracle Data Mining allows companies to build advanced business intelligence applications that mine corporate databases, discover new insights, and integrate that information into business applications. Oracle Data Mining embeds data mining functionality for making classifications, predictions, and associations. All model-building and scoring functions are accessible through a Java-based API.

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.

Oracle Warehouse Builder Enterprise ETL Option

The Enterprise ETL 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. This option 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 Connector – eBusiness Suite

The Warehouse Builder Connector to eBusiness Suite provides access to the technical and business metadata within Oracle E-Business Suite. Subsequently, you can build mappings and process flows that either source or target Oracle E-Business Suite.

Oracle Warehouse Builder Connector - PeopleSoft

With Warehouse Builder Connector to PeopleSoft, you can connect to and then extract data and metadata from PeopleSoft applications. Subsequently, you can include PeopleSoft objects as sources or targets in Warehouse Builder mappings, create process flow, and generate SQL code.

Oracle Warehouse Builder Connector – SAP R/3

With the Warehouse Builder Connect to SAP R/3, you can connect to and then extract data and metadata from SAP R/3. You can access both the technical and business metadata in the SAP R/3 application. Subsequently, you can include SAP R/3 objects in Warehouse Builder mappings and process flows and generate ABAP code.

ORACLE MANAGEMENT PACKS

The sections that follow describe the Oracle management packs. The features in these packs are accessible through Oracle Enterprise Manager Database Control,

Oracle Enterprise Manager Grid Control, and APIs provided with Oracle Database software.

Oracle 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:

- Capture and store object definitions
- Compare object definitions and highlight differences
- Synchronize object definitions
- Propagate object definitions to one or more sites
- Clone objects with a subset of their data
- Manage and plan changes over the life of the database and its applications

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

Oracle 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

Oracle 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. The Configuration Management Pack includes the following features:

- Extensive searching on configuration data, such as Oracle home patch status, versions deployed, parameter settings, database feature use, etc.
- Ability to compare the configuration of two databases
- Host-to-host and host-to-multiple-hosts configuration comparison
- Exporting of host configuration information on the same or a different instance of Enterprise Manager for later browsing or comparison
- Patch management, including automated determination of what patches apply to a given Oracle home, using data obtained directly from MetaLink, as well as mass deployment of patches
- Database and Oracle home software cloning
- Policy management to alert the administrator to deviations from best practices
- Automated in-context Critical Patch advisory assessment

Oracle 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
- Critical Patch Facility
- Software Image Library
- Database, RAC, Application Server and Application provisioning
- Single instance-to-RAC conversion
- Enterprise Security Advisor
- Provisioning and deployment reports

OTHER ORACLE PRODUCTS

Oracle Secure Backup

Oracle Secure Backup provides tape backup management for the entire Oracle environment. You can use Oracle Secure Backup to back up Oracle databases and host file systems to tape through direct-attached or network-attached tape drives. Oracle Secure Backup provides centralized management and control over backup and restore operations. Oracle Secure Backup is available in the following forms, each suitable for different development and deployment scenarios:

- **Oracle Secure Backup -** For environments that consist of many servers, Oracle Secure Backup offers high performance data protection from server to tape. This protection is crucial for local and offsite storage of business-critical data.
- **Oracle Secure Backup Express -** For environments that consist of a single server, Oracle Secure Backup Express offers the same tape backup functionality as Oracle Secure Backup, but is limited to a single host with one direct-attached tape drive. It is bundled with the Oracle Database.

Oracle Programmer

Oracle Programmer is an Oracle product that provides a rich set of interfaces for developers who build enterprise applications that access and manipulate Oracle Database 10*g*.

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

Oracle Database Lite

Oracle Database Lite provides efficient, reliable, and secure data management for applications running locally on mobile and small-footprint devices (handhelds, laptops, communicators, etc). Oracle Database Lite supports scalable synchronization of data between devices and any Oracle Database while offering complete management of users, devices, and applications.

FEATURE AND PRODUCT AVAILABILITY

Not all features and options are available with all editions of the Oracle Database 10*g*

Oracle Database 10*g* Personal Edition is available on Windows 2000, Windows NT, Windows XP and Windows Server 2003 (32-bit and 64-bit). It includes all components and options that are available with Oracle Database 10*g* Enterprise Edition, such as Oracle Partitioning and Oracle Advanced Security, with the exception of the Oracle Real Application Clusters option. The management

packs are not included in Personal Edition. The Express Edition is available only on Windows and Linux.

See the following table for Oracle Database 10g Express Edition, Oracle Database 10*g* Standard Edition and Standard Edition One, and Oracle Database 10*g* Enterprise Edition feature and option availability.

Feature/Option	XE	SE1	SE	EE	Notes
High Availability					
Oracle Data Guard – Redo Apply	N	N	N	Y	
Oracle Data Guard – SQL Apply	N	N	N	Y	
Rolling Upgrades – Patch Set, Database and O/S	N	N	N	Y	
Fast-start selectable recovery time	N	N	N	Y	
Comprehensive online schema reorganization/redefinition	N	N	N	Y	
Online system changes – CPU, disk, memory	N	Y	Y	Y	
Flashback Query	Y	Y	Y	Y	
Flashback Table	N	N	N	Y	
Flashback Database	N	N	N	Y	
Flashback Transaction Query	N	N	N	Y	
Block-level media recovery	N	N	N	Y	
Incremental backup and recovery	Y	Y	Y	Y	SE/XE: No optimized incremental backup
Parallel backup and recovery	N	N	N	Y	
Point-in-time tablespace recovery	N	N	N	Y	
Trial recovery	N	N	N	Y	
Oracle Fail Safe	N	N	Y	Y	Windows only
Scalability					
Oracle Real Application Clusters	N	N	Y	Y	Extra cost with Enterprise Edition, included with SE
Oracle Clusterware	N	N	Y	Y	

Feature/Option	XE	SE1	SE	EE	Notes
Automatic Workload Management	N	N	Y	Y	Requires RAC
Java native compilation	N	Y	Y	Y	
PL/SQL native compilation	Y	Y	Y	Y	
Security					
Advanced Security Option	N	N	N	Y	Extra cost option
Oracle Label Security	N	N	N	Y	Extra cost option
Encryption toolkit	Y	Y	Y	Y	
Virtual Private Database	N	N	N	Y	
Fine grained auditing	N	N	N	Y	
Development Platform					
Java support	N	Y	Y	Y	
Database Web Services	N	Y	Y	Y	
SQLJ	N	Y	Y	Y	Requires Oracle Programmer
JDBC drivers	Y	Y	Y	Y	XE: client side JDBC only
Comprehensive XML support in the database	Y	Y	Y	Y	XE: No JNDI or Servlet support
XQuery	N	Y	Y	Y	
Objects and extensibility	Y	Y	Y	Y	
Regular Expressions	Y	Y	Y	Y	
PL/SQL stored procedures and triggers	Y	Y	Y	Y	
PL/SQL server pages	Y	Y	Y	Y	
Java Server Pages	N	Y	Y	Y	
Oracle Developer Tools for Visual Studio.Net	Y	Y	Y	Y	Windows only
Microsoft Distributed Transaction Coordinator support	Y	Y	Y	Y	Windows only
Active Directory integration	Y	Y	Y	Y	Windows only, XE: No storing of tnsnames in Active Directory

Feature/Option	XE	SE1	SE	EE	Notes
Native .NET Data Provider – ODP.NET	Y	Y	Y	Y	Windows only
.NET Stored Procedures	Y	Y	Y	Y	Windows only
64-bit Itanium support for Windows, Linux, and HP-UX	N	Y	Y	Y	
Globalization support	Y	Y	Y	Y	XE: Limited char sets and translations for DB messages
Integrated Web Application Development Environment	Y	Y	Y	Y	Oracle Application Express, formerly HTML DB
SQL*Plus	Y	Y	Y	Y	
iSQL*Plus	N	Y	Y	Y	
Manageability					
Oracle Change Management Pack	N	N	N	Y	Extra cost option
Oracle Configuration Management Pack	N	N	N	Y	Extra cost option
Oracle Diagnostic Pack	N	N	N	Y	Extra cost option
Oracle Tuning Pack	N	N	N	Y	Extra cost option, also requires the Diagnostic Pack
Fast, Lightweight Server Install	Y	Y	Y	Y	
Easy Client Install	Y	Y	Y	Y	
Oracle Enterprise Manager - Database Control, automatic configuration	N	Y	Y	Y	
Automatic memory management	Y	Y	Y	Y	
Automatic Storage Management	N	Y	Y	Y	
Automatic undo management	Y	Y	Y	Y	
Automatic statistics management	Y	Y	Y	Y	
Server managed backup and recovery	N	Y	Y	Y	
Automatic Backup/Recovery to Flash Recovery Area, including out of the box configuration	N	Y	Y	Y	
Duplexed backup sets	N	N	N	Y	

Feature/Option	XE	SE1	SE	EE	Notes
Server-generated Alerts	Y	Y	Y	Y	
End-to-End Application Tracing	Y	Y	Y	Y	
Database Resource Manager	N	N	N	Y	
VLDB, Data Warehousing, Business Intelligence					
Oracle Partitioning	N	N	N	Y	Extra cost option
Oracle OLAP	N	N	N	Y	Extra cost option
Oracle Data Mining	N	N	N	Y	Extra cost option
Data Compression	N	N	N	Y	
SQL Analytic functions	Y	Y	Y	Y	
Bitmapped index and bitmapped join index	N	N	N	Y	
Function-based index	Y	Y	Y	Y	
Parallel Query/DML	N	N	N	Y	
Parallel statistics gathering	N	N	N	Y	
Parallel index build/scans	N	N	N	Y	
Parallel Data Pump Export/Import	N	N	N	Y	XE/SE: Non-parallel only
Transportable tablespaces, including cross-platform	N	N	N	Y	
Star query transformation	Y	Y	Y	Y	XE/SE: B-tree indexes only
Sample scan	Y	Y	Y	Y	
Summary management – Materialized View Query Rewrite	N	N	N	Y	
Direct Path Load API	Y	Y	Y	Y	
External tables	Y	Y	Y	Y	
SQL Model	Y	Y	Y	Y	
Synchronous Change Data Capture	N	Y	Y	Y	
Asynchronous Change Data Capture	N	N	N	Y	
Integration					
Oracle Streams	N	N	N	Y	XE/SE: Apply only

Feature/Option	XE	SE1	SE	EE	Notes
Oracle Streams Advanced Queuing	Y	Y	Y	Y	
Oracle Workflow	N	Y	Y	Y	
Messaging Gateway	N	N	N	Y	
Basic Replication	Y	Y	Y	Y	XE/SE: Read only, updateable materialized view
Advanced Replication	N	N	N	Y	Multi-master replication
Distributed queries/transactions	Y	Y	Y	Y	
Job Scheduler	Y	Y	Y	Y	
External procedures	Y	Y	Y	Y	
Generic connectivity	Y	Y	Y	Y	
Transparent Gateways	N	Y	Y	Y	Licensed separately for SE/EE
Networking					
Connection pooling	Y	Y	Y	Y	
Oracle Connection Manager	N	N	N	Y	
Oracle Names	N	Y	Y	Y	
Infiniband Support	N	N	N	Y	
Content Management					
Oracle Spatial	N	N	N	Y	Extra cost option
Oracle Locator	Y	Y	Y	Y	
Oracle Workspace Manager	N	Y	Y	Y	
Ultra Search	N	Y	Y	Y	
interMedia	N	Y	Y	Y	
Oracle Text	Y	Y	Y	Y	XE: No English/French Knowledge Bases
Additional Database Features					
Database event triggers	Y	Y	Y	Y	

Feature/Option	XE	SE1	SE	EE	Notes
Drop column	Y	Y	Y	Y	
Rename column, constraint	Y	Y	Y	Y	
Index-organized table	Y	Y	Y	Y	
Instead-of triggers	Y	Y	Y	Y	
LOB (large object) support	Y	Y	Y	Y	
LogMiner	Y	Y	Y	Y	
Multiple block size support	Y	Y	Y	Y	
Temporary table	Y	Y	Y	Y	

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

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