

Oracle Database 11g New Features

Enterprise Edition Options

Feature	Benefits	Details
Real Application Testing	Manage and reduce risks due to minor/major changes e.g. upgrade, hardware platform, or initialisation parameter.	Supports Oracle 9i and 10g databases, facilitating migration to Oracle 11g.
Database Replay	Provides an opportunity to test the impact and benefits of minor/major changes upon database performance and behaviour before they are implemented on live systems.	Allows capture of a realistic workload from (for example) a production system, and replay on a (for example) test system. Useful in assessing the impact on performance of database and OS upgrades and patches, large scale configuration changes e.g. implementation of ASM/RAC etc. Can be configured and managed using PL/SQL APIs or Enterprise Manager.
SQL Performance Analyser	Evaluate how SQL performance has been, or will be affected by a database change.	Compare the performance of SQL Tuning Sets before and after a minor or major change, e.g. upgrade, patching. Produces a text or HTML report detailing the findings. Use in conjunction with Database Replay on a test database or snapshot standby to predict effects of change.
Data Guard		
Active Data Guard	Reduced resources and management.	A physical standby database can be simultaneously open for read-only queries and be continuously updated from the primary (live) database. Previously a physical standby database could be either open read-only OR recovering so this functionality would have required two standby databases, one for DR purposes and one for reporting.

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Transaction Management		
Enterprise Manager LogMiner Interface	LogMiner more accessible.	LogMiner functionality can now be accessed through Enterprise Manager, which is much simpler than using the DBMS_LOGMNR package which was the only interface previously. DBMS_LOGMNR is still available.
Oracle Total Recall/Flashback Data Archive	Reduces impact of user errors.	Retain historical data securely over long periods of time within its original database. Works by extending the Flashback Technology recovery window. Previously could only flashback as long as the required data was available in the UNDO tablespace. Flashback Archives can now be created outside of the UNDO tablespace to extend the flashback window. The increased availability of historical data reduces downtime due to user errors, and can satisfy the requirements of regulatory oversight.
Partitioning		
	All new partition types extend the opportunities to use partitioning and thus improve performance.	
Extended Composite Partitioning	New functionality. Increase opportunities to use sub-partitions, improving performance.	Previously limited to range-hash (sub-partition a range partition using the hash method) and range-list (sub-partition a range partition using list partitioning) partitioning. Oracle 11g supports range-range, list-range, list-hash and list-list composite indexes.
Interval Partitioning	Reduced maintenance.	Automatic creation of range-partitioned partitions when required as data is inserted into a partitioned table. No need to manually pre-create partitions before data is inserted that falls outside the range of the existing partitions.
System Partitioning	New functionality. Increase opportunities to use partitions, improving performance.	Provides the performance and storage benefits of partitioning when there is no logical criteria for partitioning the data. The partition must be specified as the data is inserted.
Reference Partitioning	Easier to configure partitions on related tables.	Partition the child table in a referential/foreign key constraint using the same criteria as the parent table, even if the child table does not contain the column that the parent table is partitioned on.

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Partitioning	All new partition types extend the opportunities to use partitioning and thus improve performance.	
Virtual Column Based Partitioning	New functionality. Do not have to store data solely for the purpose of using it to divide partitions.	Partitions can be based on Virtual Columns, itself a new 11g feature.
Single Partition Tablespace Transport	Improved manageability.	Ability to transfer a single partition from one database to another using transportable tablespaces (the fastest method of transferring data to another database). Previously had to transfer the whole table (all partitions of the table).
Partitioning Adviser	Extended functionality bringing benefits of EM advisors to partitioning.	The SQL Access Advisor has been updated and can advise on partitioning schemes for tables, indexes and materialised views.
Advanced Compression		Data volumes triple on average every few years. Effective data management helps reduce storage costs and use resources more efficiently. Can compress network traffic, RMAN backups and any type of data including structured (normal tables) and unstructured (e.g. documents, images, multimedia).
Faster Backup Compression	Backup time will be reduced.	ZLIB binary compression algorithm now supported which is optimised for CPU efficiency rather than compression. Consequently compression will be reduced, but faster. The BZIP2 compression algorithm providing better but slower compression is still configurable.

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All Editions

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Advanced Fault Diagnosis Infrastructure	Reduces downtime.	Simplifies and speeds up customer interaction with Oracle Support following a problem (critical error). A tool to investigate, report and resolve. Goal is to proactively detect and prevent critical errors, thereby limiting damage and downtime after a problem.
Automatic Diagnosis Repository	Assists Oracle Support in investigating and resolving problems more effectively.	Increased and improved collection of diagnostic data and collection of new types of diagnostic data. The repository is file based, outside of the database, and so is available even when the database is not. Location is configured using initialisation parameter DIAGNOSTIC_DEST (BACKGROUND_DUMP_DEST, USER_DUMP_DEST and CORE_DUMP_DEST initialisation parameters are now deprecated).
Incident Packaging Service	Simplifies and speeds up supply of relevant data to Oracle Support.	Packaging of required diagnostic data into a zip file, ready to be transmitted to Oracle Support for diagnosis.
Enterprise Manager Support Workbench	Easy to use interface.	Investigation and reporting of problems (critical errors) through the Enterprise Manager GUI. Ability to gather and manage diagnostic data and upload to Oracle Support.
First Failure Diagnostic Data Gathering	Reduces downtime and recurrence of problems.	Proactively gathers and records diagnostic data from the database so that the required information is available following a first-time-failure incident. Removes the need to reproduce a problem in order to collect the necessary diagnostic data and consequently the time required to diagnose and resolve a problem.
Health Checks	New analysis tool.	Run automatically following detection of a critical error to dig deeper, e.g. looking for corruption in the data dictionary, undo and redo structures, or data blocks. Can also be run manually or on a regular basis.
SQL Test Case Builder	Assists Oracle Support in investigating and resolving problems quickly & more accurately	Automates the production of a reproducible test case, enabling Oracle Support to quickly and accurately reproduce the problem.

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Manageability		
Automatic Memory Management	Memory management simplified even further. Oracle automatically tunes for all of the memory allocated to it to optimise performance.	Oracle can now dynamically manage all of the memory allocated to it. It is only necessary to provide the upper limit that you want Oracle to use. This removes the need to allocate memory individually to the System and Process Global Areas. Initialisation parameters MEMORY_TARGET (the database tunes usable memory to this value) and MEMORY_MAX_TARGET (the upper limit that MEMORY_TARGET can be set to).
Data Guard		
Snapshot Standby	Use standby database for testing purposes without affecting resilience. Avoid necessity for additional server/storage to hold a duplicated database. Use existing resources for dual purpose.	A physical standby database can be temporarily opened for read-write activities in order to perform testing against a realistic production-like database. The primary/live database is unaffected, and redo from the primary is transferred to the standby site as normal, just not applied. Consequently there will be no data loss at the standby, the only impact is the time taken to apply the redo once the snapshot standby is converted back to a physical standby database. The conversions from physical standby to snapshot standby to physical standby are performed by one SQLPlus command, and a database restart. Data Guard Broker is not required.
SQL Apply Event Table	Minor monitoring improvement.	Events relating to a logical standby database can now be written to a table (SYSTEM.LOGSTDBY\$EVENTS) as well as the alert log, greatly simplifying the task of monitoring a logical standby and generating alerts when necessary.

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Schema Management		
DDL Wait Option	DDL commands will be actioned, and not timeout even if the object is locked.	Previously an attempted DDL statement (e.g. alter table) on a locked object would fail immediately, and the command would have to be manually re-executed until the object was not locked by another transaction. Setting the DDL_LOCK_TIMEOUT parameter tells Oracle to keep retrying the DDL statement for a specified period of time.
Invisible Indexes	Assists in performance tuning and testing.	Indexes can be marked as invisible to determine if they are usable by the optimiser, but are still maintained like normal valid indexes. Previously indexes had to be marked as unusable or dropped to (usually temporarily) stop the optimiser from using them. Useful whilst performing SQL performance tuning; a parameter OPTIMISER_USE_INVISIBLE_INDEXES can be set globally at the instance level to make all invisible indexes usable by the optimiser, then set the parameter at the session level to make the optimiser ignore invisible indexes within that session.
Table Compression	Transaction processing environments can now benefit from reduced storage and potential performance improvements of compressed tables.	Now supported for OLTP environments, including DML statements and add/drop column statements. Previously was recommended for only OLAP and data warehousing environments. Compressed tables can generate storage space savings, possible increased I/O performance, and reduced buffer cache memory area usage.
Read Only Tables	Reduced maintenance/management.	An individual table can be made read-only even if it resides in a read-write tablespace (previously this had to be achieved by making the tablespace read-only).
Virtual Columns	Reduced storage, potentially improved performance.	Virtual Columns can be defined for a table to represent derived values, without the need to store the data. May be used as an alternative to views or triggers, on occasion. Virtual columns can be used in the partition key for (basic) partitioned tables.

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RMAN		
Network Enabled Database Duplication Without Backups	Database duplication now easier and faster.	Allows duplication of a database to a different host without the need to make a backup and transfer the files to the other host. Duplicates directly from the original database. Avoids unnecessary task of placing backup files in same directory structure that the backup was made to.
Improved Handling of Long Term Backups (Archives)	Reduced storage requirement.	Backups made with the KEEP option override the normal retention policy. Oracle 11g will backup only the archive redo logs necessary to make the backup consistent, possibly generating substantial storage savings.
Optimisation of UNDO Backup	Reduces backup duration and size.	Only UNDO data needed for recovery is backed up (active undo data). The remaining data in the UNDO tablespace (that for transactions already committed) is not backed up, potentially reducing the time and space needed for the backup.
Data Recovery Advisor	Guidance with the complex subject of recovery, at a critical time when mistakes can be costly.	The advisor can be accessed through either Enterprise Manager or RMAN command line interface. With EM there is no need to know any RMAN commands, a job can be submitted to perform the restoration and recovery. The RMAN advisor will generate a script containing RMAN commands to restore and recover as necessary.
Security		
Case sensitivity passwords	Satisfy higher security standards e.g. Financial Industry.	Can enforce case sensitivity in passwords to provide extra security.
SYSTAM Role	No need to provide unnecessary privileges to ASM System Administrators.	In many cases, ASM configuration and management is performed by System Administrators who previously had to be granted the SYSDBA role. This new task specific role can be granted to those who manage ASM without the need to give them all the unnecessary privileges as well.
Default Password Identification	Easy method to identify unsecured accounts, with default (and therefore known) passwords.	A new view DBA_USERS_WITH_DEFPWD shows which user accounts have default passwords.