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Get the scalability of relational frameworks with the simplicity of document models using JSON relational duality. Use the built-in APEX platform for faster GenAI-powered, low-code development. Simplify the development and deployment of microservices with containerized, pluggable databases. Discover JSON Relational Duality Improve application response times while reducing the load on database servers with True Cache; no need to rewrite your apps. Protect databases against SQL injection attacks — including zero-day attacks —with SQL Firewall. Manage data across multiple regions while meeting data residency regulations using Globally Distributed Database with RAFT replication. Use the same technology whether your data lives on-premises or in Oracle Cloud. Discover True Cache See more customer successes Run Oracle Database at your own location on your own hardware. Or, use Oracle Exadata in your data center for extreme performance, flexibility, and robustness. The best hybrid cloud platform for Oracle Database, delivered securely behind your firewall and managed by Oracle. Benefit from the computing power, physical storage, and tooling that simplify routine database management operations as well as Oracle’s highest-performance engineered system, designed specifically for running enterprise-scale cloud databases. Autonomous Database provides a fully automated experience for organizations and with auto-scaling capabilities offers the lowest TCO of any database on OCI. Database applications achieve high performance, scale, and availability in your selected hyperscaler by using Oracle Database services running on Oracle Cloud Infrastructure, which is collocated in the hyperscaler’s data centers and deeply integrated with the hyperscaler’s console and API. Oracle Multicloud solutions February 24, 2025 Roger Ford, Principal Product Manager, Oracle With this API, developers can continue to use MongoDB's open-source tools and drivers connected to an Oracle Autonomous JSON Database while gaining access to Oracle’s multi-model capabilities and the benefits of a self-driving database. Customers can now run MongoDB workloads on Oracle Cloud Infrastructure (OCI). Read the latest guidance and start coding. Build, test, and deploy applications on Oracle Cloud Infrastructure Platform. Interested in learning more? Contact one of our industry-leading experts. Careers Developers Investors Partners Startups Students and Educators Last updated on JULY 08, 2025Applies to: Oracle Database - Standard EditionOracle Database - Enterprise EditionOracle Database - Personal EditionGen 2 Exadata Cloud at CustomerInformation in this document applies to any platform.Purpose The Database patch bundles that were released on April 15, 2025 for Release 19c were: NameDownload Link Database Release Update 19.27.0.0.250415 Grid Infrastructure Release Update 19.27.0.0.250415 OJVM Release Update 19.27.0.0.250415 Microsoft Windows 32-Bit & x86-64 Bundle Patch 19.27.0.0.250415 This is the Known Issues note for the patches listed above. These known issues are in addition to the issues listed: in the README file for each individual Release Update (RU),, or Bundle Patch (BP). in , "Oracle Database 19c Important Recommended One-off Patches" Beginning with the October 2022 patching cycle, 19c Release Update Revisions (RURs) will no longer be provided for 19.17.0 and above. No additional RURs will be delivered on any platform after the delivery of Oracle Database 19c RUR 19.16.2 in January, 2023. Refer to Sunsetting of 19c RURs and FAQ () for further details. To provide customers more frequent access to recommended and well-tested collections of patches, Oracle is pleased to introduce Monthly Recommended Patches (MRPs) starting in Nov 2022. MRPs are supported only on the Linux x86-64 platform. Refer to Introducing Monthly Recommended Patches (MRPs) and FAQ () for further details. Scope This known issues document will be of interest to Database Administrators who are responsible for bundle patching for Oracle Database / Grid Infrastructure / OJVM Release 19c. Details My Oracle Support provides customers with access to over a million knowledge articles and a vibrant support community of peers and Oracle experts. Oracle offers a comprehensive and fully integrated stack of cloud applications and platform services. For more information about Oracle (NYSE:ORCL), visit oracle.com. ⓡ Oracle | Contact and Chat | Support | Communities | Connect with us | | | | Legal Notices | Terms of Use On Linux platforms only, Oracle recommends against explicitly setting values for MEMORY_TARGET and MEMORY_MAX_TARGET in the initialization parameter file at the time of instance startup. Doing so may result in suboptimal small page allocation in the SGA. Furthermore, if the USE_LARGE_PAGES parameter is set to ONLY and you attempt to set values for MEMORY_TARGET and MEMORY_MAX_TARGET, the instance will fail to start. See MEMORY_TARGET, MEMORY_MAX_TARGET, and USE_LARGE_PAGES. Page 2 Page 3 This chapter describes the first set (in alphabetical order) of dynamic performance views. The remaining dynamic performance views appear in alphabetical order in Dynamic Performance (V$) Views: V$IM_COLUMN_LEVEL to V$RULE_SET_AGGREGATE_STATS through Dynamic Performance (V$) Views: V$SCHEDULER_RUNNING_JOBS to V$ZONEMAP_USAGE_STATS. This chapter contains the following topics: Page 4 The actual dynamic performance views are identified by the prefix V_$. Public synonyms for these views have the prefix V$. Database administrators and other users should access only the V$ objects, not the V_$ objects. The dynamic performance views are used by Oracle Enterprise Manager, which is the primary interface for accessing information about system performance. After an instance is started, the V$ views that read from memory are accessible. Views that read data from disk require that the database be mounted, and some require that the database be open. V$ views are CONTAINER_DATA objects. When a user connected to the root queries a V$ view, the query results will depend on the CONTAINER_DATA attribute for users for the view. The CONTAINER_DATA clause of the SQL ALTER USER statement is used to set and modify users' CONTAINER_DATA attribute. V$ views can return data from different containers in a CDB when queried from the root container. These objects will implicitly convert data to the character set of the root container (AL32UTF8) and then return the result to the user. Some character sets may have character expansion (more bytes needed to represent a character) when converted to AL32UTF8, so there may be data truncation if the view column width is not able to accommodate data from a given PDB. Page 5 Descriptions of Oracle Exadata Database Machine views are not provided in this manual. See Oracle Exadata System Software User's Guide for descriptions of Oracle Exadata Database Machine views. Page 6 The remainder of this chapter describes the dynamic performance views in alphabetical order. Page 7 V$ACCESS displays information about locks that are currently imposed on library cache objects. The locks are imposed to ensure that they are not aged out of the library cache while they are required for SQL execution. Column Datatype Description SID NUMBER Session number that is accessing an object OWNER VARCHAR2(64) Owner of the object OBJECT VARCHAR2(1000) Name of the object TYPE VARCHAR2(64) Type identifier for the object CON_ID NUMBER The ID of the container to which the data pertains. Possible values include: 0: This value is used for rows containing data that pertain to the entire multitenant container database (CDB). This value is also used for rows in non-CDBs. 1: This value is used for rows containing data that pertain to only the root n: Where n is the applicable container ID for the rows containing data Page 8 V$ACTIVE_INSTANCES displays the mapping between instance names and instance numbers for all instances that have the database currently mounted. Column Datatype Description INST_NUMBER NUMBER Instance number INST_NAME VARCHAR2(256) Instance name CON_ID NUMBER The ID of the container to which the data pertains. Possible values include: 0: This value is used for rows containing data that pertain to the entire CDB. This value is also used for rows in non-CDBs. 1: This value is used for rows containing data that pertain to only the root n: Where n is the applicable container ID for the rows containing data Page 9 SESSION_STATE_CONSISTENCY VARCHAR2(128) Describes how non-transactional is changed during a request. This parameter is considered only if failover_type is set to TRANSACTION for Application Continuity. Examples of session state are NLS settings, optimizer preferences, event settings, PL/SQL global variables, temporary tables, advanced queues, LOBs, and result cache. If non-transactional values change after the request starts, the default value of DYNAMIC should be set. Almost all applications should use DYNAMIC mode. If you are unsure, use DYNAMIC mode. Page 10 V$ACTIVE_SESS_POOL_MTH displays available active session pool resource allocation methods. Column Datatype Description NAME VARCHAR2(40) Name of the active session pool resource allocation method CON_ID NUMBER The ID of the container to which the data pertains. Possible values include: 0: This value is used for rows containing data that pertain to the entire CDB. This value is also used for rows in non-CDBs. 1: This value is used for rows containing data that pertain to only the root n: Where n is the applicable container ID for the rows containing data Page 11 TIME_WAITED NUMBER If SESSION_STATE = WAITING, then the time that the session actually spent waiting for that event (in microseconds). This column is set for waits that were in progress at the time the sample was taken. If a wait event lasted for more than a second and was caught waiting in more than one session sample row, then the actual time spent waiting for that wait event will be populated in the last of those session sample rows. At any given time, this information will not be available for the latest session sample. Page 12 V$ADVISOR_PROGRESS displays information about the progress of advisor execution. Column Datatype Description SID NUMBER Session ID SERIAL# NUMBER Session serial number USERNAME VARCHAR2(128) Oracle user name OPNAME VARCHAR2(64) Operation name ADVISOR_NAME VARCHAR2(64) Advisor name TASK_ID NUMBER Task ID TARGET_DESC VARCHAR2(32) Description of the target of the advisor SOFAR NUMBER Amount of work done so far TOTALWORK NUMBER Total work to be done UNITS VARCHAR2(32) Units that the work is measured in BENEFIT_SOFAR NUMBER Benefit obtained so far BENEFIT_MAX NUMBER Estimate of maximum benefit that could be obtained FINDINGS NUMBER Number of findings so far RECOMMENDATIONS NUMBER Number of recommendations so far TIME_REMAINING NUMBER Estimate of time remaining for the completion of the task (in seconds) START_TIME DATE Start time of the task LAST_UPDATE_TIME DATE Last time progress was posted ELAPSED_SECONDS NUMBER Elapsed time so far ADVISOR_METRIC1 NUMBER Value of the advisor-specific metric METRIC1_DESC VARCHAR2(64) Description of the advisor-specific metric EXECUTION_TYPE VARCHAR2(64) Type of the last execution. This information is optional for single-execution tasks. CON_ID NUMBER The ID of the container to which the data pertains. Possible values include: 0: This value is used for rows containing data that pertain to the entire CDB. This value is also used for rows in non-CDBs. 1: This value is used for rows containing data that pertain to only the root n: Where n is the applicable container ID for the rows containing data Page 13 V$ALERT_TYPES displays information about server alert types. Column Datatype Description REASON_ID NUMBER ID of the alert reason OBJECT_TYPE VARCHAR2(64) Object type TYPE VARCHAR2(9) Alert type: GROUP_NAME VARCHAR2(64) Group name SCOPE VARCHAR2(8) Scope: INTERNAL_METRIC_CATEGORY VARCHAR2(64) Internal metric category INTERNAL_METRIC_NAME VARCHAR2(64) Internal metric name CON_ID NUMBER The ID of the container to which the data pertains. Possible values include: 0: This value is used for rows containing data that pertain to the entire CDB. This value is also used for rows in non-CDBs. 1: This value is used for rows containing data that pertain to only the root n: Where n is the applicable container ID for the rows containing data Page 14 TIME_WAITED NUMBER If SESSION_STATE = WAITING, then the time that the session actually spent waiting for that event (in microseconds). This column is set for waits that were in progress at the time the sample was taken. If a wait event lasted for more than a second and was caught waiting in more than one session sample row, then the actual time spent waiting for that wait event will be populated in the last of those session sample rows. At any given time, this information will not be available for the latest session sample. Page 15 BINDS_XML CLOB Information about bind variables used with the SQL, such as name, position, value, data type, and so on (stored in XML format) Page 16 WORKAREA_MEM NUMBER Amount of memory (in bytes) used by the operation when the query is executing; NULL if the execution is done. This applies only to operations using a work area, such as sort, hash-join, group-by, and so on. Page 17 V$AQ displays statistics for the queues in the database. Column Datatype Description QID NUMBER Unique queue identifier WAITING NUMBER Number of messages in the queue in the state 'WAITING' READY NUMBER Number of messages in the queue in the state 'READY' EXPIRED NUMBER Number of messages in the queue the state 'EXPIRED' AVERAGE_MSG_AGE NUMBER Average age of the messages in the queue' TOTAL_WAIT NUMBER Total wait time of all 'READY' messages in the queue AVERAGE_WAIT NUMBER Average wait time of 'READY' messages in the queue CON_ID NUMBER The ID of the container to which the data pertains. Possible values include: 0: This value is used for rows containing data that pertain to the entire CDB. This value is also used for rows in non-CDBs. 1: This value is used for rows containing data that pertain to only the root n: Where n is the applicable container ID for the rows containing data Oracle Database releases are categorized by five numeric segments that indicate release information. Oracle Database releases are released in version and version_full releases. The version release is designated in the form major release version.0.0.0.0. The major release version is based on the last two digits of the year in which an Oracle Database version is released for the first time. For example, the Oracle Database version released for the first time in the year 2018 has the major release version of 18, and thus its version release is 18.0.0.0.0. The version_full release is an update of a version release and is designated based on the major release version, the quarterly release update version (Update), and the quarterly release update revision version (Revision). The version_full releases are categorized by five numeric segments separated by periods as shown in the following example: First numeral: This numeral indicates the major release version. It also denotes the last two digits of the year in which the Oracle Database version was released for the first time. Second numeral: This numeral indicates the release update version (Update, or RU). Third numeral: This numeral indicates the release update revision version (Revision, or RUR). Fourth numeral: This numeral is reserved for future use. Currently it is always set to 0. Fifth numeral: Although only the first three fields are commonly used, the fifth field can show a numerical value that redundantly clarifies the release date of a release update (RU), such as 19.7.0.0.200414. Page 2 Review to understand how statements apply to releases. When a statement is made in Oracle Database Upgrade Guide about a major database release number, the statement applies to all releases within that major database release. Similarly, when a statement is made in Oracle Database Upgrade Guide about a maintenance release, the statement applies to all component-specific and platform-specific releases within that maintenance release. A statement about Oracle Database 12c applies to all component-specific and platform-specific releases within this release. A statement about Oracle Database 11g Release 2 (11.2) applies to release 11.2.0.2, release 11.2.0.3, and all other platform-specific releases within Oracle Database 11g Release 2 (11.2). Page 3 Review to understand how to set the COMPATIBLE initialization parameter for non-CDB and multitenant architecture containers. Oracle Database enables you to control the compatibility of your database with the COMPATIBLE initialization parameter. Understanding the COMPATIBLE Initialization Parameter In Oracle Database 19c, when the COMPATIBLE initialization parameter is not set in your parameter file, the COMPATIBLE parameter value defaults to 19.0.0 If you do not set the COMPATIBLE initialization parameter to 19.0.0, then you cannot use the new Oracle Database 19c features, because your upgraded database is not running in the required COMPATIBILITY setting for Oracle Database 19c features. Due to changes in internal SQL identifier and schema object name restrictions, you can experience an initial delay for any process where the database runs a Java stored procedure directly or indirectly in the database server after you increase the COMPATIBLE parameter setting. When you increase the Oracle Database COMPATIBLE parameter to 12.2.0 or later from a COMPATIBLE setting earlier than 12.2.0, and the database runs a Java stored procedure, the database performs a "name translation" operation. This operation can require a few minutes to complete. You should expect this delay the first time the database runs a Java stored procedure after you increase the compatibility parameter. This delay for the database to perform the name translation occurs only during the first Java process call. Rules for COMPATIBLE Parameter Settings in Multitenant Architecture The COMPATIBLE parameter of the container database (CDB) affects the COMPATIBLE parameter settings of pluggable databases (PDBs) plugged into that container database. Review the following scenarios that occur when you plug in a PDB to a CDB: PDB COMPATIBLE equal to CDB$ROOT COMPATIBLE parameter setting. Result: No change to the PDB COMPATIBLE parameter setting. PDB COMPATIBLE is lower than CDB$ROOT COMPATIBLE parameter setting. Result: The PDB COMPATIBLE parameter is increased automatically to the same COMPATIBLE parameter setting as CDB$ROOT. After you plug in the PDB, you cannot downgrade the PDB to an earlier release. PDB COMPATIBLE is higher than CDB$ROOT COMPATIBLE parameter setting. Result: The PDB cannot be plugged in. Only PDBs with a COMPATIBLE parameter setting equal to or lower than CDB$ROOT can be plugged in to the CDB. Page 4 In the context of upgrading Oracle Database, interoperability is the ability of different releases of Oracle Database to communicate and work in a distributed environment. A distributed database system can comprise different releases of Oracle Database, and all supported releases of Oracle Database can participate in the distributed database system. However, the applications that work with a distributed database must also be able to interoperate with the features and functions that are available at each node in the system. Interoperability across disparate operating systems and operating system versions can cause problems (especially during rolling upgrades) because the minimum requirements for the new Oracle Database release may require you to upgrade the operating systems on some or all of your hosts. For this reason, before you start an Oracle Database upgrade, you must check to ensure that drivers, network, and storage are compatible for all the interim upgrade states of the system during the rolling upgrade. Page 5 Run utlrp.sql to validate invalid objects as part of your upgrade test plan. After database upgrades, release changes can result in invalid schema objects in the upgraded database. Typically, invalid objects fix themselves as they are accessed or run. However, Oracle recommends that you recompile invalid objects in the database as part of your patching and upgrade procedure, so that you resolve issues with invalid objects, and any required dependencies, before users encounter these invalid objects. Object validation is an operation that checks the Oracle Database Data Definition Language (DDL) statements. These statements are used to define the database structure or schema. Validating DDL statements can take time to complete. The following is a list of some common factors that can affect object validation time: Number of invalid objects CPU types Processor speeds System loads Available physical memory The utlrp.sql command recompiles all objects in an invalid state, including packages, procedures, and types. It is located in the $ORACLE_HOME/rdbms/admin directory. The utlrp.sql script automatically runs in serial or in parallel recompilation, based on the number of CPUs available (identified by the parameter cpu_count), multiplied by the number of threads for each CPU (identified by the parameter parallel_threads_per_cpu). On Oracle Real Application Clusters systems (Oracle RAC), the number of parallel threads is added across all Oracle RAC nodes. Run the command either as the SYS user, or as another user account that is granted the SYSDBA system privileges. Oracle recommends that you run the utlrp.sql command in the earlier release Oracle Database to recompile any existing invalid objects in your database. Particularly ensure that SYS and SYSTEM user schema invalid objects are updated. During upgrade tests, run utlrp.sql in the upgraded Oracle Database as part of your upgrade test plan, so that you can include planning for recompilation time as part of your upgrade. Recompilation time is proportional to the number of invalid objects in the database. If the upgrade results in a large number of invalid objects, then utlrp.sql can take a significant amount of time to run. Page 6 Security policies are stored differently starting with Oracle Database 12c. If your existing Oracle Database is 11g Release 11.2, then delete security roles. In Oracle Database 12c, Oracle OLAP uses Oracle Real Application Security (ORAS) to store OLAP data security policies instead of Extensible Data Security (XDS), which it used in Oracle Database 11g releases. When you upgrade Oracle Database from release 11g to new Oracle Database releases, any XDS data security policies are automatically converted to ORAS. Page 7 Oracle Database supports multiple Oracle homes. You can install this release or earlier releases of the software more than once on the same system, in different Oracle home directories. Careful selection of mount point names can make Oracle software easier to administer. Configuring multiple Oracle homes in compliance with Optimal Flexible Architecture (OFA) rules provides the following advantages: You can install this release, or earlier releases of the software, more than once on the same system, in different Oracle home directories. However, you cannot install products from one release of Oracle Database into an Oracle home directory of a different release. Multiple databases, of different versions, owned by different users can coexist concurrently. To install Oracle Database software in multiple Oracle homes, you must extract the image file in each Oracle home, and then run the setup wizard from the respective Oracle home. You must install a new Oracle Database release in a new Oracle home that is separate from earlier releases of Oracle Database. You cannot install multiple releases in one Oracle home. Oracle recommends that you create a separate Oracle Database Oracle home for each release, in accordance with the Optimal Flexible Architecture (OFA) guidelines. In production, the Oracle Database server software release is the release number in the format of major and RU release number. For example, with the release number 19.3.0.0.0, the major release is 19 and the RU release number is 3. Later Oracle Database releases can access earlier Oracle Database releases. However, this access is only for upgrades. For example, Oracle Database 19c can access an Oracle Database 18c if the 18c database is started up in upgrade mode. Structured organization of directories and files, and consistent naming for database files simplify database administration. Login home directories are not at risk when database administrators add, move, or delete Oracle home directories. For information about release support timelines, refer to My Oracle Support Doc ID 742060.1 Page 8 Review these topics to determine which is the best path for you to select to upgrade Oracle Databases. Review these steps to obtain a high-level overview of how to upgrade Oracle Database using Oracle GoldenGate. Upgrading to the new Oracle Database release using Oracle GoldenGate consists of the following steps. Set up a target database running the earlier Oracle Database software release, using an existing database backup. Upgrade the target database to the new Oracle Database release. Synchronize the target database with the production database. Test your environment in active/live mode. Switch over the application to the target database. Perform comprehensive testing of the new release on the target database, including enabling any features that were installed disabled by default that you plan to use in the new Oracle Database release. Upgrade the production database to the new Oracle Database release. Page 9 There are two methods to convert non-CDBs to multitenant architecture Oracle Databases during upgrades, and several different technologies you can use. Oracle Database 19c is the terminal release for non-CDB Oracle Database upgrades to non-CDB architecture. Review the upgrade options for migration and upgrade from non-CDB Oracle Database architecture to Oracle Database deployed using the multitenant architecture. Options for Manual Migration and Upgrades of Oracle Database Non-CDB Architecture to the Multitenant Architecture There are two ways you can perform manual migrations and upgrades of non-CDBs to Oracle Database container databases (CDBs) and pluggable databases (PDBs), which use the multitenant architecture: Convert the non-CDB to a PDB before upgrade. With this option, you plug in the non-CDB Oracle Database release to the same release CDB. (For example, plug in a non-CDB Oracle Database Release 18c into an Oracle Database 18c release CDB). Finish converting the non-CDB Oracle Database to a PDB. Then, upgrade the entire CDB, with its PDBs, to Oracle Database 19c. Plug in the non-CDB, upgrade, and finish converting the non-CDB to a PDB after upgrade. With this option, you plug in a non-CDB Oracle Database release to an Oracle Database 19c CDB. Upgrade the plugged-in non-CDB Oracle Database to Oracle Database 19c. Then, finish converting the non-CDB Oracle Database to a PDB. Upgrade Technology Methods for Options The following table lists methods that you can use to convert upgrades, including references to availability issues. It also provides references to the documentation that describes how to carry out each upgrade method. Table 1-3 Technology Methods for Migrating and Upgrading Databases During Upgrades Method Description Reference AutoUpgrade for Oracle Database Use the AutoUpgrade tool to automate the upgrade of your database. Refer to the topic "Using AutoUpgrade for Oracle Database Upgrades" Oracle Data Guard Transient Standby (Physical Standby) database Use an existing physical standby database to perform a database upgrade by temporarily converting it to a logical standby database, and then converting it back to a physical standby. Refer to the topic “About Upgrading Using Standby Databases” Parallel Upgrade Utility Use the Parallel Upgrade Utility to perform a manual upgrade of Oracle Database. If the Oracle Database is a non-CDB, then you must convert the database to a PDB Refer to the topics under "Upgrading Oracle Database with DBUA or Parallel Upgrade Utility" Oracle GoldenGate synchronization of production and standby databases for zero downtime upgrades Use Oracle GoldenGate with software upgrades and with Oracle Database data migration procedures to carry out a synchronization approach to maintaining availability during an upgrade. Use RMAN restore and upgrade to set up a standby database running the earlier release software using an existing backup Upgrade the standby database to the new Oracle Database release Move the entire database and synchronize the standby database with the production database using the following tools: Oracle Data Pump Transportable Tablespaces (TTS) CREATE TABLE AS SELECT (CTIS) to create new tables and populate them with rows from specified queries. INSERT AS SELECT (IAS) to create nonpartitioned tables Use Data Load/Unload to load data into the new database release, and unload data from the old database release Refer to Oracle GoldenGate documentation, and relevant Oracle Database documentation for your use case. Oracle Enterprise Manager Cloud Control Oracle provides Cloud Control support for performing database upgrades with Oracle Database 12c and later releases. This option requires that you purchase the Enterprise Manager Lifecycle Management Pack. Refer to Online help in Oracle Enterprise Manager Cloud Control Page 10 You can perform rolling upgrades of databases by using Active Oracle Data Guard, or by using Oracle Enterprise Manager Cloud Control. The DBMS_ROLLING PL/SQL package enables you to upgrade the database software in an Oracle Data Guard configuration in a rolling fashion. Rolling upgrades using Active Data Guard uses an Oracle Data Guard physical standby database and the SQL Apply process. Using Data Guard for rolling upgrades is supported for Oracle Database 12c release 1 (12.1) and later Oracle Database releases. With Oracle Database 12c release 2 (12.2) and later releases, when you perform a rolling upgrade using the DBMS_ROLLING PL/SQL package, you no longer need to disable the broker. In addition, the broker now reports when a rolling upgrade is in place, and tracks its status. The status information is displayed in the output of the DGMGRL commands SHOW CONFIGURATION and SHOW DATABASE. Oracle Enterprise Manager Cloud Control provides options to perform a rolling upgrade of databases in a Data Guard configuration. The procedures are described in online help within Cloud Control. Page 11 Review these options to migrate to Oracle Database Enterprise Edition from Oracle Database Standard Edition If you have Oracle Database Standard Edition at a release earlier than the new Oracle Database release, then you can change it from a Standard Edition release to Oracle Database Enterprise Edition by selecting one of the following options: Perform a normal upgrade procedure. Install Oracle Enterprise Edition software in a new Oracle home, and follow the normal upgrade procedures as described in the "Upgrading Oracle Database" chapter. The Data Dictionary for Standard Edition and Enterprise Edition configurations are the same. The difference between Standard Edition and Enterprise Edition is in the options that are available in the server executable. Perform an In-Place Upgrade using the same Oracle home. If you have a Standard Edition database at a release earlier than the new release of Oracle Database, and you want to perform an in-place upgrade using the same Oracle home, then you must first upgrade the Standard Edition Database. After you complete the upgrade, use the procedure described here to install Oracle Database Enterprise Edition software and to move to Oracle Database Enterprise Edition. Ensure that the release number of your Oracle Standard Edition server software is the same release as your Oracle Enterprise Edition server software. Shut down your database. If your operating system is Windows, then stop all Oracle services, including the OracleServiceSID Oracle service, where SID is the instance name. Back up all database files under the current Oracle home that you must keep. Deinstall the Standard Edition server software. Run the deinstallation tool from the Oracle home. The deinstallation tool is available as a separate command (deinstall) under the Oracle home directory after installation. It is located under ORACLE_HOME/deinstall. To deinstall an Oracle home on Microsoft Windows, use the following syntax: setup.exe –deinstall –home path_of_Oracle_home_to_be_deinstalled To deinstall an Oracle home on Linux and Unix, use the following syntax: $ ./runInstaller –deinstall –home path_of_Oracle_home_to_be_deinstalled Install Oracle Enterprise Edition server software. Select the same Oracle home that was used for the Standard Edition that you uninstalled, or select a new Oracle home. During the installation, be sure to select Enterprise Edition. When prompted, choose Software Only. If you have an existing database, then set your ORACLE_SID to this preexisting database. If your existing database is on Microsoft Windows, then you must recreate the database service by using the ORADIM utility. Start up your database. Page 12 Converting from Enterprise Edition to Standard Edition requires exporting and importing data, using the Export utility. To properly convert from an Enterprise Edition database to a Standard Edition database, you must perform an Export/Import operation. If you only install Standard Edition software, then some data dictionary objects become invalid. These invalid objects create problems when maintaining the database. The Export/Import operation does not introduce data dictionary objects specific to the Enterprise Edition, because the SYS schema objects are not exported. After the Import in the Standard Edition database, you are only required to drop user schemas related to Enterprise Edition features. Page 13 You must upgrade from Oracle Database Express Edition to Oracle Database Enterprise Edition, and then upgrade to the current Oracle Database release. Oracle Database Express Edition (Oracle Database XE) is an entry-level edition of Oracle Database. To upgrade Oracle Database 11g release 2 (11.2) Express Edition (Oracle Database XE) to Oracle Database 12c Release 2 or later releases, you must first upgrade from Oracle Database XE to Oracle Database 12c Release 1 (12.1.0.2) Enterprise Edition, and then upgrade to a later Oracle Database Enterprise Edition release. For more information, see the "Oracle Database Express Edition (XE)" Oracle online forum: Page 14 Review these restrictions and guidelines if you want to perform a cross-platform upgrade. When using DBUA or when performing a manual upgrade for Oracle Database, you cannot directly migrate or transport data in a database on one operating system to a database on another operating system. For example, you cannot migrate data in an Oracle database on Solaris to an Oracle 12c database on Windows using DBUA. You must follow procedures specific to your operating system platforms. To see the platforms that support cross-platform data transport, run the following query using SQL*Plus:SELECT * FROM V$TRANSPORTABLE_PLATFORM ORDER BY PLATFORM_NAME; Page 15 Understand image-based installation to simplify installation and configuration of Oracle Database software. To install Oracle Database, create the new Oracle home, extract the image file into the newly-created Oracle home, and run the setup wizard to register the Oracle Database product. Using image-based installation, you can install and upgrade Oracle Database for single-instance and cluster configurations. This installation feature streamlines the installation process and supports automation of large-scale custom deployments. You can also use this installation method for deployment of customized images, after you patch the base-release software with the necessary Release Updates (Updates) or Release Update Revisions (Revisions). Page 16 Complete preupgrade tasks and checks to assist you with completing a successful upgrade. This chapter provides information and procedures for the pre-upgrade tasks, including planning your upgrades, data-gathering, testing, installing the new Oracle software for the upgrade, using the Parallel Upgrade Utility to carry out your upgrade, and performing other checks and tasks. Page 17 Carry out these tasks to prepare your upgrade. Before you upgrade your database, Oracle recommends that you review the new features and determine the best upgrade path and method to use, and carry out procedures to prepare your database for upgrade. Oracle strongly recommends that you test the upgrade process and prepare a backup strategy. Page 18 Before you plan the upgrade process, become familiar with the features of the new Oracle Database release. Oracle Database New Features Guide is a good starting point for learning the differences between Oracle Database releases. Also, check specific guides in the Oracle Database documentation library to find information about new features for a certain component. For example, see Oracle Real Application Clusters Administration and Deployment Guide for changes in Oracle Real Application Clusters. Page 19 To obtain a checklist of tasks you must complete before upgrading an Oracle Database, run the AutoUpgrade utility (autoupgrade.jar) in analyze mode. Oracle recommends that you download and run the most recent release of AutoUpgrade in -analyze mode before you upgrade Oracle Database. AutoUpgrade can identify issues for you to address before you start your upgrade. In certain cases, AutoUpgrade can also generate scripts that can resolve some issues. Page 20 Before you upgrade, check to see if deprecated or desupported features require attention in your upgrade plan. Every release, Oracle modifies or removes support for features, views, and parameters, so that Oracle can focus on improving core manageability and functionality of other features in the database. For that reason, as part of your upgrade planning, Oracle recommends that you review the list of features listed as deprecated or desupported in a new release, and determine if these changes are of concern for your applications. There are two categories of features scheduled for removal: Deprecated features are features that are no longer being enhanced, but are still supported for the full life of this release of Oracle Database. Desupported features are features that are no longer supported by fixing bugs related to that feature. Often, Oracle can choose to remove the code required to use the feature. A deprecated feature can be desupported in the next Oracle Database release. If you see that a feature is deprecated, then Oracle strongly recommends that you stop using that feature as soon as it is practicable for you to do so. Start planning your migration away from deprecated features at the time that they are deprecated. Page 21 The AutoUpgrade utility identifies issues before upgrades, performs pre- and postupgrade actions, deploys upgrades, performs postupgrade actions, and starts the upgraded Oracle Database. Oracle recommends that you download the most recent version of the AutoUpgrade Utility from My Oracle Support Document 2485457.1, and use autoupgrade.jar to prepare for and to deploy your upgrade. The AutoUpgrade utility is designed to automate the upgrade process, both before starting upgrades, during upgrade deployments, and during postupgrade checks and configuration migration. You use AutoUpgrade after you have downloaded binaries for the new Oracle Database release, and set up new release Oracle homes. When you use AutoUpgrade, you can upgrade multiple Oracle Database deployments at the same time, using a single configuration file, customized as needed for each database deployment. Starting with Oracle Database 21c, when you have an existing target release CDB, you can use AutoUpgrade to convert a non-CDB Oracle Database to a PDB on the target release CDB during the upgrade. With AutoUpgrade, when you have an existing target release CDB, you can use AutoUpgrade to convert a non-CDB Oracle Database to a PDB on the target release CDB during the upgrade. Starting with AutoUpgrade version 22.1, Oracle provides REST APIs that enable you to perform upgrades remotely over SSH using Oracle REST Data Services (ORDS) or Oracle Cloud Infrastructure (OCI) REST API. The ORDS database API is a database management and monitoring REST API embedded into Oracle REST Data Services. The OCI REST API is enabled by configuring the REST Adapter connection to use the OCI Signature Version 1 security policy. You can now use these features to run AutoUpgrade upgrades remotely over HTTPS or HTTP. The minimum COMPATIBLE parameter setting for the source database must be at least 12.2.0. If the COMPATIBLE setting is a lower version, then during the conversion and upgrade process, COMPATIBLE is set to 12.2.0. During the conversion, the original datafiles are retained. They are not copied to create the new PDB. To enable AutoUpgrade to perform the upgrade, edit the AutoUpgrade configuration file to set the AutoUpgrade parameters target_version to the target CDB release, and identify the CDB to which the upgraded database is placed using target_cdb. During the conversion and upgrade process, AutoUpgrade uses that information to complete the upgrade to the target CDB. Page 22 When you upgrade or patch the database, you must install the new Oracle home in a new location (an out-of-place upgrade or patch). AutoUpgrade performs out-of-place upgrades and patches: This means that the upgrade or the patched Oracle home is in a new Oracle home. Previously, with an in-place upgrade or patch, the upgrade or patch was applied to the existing Oracle home. Using separate installation locations enables you to keep your existing Oracle software installed along with the new Oracle software. By using separate installation locations, you can test the upgrade or patch process in the out-of-place Oracle home database before replacing your production environment entirely. When you upgrade a database, whether the database is a non-CDB or a CDB, the upgrade must be an out-of-place upgrade, which means that a new location is needed to install the new Oracle home. Page 23 Review this topic to understand how to carry out SQL plan managements after upgrades to avoid performance regressions. A database upgrade that installs a new optimizer version usually results in plan changes for a small percentage of SQL statements. Most plan changes result in no performance change or improvement. However, certain plan changes may cause performance regressions. SQL plan management prevents performance regressions resulting from sudden changes to the execution plan of a SQL statement by providing components for capturing, selecting, and evolving SQL plan information. SQL plan management is a preventative mechanism that records and evaluates the execution plans of SQL statements over time, and builds SQL plan baselines composed of a set of existing plans that are proven efficient after repeated use. SQL plan management uses the SQL plan baselines to preserve the performance of corresponding SQL statements, regardless of changes occurring in the system. With SQL plan management, the optimizer automatically manages execution plans and ensures that only known or verified plans are used. When SQL Plan management finds a new plan for a SQL statement, it does not use this plan until the database verifies that the new plan has comparable or better performance than the current plan. If you seed SQL plan management with your current execution plans, then those plans becomes the SQL plan baseline for each statement. The optimizer uses these plans after the upgrade. If the Oracle Database 12c optimizer determines that a different plan can result in better performance, then the new plan is queued for verification and is not used until it has been confirmed to have comparable or better performance than the current plan. There are several ways to seed or populate a SQL Management Base (SMB) with execution plans: Bulk Load a SQL Management Base from the Cursor Cache Bulk loading of execution plans or SQL plan baselines from the cursor cache is useful when upgrading a database from Oracle Database 11g to the latest release of Oracle Database. The cursor cache is a shared SQL area, and SQL plans that are bulk loaded are automatically accepted and added to existing or new plan histories as SQL plan baselines. In the source release of Oracle Database, use the DBMS_SPM.LOAD_PLAN_FROM_CURSOR_CACHE procedure or Oracle Enterprise Manager to load all of the execution plans in the cursor cache into the SQL Management Base. Upgrade the database. Bulk Load a SQL Management Base with a SQL Tuning Set (STS) Bulk loading of execution plans or SQL plan baselines may be done with a SQL Tuning Set. This is useful when upgrading from Oracle Database 10g, where no SQL Management Base (SMB) exists to directly load from the cursor cache, or to load historic plans from the Automatic Workload Repository. In the source release of Oracle Database, create an STS that includes the execution plan for each of the SQL statements. Load the STS into a staging table and export the staging table into a dump file. Import the staging table from a dump file into the new release of Oracle and unload the STS. Use Oracle Enterprise Manager or DBMS_SPM.LOAD_PLANS_FROM_SQLSET to load the execution plans into the SQL Management Base. Unpack Existing SQL Plan Baselines from a Staging Table You can test and tune all of your critical SQL queries on an Oracle Database test environment and then move those SQL execution plans to your Oracle Database production environment. Alternatively, you can take plans for SQL queries from your pre-upgrade Oracle Database production environment and move them to your post-upgrade production environment. On the Oracle Database 12c test system, after completing all testing and tuning, use the DBMS_SPM.LOAD_PLAN_FROM_CURSOR_CACHE procedure or Enterprise Manager to load all of the execution plans in the cursor cache into the SQL Management Base. Create a staging table using the DBMS_SPM.CREATE_STGTAB_BASELINE procedure. Pack the SQL plan baselines you created in step 1 into the staging table using the DBMS_SPM.PACK_STGTAB_BASELINE function. Export the staging table into a flat file using Data Pump. Transfer this flat file to the target system. Import the staging table from the flat file using Data Pump. Unpack the SQL plan baselines from the staging table into the SQL Management Base on the target system using the DBMS_SPM.UNPACK_STGTAB_BASELINE function. To prevent users from encountering performance regressions after an Oracle Database upgrade, carry out SQL plan management. An Oracle Database upgrade that installs a new optimizer version usually results in plan changes for a small percentage of SQL statements. Most plan changes result in no

Planned Not Planned Not Planned Not Planned Oracle Solaris SPARC (64-bit) TBA See DOC ID 2853097.1 26-Apr-2019 30-Jul-2018 1-Mar-2017 22-Jul-2014 25-Jun-2013 29-Aug-2013 Oracle Solaris x86-64 (64-bit) Platform de-supported Platform de-supported 07-Nov-2019 Terminal Release 6-Aug-2018 1-Mar-2017 22-Jul-2014 25-Jun-2013 29-Aug-2013 Microsoft Windows x64 (64-bit) TBA (Instant Client is available today) 08-Oct-2021 08-Jun-2019 21-Aug-2018 16-Mar-2017 25-Sep-2014 9-Jul-2013 25-Oct-2013 OpenVMS Itanium Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Terminal Release HP-UX Itanium (See Doc ID 3080621.1) TBA 28-Sept-2021 28-May-2019 20-Nov -2018 13-Apr-2017 14-Nov-2014 9-Jan-2014 10-Oct-2013 HP-UX PA-RISC (64-bit) Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported 2-Jan-2014 IBM AIX on POWER Systems TBA See DOC ID 2766930.1 28-May-2019 20-Nov -2018 13-Apr-2017 14-Nov-2014 9-Jan-2014 10-Oct-2013 IBM Linux on System z TBA See DOC ID 2766930.1 06-June-2019 20-Nov -2018 6-Jun-2017 14-Nov-2014 9-Jan-2014 9-Jan-2014 Microsoft Windows (32-bit) Not Planned Client Only - Oct 2021 Client only - June 2019 Client Only Client Only Client Only Not planned 25-Oct-2013 Platform23ai21c191812.2.0.112.1.0.212.1.0.111.2.0.4 Apple macOS (Intel) download Not planned 10-Sept-2019 Mar-2018 15-Jan-2018 2016 Not planned 20-Apr-2014 Download Apple macOS ARM64 21-Jun-2024 Download IBM Linux on POWER (Big Endian) 18-Dec-2015 (download) 4-Dec-2014 IBM Linux on POWER (Little Endian) download Jul-2019 download 31-Oct-2018(download) 7-Jun-2017 (download) 18-Dec-2015(download) 1 Oracle Base Database Service (formerly Oracle Database Cloud Service) and Exadata Database Service (formerly Exadata Cloud Service and Exadata Cloud@Customer) follow the same support life and error correction schedule as on-premises dates unless otherwise noted in Table 1 above (for example, 11.2.0.4 MDS). Also, Extended Support is bundled with both the license-included and BYOL versions of these services and does not require additional fees. These services will not be covered under Sustaining Support and Oracle makes no commitment that any cloud service instances will continue to run after the end of their support life (Premier, extended, error correction, or MDS). We will not disable any installed databases upon the expiration of support, but the underlying infrastructure will continue to be updated. The infrastructure updates may render the unpatched databases inoperable. We make no commitment as to how long any unpatched databases will continue to run. 2 Oracle's current plan for Oracle Autonomous Database - Shared Exadata Infrastructure, Oracle Autonomous Database - Dedicated Exadata Infrastructure, Autonomous Database on Exadata Cloud@Customer services is to support Long Term Release versions for a similar period of time found for those major releases when deployed on-premises. The intent of this plan is to provide stability of service experience for the thousands of critical database deployments found in Oracle Cloud. Additionally, we will at times make available Innovation Releases as part of the Autonomous Database Cloud Services. Innovation Releases, when provided, will be supported for a shorter period of time as compared to a Long Term Release, similar to what is found for those releases when deployed on-premises. Oracle reserves the right to change this plan with changing business requirements. Any change will take into account that stability is of utmost importance to Oracle's many thousands of mission critical deployments. 3 Private Cloud Appliance (PCA) using 23ai is supported with PCA Software Version 3+. Due to PCA Software v3 Hardware requirement, it is thus supported on PCA Hardware X9-2 (and later) and Compute Cloud @ Customer X10 (and later) References for Client-Only: //www.oracle.com/technetwork/database/enterprise-edition/downloads/oracle19c-windows-5539283.html 32-bit Linux & Windows Instant Clients, The support for 32-bit Oracle Clients (both Full and Instant Client) has been discontinued since 23ai; i.e., there will be no 32-bit Instant Client releases with 23ai and beyond. Legend: Qn CYyyyy: Date falls within the Calendar Year specified. 1H or 2H CYyyyy: Date falls within the 1st half (six months) or 2nd half of Calendar Year. For example 1H CY2024 means "within the first six months of 2024". TBA = Schedule To Be Announced Actions The dates published in this document are for planning and discussion purposes only. Contacts In this Document Oracle Database Release Roadmap Oracle Database Release Schedule Oracle Public Cloud Releases On-Premises Engineered Systems On-Premises Server Releases (includes client) Instant Client-Only Releases Change History (2020-2025) My Oracle Support provides customers with access to over a million knowledge articles and a vibrant support community of peers and Oracle experts. Oracle offers a comprehensive and fully integrated stack of cloud applications and platform services. For more information about Oracle (NYSE:ORCL), visit oracle.com. ◆ Oracle | Contact and Chat | Support | Communities | Connect with us | | | | Legal Notices | Terms of Use Last updated on MAY 19, 2025Applies to: Oracle Database Cloud Service - Version N/A and laterOracle Database - Personal Edition - Version 11.2.0.4 and laterOracle Database - Enterprise Edition - Version 11.2.0.4 and laterAutonomous Database Dedicated - Version NA and laterAutonomous Database Serverless - Version N/A and laterInformation in this document applies to any platform. Information in this document applies to any commercial (i.e., not free) edition of Oracle Database version 11.2.0.4 and later, on any supported platform in the cloud or on-premises.Details Disclaimer: The dates published in this document are for planning and discussion purposes only. It is intended solely to help you plan your I.T. projects. A date that exists in the future should not be considered a firm development date as the release and timing of platform releases are subject to change at any time and are at Oracle's sole discretion. Your access to and use of this confidential material is subject to the terms and conditions of your Oracle Software License and Service Agreement, which has been executed and with which you agree to comply. This document and information contained herein may not be disclosed, copied, reproduced or distributed to anyone outside of the licensed organization without prior written consent of Oracle. This document is not part of your license agreement nor can it be incorporated into any contractual agreement with Oracle or its subsidiaries or affiliates. The content below represents the most accurate information that Oracle can provide. This is a living document that will change as various milestones are reached and releases go in and out of the product life cycle. It is intended to give you current information about releases that are covered under the Database's Premier Support (PS) and Extended Support (ES) Lifetime policies. Support cannot provide additional dates not listed in this document; do not log a Service Request asking for a future release date. If you wish to be notified when this document changes, set the article as a Favorite, and follow the instructions for Email Notification in KM Doc ID: 793436.2 What's New The most recent changes will be highlighted with a "New" or "Updated" icon to help you quickly identify the modifications. (For a history of modifications, see the Change Record Table at the bottom of the document.) Restricted Upgrade Support has been added for 2026 through Customer Success Services (11.2, 12.1, 12.2) Updated Lifetime Support Dates for 23ai Updated Lifetime Support Dates for19c 23ai Released on Oracle Database Appliance and Oracle Exadata Oracle Database Release Roadmap Oracle Database releases fall under one of the following: Long Term Release or Innovation Release. Oracle Database Long Term releases are ideal for use cases that benefit from less frequent upgrades to newer releases. Long Term Releases offer the highest level of stability and the longest length of error correction support. These releases have at least 5 years of Premier Support followed by 3 years of Extended Support. As necessary, Oracle may extend the Premier Support period or waive the Extended Support fee. When combined with Extended Support, customers typically have 4 or more years to upgrade from one Long Term release to the next Long Term release. In between Oracle Database Long Term releases, Oracle delivers Oracle Database Innovation releases that include many enhancements and new capabilities which will also be included in the next Long Term release. Innovation releases are designed to enable customers to continuously use leading-edge technologies to rapidly develop or deploy new applications or augment existing applications. Support for Innovation releases includes at least 2 years of Premier Support and there will be no Extended Support or exceptions. Production workloads can be deployed on Innovation releases if upgrading to the next database release within one year after the next database release ships is factored into the deployment plan. To help you plan ahead, below is a visual roadmap that captures Oracle Database Releases from 11.2 onward, showing the lifetime support stages (Premier, Extended, etc.) and the Error Correction windows for each release. Note, not all releases are eligible for Extended Support (i.e. 12.2.0.1, 18c, 21c). Figure 1 - Database Release Roadmap Oracle is mindful of the unprecedented economic and business disruption our customers faced in 2020. We decided to not promote our Database 20c Preview version to General Availability. Instead, we incorporated all of the 20c functionality into the 21c release and made 21c available initially in our Autonomous Database Free Tier so that all can test drive the new features and enhancements for free. Oracle has a adopted a cloud-first, developer-first strategy for Oracle Database releases. (Doc ID 3068039.1) For details on the Database Suite Lifetime Support Policy (incl. Premier, Extended, Sustaining), see Lifetime Support Policy - Oracle Technology Products. For details on the Database Suite Error Correction Policy (incl. Patching end dates and grace periods), see Database, FMW, EM Grid Control, and OCS Software Error Correction Support Policy (Doc ID 209768.1). For details on Global Database Extended Support (ES) Fee Waivers, and Limited Error Correction, see Oracle Software Technical Support Policies Section 3 "Lifetime Support" subtitle "Exceptions". Table 1 - Patching End Dates for Roadmap ReleasePatching End Date Notes and Exceptions 23ai Long Term Release Premier Support - December 31, 2031 Extended Support - TBD Because of the importance of the breakthrough AI technology in this release, we are renaming it from Oracle Database 23c to Oracle Database 23ai Now available in cloud, Oracle Exadata and Oracle Database Appliance. See details in the Oracle Database Schedule table below. Premier Support ends December 31, 2031 Error Correction / Patching with Extended Support fees or ULA - end date is TBD 21c Innovation Release July 31, 2027 Error Correction / Patching is available until July 31, 2027 21c is not eligible for Extended Support (ES) Only quarterly Release Updates (RUs) are provided for 21c. 21c is not available with Exadata Database Service 19c Long Term Release December 31, 2029 with Premier Support December 31, 2032 with ES/ULA Premier Support (PS) ends December 31, 2029. Extended Support (ES) will be Jan 01, 2030 through December 31, 2032 Error Correction / Patching is available through December 31, 2032 with paid ES. Without paid ES, patching is only available until December 31, 2029 Beginning with the October 2022 patching cycle, 19c RURs will no longer be provided for 19.17.0 and above. No additional RURs will be delivered on any platform after the delivery of Oracle Database 19c RUR 19.16.2 in January 2023. (Refer to Sunsetting of 19c RURs and FAQ (Doc ID 2898381.1) for further details.)To provide customers more frequent access to recommended and well-tested collections of patches, Oracle is pleased to introduce Monthly Recommended Patches (MRPs) starting Nov 2022. MRPs are supported only on the Linux x86-64 platform. (Refer to Introducing Monthly Recommended Patches (MRPs) and FAQ (Doc ID 2898740.1) for further details.) 18c Innovation Release Jun 30, 2021 Error Correction / Patching was available until Jun 30, 2021. 18c is now in Sustaining Support. 18c is not eligible for Extended Support (ES) 18c is not supported on Exadata Database Service, Base Database Service or Exadata Cloud@Customer 12.2.0.1 Mar 31, 2022 Upgrade Support (Restricted Availability) Jan 1, 2024- Dec 31, 2026 - Contact CSS for details Error Correction / Patching has ended for this release. 12.2.0.1 is not eligible for Extended Support (ES) Upgrade Support (Restricted Availability) (aka MDS) required to provision and/or run 12.2.0.1 on Exadata Database Service, Base Database Service or Exadata Cloud@Customer 12.1.0.2 Terminal Release Jul 31, 2022 with paid ES, ULA, or EBS waiver Upgrade Support (Restricted Availability) through Dec 31, 2026 - Contact CSS for details Error Correction / Patching has ended for this release. Premier Support (PS) ended Jul 31, 2018 and one year of free Extended Support (ES) was in effect until July 31, 2019. ES fees or a ULA was required beginning 01-Aug-2019 through 31-Jul-2022. Without paid ES or ULA, patching ended 31-Jul-2019. A global ES uplift fee waiver was in place for E-Business customers. For details and dates of expiration see: Extended Support Fee Waiver for Oracle Database 12.1 and 11.2 for Oracle E-Business Suite (Doc ID 2522948.1) or Technical Support Policy Document. Apple Macintosh platform patching end date (Error Correction end date) was July 31, 2021. Microsoft Windows: Regardless of the version used to run the 12.1.0.2 Database, Oracle built the 12.1.0.2 Database on Microsoft Windows 2008. This platform reached end-of-life support on January 14, 2020. Oracle made reasonable efforts to deliver patches for the Database 12.1.0.2 on Windows until July 2022 but that support has expired. Upgrade Support (Restricted Availability) (aka MDS) is required to provision and/or run 12.1.0.2 on Exadata Database Service, Base Database Service or Exadata Cloud@Customer 12.1.0.1 Aug 31, 2016 Error Correction / Patching has ended for this release. 12.1.0.1 is not eligible for Extended Support (ES) 12.1.0.1 was the last release of Standard Edition (SE) and Standard Edition One (SE1) 11.2.0.4 Terminal Release for 11.2 Dec 31, 2020 (with paid Extended Support or ULA Extended Support or EBS Waiver) Upgrade Support (Restricted Availability) through Dec 31, 2026 Contact CSS for details Dec 31, 2021 for OpenVMS platform Premier Support (PS) ended 31-Jan-2015 and one year of free Extended Support (ES) was in effect until Dec 31, 2018. ES fees or a ULA was required beginning Jan 1, 2019 through Dec 31, 2020. A global Extended Support Uplift Fee waiver was in place for E-Business customers. For details and dates of expiration see: Extended Support Fee Waiver for Oracle Database 12.1 and 11.2 for Oracle E-Business Suite (Doc ID 2522948.1) or Technical Support Policy Document. Gen 1 and Gen 2 ExaCC, OCC DBCS, OCI DBCS,OCI ExaCS and ODA had 3 additional months of Extended Support. The end of Extended Support for 11.2.0.4 databases on these platforms was: 31-March 2021. New instances could be created up until the end of extended support; however, Oracle made no commitment that any 11.2.0.4 DBCS instances will continue to run after the end of Support. Market Driven Support was only available for the following Database Cloud Services: Gen 1 and Gen 2 ExaCC, OCC DBCS, OCI DBCS (non-PSM), OCI ExaCS. New instances could be created up until the end of Market Driven Support. Oracle made no commitment that any 11.2.0.4 DBCS instances would continue to run after the end of MDS support. Market Driven Support was not available for PSM-based OCI DBCS, OCI-C DBCS and OCI-C ExaCS. Upgrade Support (Restricted Availability) (aka MDS) required to provision and/or run 11.2.0.4 on Exadata Database Service, Base Database Service or Exadata Cloud@Customer 11.2.0.4 is the terminal release on OpenVMS. During calendar year 2021, customers received Severity 1 Fixes and Security Updates for no additional charge beyond standard Premier Support costs. Coverage did not extend to new certifications, third-party products, or any Java/JDK functionality including Java components embedded in the database. Coverage also excluded any updates related to cryptography and network encryption. This offering did not include standard Security Patch Updates (SPUs). Recommended Upgrade Path Oracle recommends the following upgrade options: For product longevity and patching, Oracle strongly recommends upgrading to 19c which is the current on-premises Long Term release with a support end date of December 31, 2032 (or December 31, 2029 if you choose not to pay Extended Support fees or purchase a ULA). If you are currently running 11.2.x/12.1.x you will need to upgrade to the terminal release (i.e. 11.2.0.4/12.1.0.2) for the DB Release you are running and then continue the upgrade process to 19c. 11.2.0.4, 12.1.0.2 and 12.2 are in Sustaining Support with Upgrade Support available for limited platforms. Contact CSS for details. Note: ACS has been renamed to Customer Success Services. If you are currently running 18c, you should upgrade to 19c without delay. 18c is in Sustaining Support. The next Long Term release is 23ai. To upgrade to 23ai, you must be on 19c or later. For questions related to certification combinations and Lifetime Support agreements with other Oracle products like Oracle E-Business Suite, Oracle JD Edwards, Oracle PeopleSoft, and Oracle Siebel, please contact your Oracle Account Representative. Oracle Database Release Schedule These are server releases unless otherwise specified. Server releases always include the native word size client (e.g. 64-bit). Where the platform supports it, a 32-bit and 64-bit client is also part of the release. Table 2 - Database Release Schedule Platform 23ai Long Term Release 21c Innovation Release 19c Long Term Release 18c12.2.0.112.1.0.212.1.0.111.2.0.4 Exadata Express Cloud Service Not Planned Not Planned Not Planned Not Planned 18-Sep-2016 N/A Base Database Service1 (Previously known as: Database Cloud Service) 19-Sep-2023 08-Dec-2020 available on VM (RAC or single-instance) and Bare Metal (single-instance) OCI DB System - VM: Jul-2019 OCI DB System - Bare Metal: April 2020 1-Mar-2018 4-Nov-2016 Sep-2014 N/A Sep-2014 Exadata Database Service on Dedicated Infrastructure1 (Previously known as: Exadata Cloud Service) 2-May-2024 N/A 19-Jun-2019 Jun-2018 4-Nov-2016 Oct-2015 N/A Oct-2015 Gen 1 Exadata Cloud at Customer1 (Previously known as: Exadata Cloud at Customer) N/A N/A 17-Sep-2019 May-2018 2-May-2017 Dec-2016 N/A Exadata Database Service on Cloud at Customer 1 2-May-2024 N/A 17-Sep-2019 N/A N/A N/A N/A Autonomous Database on Dedicated Exadata Infrastructure 2 31-May-2024 N/A 26-Jun-2019 N/A N/A N/A N/A Autonomous Database on Exadata Cloud at Customer 2 31-May-2024 N/A 08-Jul-2020 N/A N/A N/A N/A Autonomous Database on Shared Exadata Infrastructure 28-Jun-2024 N/A 15-Mar-2020 18-Mar-2018 N/A N/A N/A Compute Cloud at Customer 22-Jul-2024 N/A N/A N/A N/A N/A N/A (Same software as released for other platforms but tested on Engineered Systems) Oracle Database Appliance 22-Jul-2024 16-Sep-2021 16-Oct-2019 7-Mar-2018 17-Nov-2017 Apr 2014 N/A Oct 2013 Exadata 22-Jul-2024 13-Aug-2021 13-Feb-2019 16-Feb-2018 10-Feb-2017 Oct 2014 Mar 2013 Nov 2013 Supercluster TBA N/A 26-Apr-2019 12-Mar-2018 10-Feb-2017 Nov 2014 Apr 2014 Dec 2013 Private Cloud Appliance 3 22-Jul-2024 N/A N/A N/A N/A N/A N/A N/A (Download here) Linux x86 Not Planned Not Planned Not planned Not planned Not planned Not planned 28-Aug-2013 Linux x86-64 TBA (Instant Client and Full Client are available today) 13-Aug-2021 25-Apr-2019 23-Jul-2018 1-Mar-2017 22-Jul-2014 25-Jun-2013 27-Aug-2013 Linux on Arm TBA Not Planned 28-June-2023 Client: May-2021 download Not Planned Not Planned Not Planned Not Planned Not Planned Oracle Solaris SPARC (64-bit) TBA See DOC ID 2853097.1 26-Apr-2019 30-Jul-2018 1-Mar-2017 22-Jul-2014 25-Jun-2013 29-Aug-2013 Oracle Solaris x86-64 (64-bit) Platform de-supported Platform de-supported 07-Nov-2019 Terminal Release 6-Aug-2018 1-Mar-2017 22-Jul-2014 25-Jun-2013 29-Aug-2013 Microsoft Windows x64 (64-bit) TBA (Instant Client is available today) 08-Oct-2021 08-Jun-2019 21-Aug-2018 16-Mar-2017 25-Sep-2014 9-Jul-2013 25-Oct-2013 OpenVMS Itanium Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Terminal Release HP-UX Itanium (See Doc ID 3080621.1) TBA 28-Sept-2021 28-May-2019 20-Nov -2018 13-Apr-2017 14-Nov-2014 9-Jan-2014 10-Oct-2013 HP-UX PA-RISC (64-bit) Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported 2-Jan-2014 IBM AIX on POWER Systems TBA See DOC ID 2766930.1 28-May-2019 20-Nov -2018 13-Apr-2017 14-Nov-2014 9-Jan-2014 10-Oct-2013 IBM Linux on System z TBA See DOC ID 2766930.1 06-June-2019 20-Nov -2018 6-Jun-2017 14-Nov-2014 9-Jan-2014 9-Jan-2014 Microsoft Windows (32-bit) Not Planned Client Only - Oct 2021 Client only - June 2019 Client Only Client Only Client Only Not planned 25-Oct-2013 Platform23ai21c191812.2.0.112.1.0.212.1.0.111.2.0.4 Apple macOS (Intel) download Not planned 10-Sept-2019 Mar-2018 15-Jan-2018 2016 Not planned 20-Apr-2014 Download Apple macOS ARM64 21-Jun-2024 Download IBM Linux on POWER (Big Endian) 18-Dec-2015 (download) 4-Dec-2014 IBM Linux on POWER (Little Endian) download Jul-2019 download 31-Oct-2018(download) 7-Jun-2017 (download) 18-Dec-2015(download) 1 Oracle Base Database Service (formerly Oracle Database Cloud Service) and Exadata Database Service (formerly Exadata Cloud Service and Exadata Cloud@Customer) follow the same support life and error correction schedule as on-premises dates unless otherwise noted in Table 1 above (for example, 11.2.0.4 MDS). Also, Extended Support is bundled with both the license-included and BYOL versions of these services and does not require additional fees. These services will not be covered under Sustaining Support and Oracle makes no commitment that any cloud service instances will continue to run after the end of their support life (Premier, extended, error correction, or MDS). We will not disable any installed databases upon the expiration of support, but the underlying infrastructure will continue to be updated. The infrastructure updates may render the unpatched databases inoperable. We make no commitment as to how long any unpatched databases will continue to run. 2 Oracle's current plan for Oracle Autonomous Database - Shared Exadata Infrastructure, Oracle Autonomous Database - Dedicated Exadata Infrastructure, Autonomous Database on Exadata Cloud@Customer services is to support Long Term Release versions for a similar period of time found for those major releases when deployed on-premises. The intent of this plan is to provide stability of service experience for the thousands of critical database deployments found in Oracle Cloud. Additionally, we will at times make available Innovation Releases as part of the Autonomous Database Cloud Services. Innovation Releases, when provided, will be supported for a shorter period of time as compared to a Long Term Release, similar to what is found for those releases when deployed on-premises. Oracle reserves the right to change this plan with changing business requirements. Any change will take into account that stability is of utmost importance to Oracle's many thousands of mission critical deployments. 3 Private Cloud Appliance (PCA) using 23ai is supported with PCA Software Version 3+. Due to PCA Software v3 Hardware requirement, it is thus supported on PCA Hardware X9-2 (and later) and Compute Cloud @ Customer X10 (and later) References for Client-Only: //www.oracle.com/technetwork/database/enterprise-edition/downloads/oracle19c-windows-5539283.html 32-bit Linux & Windows Instant Clients, The support for 32-bit Oracle Clients (both Full and Instant Client) has been discontinued since 23ai; i.e., there will be no 32-bit Instant Client releases with 23ai and beyond. Legend: Qn CYyyyy: Date falls within the Calendar Year specified. 1H or 2H CY2024 means "within the first six months of 2024". TBA = Schedule To Be Announced Actions The dates published in this document are for planning and discussion purposes only. Contacts In this Document Oracle Database Release Roadmap Oracle Database Release Schedule Oracle Public Cloud Releases On-Premises Engineered Systems On-Premises Server Releases (includes client) Instant Client-Only Releases Change History (2020-2025) My Oracle Support provides customers with access to over a million knowledge articles and a vibrant support community of peers and Oracle experts. Oracle offers a comprehensive and fully integrated stack of cloud applications and platform services. For more information about Oracle (NYSE:ORCL), visit oracle.com. ◆ Oracle | Contact and Chat | Support | Communities | Connect with us | | | | Legal Notices | Terms of Use Skip to content Accessibility Policy Whether you are a developer, a data scientist, a DBA, an educator, or just interested in databases, Oracle Database 23ai is the ideal way to get started. It provides native support for all modern data types, analytics, and the latest development paradigms—all built into one product. Explore the perfect database solution for your upcoming project! Experience Oracle Database for free, available in both cloud and on-premises options. Click the links below to choose your ideal version. Contains Oracle Database Enterprise Edition 21c running on Oracle Linux 7. Ideal for macOS, Linux, and other platforms. Use the following pull command for the latest: docker pull container-registry.oracle.com/database/enterprise:latest For details, see the Oracle Container Registry. This chapter describes the features that are new in Oracle Database 19c Release Updates (RUs). You can create SQL Macros (SQM) to factor out common SQL expressions and statements into reusable, parameterized constructs that can be used in other SQL statements. Starting with Oracle Database release 19c, version 19.7, SQL table macros are supported. SQL table macros are expressions, typically used in a FROM clause, to act as a sort of polymorphic (parameterized) view. SQL macros increase developer productivity, simplify collaborative development, and improve code quality. Starting with this release, when you configure Kerberos authentication for an Oracle Database client, you can specify multiple Kerberos principals with a single Oracle Database client. To enable this functionality, you will need to create a separate credential cache for each user in the client and then use the connect string to specify the user. In previous releases, you were restricted to one Kerberos principal for each Oracle Database client. Oracle provides two core mechanisms to work with data in object stores, as part of the new DBMS_CLOUD package or manually defining external tables. Using DBMS_CLOUD provides benefits and additional functionality that goes beyond DDL and is fully compatible with Oracle Autonomous Database. Oracle strongly recommends leveraging the new DBMS_CLOUD package over manual external table creation. New database initialization parameters, MIN_AUTH_SERVERS and MAX_AUTH_SERVERS, have been added to configure Database Resident Connection Pooling (DRCP). MIN_AUTH_SERVERS and MAX_AUTH_SERVERS allow the number of processes used to handle session authentication for DRCP to be configured for optimal usage. Blockchain tables are append-only tables in which only insert operations are allowed. Deleting rows is either prohibited or restricted based on time. Rows in a blockchain table are made tamper-resistant by special sequencing and chaining algorithms. Users can verify that rows have not been tampered. A hash value that is part of the row metadata is used to chain and validate rows. Blockchain tables can be used to implement blockchain applications where the participants trust the Oracle Database provider, but want means to verify that their data hasn't been tampered with. The participants are different database users who trust the Oracle Database provider to maintain a verifiable, tamper-resistant blockchain of transactions. All participants must have privileges to insert data into the blockchain table. The contents of the blockchain table are defined and managed by the application, with a few added metadata fields maintained by Oracle Database. By leveraging a trusted provider with verifiable crypto-secure data management practices, such applications can avoid the distributed consensus requirements. This provides most of the protection of the distributed peer-to-peer blockchains, but with much higher throughput and lower transaction latency compared to peer-to-peer blockchains using distributed consensus. To securely capture and replicate individual PDB changes to Oracle Autonomous Database, you can now use Oracle GoldenGate to provide per-PDB capture. You can now provide local user credentials to connect to an individual PDB in a multitenant architecture Oracle Database, and replicate the data from just that PDB to an Oracle Autonomous Database. You no longer need to create a common user with access to all PDBs on the multitenant container database (CDB) to replicate a PDB to an Oracle Autonomous Database. Instead, you can now provision a local user with a predefined set of privileges to the source PDB that you want to capture. All LogMiner and Capture processing takes place only in this PDB, and only data from this specific PDB is captured and written to the Oracle GoldenGate trail. As part of this feature, the behavior for V$LOGMNR_CONTENTS changes, depending on whether you connect to a PDB, or connect to the CDB$ROOT. Starting with this release, Oracle Database supports Micro Edition Suite (MES) version 4.5 for FIPS 140.2. The Micro Edition Suite (MES) version 4.5 updates include four new CVEs in the RSA BSAFE MES library, support for the rules that FIPS 140.2 requires, and access to the updated NZ/ZT library from the Crypto Foundation. This enhancement enables the Oracle Database FIPS 140.2 configuration to benefit from new features and security improvements available from the latest RSA BSAFE MES library. Application Continuity Protection Check (ACCHK) provides guidance on the level of protection for each application that uses Application Continuity and assists you to increase protection, if required. ACCHK identifies which application configuration is protected to help you make an informed decision about which configuration to use for maximum protection or how to increase protection level for an application configuration. ACCHK also provides diagnostics for an unsuccessful failover. Immutable tables are insert-only tables in which existing data cannot be modified. Deleting rows is either prohibited or restricted based on the insertion time of the rows. Immutable tables protect data against unauthorized modification by insiders. This includes database administrators or compromised users who have access to insider credentials. Immutable tables also prevent accidental data modification that may be caused by human error. A new database initialization parameter, DRCP_DEDICATED_OPT, has been added to configure Database Resident Connection Pooling (DRCP). With DRCP, when the number of application connections to the broker is less than the maximum pool size, a "dedicated optimization" makes DRCP behave like dedicated servers. With this optimization, DRCP tends towards a one-to-one correspondence between application connections and DRCP server processes even if those processes are not currently doing database work. Setting DRCP_DEDICATED_OPT to NO turns off the optimization and reduces the tendency of the pool to grow towards its maximum size until necessary. This helps keep the number of DRCP server processes small when statement execution concurrency is low, therefore reducing memory usage on the database host. Starting with Oracle Grid Infrastructure 19c Release Update (19.11), Oracle FPP enables you to install the gold images without transferring them to the target host. You can make the gold images available as zip files, either on a shared file system (NFS) or target hosts. The Zip copy image transfer feature avoids errors and timeout for deployments with low bandwidth or high latency networks between the Oracle FPP Server and targets. This enables deployments in different data centers. Related Topics Oracle Fleet Patching and Provisioning Administrator's Guide Starting with this release update, an application can change its database passwords without an administrator having to schedule downtime. To accomplish this, a database administrator can associate a profile having a non-zero limit for the PASSWORD_ROLLOVER_TIME password profile parameter, new with this release, with an application schema. This allows the database password of the application user to be altered while allowing the older password to remain valid for the time specified by the PASSWORD_ROLLOVER_TIME limit. During the rollover period of time, the application instance can use either the old password or the new password to connect to the database server. When the rollover time expires, only the new password is allowed. Before this enhancement, an administrator normally took the application down when the application database password was being rotated. This is because the password update requires changes on both the database and the application side. With the gradual database password rollover enhancement, the application can continue to use the older password until the new password is configured in the application. In addition to the new clause PASSWORD_ROLLOVER_TIME in the CREATE PROFILE and ALTER PROFILE statements, the ALTER USER statement has a new clause, EXPIRE PASSWORD ROLLOVER PERIOD. The ACCOUNT_STATUS column of the DBA_USERS and USER_USERS data dictionary views have several new statuses indicating values to indicate rollover status. Oracle recommends that you use Oracle Database with the Oracle Memory Speed (OMS) file system to fully utilize the potential of persistent memory (PMEM) devices safely in data centers. With PMEM as the backing device, OMS utilizes a memory-mapped file hosted on an XFS-based, DAX-enabled file system to perform I/O operations. You must export the PMEM device as a file using a DAX-enabled file system, such as XFS. Available for Oracle Database release 19.16 are enhancements to the integration of Identity and Access Management (IAM) users with Oracle Database Environments. Additional Oracle Database environments: The full list of supported Oracle Database environments is as follows: Oracle Autonomous Database on Dedicated Exadata Infrastructure Oracle Autonomous Database on Shared Exadata Infrastructure Oracle Base Database Service Ability to use the IAM user name and password to retrieve an IAM token: Retrieving a token using an IAM user name and password or secure external password store (SEPS) is more secure than using the password verifier method of database access. Related Topics Oracle® Database Security Guide Available for Oracle Database release 19.16, Oracle Data Guard enables you to decrypt redo operations in hybrid cloud disaster recovery configurations where the Cloud database is encrypted with TDE and the on-premises database is not. Hybrid disaster recovery is often considered a quick-stepping stone to cloud adoption. By enabling the ability to quickly configure disaster recovery even in cases where on-premises databases might not already be encrypted with TDE, the steps required to configure hybrid disaster recovery environments are reduced while still ensuring that redo data is still encrypted during the transportation process. To enable this feature, Oracle Database introduces the TABLESPACE_ENCRYPTION initialization parameter, which enables you to control the automatic encryption of tablespaces in both the primary and standby databases, for on-premises and Oracle Cloud Infrastructure (OCI) environments. For example, an on-premises database can be unencrypted and an OCI database can be encrypted. Related Topics Oracle® Database Advanced Security Guide Starting with Oracle Database 19c RU 19.18.0, all available DST patches are installed with the RU, and deployed into the Oracle_home/oracore/zoneinfo directory. Installing DST patches does not affect database operation. However, installing the patches with the RU makes it easier for you to adjust the timezone version of your database, if you have a requirement to do so. For example, if you are using Transportable Tablespaces, or Full Transportable Export/Import, then you must ensure that your source and target databases are using identical character sets and identical time zone settings. With this change, you can more easily choose to change your destination database to use a different time zone file version than the default. By default, AutoUpgrade changes the database time zone to the latest available level. If you don't want the time zone to be upgraded, then you must explicitly set the local parameter timezone_upg in your AutoUpgrade configuration file to no. For example: upg1.timezone_upg=noIf you choose to use an older database time zone file, then set the database environment variable ORA_TZFILE to the older time zone file. The time zone files are located in Oracle_home/oracore/zoneinfo. By using the environment variable ORA_TZFILE, you can override the default of using the highest-numbered time zone file. Related Topics Many workloads benefit from Database In-Memory, however some may not. The In-Memory Eligibility Tool determines if a given workload would benefit or not benefit from Database In-Memory and assesses its eligibility for use of this feature. Eligibility is gauged by the percentage of analytical activity in the workload. If you are planning to implement Database In-Memory, you can use this tool to quickly identify and filter out databases that are ineligible - those where analytic activity is low and where you would see no substantive gain from the use of Database In-Memory. You can then focus your Database In-Memory deployment on databases whose workload includes more intense analytic activity and could therefore benefit substantially. The higher the percentage of analytical activity in the workload, the more benefit you gain from Database In-Memory. Related Topics AutoUpgrade automates the steps necessary to upgrade a database in an Oracle Data Guard configuration. Note that in Oracle Database 19c, Data Guard operations are not fully automated. Oracle only supports upgrading a primary database and shutting down of redo apply to a standby database. Steps that AutoUpgrade automates includes disabling and re-enabling the Data Guard Broker (if present), and deferring log file transport while the upgrade takes place. Automation of these Oracle Data Guard operations in the context of a database upgrade eliminates the need for manual or scripted steps that you otherwise would have to perform yourself. This in turn makes it easier to automate upgrades of databases in Oracle Data Guard configurations. This feature particularly helps to automate upgrades in high-end environments, where there can be many hundreds of such databases that you upgrade as part of your upgrade project. Related Topics Oracle® Database Database Upgrade Guide AutoUpgrade automates all the steps needed to upgrade an Oracle Real Application Clusters (Oracle RAC) database. AutoUpgrade automates steps that previously had to be performed manually or scripted. Steps that AutoUpgrade automates include the SRVCTL commands to stop and restart instances on multiple nodes, handling of CLUSTER_DATABASE, updating initialization parameter files, and restarting services, where appropriate. This feature reduces the possibility of manual errors and decreases the work needed for DBAs to perform routine maintenance and upgrade activities. Related Topics Oracle® Database Database Upgrade Guide To simplify upgrades to Oracle Database 21c, AutoUpgrade automates steps to convert a database from a non-CDB to a PDB as part of a database upgrade. Oracle Database 21c requires multitenant architecture. With this release, you can use AutoUpgrade for non-CDB to PDB upgrades from Oracle Database 12c Release 2 (12.2) and later releases. Using the automation features of AutoUpgrade reduces both the effort required of DBAs for upgrades, and the risk associated with typographical errors in a manual process. Related Topics Oracle® Database Database Upgrade Guide AutoUpgrade automates unplugging a PDB from a CDB, plugging it into a higher version CDB, and upgrading the PDB to that new target version. As part of the process to simplify upgrade, you can upgrade pluggable databases (PDBs) using an unplug/plug, where the upgrade occurs when you plug the PDB into the target release container database (CDB). This feature adds another scenario in which AutoUpgrade can automate the entire database upgrade process. Related Topics Oracle® Database Database Upgrade Guide AutoUpgrade supports the option of using AutoUpgrade to perform out-of-place Oracle home Release Update patching. For an out-of-place patch of Oracle Database using AutoUpgrade, AutoUpgrade moves the source database that you want to patch to a new Oracle Database Oracle home, and then patches the database binaries in that target Oracle home with the Release Update that you select. With this option, you can use AutoUpgrade at any time that you want to move the database to a new Oracle home, either as part of a planned upgrade or as part of a patch plan. In a patch operation, AutoUpgrade performs the patch using the following workflow: AutoUpgrade recognizes that the source database and the target Oracle Database are the same base release. AutoUpgrade skips the upgrade steps. AutoUpgrade patches the target database using the Release Update. Related Topics AutoUpgrade automatically evaluates system resources and makes an intelligent decision as to how many upgrade jobs can run simultaneously. AutoUpgrade uses the CPU_COUNT value and system process parameters to determine available system resources, and calibrates both the number of upgrades that can run at a time and the number of parallel threads for each upgrade. Upgrades that exceed a safe threshold are put in a queue so that they can be run as system resources become available. Related Topics AutoUpgrade enhances support for databases that use transparent data encryption (TDE) by enabling keystore generation. AutoUpgrade now enables you to provide passwords to an external key manager generated and maintained by AutoUpgrade. With this configuration, AutoUpgrade supports unmanned or automated operations of TDE-enabled databases. AutoUpgrade can open the source database keystore without prompting for the keystore password, and enroll the target database into the TDE external keystore for key management, so that the target database can start automatically. Related Topics Upgrades and Transparent Data Encryption You can now use the Oracle Database AutoUpgrade Unplug/Plug method to unplug a PDB from one system and plug into a different system and upgrade. In ear

Date falls within the 1st half (six months) or 2nd half of Calendar Year. For example 1H CY2024 means "within the first six months of 2024". TBA = Schedule To Be Announced Actions The dates published in this document are for planning and discussion purposes only. Contacts In this Document Oracle Database Release Roadmap Oracle Database Release Schedule Oracle Public Cloud Releases On-Premises Engineered Systems On-Premises Server Releases (includes client) Instant Client-Only Releases Change History (2020-2025) My Oracle Support provides customers with access to over a million knowledge articles and a vibrant support community of peers and Oracle experts. Oracle offers a comprehensive and fully integrated stack of cloud applications and platform services. For more information about Oracle (NYSE:ORCL), visit oracle.com. ⌂ Oracle | Contact and Chat | Support | Communities | Connect with us | | | | Legal Notices | Terms of Use For the database developed by DEC, see Oracle Rdb. Proprietary database management system Oracle DatabaseDeveloper(s)Oracle CorporationInitial release1979; 46 years ago (1979)Stable release23ai[1] / 19 September 2023; 22 months ago (19 September 2023) Written inAssembly language, C, C++[2]TypeMulti-model databaseLicenseProprietary[3]Websitewww.oracle.com/database/ Oracle Database (commonly referred to as Oracle DBMS, Oracle Autonomous Database, or simply as Oracle) is a proprietary multi-model[4] database management system produced and marketed by Oracle Corporation. It is a database commonly used for running online transaction processing (OLTP), data warehousing (DW) and mixed (OLTP & DW) database workloads. Oracle Database is available by several service providers on-premises, on-cloud, or as a hybrid cloud installation. It may be run on third party servers as well as on Oracle hardware (Exadata on-premises, on Oracle Cloud or at Cloud at Customer).[5] Oracle Database uses SQL for database updating and retrieval.[6] Larry Ellison and his two friends and former co-workers, Bob Miner and Ed Oates, started a consultancy called Software Development Laboratories (SDL) in 1977, later Oracle Corporation. SDL developed the original version of the Oracle software. The name Oracle comes from the code-name of a CIA-funded project Ellison had worked on while formerly employed by Ampex;[7] CIA was Oracle's first customer, and allowed the company to use the code name for the new product.[8] Ellison wanted his database to be compatible with IBM System R, but that company's Don Chamberlin declined to release its error codes.[9] By 1985 Oracle advertised, however, that "Programs written for SQL/DS or DB2 will run unmodified" on the many non-IBM mainframes, minicomputers, and microcomputers its database supported "Because all versions of ORACLE are identical".[10] Oracle products follow a custom release-numbering and -naming convention. The "ai" in the current release, Oracle Database 23ai, stands for "Artificial Intelligence". Previous releases (e.g. Oracle Database 19c, 10g, and Oracle9i Database) have used suffixes of "c", "g", and "i" which stand for "Cloud", "Grid", and "Internet" respectively. Prior to the release of Oracle8i Database, no suffixes featured in Oracle Database naming conventions. There was no v1 of Oracle Database, as Ellison "knew no one would want to buy version 1".[11][9] For some database releases, Oracle also provides an Express Edition (XE) that is free to use.[12][13] Oracle Database release numbering has used the following codes: Legend:UnsupportedSupportedLatest versionPreview versionFuture version LTR = Long-Term Release, IR = Innovation Release Oracle Database Version Initial Release Version Initial Release Date Terminal Version Marquee Features Latest version: Oracle Database 23ai (LTR) 23.4.0 On May 2, 2024, Oracle Database 23ai[14] was released on Oracle Cloud Infrastructure (OCI) as cloud services, including OCI Exadata Database Service, OCI Exadata Database Cloud@Customer, and OCI Base Database Service. It is also available in Always Free Autonomous Database. Oracle Database 23c (previously released in 2023) was renamed to Oracle Database 23ai (23.4) due to the significant additional engineering effort to add features that bring AI capabilities to the data in Oracle Database. Oracle Database 23c (23.2 and 23.3) was released in 2023: April 2023 (Linux) Oracle Database Free - Developer Release[15] September 2023 Oracle Database on Base Database Service[16] AI Vector Search[17] (includes new Vector data type, Vector indexes, and Vector SQL operators/functions), JSON Relational Duality,[18] JSON Schema Validation, Transactional Microservices Support, OKafka, Operational Property Graphs, Support for SQL/PGQ, Schema Privileges, Developer Role, In-database SQL Firewall, TLS 1.3 Support, Integration with Azure Active Directory OAuth2, True Cache for mid-tier caching, Readable Per-PDB Standby, Globally Distributed Database with active-active RAFT-based replication, Real-time SQL Plan Management, Priority Transactions, SQL Syntax Simplification, Schema Annotations, Data Use Case Domains, Column Value Lock-free Reservations Supported: Oracle Database 21c (IR) 21.1.0 December 2020 (cloud)[19] August 2021 (Linux)[20] Blockchain Tables, Multilingual Engine - JavaScript Execution in the Database, Binary JSON Data Type, Per-PDB Data Guard Physical Standby (aka Multitenant Data Guard), Per-PDB GoldenGate Change Capture, Self-Managing In-Memory, In-Memory Hybrid Columnar Scan, In-Memory Vector Joins with SIMD, Sharding Advisor Tool, Property Graph Visualization Studio, Automatic Materialized Views, Automatic Zone Maps, SQL Macros, Gradual Password Rollover Supported: Oracle Database 19c (LTR) 19.1.0 // 12.2.0.3 February 2019 (Exadata)[21] April 2019 (Linux)[22] June 2019 (cloud) Active Data Guard DML Redirection, Automatic Index Creation, Real-Time Statistics Maintenance, SQL Queries on Object Stores, In-Memory for IoT Data Streams, Hybrid Partitioned Tables, Automatic SQL Plan Management, SQL Quarantine, Zero-Downtime Grid Infrastructure Patching, Finer-Granularity Supplemental Logging, Automated PDB Relocation Unsupported: Oracle Database 18c (IR) 18.1.0 // 12.2.0.2 February 2018 (cloud, Exadata)[23] July 2018 (other)[24] 18.17.0January 2022 Polymorphic Table Functions, Active Directory Integration, Transparent Application Continuity, Approximate Top-N Query Processing, PDB Snapshot Carousel, Online Merging of Partitions and Subpartitions Unsupported: Oracle Database 12c Release 2 12.2.0.1March 2017 August 2016 (cloud) March 2017 (on-premises) 12.2.0.1March 2017 Native Sharding, Zero Data Loss Recovery Appliance, Exadata Cloud Service, Cloud at Customer Unsupported: Oracle Database 12c Release 1 12.1.0.1 July 2013[25] 12.1.0.2July 2014 Multitenant architecture, In-Memory Column Store, Native JSON, SQL Pattern Matching, Database Cloud Service Unsupported: Oracle Database 11g Release 2 11.2.0.1 September 2009[26] 11.2.0.4August 2013 Edition-Based Redefinition, Data Redaction, Hybrid Columnar Compression, Cluster File System, Golden Gate Replication, Database Appliance Unsupported: Oracle Database 11g Release 1 11.1.0.6 September 2007 11.1.0.7September 2008 Active Data Guard, Secure Files, Exadata Unsupported: Oracle Database 10g Release 2 10.2.0.1 July 2005[27] 10.2.0.5April 2010 Real Application Testing, Database Vault, Online Indexing, Advanced Compression, Data Guard Fast-Start Failover, Transparent Data Encryption Unsupported: Oracle Database 10g Release 1 10.1.0.2 2003 10.1.0.5February 2006 Automated Database Management, Automatic Database Diagnostic Monitor, Grid infrastructure, Oracle ASM, Flashback Database Unsupported: Oracle9i Database Release 2 9.2.0.1 2002 9.2.0.8April 2007 Advanced Queuing, Data Mining, Streams, Logical Standby Unsupported: Oracle9i Database 9.0.1.0 2001 9.0.1.5December 2003 Oracle Real Application Clusters (RAC), Oracle XML DB Unsupported: Oracle8i Database 8.1.5.0 1998 8.1.7.4August 2000 Native internet protocols and Java, Virtual Private Database Unsupported: Oracle8 Database 8.0.3 June 1997 8.0.6 Recovery Manager, Partitioning. First version available for Linux.[28] Unsupported: Oracle 7.3 7.3.0 February 1996 7.3.4 Object-relational database Unsupported: Oracle 7.2 7.2.0 May 1995 Shared Server, XA Transactions, Transparent Application Failover Unsupported: Oracle 7.1 7.1.0 May 1994 Parallel SQL Execution. First version available for Windows NT.[29] Unsupported: Oracle7 7.0.12 June 1992 Distributed 2-phase commit,[8] PL/SQL stored procedures, triggers, shared cursors, cost-based optimizer Unsupported: Oracle 6.2 6.2.0 Oracle Parallel Server Unsupported: Oracle v6 6.0.17 1988 6.0.37 Row-level locking, SMP scalability / performance, storing of undo in database,[8] online backup and recovery, B*Tree indexes, PL/SQL executed from compiled programs (C etc.). First version available for Novell Netware 386.[30] Unsupported: Oracle v5 5.0.22 (5.1.17) 1985 5.1.22 C2 security certification. Support for distributed database systems[8] and client/server computing. First version available for OS/2. Correlated sub-queries.[31] DOS version supports extended memory.[8] Unsupported: Oracle v4 4.1.4.0 1984 4.1.4.4 Multiversion read consistency. Halloween Problem solved. Improved concurrency.[8] First version available for MS-DOS[32][33] and IBM mainframe.[8] Unsupported: Oracle v3 3.1.3 1983 Concurrency control, data distribution, and scalability. Re-written in C for portability to other operating systems, including UNIX.[34][8] Unsupported: Oracle v2 2.3 1979 First commercially available SQL RDBMS. Basic SQL queries, simple joins[35] and CONNECT BY joins. Atomic role-level SQL statements. Rudimentary concurrency control and database integrity. No query optimizer. Written in assembly language for the PDP-11[8] to run in 128KB of RAM.[36] Ran on PDP-11 and VAX/VMS in PDP-11 compatibility mode.[8] Legend:UnsupportedSupportedLatest versionPreview versionFuture version LTR = Long-Term Release, IR = Innovation Release The Introduction to Oracle Database includes a brief history on some of the key innovations introduced with each major release of Oracle Database. See My Oracle Support (MOS) note Release Schedule of Current Database Releases (Doc ID 742060.1) for the current Oracle Database releases and their patching end dates. Prior to Oracle Database 18c, Oracle Corporation released Critical Patch Updates (CPUs) and Security Patch Updates (SPUs)[37] and Security Alerts to close security vulnerabilities. These releases are issued quarterly; some of these releases have updates issued prior to the next quarterly release. Starting with Oracle Database 18c, Oracle Corporation releases Release Updates (RUs) and Release Update Revisions (RURs).[38] RUs usually contain security, regression (bug), optimizer, and functional fixes which may include feature extensions as well. RURs include all fixes from their corresponding RU but only add new security and regression fixes. However, no new optimizer or functional fixes are included. In the market for relational databases, Oracle Database competes against commercial products such as IBM Db2 and Microsoft SQL Server.[13] Oracle and IBM tend to battle for the mid-range database market on Unix and Linux platforms, while Microsoft dominates the mid-range database market on Microsoft Windows platforms. However, since they share many of the same customers, Oracle and IBM tend to support each other's products in many middleware and application categories (for example: WebSphere, PeopleSoft, and Siebel Systems CRM), and IBM's hardware divisions work closely[citation needed] with Oracle on performance-optimizing server-technologies (for example, Linux on IBM Z). Niche commercial competitors include Teradata (in data warehousing and business intelligence), Software AG's ADABAS, Sybase, and IBM's Informix, among many others. In the cloud, Oracle Database competes against the database services of AWS, Microsoft Azure, and Google Cloud Platform. Increasingly, the Oracle database products compete against open-source software relational and non-relational database systems such as PostgreSQL, MongoDB, Couchbase, Neo4j, ArangoDB and others. Oracle acquired Innobase, supplier of the InnoDB codebase to MySQL, in part to compete better against open source alternatives, and acquired Sun Microsystems, owner of MySQL, in 2010. Database products licensed as open-source are, by the legal terms of the Open Source Definition, free to distribute and free of royalty or other licensing fees. The Rosen Electronics Letter in February 1983 stated that Oracle was "the most comprehensive offering we've seen" among databases, with good marketing and substantial installed base encouraging developers to write software for it. The newsletter especially approved of the user interface, noting the "simplicity of setting up 'programs'—queries, data manipulation, updates—without actually programming".[39] Companies portal Comparison of relational database management systems Comparison of object–relational database management systems Database management system List of relational database management systems List of databases using MVCC Oracle SQL Developer Oracle Real Application Testing ^ "Oracle Database 23c: The Next Long Term Support Release". ^ Lextrait, Vincent (March 2016). "The Programming Languages Beacon, v16". Archived from the original on 30 May 2012. Retrieved 15 December 2016. ^ "OTN Standard License", Technical network, Oracle ^ "Multimodel Database with Oracle Database 12c Release 2" (PDF). Oracle. Archived (PDF) from the original on 14 April 2017. 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Information in this document applies to any commercial (i.e., not free) edition of Oracle Database version 11.2.0.4 and later, on any supported platform in the cloud or on-premises.Details Disclaimer: The dates published in this document are for planning and discussion purposes only. It is intended solely to help you plan your I.T. projects. A date that exists in the future should not be considered a firm development date as the release and timing of platform releases are subject to change at any time and are at Oracle's sole discretion. Your access to and use of this confidential material is subject to the terms and conditions of your Oracle Software License and Service Agreement, which has been executed and with which you agree to comply. This document and information contained herein may not be disclosed, copied, reproduced or distributed to anyone outside of the licensed organization without prior written consent of Oracle. This document is not part of your license agreement nor can it be incorporated into any contractual agreement with Oracle or its subsidiaries or affiliates. The content below represents the most accurate information that Oracle can provide. This is a living document that will change as various milestones are reached and releases go in and out of the product life cycle. It is intended to give you current information about releases that are covered under the Database's Premier Support (PS) and Extended Support (ES) Lifetime policies. Support cannot provide additional dates not listed in this document; do not log a Service Request asking for a future release date. If you wish to be notified when this document changes, set the article as a Favorite, and follow the instructions for Email Notification in KM Doc ID: 793436.2 What's New The most recent changes will be highlighted with a "New" or "Updated" icon to help you quickly identify the modifications. (For a history of modifications, see the Change Record Table at the bottom of the document.) Restricted Upgrade Support has been added for 2026 through Customer Success Services (11.2, 12.1, 12.2) Updated Lifetime Support Dates for 23ai Updated Lifetime Support Dates for19c 23ai Released on Oracle Database Appliance and Oracle Exadata Oracle Database Release Roadmap Oracle Database releases fall under one of the following: Long Term Release or Innovation Release. Oracle Database Long Term releases are ideal for use cases that benefit from less frequent upgrades to newer releases. Long Term Releases offer the highest level of stability and the longest length of error correction support. These releases have at least 5 years of Premier Support followed by 3 years of Extended Support. As necessary, Oracle may extend the Premier Support period or waive the Extended Support fee. When combined with Extended Support, customers typically have 4 or more years to upgrade from one Long Term release to the next Long Term release. In between Oracle Database Long Term releases, Oracle delivers Oracle Database Innovation releases that include many enhancements and new capabilities which will also be included in the next Long Term release. Innovation releases are designed to enable customers to continuously use leading-edge technologies to rapidly develop or deploy new applications or augment existing applications. Support for Innovation releases includes at least 2 years of Premier Support and there will be no Extended Support or exceptions. Production workloads can be deployed on Innovation releases if upgrading to the next database release within one year after the next database release ships is factored into the deployment plan. To help you plan ahead, below is a visual roadmap that captures Oracle Database Releases from 11.2 onward, showing the lifetime support stages (Premier, Extended, etc.) and the Error Correction windows for each release. Note, not all releases are eligible for Extended Support (i.e. 12.2.0.1, 18c, 21c). Figure 1 - Database Release Roadmap Oracle is mindful of the unprecedented economic and business disruption our customers faced in 2020. We decided to not promote our Database 20c Preview version to General Availability. Instead, we incorporated all of the 20c functionality into the 21c release and made 21c available initially in our Autonomous Database Free Tier so that all can test drive the new features and enhancements for free. Oracle has a adopted a cloud-first, developer-first strategy for Oracle Database releases. (Doc ID 3068039.1) For details on the Database Suite Lifetime Support Policy (incl. Premier, Extended, Sustaining), see Lifetime Support Policy - Oracle Technology Products. For details on the Database Suite Error Correction Policy (incl. Patching end dates and grace periods), see Database, FMW, EM Grid Control, and OCS Software Error Correction Support Policy (Doc ID 209768.1). For details on Global Database Extended Support (ES) Fee Waivers, and Limited Error Correction, see Oracle Software Technical Support Policies Section 3 "Lifetime Support" subtitle "Exceptions". Table 1 - Patching End Dates for Roadmap ReleasePatching End Date Notes and Exceptions 23ai Long Term Release Premier Support - December 31, 2031 Extended Support - TBD Because of the importance of the breakthrough AI technology in this release, we are renaming it from Oracle Database 23c to Oracle Database 23ai Now available in cloud, Oracle Exadata and Oracle Database Appliance. See details in the Oracle Database Schedule table below. Premier Support ends December 31, 2031 Error Correction / Patching with Extended Support fees or ULA - end date is TBD 21c Innovation Release July 31, 2027 Error Correction / Patching is available until July 31, 2027 21c is not eligible for Extended Support (ES) Only quarterly Release Updates (RUs) are provided for 21c. 21c is not available with Exadata Database Service 19c Long Term Release December 31, 2029 with Premier Support December 31, 2032 with ES/ULA Premier Support (PS) ends December 31, 2029. Extended Support (ES) will be Jan 01, 2030 through December 31, 2032 Error Correction / Patching is available through December 31, 2032 with paid ES. Without paid ES, patching is only available until December 31, 2029 Beginning with the October 2022 patching cycle, 19c RURs will no longer be provided for 19.17.0 and above. No additional RURs will be delivered on any platform after the delivery of Oracle Database 19c RUR 19.16.2 in January 2023. (Refer to Sunsetting of 19c RURs and FAQ (Doc ID 2898381.1) for further details.)To provide customers more frequent access to recommended and well-tested collections of patches, Oracle is pleased to introduce Monthly Recommended Patches (MRPs) starting Nov 2022. MRPs are supported only on the Linux x86-64 platform. (Refer to Introducing Monthly Recommended Patches (MRPs) and FAQ (Doc ID 2898740.1) for further details.) 18c Innovation Release Jun 30, 2021 Error Correction / Patching was available until Jun 30, 2021. 18c is now in Sustaining Support. 18c is not eligible for Extended Support (ES) 18c is not supported on Exadata Database Service, Base Database Service or Exadata Cloud@Customer 12.2.0.1 Mar 31, 2022 Upgrade Support (Restricted Availability) Jan 1, 2024- Dec 31, 2026 - Contact CSS for details Error Correction / Patching has ended for this release. 12.2.0.1 is not eligible for Extended Support (ES) Upgrade Support (Restricted Availability) (aka MDS) required to provision and/or run 12.2.0.1 on Exadata Database Service, Base Database Service or Exadata Cloud@Customer 12.1.0.2 Terminal Release Jul 31, 2022 with paid ES, ULA, or EBS waiver Upgrade Support (Restricted Availability) through Dec 31, 2026 - Contact CSS for details Error Correction / Patching has ended for this release. Premier Support (PS) ended Jul 31, 2018 and one year of free Extended Support (ES) was in effect until July 31, 2019. ES fees or a ULA was required beginning 01-Aug-2019 through 31-Jul-2022. Without paid ES or ULA, patching ended 31-Jul-2019. A global ES uplift fee waiver was in place for E-Business customers. For details and dates of expiration see: Extended Support Fee Waiver for Oracle Database 12.1 and 11.2 for Oracle E-Business Suite (Doc ID 2522948.1) or Technical Support Policy Document. Apple Macintosh platform patching end date (Error Correction end date) was July 31, 2021. Microsoft Windows: Regardless of the version used to run the 12.1.0.2 Database, Oracle built the 12.1.0.2 Database on Microsoft Windows 2008. This platform reached end-of-life support on January 14, 2020. Oracle made reasonable efforts to deliver patches for the Database 12.1.0.2 on Windows until July 2022 but that support has expired. Upgrade Support (Restricted Availability) (aka MDS) is required to provision and/or run 12.1.0.2 on Exadata Database Service, Base Database Service or Exadata Cloud@Customer 12.1.0.1 Aug 31, 2016 Error Correction / Patching has ended for this release. 12.1.0.1 is not eligible for Extended Support (ES) 12.1.0.1 was the last release of Standard Edition (SE) and Standard Edition One (SE1) 11.2.0.4 Terminal Release for 11.2 Dec 31, 2020 (with paid Extended Support or ULA Extended Support or EBS Waiver) Upgrade Support (Restricted Availability) through Dec 31, 2026 Contact CSS for details Dec 31, 2021 for OpenVMS platform Premier Support (PS) ended 31-Jan-2015 and one year of free Extended Support (ES) was in effect until Dec 31, 2018. ES fees or a ULA was required beginning Jan 1, 2019 through Dec 31, 2020. A global Extended Support Uplift Fee waiver was in place for E-Business customers. For details and dates of expiration see: Extended Support Fee Waiver for Oracle Database 12.1 and 11.2 for Oracle E-Business Suite (Doc ID 2522948.1) or Technical Support Policy Document. Gen 1 and Gen 2 ExaCC, OCC DBCS, OCI DBCS,OCI ExaCS and ODA had 3 additional months of Extended Support. The end of Extended Support for 11.2.0.4 databases on these platforms was: 31-March 2021. New instances could be created up until the end of extended support; however, Oracle made no commitment that any 11.2.0.4 DBCS instances will continue to run after the end of Support. Market Driven Support was only available for the following Database Cloud Services: Gen 1 and Gen 2 ExaCC, OCC DBCS, OCI DBCS (non-PSM), OCI ExaCS. New instances could be created up until the end of Market Driven Support. Oracle made no commitment that any 11.2.0.4 DBCS instances would continue to run after the end of MDS support. Market Driven Support was not available for PSM-based OCI DBCS, OCI-C DBCS and OCI-C ExaCS. Upgrade Support (Restricted Availability) (aka MDS) required to provision and/or run 11.2.0.4 on Exadata Database Service, Base Database Service or Exadata Cloud@Customer 11.2.0.4 is the terminal release on OpenVMS. During calendar year 2021, customers received Severity 1 Fixes and Security Updates for no additional charge beyond standard Premier Support costs. Coverage did not extend to new certifications, third-party products, or any Java/JDK functionality including Java components embedded in the database. Coverage also excluded any updates related to cryptography and network encryption. This offering did not include standard Security Patch Updates (SPUs). Recommended Upgrade Path Oracle recommends the following upgrade options: For product longevity and patching, Oracle strongly recommends upgrading to 19c which is the current on-premises Long Term release with a support end date of December 31, 2032 (or December 31, 2029 if you choose not to pay Extended Support fees or purchase a ULA). If you are currently running 11.2.x/12.1.x you will need to upgrade to the terminal release (i.e. 11.2.0.4/12.1.0.2) for the DB Release you are running and then continue the upgrade process to 19c. 11.2.0.4, 12.1.0.2 and 12.2 are in Sustaining Support with Upgrade Support available for limited platforms. Contact CSS for details. Note: ACS has been renamed to Customer Success Services. If you are currently running 18c, you should upgrade to 19c without delay. 18c is in Sustaining Support. The next Long Term release is 23ai. To upgrade to 23ai, you must be on 19c or later. For questions related to certification combinations and Lifetime Support agreements with other Oracle products like Oracle E-Business Suite, Oracle JD Edwards, Oracle PeopleSoft, and Oracle Siebel, please contact your Oracle Account Representative. Oracle Database Release Schedule These are server releases unless otherwise specified. Server releases always include the native word size client (e.g. 64-bit). Where the platform supports it, a 32-bit and 64-bit client is also part of the release. Table 2 - Database Release Schedule Platform 23ai Long Term Release 21c Innovation Release 19c Long Term Release 18c12.2.0.112.1.0.212.1.0.111.2.0.4 Exadata Express Cloud Service Not Planned Not Planned Not Planned Not Planned 18-Sep-2016 N/A Base Database Service1 (Previously known as: Database Cloud Service) 19-Sep-2023 08-Dec-2020 available on VM (RAC or single-instance) and Bare Metal (single-instance) OCI DB System - VM: Jul-2019 OCI DB System - Bare Metal: April 2020 1-Mar-2018 4-Nov-2016 Sep-2014 N/A Sep-2014 Exadata Database Service on Dedicated Infrastructure1 (Previously known as: Exadata Cloud Service) 2-May-2024 N/A 19-Jun-2019 Jun-2018 4-Nov-2016 Oct-2015 N/A Oct-2015 Gen 1 Exadata Cloud at Customer1 (Previously known as: Exadata Cloud at Customer) N/A N/A 17-Sep-2019 May-2018 2-May-2017 Dec-2016 N/A Exadata Database Service on Cloud at Customer 1 2-May-2024 N/A 17-Sep-2019 N/A N/A N/A N/A Autonomous Database on Dedicated Exadata Infrastructure 2 31-May-2024 N/A 26-Jun-2019 N/A N/A N/A N/A Autonomous Database on Exadata Cloud at Customer 2 31-May-2024 N/A 08-Jul-2020 N/A N/A N/A N/A Autonomous Database on Shared Exadata Infrastructure 28-Jun-2024 N/A 15-Mar-2020 18-Mar-2018 N/A N/A N/A Compute Cloud at Customer 22-Jul-2024 N/A N/A N/A N/A N/A N/A (Same software as released for other platforms but tested on Engineered Systems) Oracle Database Appliance 22-Jul-2024 16-Sep-2021 16-Oct-2019 7-Mar-2018 17-Nov-2017 Apr 2014 N/A Oct 2013 Exadata 22-Jul-2024 13-Aug-2021 13-Feb-2019 16-Feb-2018 10-Feb-2017 Oct 2014 Mar 2013 Nov 2013 Supercluster TBA N/A 26-Apr-2019 12-Mar-2018 10-Feb-2017 Nov 2014 Apr 2014 Dec 2013 Private Cloud Appliance 3 22-Jul-2024 N/A N/A N/A N/A N/A N/A N/A (Download here) Linux x86 Not Planned Not Planned Not planned Not planned Not planned 28-Aug-2013 Linux x86-64 TBA (Instant Client and Full Client are available today) 13-Aug-2021 25-Apr-2019 23-Jul-2018 1-Mar-2017 22-Jul-2014 25-Jun-2013 27-Aug-2013 Linux on Arm TBA Not Planned 28-June-2023 Client: May-2021 download Not Planned Not Planned Not Planned Not Planned Not Planned Oracle Solaris SPARC (64-bit) TBA See DOC ID 2853097.1 26-Apr-2019 30-Jul-2018 1-Mar-2017 22-Jul-2014 25-Jun-2013 29-Aug-2013 Oracle Solaris x86-64 (64-bit) Platform de-supported Platform de-supported 07-Nov-2019 Terminal Release 6-Aug-2018 1-Mar-2017 22-Jul-2014 25-Jun-2013 29-Aug-2013 Microsoft Windows x64 (64-bit) TBA (Instant Client is available today) 08-Oct-2021 08-Jun-2019 21-Aug-2018 16-Mar-2017 25-Sep-2014 9-Jul-2013 25-Oct-2013 OpenVMS Itanium Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Terminal Release HP-UX Itanium (See Doc ID 3080621.1) TBA 28-Sept-2021 28-May-2019 20-Nov -2018 13-Apr-2017 14-Nov-2014 9-Jan-2014 10-Oct-2013 HP-UX PA-RISC (64-bit) Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported Platform de-supported 2-Jan-2014 IBM AIX on POWER Systems TBA See DOC ID 2766930.1 28-May-2019 20-Nov -2018 13-Apr-2017 14-Nov-2014 9-Jan-2014 10-Oct-2013 IBM Linux on System z TBA See DOC ID 2766930.1 06-June-2019 20-Nov -2018 6-Jun-2017 14-Nov-2014 9-Jan-2014 9-Jan-2014 Microsoft Windows (32-bit) Not Planned Client Only - Oct 2021 Client only - June 2019 Client Only Client Only Client Only Not planned 25-Oct-2013 Platform23ai21c191812.2.0.112.1.0.212.1.0.111.2.0.4 Apple macOS (Intel) download Not planned 10-Sept-2019 Mar-2018 15-Jan-2018 2016 Not planned 20-Apr-2014 Download Apple macOS ARM64 21-Jun-2024 Download IBM Linux on POWER (Big Endian) 18-Dec-2015 (download) 4-Dec-2014 IBM Linux on POWER (Little Endian) download Jul-2019 download 31-Oct-2018(download) 7-Jun-2017 (download) 18-Dec-2015(download) 1 Oracle Base Database Service (formerly Oracle Database Cloud Service) and Exadata Database Service (formerly Exadata Cloud Service and Exadata Cloud@Customer) follow the same support life and error correction schedule as on-premises dates unless otherwise noted in Table 1 above (for example, 11.2.0.4 MDS). Also, Extended Support is bundled with both the license-included and BYOL versions of these services and does not require additional fees. These services will not be covered under Sustaining Support and Oracle makes no commitment that any cloud service instances will continue to run after the end of their support life (Premier, extended, error correction, or MDS). We will not disable any installed databases upon the expiration of support, but the underlying infrastructure will continue to be updated. The infrastructure updates may render the unpatched databases inoperable. We make no commitment as to how long any unpatched databases will continue to run. 2 Oracle's current plan for Oracle Autonomous Database - Shared Exadata Infrastructure, Oracle Autonomous Database - Dedicated Exadata Infrastructure, Autonomous Database on Exadata Cloud@Customer services is to support Long Term Release versions for a similar period of time found for those major releases when deployed on-premises. The intent of this plan is to provide stability of service experience for the thousands of critical database deployments found in Oracle Cloud. Additionally, we will at times make available Innovation Releases as part of the Autonomous Database Cloud Services. Innovation Releases, when provided, will be supported for a shorter period of time as compared to a Long Term Release, similar to what is found for those releases when deployed on-premises. Oracle reserves the right to change this plan with changing business requirements. Any change will take into account that stability is of utmost importance to Oracle's many thousands of mission critical deployments. 3 Private Cloud Appliance (PCA) using 23ai is supported with PCA Software Version 3+. Due to PCA Software v3 Hardware requirement, it is thus supported on PCA Hardware X9-2 (and later) and Compute Cloud @ Customer X10 (and later) References for Client-Only: //www.oracle.com/technetwork/database/enterprise-edition/downloads/oracle19c-windows-5539283.html 32-bit Linux & Windows Instant Clients, The support for 32-bit Oracle Clients (both Full and Instant Client) has been discontinued since 23ai; i.e., there will be no 32-bit Instant Client releases with 23ai and beyond. Legend: Qn CYyyyy: Date falls within the Calendar Year specified. 1H or 2H CYyyyy: Date falls within the 1st half (six months) or 2nd half of Calendar Year. For example 1H CY2024 means "within the first six months of 2024". TBA = Schedule To Be Announced Actions The dates published in this document are for planning and discussion purposes only. Contacts In this Document Oracle Database Release Roadmap Oracle Database Release Schedule Oracle Public Cloud Releases On-Premises Engineered Systems On-Premises Server Releases (includes client) Instant Client-Only Releases Change History (2020-2025) My Oracle Support provides customers with access to over a million knowledge articles and a vibrant support community of peers and Oracle experts. Oracle offers a comprehensive and fully integrated stack of cloud applications and platform services. For more information about Oracle (NYSE:ORCL), visit oracle.com. ⌂ Oracle | Contact and Chat | Support | Communities | Connect with us | | | | Legal Notices | Terms of Use Title and Copyright Information

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