Oracle® Database Free

Installation Guide

23ai for Microsoft Windows

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Oracle Database Free Installation Guide, 23ai for Microsoft Windows

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Preface

This guide explains how to install and configure Oracle Database Free on Microsoft Windows.

This guide also provides information about resources available to develop applications and how to remove the database software.

- Audience
- Documentation Accessibility
- Command Syntax
- Related Documents
- Conventions

Audience

This guide is intended primarily for application developers who are either developing applications or converting applications to run in the Oracle Database environment.

Oracle Database Free is a free version of the world's most advanced database. Oracle Database Free is easy to install, easy to manage, and easy to develop with. With Oracle Database Free, you use an intuitive, browser-based interface to administer the database, create tables, views, and other database objects, import, export, and view table data, run queries and SQL scripts, and generate reports.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Command Syntax

Refer to these command syntax conventions to understand command examples in this guide.

Convention	Description
$	Bourne or BASH shell prompt in a command example. Do not enter the prompt as part of the command.
%	C Shell prompt in a command example. Do not enter the prompt as part of the command.

Convention	Description
#	Superuser (root) prompt in a command example. Do not enter the prompt as part of the command.
monospace	UNIX command syntax
backslash \	A backslash is the UNIX and Linux command continuation character. It is used in command examples that are too long to fit on a single line. Enter the command as displayed (with a backslash) or enter it on a single line without a backslash: `dd if=/dev/rdsk/c0t1d0s6 of=/dev/rst0 bs=10b \  count=10000`
braces { }	Braces indicate required items: `.DEFINE {macro1}`
brackets [ ]	Brackets indicate optional items: `cvtcrt termname [outfile]`
ellipses ...	Ellipses indicate an arbitrary number of similar items: `CHKVAL fieldname value1 value2 ... valueN`
italic	Italic type indicates a variable. Substitute a value for the variable: `library_name`
vertical line		A vertical line indicates a choice within braces or brackets: `FILE filesize [K|M]`

Related Documents

To help you with your development efforts, consult the books in the development category of the *Oracle Database documentation set.*

For more information, see these documents in the Oracle Database documentation set:

- *Oracle Database SQL Language Reference*

- *Oracle Database PL/SQL Language Reference*

- *Oracle Database PL/SQL Packages and Types Reference*

- *Oracle Database JSON Developer's Guide*

- *Oracle Database Development Guide*

- *Oracle Database Administrator's Guide*

- *Oracle Database SecureFiles and Large Objects Developer's Guide*

- *Oracle Database Object-Relational Developer's Guide*

- *Oracle Database Concepts*
- *Oracle Database Sample Schemas*
- *Oracle APEX Documentation*
- *Application Development with Oracle Database*

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

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Introduction

Oracle Database Free is a fully free edition of the Oracle Database.

Development Environments

Oracle Database Free supports the following development environments:

- **Java**: Develop and deploy modern database-bound Java Web applications (Servlets), modules (Microservices) or standalone Java frameworks using the Oracle JDBC Driver, the Universal Connection Pool (UCP), and the Database-embedded JVM (for in-place, server-side processing).

  Visit https://www.oracle.com/database/technologies/appdev/jdbc.html for more information.

- **C and C++** : Developers can use Oracle Call Interface (OCI) and Oracle C++ Call Interface (OCCI) to create high performance programs accessing Oracle Database Free. ODBC and the ODPI-C wrapper over OCI are also usable.

  Visit https://www.oracle.com/database/technologies/appdev/oci.html for more information.

- **.NET, Visual Studio, and Visual Studio Code:**: Developers can use Oracle Data Provider for .NET (ODP.NET) for C# and VB.NET data access to any Oracle Database. At design-time, they can use Oracle Developer Tools for Visual Studio or Oracle Developer Tools for VS Code for full development life cycle support.

  Visit https://www.oracle.com/database/technologies/appdev/dotnet.html for more information

  For walk-throughs on creating a .NET application with Oracle Database Free:

  Visit https://www.oracle.com/tools/technologies/quickstart-dotnet-for-oracle-database.html

  The walk-throughs cover several development scenarios, including with VS Code, Visual Studio, and command line.

- **Oracle SQL Developer**: Oracle SQL Developer is a graphical version of SQL*Plus that gives database developers a convenient way to perform basic tasks. You can connect to any target Oracle Database Free schema using standard Oracle database authentication. Once connected, you can perform operations on objects in the database.

  Download and install Oracle SQL Developer from:

  https://www.oracle.com/database/sqldeveloper/

- **Oracle SQL Developer Web**: Included with Oracle REST Data Services, Oracle SQL Developer Web is the web-based version of Oracle SQL Developer that enables you to run queries and scripts, create database objects, build data models, and monitor database activity.

- **Oracle Developer Tools for VS Code**: This free Visual Studio Code extension enables you to edit and run SQL and PL/SQL for Oracle Database and Oracle Autonomous Database.

  Download and install Oracle Developer Tools for VS Code from the Visual Studio Code Marketplace:

  https://marketplace.visualstudio.com/items?itemName=Oracle.oracledevtools

- **Oracle Application Express**: Oracle Application Express (APEX) is a rapid web application development tool for the Oracle database.

  Download and install Application Express from:

  https://www.oracle.com/database/technologies/appdev/rest.html

- **Oracle REST Data Services (ORDS)**: ORDS makes it easy to develop modern REST interfaces for relational data in the Oracle Database and the Oracle Database JSON Document Store.

  Download and install ORDS from:

  https://www.oracle.com/database/technologies/appdev/rest.html

- **SODA** (Simple Oracle Document Access) APIs that let you develop NoSQL-style applications against collections of JSON documents. Native language SODA drivers are available for common languages.

  Visit https://docs.oracle.com/en/database/oracle/simple-oracle-document-access/ for more information.

Scripting Languages

You can use **scripting languages** such as:

- **Python**

  The `python-oracledb` driver is a Python programming language extension module allowing Python programs to connect to Oracle Database.

  Visit https://oracle.github.io/python-oracledb/ for more information.

- **Node.js**

  The node-oracledb driver allows Node.js applications to access Oracle Database.

  Visit https://oracle.github.io/node-oracledb/ for more information.

- **PHP**

  Access Oracle Database with the PHP OCI8 extension or the PDO_OCI Driver. PHP OCI8 and PDO_OCI are part of the PHP open source project.

  Visit https://www.php.net/oci8 for more information on PHP OCI8 and https://www.php.net/pdo_oci for more information on PDO_OCI.

- **Go**

  Access Oracle Database using the open source `godror` driver.

  Visit https://pkg.go.dev/github.com/godror/godror for more information.

- **ROracle**

  ROracle is an open source R package supporting a DBI-compliant Oracle driver based on the high performance OCI library.

  Visit https://www.oracle.com/database/technologies/roracle-downloads.html for more information about ROracle.

- **Ruby**

  Build Ruby and Ruby on Rails applications using the `ruby-oci8` driver or `JRuby` with the Oracle Enhanced Adapter for ActiveRecord.

  Visit:

  – https://www.rubydoc.info/gems/ruby-oci8/ for information about `ruby-oci8`.

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- https://www.jruby.org/ for information about JRuby.

- https://github.com/rsim/oracle-enhanced for information about Oracle Enhanced Adapter.

- **Rust**

  The open source `rust-oracle` driver lets Rust programs access Oracle Database.

  Visit https://crates.io/crates/oracle for more information.

- **Others**

  Accessing Oracle Database Free from other languages is possible using community drivers.

Oracle Call Interface (OCI) Demonstration Programs

A set of OCI demonstration programs and their corresponding project files are available in the `demo` subdirectory of Oracle home after an Oracle Database Free installation.

You can run these OCI demonstration programs to familiarize yourself with the steps involved in developing OCI applications. Oracle Database Free does not support generating the client shared library. The build option in `demo_rdbms.mk` is not valid for Oracle Database Free. You can compile and link application and demo programs with the provided header files. Because the object (`.o's`) and archive (`.a's`) libraries are not available in the installed location, you cannot use `genclntsh` and `genclntst`.

Examples

You can download and install Oracle Database Examples in an existing Oracle home to view the product demonstrations.

See Examples Installation Guide for more information about products available on the Oracle Database Examples

Examples are also available from https://github.com/oracle/oracle-db-examples

Learn More About Oracle Database Free

- Oracle Database Free home page:

  https://www.oracle.com/database/free/

- Oracle Database Free Discussion Forum:

  You can search the Oracle Database Free Discussion Forum for answers to problems already discussed and post new questions to the community for answers.

  https://forums.oracle.com/ords/apexds/domain/dev-community/category/oracle-database-free

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Requirements

This section covers the following topics:

- Software Requirements
- Permission Requirement for Installing Oracle Database Free

Software Requirements

This section covers the following topics:

- System Requirements
- Visual Studio and Visual Studio Code

System Requirements

The following are the system requirements for Oracle Database Free for Windows x64:

Table 2-1   Oracle Database Free for Microsoft Windows 64-bit

Requirement	Value
Operating system general requirements	Oracle Database Free for Windows x64 is supported on the following operating system versions: • Windows 10 x64 - Pro, Pro for Workstations, Enterprise, and Education editions • Windows 11 x64 - Pro, Enterprise, and Education editions • Windows Server 2016 x64 - Standard, Datacenter, and Essentials editions • Windows Server 2019 x64 - Standard, Datacenter, and Essentials editions • Windows Server 2022 x64 - Standard, Datacenter, and Essentials editions
Virtualization	Oracle certifies the following virtualization technologies with Oracle Database on Windows: • KVM Hypervisor • Microsoft Hyper-V • Oracle VM Server For more information on certified Hyper-V combinations and other virtualization technologies, visit https://www.oracle.com/database/technologies/virtualization-matrix.html
Disk space	8.5 GB minimum for Oracle software, plus 2 GB or more for temporary storage
RAM	2 GB RAM minimum

> **See Also:**
>
> For more information about Hyper-V support, see the following note (1563794.1) in My Oracle Support:
>
> https://support.oracle.com/rs?type=doc&id=1563794.1

Visual Studio and Visual Studio Code

If you are doing development using Visual Studio or Visual Studio Code, you can install a free Oracle extension:

Visual Studio Code extension: Oracle Developer Tools for VS Code

Visit *https://marketplace.visualstudio.com/items?itemName=Oracle.oracledevtools*

Visual Studio extension: Oracle Developer Tools for Visual Studio

Visit *https://www.oracle.com/database/technologies/developer-tools/visual-studio/*

Permission Requirement for Installing Oracle Database Free

You must be part of the Administrators group on Windows to install Oracle Database Free. If you are logged in as a domain user, ensure sure that you are connected to the network before you install Oracle Database Free.

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Licensing Restrictions

For more information on licensing details, see *Oracle Database Database Licensing Information User Manual*

This section covers the following topics:

- Oracle Database Free CPU Limitations
- Oracle Database Free Installation and Runtime Restrictions
- Oracle Database Free User Data Limitations
- Oracle Database Free RAM Limitation

Oracle Database Free CPU Limitations

Oracle Database Free limits itself automatically to two cores for processing. For example, on a computer with 2 dual-core CPUs (four cores), if a large number of database clients try to simultaneously run CPU-intensive queries, then Oracle Database Free will process the queries at the rate of just two cores even if more CPU capacity is available.

Oracle Database Free Installation and Runtime Restrictions

Oracle Database Free restricts itself to only one installation per logical environment. The logical environment can either be a virtual host such as a VM or container, or a physical host. If you attempt to start more than one Oracle Database Free installation in such a logical environment, then an `ORA-00442: Oracle Database Free single instance violation error` is displayed and your database will not start.

This does not affect any existing installation or new installations of Oracle Database Standard Edition 2 or Oracle Database Enterprise Edition.

Oracle Database Free User Data Limitations

The maximum amount of user data in Oracle Database Free cannot exceed 12 GB. If the user data grows beyond this limit, then the system displays an `ORA-12954: The request exceeds the maximum allowed database size of 12 GB` error.

Oracle Database Free RAM Limitation

The maximum amount of RAM for Oracle Database Free cannot exceed 2 GB, even if more is available.

Related Topics

- Database Memory Management Methods

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Installing Oracle Database Free

This section covers the following topics:

- Authenticated Users Group Restriction for Oracle Database Free Installations on Windows
- Running the Installer
- Performing a Silent Installation

Authenticated Users Group Restriction for Oracle Database Free Installations on Windows

On Microsoft Windows, ensure that the directory where you install Oracle Database Free 23ai, and any of its parent directories other than the root directory (eg `C:\`), cannot be modified by the **Authenticated Users** group.

If you do not meet this requirement, then the installation rolls back and fails with an error in the beginning of the log found in the installation directory you provided, in the `InstallActions<timestamp>.out` file.

For example, you might see the following error in the `C:\app\username\product\23ai\dbhomeFree\cfgtoollogs\oui\InstallActions2024-07-02_07-42-31PM.out` log file:

```
SEVERE: [FATAL] [INS-32113] The location specified for Oracle Base is under a
directory that is modifiable by Authenticated users.
ACTION: Specify a path that does not exist or is not under a directory that
is modifiable by Authenticated users.
```

> **Note:**
>
> - This restriction applies to the Authenticated Users group which cannot have the `modify` (Write/Rename/Delete) access on these directories. Administrators who are members of that group may still be able to install.
> - Non-server Windows operating systems, for example Windows 11, have `modify` access granted by default to the Authenticated Users group for directories created under `C:\`

Perform the following steps to meet this requirement before you start the Oracle Database Free installation:

1. These steps will impact the permissions of existing subfolders, files, and applications. Hence, Oracle recommends that you create a new, top-level empty folder to install Oracle Database Free. For example:
   ```
   C:\> mkdir c:\dbfree
   ```

2. Disable the inheritance of the newly created folder:
   ```
   C:\> icacls c:\dbfree /inheritancelevel:d
   ```

3. Remove the **Authenticated Users** permissions from the folder:
   ```
   C:\> icacls c:\dbfree /remove:g *s-1-5-11
   ```

4. Start the Oracle Database Free installation. When you reach the **Destination Folder** screen, the installer prompts you to enter the installation directory, click **Change** to select the installation directory that you newly created. For example, select `c:\dbfree`.

You can also install Oracle Database Free in new subfolders by providing additional subdirectories under `c:\dbfree`. For example, `c:\dbfree\product\23ai`.

Checking the Permissions of Your Directory

To check the permissions of a directory where you want to install Oracle Database Free, perform one of the following steps:

1. Run the `icacls` utility to check the permissions of the directory. For example: `C:\> icacls c:\dbfree`

2. In File Explorer, right-click the directory where you want to install Oracle Database Free and select the **Security** tab. If you see that the **Authenticated Users** group can modify the said directory or any of its parent directories other than the root directory (eg `C:\`), then you will not be able to install Oracle Database Free into that directory.

Running the Installer

Most users will install Oracle Database Free by downloading the installation package, extracting the files, double-clicking `setup.exe`, and answering graphical user interface prompts as needed.

> **✎ Note:**
>
> - Before attempting to install Oracle Database Free 23ai, uninstall any existing Oracle Database XE or Oracle Database Free or database with the `SID XE` or FREE from the target system.
>
> - The installer will use `SID FREE` for database creation. Any `SID` other than `SID FREE` will not be allowed.

To install Oracle Database Free:

1. Log on to Windows with `Administrator` privileges.

   You must be a direct member of the `Administrators` group on Windows to install Oracle Database Free. If you are logged in as a domain user, ensure that you are connected to the network. Otherwise, you may receive a prerequisite check failure for `Administrator` privileges during the install.

2. If the `ORACLE_HOME` or `TNS_ADMIN` environment variables have been set, then delete them.

3. Download the Microsoft Windows version of Oracle Database Free.

4. Extract the downloaded `zip` file to a temporary location. Locate `setup.exe` and double click it. The installation of the prerequisites will take place, if applicable, to the environment.

5. In the **Welcome to the InstallShield Wizard for Oracle Database 23ai Free** window, click **Next**.

6. In the **License Agreement** window, read the text of the agreement and if you agree to its terms, select **I accept the terms in the license agreement** and then click **Next**. If you do not accept the terms, cancel the installation and delete the Oracle Database 23ai Free software from the computer.

7. The installer now performs a prerequisite check to ensure that:

   • the version and edition of Windows is supported

   • the environment variables `ORACLE_HOME` and `TNS_ADMIN` are not set

   • the installation user is a direct member of the Administrators group

   • there is no Oracle Database Free service already created

   If any of these checks fail, a **Prerequisite Checks** window will open notifying the user. In that case, cancel the installation, fix the problem, and retry the installation.

Prerequisite Check	Details
Windows Version	See, System Requirements.
Windows Edition	Windows Home Edition is not supported.
Install Environment Variables	`ORACLE_HOME` and `TNS_ADMIN` environment variables must not be set. These environment variables must be temporarily unset at the system level (unsetting them in a command prompt is not sufficient).
Pre-existing Oracle Database Free Service	There must not be an existing Oracle Database Free Service on this machine.
User Administrative Privileges	The current user must be a direct member of the Administrators group. Indirect membership of the Administrators group (e.g. when a user is a member of a group and that group is a member of Administrators), or running the installer "as administrator" is not sufficent. If you are logged in as a domain user, make sure you are on a network that can reach the domain server. For example, if you must use a VPN to reach your domain server, make sure to enable your VPN before beginning the installation. If you cannot connect to a network that can reach the domain server, you can instead create a local user and add that user to the local Administrators group. Then you can log in and install as that local user.

8. In the **Destination Folder** window, either accept the default location or click **Change** to select a different installation directory. Do not select a directory that has spaces in its name. Then click **Next**.

> **Caution:**
>
> On Microsoft Windows, ensure that the directory where you install Oracle Database Free 23ai, and any of its parent directories, cannot be modified by the Authenticated Users group. See, Authenticated Users Group Restriction for Oracle Database Free Installations for more details.

9. In the **Oracle Database Information** window, enter and confirm the single database password to use for the `SYS`, `SYSTEM`, and `PDBADMIN` database accounts. Then click **Next**.

> **Note:**
>
> The same password will be used for these accounts. The password should conform to the Oracle recommended standards. See *Oracle Database Security Guide* for more information about guidelines for securing passwords.

10. In the Summary window, review the installation settings, and if you are satisfied, click **Install**. Otherwise, click **Back** and modify the settings as necessary.

11. When the installation is complete, the **Oracle Database Installed Successfully** window is displayed.

   Make a note of the connection strings provided for multitentant container database and the pluggable database. Click **Finish** to close the installer.

Configuration, Database Files, and Logs Location

The following table lists important locations such as `Oracle Base`, `Oracle Home`, Database files, and logs. `<INSTALL_DIR>` is the installation directory chosen by you during the time of install. The default installation directory is `C:\app\<username>\product\23ai`, where `<username>` is the name of the Windows user performing the installation.

Table 4-1   Configuration, Database Files and Logs Location

File Name and Location	Purpose
`<INSTALL_DIR>`	Oracle Base
	This is the root of the Oracle Database Free directory tree.
`<INSTALL_DIR>\dbhomeFree`	Oracle Home
	This home is where the Oracle Database Free is installed. It contains the directories of the Oracle Database Free executables and network files.
`<INSTALL_DIR>\oradata\Free`	Database files
`<INSTALL_DIR>\diag\rdbms\free\free\trace`	Diagnostic logs
	The database alert log is `<INSTALL_DIR>\diag\rdbms\free\free\trace\alert_free.log`

Table 4-1   (Cont.) Configuration, Database Files and Logs Location

File Name and Location	Purpose
`<INSTALL_DIR>\cfgtoollogs\`	Database installation, creation, and configuration logs.
	The `<INSTALL_DIR>\cfgtoollogs\dbca\Free\Free.log` file contains the results of the database creation script execution.
`%Program Files%\Oracle\Inventory\logs`	Software installation logs.

Performing a Silent Installation

If you plan to install Oracle Database Free on multiple computers or bundle it with a third-party application, then you may want to perform a silent installation, in which you download the installation file and run it at a command line using the provided response files.

If you have an existing version of Oracle Database Free, you can save your data by exporting it to data files. After you install the new version of Oracle Database Free, you can import this data into the new database.

To perform a silent installation of Oracle Database Free:

1. Log on to Windows with Administrator privileges.

   You must be part of the `Administrators` group on Windows to install Oracle Database Free. If you are logged in as a domain user, ensure that you are connected to the network.

2. Download Oracle Database Free for Microsoft Windows. Extract the files to a temporary directory.

3. Open the `FREEInstall.rsp` response file and modify the settings if necessary.

   > **Note:**
   >
   > For information on response file parameters, see Table 4-2.

4. If the `ORACLE_HOME` environment variable has been set, then delete it.

5. Run the installation file with the `FREEInstall.rsp` response file.

   For example, if you extracted the `setup.exe` file and the `FREEInstall.rsp` file to a directory called `free_temp`, you would enter the following command:

   ```
   c:\free_temp> setup.exe /s /
   v"RSP_FILE=c:\free_temp\response\FREEInstall.rsp" /v"/L*v
   c:\free_temp\setup.log" /v"/qn"
   ```

   After the installation is complete, Oracle Database Free starts.

Response File Parameters

The following table describes the important response file parameters. The parameter value cannot be empty. You must specify a valid value for the parameters.

Table 4-2   Response File Parameters

Parameter	Purpose	Default Value
`INSTALLDIR`	The install directory location. Replace `[USERNAME]` with current user.	`INSTALLDIR=C:\app\<username>\product\23ai`
`PASSWORD`	The Oracle Database Free password. All users are set with this password. Reset the password immediately after the installation is complete.	`PASSWORD=passwordvalue`
`LISTENER_PORT`	The listener port.	`LISTENER_PORT=0` If listener port is set to `0`, available ports will be automatically allocated starting from `1521`.
`CHAR_SET`	The character set of the database.	`CHAR_SET=AL32UTF8`
`DB_DOMAIN`	Specify the database domain name for the database unique name specification.	
`SOFTWARE_ONLY`	For software-only installations, specify `SOFTWARE_ONLY=TRUE`. This is required for True Cache configurations.	`SOFTWARE_ONLY=FALSE`

> **✎ Note:**
>
> After the installation is successfully completed, the following message is available in the log file that you have specified as the parameter to `setup.exe`. For example, `c:\free_temp\setup.log`:
>
> MSI (c) (28:B8) [Timestamp]: Windows Installer installed the product. Product Name: Oracle Database 23ai Free Release. Product Version: 23.0.0.0.0. Product Language: [Current Language ID]. Manufacturer: Oracle Corporation. Installation success or error status: 0.
>
> Since silent install runs asynchronously, you can check the log file for the completion status.
>
> If the installation fails, see the following installation log files:
>
> - general logs: located at `%Program Files%\Oracle\Inventory\logs`
>
> - database creation logs: located at *`Oracle_base`*`\cfgtoollogs`

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Configuring True Cache on Oracle Database Free

To configure True Cache on Oracle Database Free, set up Oracle Database Free on the primary node and then configure True Cache in another True Cache node.

- Licensing for True Cache
- Set Up Oracle Database Free Primary Database
- Configuring Oracle Database Free True Cache

Licensing for True Cache

True Cache licensing is based on the edition of Oracle Database that you're using for both the primary database and True Cache.

See Permitted Features, Options, and Management Packs by Oracle Database Offering in the *Oracle Database Licensing Information User Manual*.

Set Up Oracle Database Free Primary Database

Before you configure Oracle Database Free True Cache, install and set up the Oracle Database Free primary database on the primary node.

To set up Oracle Database Free primary database:

1. Install Oracle Database Free using the interactive or silent mode. See, Installing Oracle Database Free.

2. Ensure that a primary database is running on the primary node in archive logging (`ARCHIVELOG`) mode.

   The primary database must be in `ARCHIVELOG` mode to ship redo log files to the True Cache node. Oracle DBCA verifies that the primary database is in `ARCHIVELOG` mode.

   If the primary database is not in `ARCHIVELOG` mode, restart it in mount mode, run the `ALTER DATABASE ARCHIVELOG` command, and open the primary database again.

   > ✎ **Note:**
   >
   > Don't set `LOG_ARCHIVE_CONFIG` and `LOG_ARCHIVE_DEST_`*n* on the primary database. True Cache automatically configures these for the primary database.

Configuring Oracle Database Free True Cache

After you set up the primary database, configure Oracle Database Free True Cache on the True Cache node.

To configure Oracle Database Free True Cache:

1. Install the Oracle Database Free software using one of the following methods in silent mode:

   a. Using command-line interface:

   ```
   setup.exe /s /v"/L*v c:\free_temp\setupsw.log" /v"/qn
   INSTALLDIR=C:\app\<username>\product\23ai\ SOFTWARE_ONLY=TRUE"
   ```

   b. Using Response file:

   i. Open the `FREEInstall.rsp` response file and modify the following settings:

   ```
   INSTALLDIR=C:\app\<username>\product\23ai\
   SOFTWARE_ONLY=TRUE
   ```

   ii. Run the installation file with the `FREEInstall.rsp` response file. For example, if you extracted the `setup.exe` file and the `FREEInstall.rsp` file to a directory called `free_temp`, you would enter the following command:

   ```
   setup.exe /s /
   v"RSP_FILE=C:\free_temp\response\FREEInstall.rsp" /v"/L*v
   c:\free_temp\setupsw.log" /v"/qn"
   ```

   > **Note:**
   >
   > Do not create and configure the database on the True Cache node.

2. Copy the password file `C:\app\<username>\product\23ai\dbhomeFree\database\PWDFREE.ora` from the primary database node to the True Cache node to a temp location `C:\temp\PWDFREE.ora`.

3. Run Oracle DBCA to complete the True Cache configuration.

   ```
   dbca.bat -silent -createTrueCache -gdbName FREE -sourceDBConnectionString
   Primary DBNode:1521/FREE -passwordFileFromSourceDB C:\temp\PWDFREE.ora
   ```

   Enter the password for the Oracle Database Free primary database.

   ```
   Enter Remote DB SYS user password:
   password
   ```

4. To configure database application services for True Cache, see Create Database Application Services on the Primary Database

5. To verify the True Cache configuration, see Verifying the True Cache Configuration

Related Topics

- Using Oracle True Cache in Your Applications

6

Connecting to Oracle Database Free

Connecting Locally using OS Authentication

When you install Oracle Database Free, your Windows user is automatically added to the `ORA_DBA` operating system group, which grants you the `SYSDBA` privileges. You can use the following commands to connect to the database. In the commands, replace "*oracle_home*" with the path to your Oracle Home; see Table 4-1 for more details about the Oracle Home:

```
cd oracle_home\bin
sqlplus / as sysdba
```

These commands connect you to the root container `CDB$ROOT` of the multitenant database (CDB) as database user `SYS`. This method of connecting to the database works even if the Net Services listener is not running.

Connecting to Oracle Database Using Easy Connect Naming Method

You can connect to the database using the following Easy Connect strings:

- Multitenant container database: *host*[*:port*]
- Pluggable database: *host*[*:port*]/*service_name*

`FREEPDB1` is the service name defined for the first PDB created by default. You can replace `FREEPDB1` with the name of another PDB you want to connect to.

Specifying the port is optional when the listener is setup with the default port `1521`. You must specify the port number if you use another port.

Connection strings for local connections were provided on the final screen of the install. If you are connecting from a remote computer, you need to provide the hostname (where Free is installed) instead of localhost.

Please note that, Net Services database listener must be running on the database host on the specified port for the connections to succeed.

For example, you can connect to the root container of the database from a client computer with SQL*Plus using the following commands:

```
cd oracle_home\bin
sqlplus system@dbhost.example.com:1521
```

You can connect to the default pluggable database `FREEPDB1` using the following commands:

```
cd oracle_home\bin
sqlplus system@dbhost.example.com:1521/FREEPDB1
```

Replace `dbhost.example.com` with your database host name. If needed, replace `1521` with the port number the listener listens on. You can replace `FREEPDB1` with the name of another PDB you want to connect to.

To shorten connect strings or to avoid hardcoding host name and port in application code and DBA scripts, you can define an alias for the connect string in the configuration file `oracle_base_home\network\admin\tnsnames.ora` on database clients. See Configuring the Local Naming Method for more details.

Net Services Listener and Default Services

The Net Services database listener for Oracle Database Free allows you to connect to the database over TCP/IP from the same machine or other machines on the network. The configuration of the Listener can be viewed using the following commands run from the command prompt:

```
cd oracle_home\bin
lsnrctl status

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=dbhost.example.com)(PORT=1521)))
STATUS of the LISTENER
------------------------
Alias                   LISTENER
Version                 TNSLSNR for Linux: Version 23.0.0.0.0 - Development
Trace Level             off
Security                ON: Local OS Authentication
SNMP                    OFF
Default Service         FREE
Listener Parameter File C:\install_dir\dbhomeFree\network\admin\listener.ora
Listener Log File       C:\install_dir\diag\tnslsnr\dbhost\listener\alert\log.xml
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=dbhost.example.com)(PORT=1521)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=EXTPROC1521)))
Services Summary...
Service "dbhost.example.com" has 1 instance(s).
  Instance "FREE", status READY, has 1 handler(s) for this service...
Service "FREE.dbhost.example.com" has 1 instance(s).
  Instance "FREE", status READY, has 1 handler(s) for this service...
Service "FREEXDB.dbhost.example.com" has 1 instance(s).
  Instance "FREE", status READY, has 1 handler(s) for this service...
Service "freepdb1.dbhost.example.com" has 1 instance(s).
  Instance "FREE", status READY, has 1 handler(s) for this service...
The command completed successfully
```

The output from the `lsnrctl` command shows values of a number of important parameters:

- the port the listener listens on

- the list of services registered with the listener

- the name of the configuration file used by the listener

- the name of the log file

You specify a service when connecting to the database through the listener. The default services created by Oracle Database FREE are `FREE` and `FREEPDB1`. The `FREE` service connects you to the root container of the database (`CDB$ROOT`) and the `FREEPDB1` service connects you to the default pluggable database (`FREEPDB1`) created at the installation time. For each new pluggable database (PDB) in the database, there will be a new default service created with the same name as the PDB.

> **✎ Note:**
>
> If the Oracle Database FREE instance is shut down, the `lsnrctl` status command does not show any services you can connect to.

Related Topics

- Connection Strategies for Database Applications
- Understanding Oracle Net Services
- Multitenant Architecture

7

Starting and Stopping Oracle Database Free

After you have installed Oracle Database Free, the database is up and running and you can begin using it right away.

The Oracle Database service must be running and the database must be started and opened prior to use.

By default, when the Oracle Database service is started, the container database is started and opened, but any pluggable databases must be opened before use. See below for a command to automatically open pluggable databases when the Oracle service starts.

Starting Up and Shutting Down Using Windows Services

The Oracle Database service must be started prior to accessing the database. By default, the Oracle Database Service will automatically startup and open the container database. Pluggable databases will remain closed by default and must be opened manually or set to automatically open.

You can start or stop the database using Windows **Services**:

1. From the **Start** menu, enter `services.msc` in the search field and press **Enter**.

2. Locate the `OracleServiceFREE` service in the **Services** window.

3. Right-click the service name, and from the menu, select **Start** or **Stop**.

4. To set its startup properties, right-click and select **Properties**, and in the dialog box, select either **Automatic**, **Manual**, or **Disabled** from the **Startup** type list.

> **Note:**
>
> To control connections to the database from the network, you can start or stop the Net Services listener. The listener runs as a service with the name `OracleOraDB23Home<n>TNSListener`, where `<n>` is a number chosen by the Oracle Database Free to control the listener service similar to the database service as described above.

Starting Up and Shutting Down Using SQL*Plus

You can shut down and start the database using SQL*Plus.

To shutdown the database issue the following SQL*Plus commands:

```
cd oracle_home\bin
sqlplus / as sysdba
SQL> SHUTDOWN IMMEDIATE
```

To start the database, issue the commands:

```
SQL> STARTUP
SQL> ALTER PLUGGABLE DATABASE ALL OPEN;
```

Setting Pluggable Databases to Automatically Open

The default pluggable database FREEPDB1 will open automatically when the container database opens, such as when Windows is rebooted and the FREE service starts. It will not need to be opened manually using the SQL provided above.

Other pluggable databases can be set to automatically open when the container database opens by connecting to the container database via SQL*Plus (as above), and issuing the following SQL:

```
SQL> ALTER PLUGGABLE DATABASE ALL OPEN;
SQL> ALTER PLUGGABLE DATABASE ALL SAVE STATE;
```

> **✎ Note:**
>
> If additional pluggable databases are created, these commands will need to be reissued.

Related Topics

- *Oracle Multitenant Administrator's Guide*
- *Oracle Database Administrator's Guide*

8

Moving from Previous Versions of Oracle Database XE to Oracle Database Free

This section explains how to export data from Oracle Database Express Edition XE 21c and import to Oracle Database 23ai Free.

Note these points before you start the export and import process:

- You cannot use Oracle Database Upgrade Assistant (Oracle DBUA) to perform an upgrade.
- You cannot use Oracle Database Configuration Assistant (Oracle DBCA) to plug PDBs of previous versions to Oracle Database Free.
- Oracle Database 18c XE users must first move to 21c XE (See, Moving from Previous Versions of Oracle Database XE to XE 21c), and then export data from 21c XE to import them into Oracle Database 23ai Free.

Exporting and Importing Data between Oracle Database 21c XE and Oracle Database 23ai Free

Learn how to export and import data between Oracle Database 21c Express Edition (XE) and Oracle Database 23ai Free.

Exporting Data

To export data from your 21c XE database:

1. Create a `C:\Temp\dump1` directory for the `DUMP_DIR` directory object.

   ```
   mkdir C:\Temp\dump1
   ```

2. Perform the following steps for each pluggable database (PDB). The steps in this section are for the PDB `xepdb1`.

   a. Set the ORACLE_HOME and ORACLE_SID environment variables.

   ```
   set ORACLE_SID=XE
   set ORACLE_HOME=C:\oldexpxe\dbhomeXE
   ```

   b. Connect to the 21c XE database as user `SYS` using the `SYSDBA` privilege, and switch the container to `xepdb1`.

   c. Create the directory object `DUMP_DIR` and grant `READ` and `WRITE` privileges on the `DUMP_DIR` directory to the `SYSTEM` user.

   ```
   SQL> ALTER SESSION SET CONTAINER=xepdb1;
   SQL> CREATE DIRECTORY DUMP_DIR6 AS 'C:\TEMP\dump1';
   SQL> GRANT read, write ON DIRECTORY DUMP_DIR6 TO SYSTEM;
   ```

d. Export data from your 21c XE PDB `xepdb1` to the dump folder.

```
%ORACLE_HOME%/bin/expdp system/system_password@dbhost.example.com:1521/
xepdb1 full=Y directory=DUMP_DIR6 dumpfile=DB10G.dmp
logfile=expdpDB10G.log
```

```
OUTPUT:Master table "SYSTEM"."SYS_EXPORT_FULL_01" successfully loaded/
unloaded
******************************************************************************
******
Dump file set for SYSTEM.SYS_EXPORT_FULL_01 is:
  C:\TEMP\DUMP1\DB10G.DMP
Job "SYSTEM"."SYS_EXPORT_FULL_01" successfully completed at .*
```

> **✎ Note:**
>
> - Replace `dbhost.example.com` with your database host name. If required, replace `1521` with the port number the listener listens on.
> - The default PDB name created is `xepdb1` in 21c and `freepdb1` in 23ai.

3. Deinstall Oracle Database 21c XE if you plan to install 23ai Free on the same system. See, Deinstalling Oracle Database XE for more information.

4. Install Oracle Database 23ai Free.

Importing Data

To import data to your Oracle Database 23ai Free, perform the following steps for each PDB. The steps in this section are for importing data from PDB `xepdb1` to `freepdb1`.

1. Set the ORACLE_HOME and ORACLE_SID environment variables.

```
set ORACLE_SID=FREE
set ORACLE_HOME=C:\newimpfree\dbhomeFree
```

2. Connect to the 23ai Free database as user `SYS` using the `SYSDBA` privilege and switch the container to `freepdb1`.

3. Create the directory object `DUMP_DIR` and grant `READ` and `WRITE` privileges on the `DUMP_DIR` directory to the `SYSTEM` user.

```
SQL> ALTER SESSION SET CONTAINER=freepdb1;
SQL> CREATE DIRECTORY DUMP_DIR6 AS 'C:\Temp\dump1';
SQL> GRANT read, write ON DIRECTORY DUMP_DIR6 TO SYSTEM;
```

4. Import data to the 23ai Free PDB `freepdb1` from the dump folder created during the export operation.

```
%ORACLE_HOME%/bin/impdp system/system_password@dbhost.example.com:1521/
freepdb1 full=Y directory=DUMP_DIR6
 dumpfile=DB10G.dmp logfile=impdb23ai_freepdb1.log
```

> **Note:**
>
> - Replace `dbhost.example.com` with your database host name. If required, replace `1521` with the port number the listener listens on.
> - The default PDB name created is `xepdb1` in 21c and `freepdb1` in 23ai.

Ignore the following errors:

- ORA-31684: Object type TABLESPACE:"UNDOTBS1" already exists
- ORA-31684: Object type TABLESPACE:"TEMP" already exists
- ORA-31684: Object type TABLESPACE:"USERS" already exists
- ORA-39083: Object type PROC_SYSTEM_GRANT failed to create with error:
- ORA-29393: user EM_EXPRESS_ALL does not exist or is not logged on

```
Failing sql is:
BEGIN
dbms_resource_manager_privs.grant_system_privilege(grantee_name =>
'"EM_EXPRESS_ALL"', admin_option => TRUE);COMMIT; END;
ORA-31684: Object type DIRECTORY:"DUMP_DIR6" already exists
```

9

Deinstalling Oracle Database Free

If you want to save your data files but remove the Oracle Database Free software and database, then first export the data before you deinstall.

> ⚠️ **Caution:**
>
> When you deinstall Oracle Database Free, all components, including data files, the database, and the software, are removed.

Because the deinstallation process removes all files from the directory in which Oracle Database Free is installed, back up any files from the directory (if needed) before you deinstall. The database will no longer be operational after deinstallation.

You can deinstall Oracle Database Free using one of the following methods:

* Deinstalling Using User Interface
* Deinstalling Using Silent Mode

> ✏️ **Note:**
>
> Oracle recommends that you follow the deinstall procedure described in the deinstall section. If you have deinstalled Oracle Database Free using `ORACLE_HOME\deinstall\deinstall.bat` utility, run the following command to remove Oracle Database Free completely: `msiexec /qn /x {C220B7FD-3095-47FC-A0C0-AE49DE6E320A}`

Deinstalling Using User Interface

Use **Add or Remove Programs** to deinstall Oracle Database Free:

1. In the Windows Control Panel, select **Add or Remove Programs**.
2. Select **Oracle Database 23ai Free**.
3. Click **Uninstall**.
4. Follow the prompts to deinstall Oracle Database 23ai Free. After few minutes, the window will close and the deinstallation will be complete.

Alternatively, you can use following `msiexec` command to perform the deinstall:

```
msiexec /x {C220B7FD-3095-47FC-A0C0-AE49DE6E320A}
```

Deinstalling Using Silent Mode

If the downloaded software is available, you can use `setup.exe` to deinstall Oracle Database Free.

For example, if you downloaded and extracted the files to a directory called `free_temp`, enter the following command to deinstall Oracle Database Free:

```
c:\free_temp> setup.exe /s /x /v"/qn /Lv c:\test1.log"
```

If you do not have the downloaded software (`setup.exe`) you can deinstall using:

```
msiexec /qn /x {C220B7FD-3095-47FC-A0C0-AE49DE6E320A}
```

You can replace `/qn` with `/qb` to display the progress bar.

> **Note:**
>
> - Silent deinstall runs asynchronously; you can check the `log` file for the completion status.
> - After the deinstall is successfully completed, the following message is available in the log file: `MSI (s) (8C:C4) [Timestamp]: Windows Installer removed the product. Product Name: Oracle Database 23ai Free Release. Product Version: 23.0.0.0.0. Product Language: [Current Language ID]. Manufacturer: Oracle Corporation. Removal success or error status: 0.`

10

Reporting Security Vulnerabilities

If you find any security vulnerabilities with Oracle Database Free, then email a description of the issue to Oracle at secalert_us@oracle.com.

Include the following information in your email:

- A complete description of the problem.

- The version of Oracle Database Free you are using.

- The platform on which you are running Oracle Database Free.

- Any scripts or examples that may be helpful in tracking down the security problem.

11
Globalization Support

Oracle Database Free is configured by default to be able to process character data in all supported languages simultaneously:

- The database is created with the `Unicode AL32UTF8` character set. `AL32UTF8` is the recommended database character set suitable for storing data in practically any language. Multiple languages can be mixed even in a single character value. While not a recommended option, you can create the database with another supported database character set by calling `setup.exe` from the `Command Prompt` as follows:

  ```
  setup.exe /v"CHAR_SET=<character_set>"
  ```

  where `<character_set>` is the desired database character set. Supported database character sets are listed in tables `A-4` and `A-6` in `Appendix A` of the Database Globalization Support Guide. Character sets from `Table A-4` are preferred over character sets from Table `A-6` because of more comprehensive character repertoires.

- Oracle Database Free supports the same globalization features that Oracle Database Enterprise Edition (EE) provides.

Setting Language and Locale Preferences for Client Connections

Configure client applications connecting to an Oracle Database according to your locale preferences and your I/O device character set.

You must configure client applications connecting to an Oracle Database according to your locale preferences and your I/O device character set. If your applications do not have their own specific methods to configure locale preferences, then the method you use to configure an Oracle database client connection depends on the access API you use to connect to the database. Check your application documentation, before you configure locale preferences for your applications.

For applications that connect to Oracle Databases using Oracle Call Interface (OCI) use NLS_LANG and other client settings with names that start with `NLS_` to set the locale conventions and client character set for Oracle Database sessions. It is important that you set the character set part of the NLS_LANG value properly. The Oracle character set whose name you set in NLS_LANG must correspond to the character encoding used by your I/O devices. For Linux, it is the character encoding of the terminal or terminal emulator, and usually corresponds to what the `locale` command reports. For Microsoft Windows, it is either the ANSI Code Page (for GUI applications), such as WE8MSWIN1252, or the OEM Code Page (for Console mode applications), such as US8PC437. By doing this, the OCI API is notified about the character set of data that it receives from the application. OCI can then convert this data correctly to and from the database character set.

You can specify NLS_LANG and the other NLS settings as environment variables. On Microsoft Windows, you can also specify them as Registry settings. Environment variable values take precedence over Registry values.

Oracle Universal Installer sets a default value for the NLS_LANG setting in Registry when it creates a new Oracle home on Microsoft Windows. The NLS_LANG value is based on the

language of the Windows user interface, which is the language of Windows menu items and dialog box labels. The installer does not set NLS_LANG on Linux and other UNIX system-based operating systems.

> ⚠️ **Caution:**
>
> Failure to set the client character set correctly can cause data loss.

Java applications that connect to Oracle Databases by using Oracle JDBC do not use NLS_LANG. Instead, Oracle JDBC maps the default locale of the Java VM in which the application runs to the Oracle Database language and territory settings. Oracle JDBC then configures the connected database session using these settings. Because Java works internally in Unicode, the client character set is always set to Unicode. Unless an application explicitly changes it, the default locale of the Java VM is set based on the locale of the user operating system on which the Java VM runs. Check your Java VM documentation for information about configuring the Java VM default locale.

> ✏️ **Note:**
>
> In 3-tier architecture deployments, application servers that are database clients can have settings in their configuration files that specify the NLS_LANG value or the Java VM locale. Check the documentation accompanying these servers.

> ✏️ **See Also:**
>
> *Oracle Database Globalization Support Guide* for more information about configuring user locale preferences