

Oracle® Database Express Edition Installation Guide



21c for Microsoft Windows

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The Oracle logo, consisting of a solid red square with the word "ORACLE" in white, uppercase, sans-serif font centered within it.

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Preface

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

This guide also provides information about resources available to develop application using Oracle application Express Edition, and how to remove the database software.

- [Audience](#)
- [Documentation Accessibility](#)
- [Command Syntax](#)
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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 21c Express Edition (Oracle Database XE) is a free version of the world's most capable relational database. Oracle Database XE is easy to install, easy to manage, and easy to develop with. With Oracle Database XE, 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.

Convention	Description
%	C Shell prompt in a command example. Do not enter the prompt as part of the command.
#	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: <pre>dd if=/dev/rdskc0t1d0s6 of=/dev/rst0 bs=10b \ count=10000</pre>
braces { }	Braces indicate required items: <pre>.DEFINE {macro1}</pre>
brackets []	Brackets indicate optional items: <pre>cvtcrt termname [outfile]</pre>
ellipses ...	Ellipses indicate an arbitrary number of similar items: <pre>CHKVAL fieldname value1 value2 ... valueN</pre>
<i>italic</i>	Italic type indicates a variable. Substitute a value for the variable: <pre><i>library_name</i></pre>
vertical line	A vertical line indicates a choice within braces or brackets: <pre>FILE filesize [K M]</pre>

Related Documents

To help you with your development efforts, consult the books in the development category of the Oracle database documentation set at [Oracle Database Development](#)

Title	Content
<i>2 Day Developer's Guide</i>	Explains how to develop applications with Oracle Database.
<i>2 Day + Java Developer's Guide</i>	Provides a tutorial that shows you how to use Java and JDBC to connect to Oracle Database, and demonstrates how to develop a simple Java application that accesses and modifies data.

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 SODA for PL/SQL 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*

 **See Also:**

- *Oracle Application Express Release 21.1*
- <https://www.oracle.com/database/technologies/application-development.html>

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.
<i>italic</i>	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.

1

Installation Guide

Welcome to *Oracle Database Express Edition Installation Guide for Microsoft Windows*. This guide covers the following topics:

- [Introduction](#)
- [Requirements](#)
- [Licensing Restrictions](#)
- [Installing Oracle Database XE](#)
- [Connecting to Oracle Database XE](#)
- [Starting and Stopping Oracle Database XE](#)
- [Using Enterprise Manager Express](#)
- **[Moving from Previous Versions of Oracle Database XE to XE 21c](#)**
- [Migrating Data and Applications](#)
- [Deinstalling Oracle Database XE](#)
- [Reporting Security Vulnerabilities](#)
- [Globalization Support](#)

2

Introduction

Oracle Database Express Edition (XE) is a free edition of Oracle Database.

Development Environments

Oracle Database XE supports the following development environments (this is not a complete list):

- **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 <http://oracle.com/jdbc> 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 XE. ODBC and the ODPI-C wrapper over OCI are also usable.

Visit <https://www.oracle.com/technetwork/database/features/oci/index-090945.html> for more information

- **.NET:** Visual Studio and .NET developers can use Oracle Data Provider for .NET (ODP.NET) and Oracle Developer Tools for Visual Studio (ODT) for full development life cycle support.

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

For a walkthrough on creating a .NET application with Oracle Database XE:

visit <https://www.oracle.com/tools/technologies/quickstart-dotnet-for-oracle-database.html>.

- **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 XE schema using standard Oracle database authentication. Once connected, you can perform operations on objects in the database.

Download and install Oracle SQL Developer from:

<http://www.oracle.com/technetwork/developer-tools/sql-developer/overview/index.html>

- **Oracle Developer Tools for VS Code:** This free Visual Studio Code extension enables editing and execution of 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:

<http://www.oracle.com/technetwork/developer-tools/apex/overview/index.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 21c 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:

- **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 <http://php.net/oci8> for more information on PHP OCI8 and http://php.net/pdo_oci for more information on PDO_OCI

- **Python**

The cx_Oracle Python extension module enables access to Oracle Database.

Visit https://oracle.github.io/python-cx_Oracle/ for more information about cx_Oracle Python extension module

- **Node.js**

The node-oracledb add-on for Node.js powers high performance Oracle Database applications.

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

- **ROracle**

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

Visit <http://cran.r-project.org/web/packages/ROracle/index.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:

– <http://www.rubydoc.info/gems/ruby-oci8/> for information about the ruby-oci8

– <http://jrubby.org/> for information about JRuby

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

- **Others**

Accessing Oracle Database XE from other languages including Go is possible using community drivers based on OCI or ODPI-C.

Download Open Source drivers from:

<http://www.oracle.com/technetwork/database/database-technologies/scripting-languages/index.html>.

Learning More About Oracle Database XE

For more information on Oracle Database XE, see the following:

- Oracle Database XE home page on the Oracle Technology Network:

Visit <https://www.oracle.com/database/technologies/appdev/xe.html>

- Oracle Database XE Discussion Forum:

You can search that forum to see if the problem has already been discussed; and if you do not find the answer, you can create a new thread and provide the details.

Visit https://community.oracle.com/tech/developers/categories/oracle_database_express_edition_xe

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Requirements

This section covers the following topics:

- [Software Requirements](#)
- [Permission Requirement for Installing Oracle Database XE](#)

Software Requirements

This section covers the following topics:

- [System Requirements](#)
- [Visual Studio and Visual Studio Code](#)

System Requirements

[Table 3-1](#) provides system requirements for Oracle Database XE for Microsoft Windows 64-bit.

Table 3-1 Oracle Database XE Requirements for Microsoft Windows 64-bit

Requirement	Value
Operating system	Oracle Database XE for Windows x64 is supported on the following operating system versions: <ul style="list-style-type: none">• Windows 10 x64 - Pro, Pro for Workstations, Enterprise, and Education editions• Windows Server 2012 R2 x64 - Standard, Datacenter, Essentials, and Foundation editions• Windows Server 2016 x64 - Standard, Datacenter, and Essentials editions• Windows Server 2019 x64 - Standard, Datacenter, and Essentials editions
Virtualization	Oracle certifies the following virtualization technologies with Oracle Database on Windows: <ul style="list-style-type: none">• Oracle VM Server• Microsoft Hyper-V For more detailed information on certified Oracle VM Server combinations, check My Oracle Support note 464754.1. For more information on certified Hyper-V combinations, you can visit: https://www.oracle.com/database/technologies/virtualization-matrix.html
Disk space	8.5 gigabytes minimum for Oracle software, plus 2 gigabytes or more for temporary storage
RAM	2 gigabytes 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/epmos/faces/DocumentDisplay?_afLoop=98674914566540&id=1563794.1&_afWindowMode=0&_adf.ctrl-state=11giby7q7i_4

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 XE

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

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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 XE CPU Limitations](#)
- [Oracle Database XE Installation and Execution Restrictions](#)
- [Oracle Database XE User Data Limitations](#)
- [Oracle Database XE RAM Limitation](#)

Oracle Database XE CPU Limitations

Oracle Database XE 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 execute CPU-intensive queries, then Oracle Database XE will process the queries at the rate of just two cores even if more CPU capacity is available.

To take advantage of the full processing power of your computer, you can use a different Oracle Database Edition such as Oracle Database 21c Standard Edition 2 or Oracle Database 21c Enterprise Edition.

Oracle Database XE Installation and Execution Restrictions

Oracle Database XE 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 more than one Oracle Database XE installation is attempted to be started in such a logical environment, an "ORA-00442: Oracle Database Express Edition (XE) single instance violation error" is raised and the database will not start. This does not affect any existing installation or new installations of Oracle Database 21c Standard Edition 2 or Oracle Database 21c Enterprise Edition. To run more than one Oracle Database instance or install more than one copy of the database software, upgrade to Oracle Database 21c Standard Edition 2 or Oracle Database 21c Enterprise Edition.

Oracle Database XE User Data Limitations

The maximum amount of user data in an Oracle Database XE database cannot exceed 12 GB. If the user data grows beyond this limit, then an `ORA-12592` error will appear. To use more than 12 GB of user data, upgrade to Oracle Database 21c Standard Edition 2 or Oracle Database 21c Enterprise Edition.

Oracle Database XE RAM Limitation

The maximum amount of RAM that an Oracle Database XE database uses cannot exceed 2 gigabytes, even if more is available.

To use more than 2 gigabytes of RAM, upgrade to Oracle Database 21c Standard Edition 2 or Oracle Database 21c Enterprise Edition.

For more information about managing memory, refer to *Oracle Database 2 Day DBA*.

5

Installing Oracle Database XE

This section covers the following topics:

- [Running the Installer](#)
- [Performing a Silent Installation](#)

Running the Installer

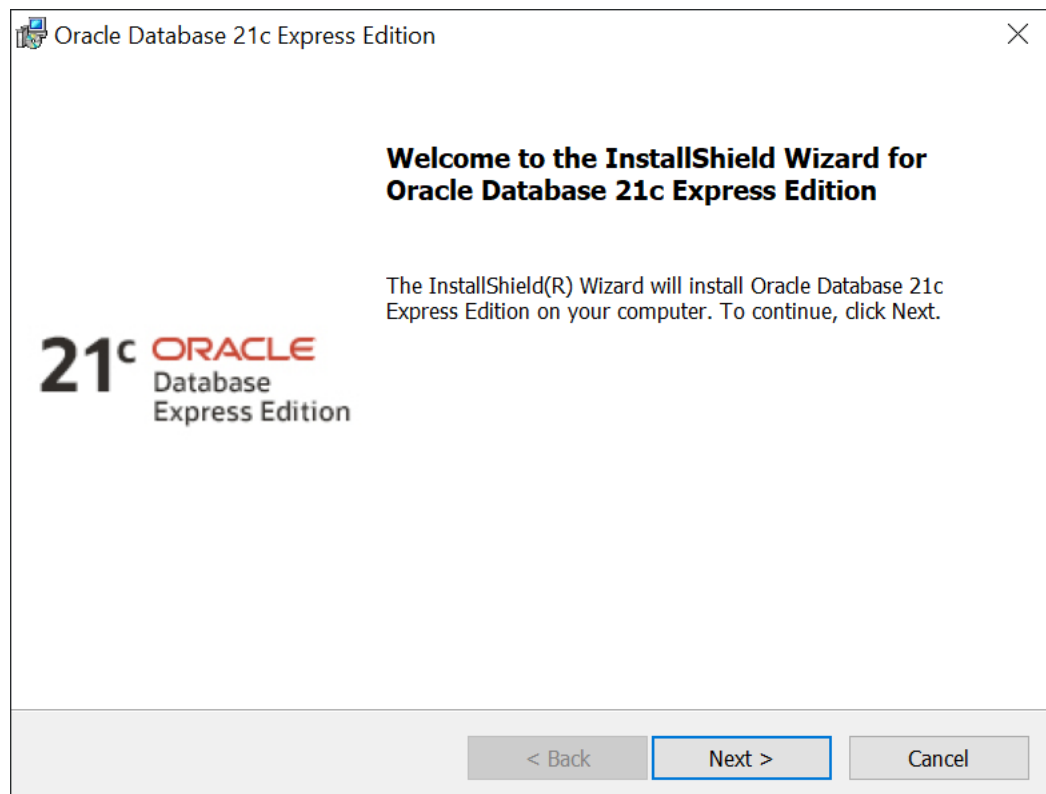
Most users will install Oracle Database XE by downloading the installation package, extracting the files, double-clicking `setup.exe`, and answering graphical user interface prompts as needed.

Note:

- Before attempting to install Oracle Database XE 21c, uninstall any existing Oracle Database XE or database with the `SID_XE` from the target system.
- The installer will use `SID_XE` for database creation. Any `SID` other than `SID_XE` will not be allowed.
- See [Migrating Data and Applications](#) if you need to move data from Oracle Database Express Edition to Oracle Database Enterprise Edition 21c.
- See [Upgrading Oracle Database XE 18c PDB to XE 21c](#)

To install Oracle Database XE:

1. Log on to Windows with `Administrator` privileges.
You must be a direct member of the `Administrators` group on Windows to install Oracle Database XE. 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 XE.
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.



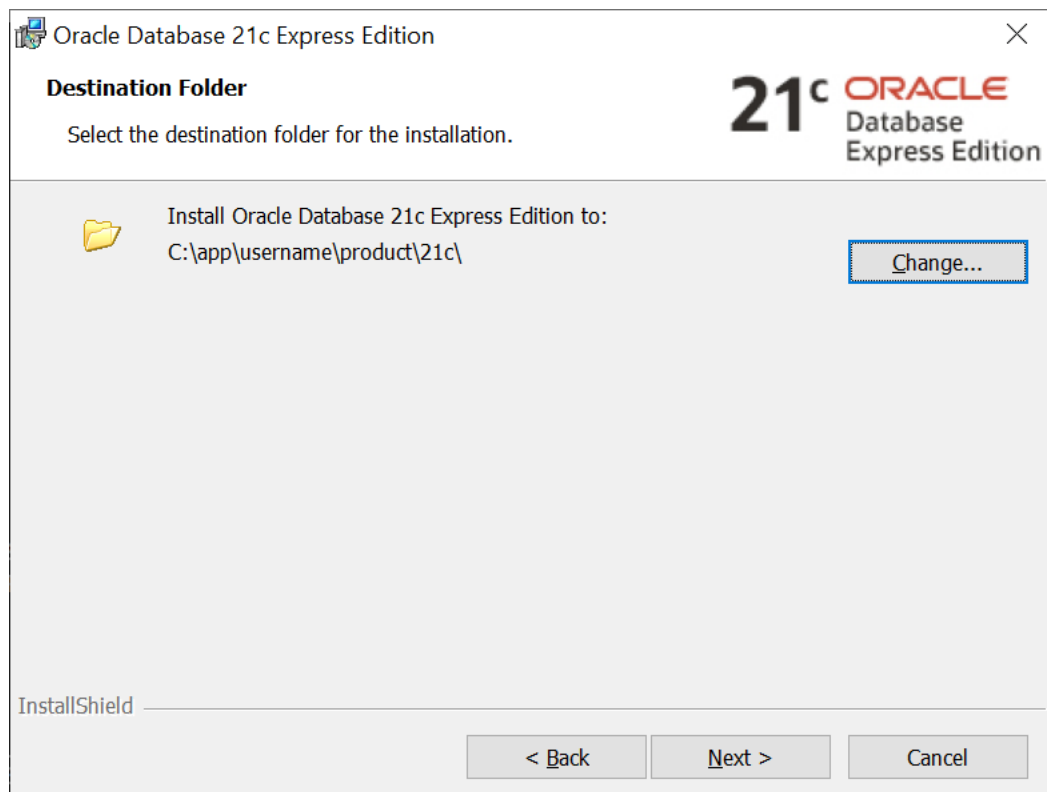
5. In the **Welcome to the InstallShield Wizard for Oracle Database 21c Express Edition** window, click **Next**.
6. In the **License Agreement** window, read the text of the agreement and if you agree to its terms, select **I accept the terms in the license agreement** and then click **Next**. If you do not accept the terms, cancel the installation and delete the Oracle Database 21c Express Edition 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 XE 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	Windows must be version 10 or higher.
Windows Edition	Windows Home Edition is not supported.
Install Environment Variables	<code>ORACLE_HOME</code> and <code>TNS_ADMIN</code> 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 Express Edition Service	There must not be an existing Oracle Database Express Edition 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 sufficient. 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.

- 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**.



- 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**.

Oracle Database 21c Express Edition

Oracle Database Information
Specify the database password.

21^c ORACLE
Database
Express Edition

This password will be used for SYS, SYSTEM and PDBADMIN accounts.

Enter Database Password

Confirm Database Password

InstallShield

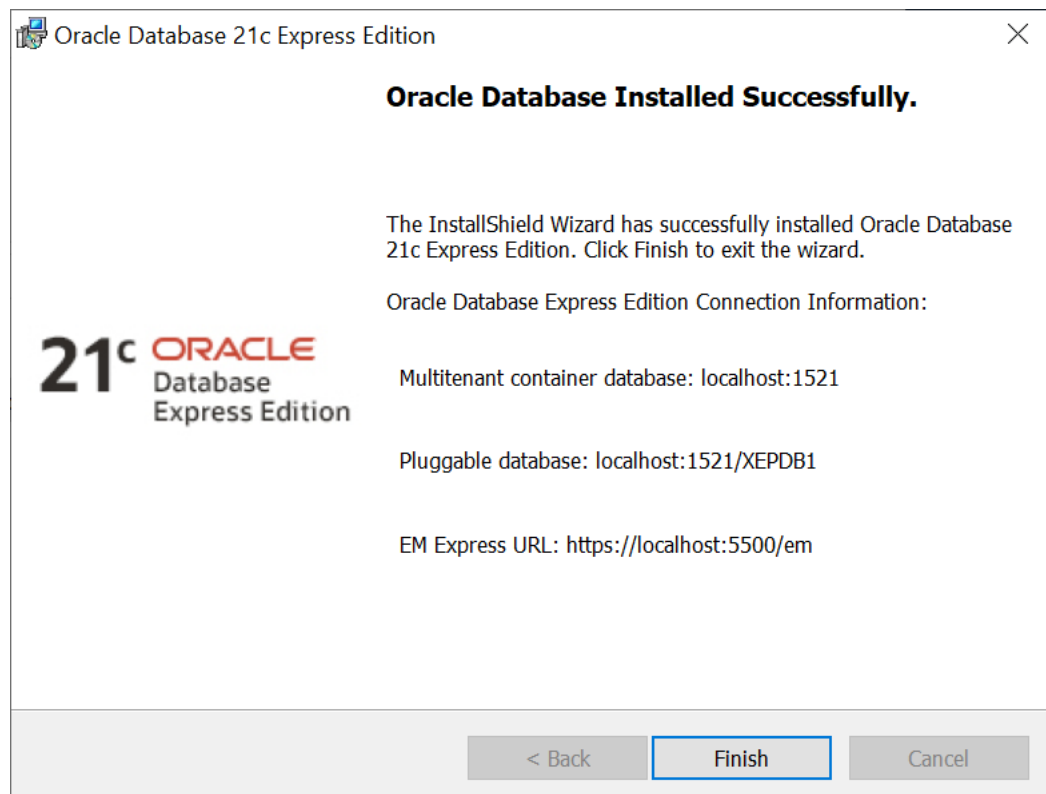
< Back Next > Cancel

 **Note:**

The same password will be used for these accounts.

Oracle recommends that the password entered should be at least 12 characters in length, contain at least 1 uppercase character, 1 lower case character and 1 digit [0-9]. 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 multitenant container database and the pluggable database, as well as the EM Express URL. 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\\product\21.0.0, where <username> is the name of the Windows user performing the installation.

Table 5-1 Configuration, Database Files and Logs Location

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

Table 5-1 (Cont.) Configuration, Database Files and Logs Location

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

Performing a Silent Installation

If you plan to install Oracle Database XE 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 executable and run it at a command line using the provided response files.

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

To perform a silent installation of Oracle Database XE:

1. Log on to Windows with Administrator privileges.
You must be part of the `Administrators` group on Windows to install Oracle Database XE. If you are logged in as a domain user, ensure that you are connected to the network.
2. Download Oracle Database XE for Microsoft Windows. Extract the files to a temporary directory.
3. Open the `XEInstall.rsp` response file and modify the settings if necessary.

Note:

For information on response file parameters, see [Table 5-2](#).

4. If the `ORACLE_HOME` environment variable has been set, then delete it.
5. Run the installation executable with the `XEInstall.rsp` response file.

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

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

After the installation is complete, Oracle Database XE 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 5-2 Response File Parameters

Parameter	Purpose	Default Value
INSTALLDIR	The install directory location. Replace [USERNAME] with current user.	INSTALLDIR=C:\app\ [USERNAME]\product\21.0.0\
PASSWORD	The XE Database 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.
EMEXPRESS_PORT	The EM express port.	EMEXPRESS_PORT=0. If EM express port is set to 0, available port will be automatically allocated starting from 5550.
CHAR_SET	The character set of the database.	CHAR_SET=AL32UTF8
DB_DOMAIN	Specify the database domain name for the database unique name specification.	

 **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:\xe_temp\setup.log`:

```
MSI (c) (28:B8) [Timestamp]: Windows Installer installed the product. Product Name:
Oracle Database 21c Express Edition. Product Version: 21.0.0.0.0. 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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Connecting to Oracle Database XE

Connecting Locally using OS Authentication

When you install Oracle Database XE, 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 5-1](#) 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`

`XEPDB1` is the service name defined for the first PDB created by default. You can replace `XEPDB1` 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 XE 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 `XEPDB1` using the following commands:

```
cd <oracle_home>\bin
sqlplus system@dbhost.example.com:1521/XEPDB1
```

Replace `dbhost.example.com` with your database host name. If needed, replace 1521 with the port number the listener listens on. You can replace `XEPDB1` 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.

The Net Services Listener and Default Services

The Net Services database listener for your XE database 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 64-bit Windows: Version 21.0.0.0.0 - Production
Trace Level          off
Security              ON: Local OS Authentication
SNMP                 OFF
Default Service      XE
Listener Parameter File
C:\app\username\product\21c\homes\OraDB21Home1\network\admin\listener.ora
Listener Log File
C:\app\username\product\21c\diag\tnslnsr\den01mrn\listener>alert\log.xml
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp) (HOST=dbhost.example.com) (PORT=1521)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc) (PIPENAME=\\.\pipe\EXTPROC1521ipc)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcps) (HOST=127.0.0.1) (PORT=5500)))
  (Security=(my_wallet_directory=C:\app\username\product\21c\admin\XE\xdb_wallet))
  (Presentation=HTTP) (Session=RAW)
Services Summary...
Service "15288327eb2b45268e6a23a805a53f8e" has 1 instance(s).
  Instance "xe", status READY, has 1 handler(s) for this service...
SERVICE "CLRExtProc" has 1 instance(s).
  Instance "CLRExtProc", status UNKNOWN, has 1 handler(s) for this service...
Service "XE" has 1 instance(s).
  Instance "xe", status READY, has 1 handler(s) for this service...
Service "XEXDB" has 1 instance(s).
  Instance "xe", status READY, has 1 handler(s) for this service...
Service "xepdb1" has 1 instance(s).
  Instance "xe", 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 port EM Express listens on
- 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 XE are XE and XEPDB1. The XE service connects you to the root container of the database (CDB\$ROOT) and the XEPDB1 service connects you to the default pluggable database (XEPDB1) 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 XE instance is shut down, the `lsnrctl status` command does not show any services you can connect to.

 **See Also:**

- *2 Day DBA* for more information about the listener and network configuration
- *Oracle Database Development Guide* for more information about connection strategies for database applications
- Oracle Database Net Services Administrator's Guide and Oracle Database Net Services Reference for more information about Net Services and their configuration.
- Oracle Multitenant Administrator's Guide for more information about containers and connecting to a container in a CDB.

7

Starting and Stopping Oracle Database XE

After you have installed Oracle Database XE, 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 `OracleServiceXE` 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 `OracleOraDB21Home<n>TNSListener`, where `<n>` is a number chosen by the Oracle Database XE installer based on other Oracle homes previously installed on the host. Use Windows **Services** 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 XEPDB1 will open automatically when the container database opens, such as when Windows is rebooted and the XE 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.

See Also:

- *Oracle Multitenant Administration Guide* for more information about shutting down and starting a PDB
- *Oracle Database Administrator's Guide* for more information about starting up and shutting down using SQL*Plus.

8

Using Enterprise Manager Express

You can leverage all the functionality and ease of use of Enterprise Manager (EM) to manage your XE database.

To connect to EM Express, go to `https://localhost:5500/em` from the browser on the system.

Port 5500 is the default port assigned during database creation. During install, we automatically choose next port (for example, 5501) if 5500 is already used. Then you must provide that port.

Making Oracle Database EM Express Available to Remote Clients

After you install Oracle Database XE, EM Express is only available from the local server, it cannot be accessed remotely.

To make EM Express available to remote clients, start SQL*Plus, log in as `SYSTEM`, and execute the following procedure. From the command prompt run the following commands. In the commands, replace "`<oracle_home>`" with the path to your Oracle Home; see [Table 5-1](#) for more details about Oracle Home.

```
cd <oracle_home>\bin
sqlplus system
Enter password: SYSTEM_password
SQL> EXEC DBMS_XDB.SETLISTENERLOCALACCESS(FALSE);
```

9

Moving from Previous Versions of Oracle Database XE to XE 21c

This section explains how to export and import data between Oracle Database XE 18c and XE 21c.

Oracle Database XE 11g Release 2 (11.2) users need to first upgrade to XE 18c and then upgrade from XE 18c to XE 21c using the information provided in this section.

For information on upgrading from Oracle Database XE 11g Release 2 (11.2) to XE 18c, see [Exporting and Importing Data between Oracle Database XE 11.2 and 18c](#).

Upgrading Oracle Database XE 18c PDB to XE 21c

Unplug the PDB from Oracle Database XE 18c

Note:

- Database Upgrade Assistant (DBUA) can not be used to perform the upgrade.
- Database Configuration Assistant (DBCA) can not be used to plug 18c XE to 21c XE database.

1. Install Oracle Database XE 18c.
2. From Oracle Database XE 18c, connect to the database as `root`.

```
SQL> CONNECT / AS SYSDBA
SQL> ALTER SESSION SET CONTAINER=CDB$ROOT;
```

Output: Session altered.

3. Close the PDB you want to unplug where `XEPDB1` is the name of the PDB you want to unplug:

```
SQL> ALTER PLUGGABLE DATABASE XEPDB1 CLOSE;
```

Output: Pluggable database altered.

4. Unplug the 18c XE PDB using the following SQL command syntax, where `XEPDB1` is the name of the PDB, and `'\tmp\xepdb1.xml'` is the location of the PDB XML file:

```
SQL> ALTER PLUGGABLE DATABASE XEPDB1 UNPLUG INTO '/tmp/xepdb1.xml';
```

Output: Pluggable database altered.

5. Drop the closed PDB and keep the data files.

```
SQL> DROP PLUGGABLE DATABASE XEPDB1 KEEP DATAFILES;
```

6. Copy the 18.4 oradatafiles of PDB XEPDB1 (typically under <INSTALL_DIR_18cXE>\oradata\XE\XEPDB1) to another location like C:\oldxepdb1\XEPDB1.

```
C:\copy <INSTALL_DIR_18cXE>\oradata\XE\XEPDB1\*. * c:\oldxepdb1\XEPDB1;
```

```
C:\oldxepdb1\XEPDB1>dir
```

```
SYSAUX01.DBF  SYSTEM01.DBF  TEMP01.DBF  UNDOTBS01.DBF  USERS01.DBF
```
7. Update /tmp/xepdb1.xml file with the new XEPDB1 oradata file paths.
8. Use Add or Remove Programs to deinstall Oracle Database XE: In the Windows Control Panel, select Add or Remove Programs. Select Oracle Database 18c Express Edition. Click Uninstall.

Plugging in the Oracle Database XE 18c PDB to XE 21c CDB

1. Install the latest version of Oracle Database XE 21c.
2. Use the command CREATE PLUGGABLE DATABASE to plug the PDB from the 18c XE CDB to the 21c XE CDB.

In the example, XEPDB2 is the new pdb:

```
SQL> CONNECT / AS SYSDBA
SQL> CREATE PLUGGABLE DATABASE XEPDB2 USING '/tmp/xepdb1.xml' NOCOPY TEMPFILE REUSE;
```

Output: Pluggable database created.

3. **Upgrading the PDB from an Earlier Release to a Later Release**

Open the PDB in UPGRADE mode:

```
SQL> ALTER PLUGGABLE DATABASE XEPDB2 OPEN UPGRADE;
```

Output: Pluggable database altered.

4. Upgrade the PDB using the Parallel Upgrade Utility command:

```
%ORACLE_HOME%\perl\bin\perl %ORACLE_HOME%\rdbms\admin\catctl.pl -u sys -d
%ORACLE_HOME%\rdbms\admin -c XEPDB2 -l C:\utility -t catupgrd.sql
```

The upgrade summary report is located in: C:\utility\upg_summary.log. The PDB will be in MOUNTED state.

5. Open the PDB to execute post-upgrade fixups:

```
SQL> ALTER PLUGGABLE DATABASE XEPDB2 OPEN;
```

6. Use the utility catcon.pl to run utlrp.sql from the directory \$ORACLE_HOME/rdbms/admin. The script recompiles INVALID objects in the database.

```
%ORACLE_HOME%\perl\bin\perl %ORACLE_HOME%\rdbms\admin\catcon.pl -d %ORACLE_HOME%
\rdbms\admin -n 1 -l C:\utlrp -e -b utlrp -c 'XEPDB2' utlrp.sql
```

Output:catcon.pl: completed successfully.

Performing a Sanity Check for the new PDB

```
SQL> CONNECT / AS SYSDBA
Connected to:
Oracle Database 21c Express Edition Release 21.0.0.0.0 - Production
Version 21.3.0.0.0
```

```
SQL> SHOW PDBS;
```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
2	PDB\$SEED	READ ONLY	NO
3	XEPDB1	READ WRITE	NO
5	XEPDB2	READ WRITE	NO

```
SQL> ALTER SESSION SET CONTAINER=XEPDB2;
Session altered.
```

```
SQL> SELECT COUNT(*), 'Invalid Objects' FROM ALL_OBJECTS WHERE STATUS status = 'INVALID';
COUNT(*) 'INVALIDOBJECTS'
-----
0 Invalid Objects
```

 **Note:**

- See [Plugging an Unplugged Pluggable Database](#) for more information about plugging in an unplugged pluggable database.
- See *Oracle Multitenant Administrator's Guide* for more information about plugging in an unplugged PDB.
- For information on the upgrade instructions for APEX users upgrading from 18c XE to 21c XE, see [APEX Install and Upgrade Guide](#).

10

Migrating Data and Applications

You can migrate data and applications in and out of your XE database using various methods.

You can export tables and data from one XE installation and import them into another. Oracle recommends you use 11g Release 2 and higher to export your data.

Migrating from Oracle Database XE 21c to Oracle Database Enterprise Edition 21c is supported via the unplug, plug scenario only. You can unplug a PDB from XE 21c database and plug it into another Enterprise Edition 21c database of the same release. Migrating from Oracle Database XE 21c to any of the other Oracle Database 21c offerings is not supported.

You cannot directly upgrade from Oracle Database XE 11.2 to Oracle Database XE 21c. To upgrade to XE 21c from XE 11.2, first upgrade to XE 18c, then upgrade to 21c.

Procedure to Unplug a PDB from 21c XE and Plug into 21c EE

A Pluggable Database (PDB) created in Oracle Database XE 21c can be migrated to another Multitenant Container Database (CDB) Enterprise Edition (EE) 21c.

The standard plug compatibility requirements apply. See *Oracle Multitenant Administrator's Guide* for more information about general prerequisites for PDB creation.

For example, you want to unplug your xepdb1 out of the XE 21c XE CDB and plug it in another 21c EE CDB.

- Use SQL*Plus to close the PDBs before they can be unplugged.

Note:

The pdb database may not have been opened, so you may receive an error that the PDB is already closed.

```
sqlplus / as sysdba
ALTER PLUGGABLE DATABASE xepdb1 CLOSE IMMEDIATE;
```

- Unplug the closed PDB and specify the path and name of the XML file.

```
ALTER PLUGGABLE DATABASE xepdb1 UNPLUG INTO '\tmp\xepdb1.xml';
```

- Drop the closed PDB and keep the data files.

```
DROP PLUGGABLE DATABASE xepdb1 KEEP DATAFILES;
```

- Log in to your EE environment. The xepdb1 metadata file should be available from that system.

- Run the DBMS_PDB.CHECK_PLUG_COMPATIBILITY function to determine whether the unplugged PDB is compatible with the CDB.

```
SET SERVEROUTPUT ON
DECLARE
  compatible CONSTANT VARCHAR2(3) :=
    CASE DBMS_PDB.CHECK_PLUG_COMPATIBILITY(
      pdb_descr_file => '\tmp\xepdb1.xml',
```

```

        pdb_name => 'XEPDB1')
    WHEN TRUE THEN 'YES'
    ELSE 'NO'
END;
BEGIN
    DBMS_OUTPUT.PUT_LINE(compatible);
END;
/

```

- If the PDB is compatible with the CDB, you can plug xepdb1 into the 21c EE database. Use the data files of the unplugged PDB to plug the PDB into another CDB without any copy.

```
CREATE PLUGGABLE DATABASE newxepdb USING '\tmp\xepdb1.xml' NOCOPY TEMPFILE REUSE;
```

This example assumes the following:

- The XML file accurately describes the current locations of the files. Therefore, the `SOURCE_FILE_NAME_CONVERT` clause or the `SOURCE_FILE_DIRECTORY` clause is not required.
 - The files are in the correct location. Therefore, `NOCOPY` is included.
 - Storage limits are not required for the PDB. Therefore, the `STORAGE` clause is not required.
 - A file with the same name as the temp file specified in the XML file exists in the target location. Therefore, the `TEMPFILE REUSE` clause is required.
- Verify the status and open mode of the plugged PDB.

```
SELECT pdb_name, STATUS FROM cdb_pdb$seeds WHERE pdb_name='NEWXEPDB';
SELECT OPEN_MODE FROM V$PDBS WHERE NAME='NEWXEPDB';
```

- If the PDB is in MOUNTED state, then open the PDB.

```
ALTER PLUGGABLE DATABASE newxepdb OPEN;
```

- Run catalog, catproc and utlrip on the plugged in NEWXEPDB.

```
sqlplus / as sysdba
```

```
SQL> SHOW PDBS;
CON_ID CON_NAME          OPEN MODE  RESTRICTED
-----
2      PDB$SEED              READ ONLY NO
3      ORCLPDB               READ WRITE NO
4      NEWXEPDB              READ WRITE YES
```

```
SQL> ALTER SESSION SET CONTAINER=newxepdb;
SQL> SPOOL catalog.log
SQL> @%ORACLE_HOME%\rdbms\admin\catalog
SQL> SPOOL OFF;
```

```
SQL> SPOOL catproc.log
SQL> @%ORACLE_HOME%\rdbms\admin\catproc
SQL> SPOOL OFF;
```

```
SQL> SPOOL utlrip.log
SQL> @%ORACLE_HOME%\rdbms\admin\utlrip
SQL> SPOOL OFF;
```

```
SELECT COMP_NAME, STATUS, VERSION FROM DBA_REGISTRY;
```

```
COMP_NAME          STATUS          VERSION
```

```

-----
Oracle Database Catalog Views          VALID          21.0.0.0.0
Oracle Database Packages and Types    VALID          21.0.0.0.0
Oracle Real Application Clusters       OPTION OFF     21.0.0.0.0
JServer JAVA Virtual Machine          VALID          21.0.0.0.0
Oracle XDK                              VALID          21.0.0.0.0
Oracle Database Java Packages          VALID          21.0.0.0.0
OLAP Analytic Workspace                VALID          21.0.0.0.0
Oracle XML Database                    VALID          21.0.0.0.0
Oracle Workspace Manager                VALID          21.0.0.0.0
Oracle Text                             VALID          21.0.0.0.0
Oracle Multimedia                       VALID          21.0.0.0.0
Spatial                                VALID          21.0.0.0.0
Oracle OLAP API                         VALID          21.0.0.0.0
Oracle Label Security                   VALID          21.0.0.0.0
Oracle Database Vault                   VALID          21.0.0.0.0

```

```
SQL> SELECT OWNER, OBJECT_NAME FROM DBA_INVALID_OBJECTS WHERE STATUS = 'INVALID';
```

```
no rows selected
```

 **Note:**

- See [Plugging an Unplugged Pluggable Database](#) for more information about plugging in an unplugged pluggable database.
- See [Oracle Multitenant Administrator's Guide](#) for more information about plugging in an unplugged PDB.

11

Deinstalling Oracle Database XE

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

Caution:

When you deinstall Oracle Database XE, 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 XE 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 XE using one of the following methods:

- Deinstalling Using User Interface
- Deinstalling Using Silent Mode

Note:

It is strongly recommended to follow the deinstall procedure described in deinstall section. If you have deinstalled the Express edition using `ORACLE_HOME\deinstall\deinstall.bat` utility, run following command to remove Express Edition completely: `msiexec /qn /x {C220B7FD-3095-47FC-A0C0-AE49DE6E320A}`

Deinstalling Using User Interface

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

1. In the Windows Control Panel, select **Add or Remove Programs**.
2. Select **Oracle Database 21c Express Edition**.
3. Click **Uninstall**.
4. Follow the prompts to deinstall Oracle Database 21c Express Edition. 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 XE.

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

```
c:\xe_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 `/qtb` 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 21c Express Edition. Product Version: 21.1.0.0.0. Product Language: [Current Language ID]. Manufacturer: Oracle Corporation. Removal success or error status: 0.

12

Reporting Security Vulnerabilities

If you find any security vulnerabilities with Oracle Database XE, then send a description of the problem to Oracle at the following e-mail address:

secalert_us@oracle.com

Include the following information in your e-mail:

- A complete description of the problem you encountered
- The version of Oracle Database XE you were using
- The platform on which you were running Oracle Database XE
- Any scripts or examples that may be helpful in tracking down the security problem

13

Globalization Support

Oracle Database XE 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.

- The Oracle Database Express Edition (XE) 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 character set you set must correspond to the character set used by your I/O devices, which in case of Microsoft Windows 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.

`NLS_LANG` and the other NLS settings can be specified either as environment variables or as Windows 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.

 **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