# Oracle® Database Using Oracle Client for Microsoft Tools



Release 19c F84376-01 October 2023

ORACLE

Oracle Database Using Oracle Client for Microsoft Tools, Release 19c

F84376-01

Copyright © 2023, 2023, Oracle and/or its affiliates.

Primary Authors: Alex Keh, Pedro Torres, Nari Akiyama

Contributing Authors: CM Dietrich

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software, software documentation, data (as defined in the Federal Acquisition Regulation), or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, then the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs (including any operating system, integrated software, any programs embedded, installed, or activated on delivered hardware, and modifications of such programs) and Oracle computer documentation or other Oracle data delivered to or accessed by U.S. Government end users are "commercial computer software," "commercial computer software documentation," or "limited rights data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, reproduction, duplication, release, display, disclosure, modification, preparation of derivative works, and/or adaptation of i) Oracle programs (including any operating system, integrated software, any programs embedded, installed, or activated on delivered hardware, and modifications of such programs), ii) Oracle computer documentation and/or iii) other Oracle data, is subject to the rights and limitations specified in the license contained in the applicable contract. The terms governing the U.S. Government's use of Oracle cloud services are defined by the applicable contract for such services. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle®, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Inside are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Epyc, and the AMD logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

## Contents

2

3

### 1 Installing and Configuring Oracle Client for Microsoft Tools

1.1 About Oracle Client for Microsoft Tools	1-1
1.1.1 Example: Determining the Bitness of a Microsoft Product	1-2
1.2 Installing Oracle Client for Microsoft Tools	1-2
Database Client Configuration Files	
2.1 Setting Up On-Premises Databases	2-1
2.2 Setting Up Oracle Autonomous Database	2-2
Connecting with Microsoft Tools	
Connecting with Microsoft Tools	2.1
Connecting with Microsoft Tools 3.1 Microsoft Power BI Desktop 3.1.1 Validating Power BI Connects to Oracle DB	3-1
Connecting with Microsoft Tools 3.1 Microsoft Power BI Desktop 3.1.1 Validating Power BI Connects to Oracle DB 3.2 Microsoft Power BI Service	3-1 3-1 3-4
Connecting with Microsoft Tools 3.1 Microsoft Power BI Desktop 3.1.1 Validating Power BI Connects to Oracle DB 3.2 Microsoft Power BI Service 3.2.1 Installing and Configuring Power BI Gateway	3-1 3-1 3-4 3-5
Connecting with Microsoft Tools 3.1 Microsoft Power BI Desktop 3.1.1 Validating Power BI Connects to Oracle DB 3.2 Microsoft Power BI Service 3.2.1 Installing and Configuring Power BI Gateway 3.2.2 Validating Power BI Connects to Oracle DB	3-1 3-1 3-4 3-5 3-10
<ul> <li>Connecting with Microsoft Tools</li> <li>3.1 Microsoft Power BI Desktop <ul> <li>3.1.1 Validating Power BI Connects to Oracle DB</li> </ul> </li> <li>3.2 Microsoft Power BI Service <ul> <li>3.2.1 Installing and Configuring Power BI Gateway</li> <li>3.2.2 Validating Power BI Connects to Oracle DB</li> </ul> </li> <li>3.3 Performance Tuning for Large Data Retrievals</li> </ul>	3-1 3-1 3-4 3-5 3-10 3-13
Connecting with Microsoft Tools         3.1 Microsoft Power BI Desktop         3.1.1 Validating Power BI Connects to Oracle DB         3.2 Microsoft Power BI Service         3.2.1 Installing and Configuring Power BI Gateway         3.2.2 Validating Power BI Connects to Oracle DB         3.3 Performance Tuning for Large Data Retrievals         3.3.1 Performance Tuning for Unmanaged ODP.NET	3-1 3-1 3-4 3-5 3-10 3-13 3-13

#### Index



## 1 Installing and Configuring Oracle Client for Microsoft Tools

Learn about Oracle Client for Microsoft Tools, including determining the correct install type and installation instructions.

- About Oracle Client for Microsoft Tools
   Learn about Oracle Client for Microsoft Tools, supported Microsoft tools, and how to
   select the appropriate Oracle Client for Microsoft Tools install type.
- Installing Oracle Client for Microsoft Tools
   General steps for installing Oracle Client for Microsoft Tools.

### 1.1 About Oracle Client for Microsoft Tools

Learn about Oracle Client for Microsoft Tools, supported Microsoft tools, and how to select the appropriate Oracle Client for Microsoft Tools install type.

#### Introduction

Oracle Client for Microsoft Tools (OCMT) is a graphical installer that automates the installation and configuration of Oracle Data Provider for .NET (ODP.NET) to support Microsoft tool connections with Oracle on-premises and cloud databases, including Oracle Autonomous Database (ADB) Serverless. OCMT supports multiple Microsoft tools, including:

- Power BI Desktop
- Power BI service
- Excel
- SQL Server Analysis Services
- SQL Server Data Tools
- SQL Server Integration Services
- SQL Server Reporting Services
- BizTalk Server

These instructions work for on-premises database and both dedicated and serverless ADB. The instructions for on-premises database setup also apply to Oracle Database Cloud Services and Oracle Exadata Cloud Service.

#### Compatibility

Power BI Desktop, Power BI service, Excel, SQL Server Analysis Services, and BizTalk Server use **unmanaged ODP.NET** to connect to Oracle database. If you use a 64-bit product, you must use 64-bit OCMT to install 64-bit unmanaged ODP.NET. If you use a 32-bit Microsoft product, you must use 32-bit OCMT to install 32-bit unmanaged ODP.NET.

SQL Server Data Tools, SQL Server Integration Services, and SQL Server Reporting Services use **managed ODP.NET**. Managed ODP.NET works with both 32-bit and 64-bit



apps, which allows you to use either 32-bit or 64-bit OCMT with any of these Microsoft products.

• Example: Determining the Bitness of a Microsoft Product Determine the bitness of a Microsoft product.

### 1.1.1 Example: Determining the Bitness of a Microsoft Product

Determine the bitness of a Microsoft product.

If you are using unmanaged ODP.NET, determine whether you are using the 32-bit Microsoft product or the 64-bit Microsoft product so you can install the matching bitness of ODP.NET.

Let's use Power BI Desktop as an example. In Windows, start Power BI Desktop. On the menu, select **Help** , then **About** to see a window like the following:

Microsoft Power BI Desktop	
Microsoft Power BI Pockton is a companion product to app.powerbi.com	
Version: 2.107.683.0 64-bit July 2022)	
User ID: f54c2ac2-0 <del>f0d-16d</del> e-aa6c-44ae1dd4447e	
Session ID: 6ef3f4ea-e2c0-4452-9efd-b0a6a83975a2	
Copy session diagnostics to clipboard Copy	
Privacy Statement	
	Close
	close

The above screenshot notes that this is 64-bit Power BI Desktop. That means 64-bit unmanaged ODP.NET must be installed and configured for Power BI to connect to an Oracle Database.

If you are using 32-bit Power BI Desktop instead, you must install 32-bit unmanaged ODP.NET.

### 1.2 Installing Oracle Client for Microsoft Tools

General steps for installing Oracle Client for Microsoft Tools.

Determine which bitness of Oracle Client for Microsoft Tools (OCMT) you need to install. In general, if you use a 32-bit product, you should use 32-bit OCMT. If you use a 64-bit product, you should use 64-bit OCMT.

#### Note:

Screenshots may differ slightly between 32-bit OCMT and 64-bit OCMT.



For more information on selecting the bitness of a product, see About Oracle Client for Microsoft Tools for general information, or Connecting with Microsoft Tools for information on the specific tool you are using.

- **1.** From the Oracle Client for Microsoft Tools page, click on the download link:
  - For 64-bit unmanaged ODP.NET, choose **64-bit Oracle Client for Microsoft Tools**.
  - For 32-bit unmanaged ODP.NET, choose **32-bit Oracle Client for Microsoft Tools**.
  - For managed ODP.NET, you can choose either download.

OCMT downloads to your machine.

	Connect Microsoft Tools Tools to Oracle Oracle Client for Microsoft Tools installs and configures Oracle Data Provider for .NET (ODP.NET) to supp Oracle on-premises and cloud databases, including Oracle Autonomous Database. It supports connecting Server Analysis Services, SQL Server Data Tools, SQL Server Integration Services, SQL Server Reporting S
Download	Get the Details 64-bit Oracle Client for Microsoft Tools 19c 32-bit Oracle Client for Microsoft Tools 19c

2. Find the OCMT executable on your machine and doubleclick it to begin the install process.



3. Click **Yes** in the User Account Control screen.

The introductory install screen displays.





- 4. Click Next.
- 5. The OCMT Setup Type screen appears. You have two choices:
  - **Custom** Decide whether to install and configure only managed ODP.NET, only unmanaged ODP.NET, or both.
  - **Default** Both managed and unmanaged ODP.NET are installed and configured.

Oracle Client for Microsoft Tools	<
Select the setup type that best suits your needs.	>
Click the type of setup you prefer.  Custom Default  Default  Default  Description  64-bit managed ODP.NET and unmanaged ODP.NET will be installed and configured for machine-wide use. Global changes will be made to the machine's .NET setup, including placing the provider assembly into the Global Assembly Cache (GAC) and updating the machine.config with ODP.NET configuration section handler and DbProviderFactories information.	
InstallShield < Back Next > Cancel	]

#### 6. Click Next.

- 7. (Custom only) On the **Select Features** screen, select an installation option and click **Next**:
  - Managed ODP.NET Installs only managed ODP.NET.
  - Unmanaged ODP.NET Installs only unmanaged ODP.NET.
  - **Both** Installs both managed and unmanaged ODP.NET.

Oracle Client for Microsoft Tools			×
Select Features			10000000
Select the features setup will install.			0
Select the features you want to install, an	d deselect the feat	ures you do not	want to install.
Oracle Base Components	Description Oracle Dat (ODP.NET) supports c products. T Microsoft F Analysis Se	a Provider for .N , Unmanaged Dr onnectivity to Po Those products i Power BI, Excel, ervices, and BizT	IET iver wer Query nclude SQL Server 'alk Server.
265.45 MB of space required on the C driv 180286.19 MB of space available on the C InstallShield	ve drive		
	< Rack	Next >	Cancel

8. On the **Destination Location** screen, click **Browse** and select the installation directory for ODP.NET.

Oracle Client for Microsoft Tools			×
Choose Destination Location			
Select folder where setup will install files.			0
Setup will install Oracle Client for Microsoft T	ools in the follo	wing folder.	
To install to this folder, click Next. To install t select another folder.	to a different fol	der, click Browse	and
Destination Folder			
C:\Program Files\Oracle Client for Microsof	ft Tools		Browse
installShield			
	< Back	Next >	Cancel

9. Click Next.



10. On the Oracle Configuration File Directory screen, click Browse to select the location of the Oracle Client configuration files, sqlnet.ora and tnsnames.ora, and click Next.

For example, C:\network\admin.

Oracle Client for Microsoft Tools	×
Oracle Configuration File Directory	0
Please specify the directory where Oracle Database Client will search configuration files, sqlnet.ora and tnsnames.ora.	for its
C:\network\admin	Proviso
	browse
InstallShield	Cancel
- DOCK INEX	Cuncer

- **11.** If you are connecting to Oracle Autonomous Database Serverless:
  - a. Download the database connection credentials zip file from the Oracle Cloud Console.
  - **b.** Unzip the contents into the configuration file directory you specified in the previous step.
  - c. Open sqlnet.ora.
  - d. Update the wallet location's DIRECTORY setting value to the same configuration file directory.

For more information on configuring Oracle database connections with specific Microsoft tools, see Connecting with Microsoft Tools.

12. Click Install.



Ready to Install the Program         The wizard is ready to begin installation.         Click Install to begin the installation.         If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.	Oracle Client for Microsoft Tools			×
The wizard is ready to begin installation. Click Install to begin the installation. If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.	Ready to Install the Program			Second State
Click Install to begin the installation. If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.	The wizard is ready to begin installation.			0
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.	Click Install to begin the installation.			
	If you want to review or change any of yo exit the wizard.	our installation sett	tings, click Back. Clic	:k Cancel to
InstallShield	InstallShield			
< Back Install Cancel		< Back	Install	Cancel

- **13.** (Optional) Select the checkbox to view the README file.
- 14. Click Finish.



The installation is complete and configured for use on your machine. Your Microsoft tools can now connect to Oracle databases.



#### Note:

For more information on connecting specific Microsoft tools, see Connecting with Microsoft Tools.



## 2 Database Client Configuration Files

Learn about database client configuration files for on-premises database and Oracle Autonomous Database (ADB).

In order to use Oracle Client for Microsoft Tools, an on-premises Oracle Database or ADB must already be provisioned. Connecting to Oracle databases on-premises and through ADB are similar, but there are some variations in the steps needed.

- Setting Up On-Premises Databases
   Locate the client configuration files and place them into a specified location on your machine.
- Setting Up Oracle Autonomous Database
   Download your database credentials and unzip the content onto your client machine.

### 2.1 Setting Up On-Premises Databases

Locate the client configuration files and place them into a specified location on your machine.

To connect to an on-premises database:

- 1. Locate the configuration files required for your database server setup.
  - Typically, ODP.NET requires tnsnames.ora and sqlnet.ora to be accessible to connect to the database server. These files can be copied from another Oracle database client that connects to the target database server.
  - Alternatively, an Easy Connect or Easy Connect Plus string can be used in lieu of credential files for on-premises databases. If you use Easy Connect (Plus), you can skip the credential file downloading and setup steps.

For example, the Power BI Desktop **Server** configuration setting accepts an Easy Connect string with the following format:

<DB hostname>:<Port>/<Service Name>

2. Place the client configuration files on your Windows machine into a directory, and note the directory location.

For example, C:\data\wallet.



Name	Date modified	Туре	Size
cwallet.sso	2/3/2023 8:25 AM	SSO File	7 KB
🎲 ewallet.p12	2/3/2023 8:25 AM	Personal Informati	7 KB
📄 ewallet.pem	2/3/2023 8:25 AM	PEM File	8 KB
keystore.jks	2/3/2023 8:25 AM	JKS File	4 KB
ojdbc.properties	2/3/2023 8:25 AM	<b>PROPERTIES</b> File	1 KB
README	2/3/2023 8:25 AM	File	3 KB
all sqlnet.ora	2/3/2023 8:25 AM	ORA File	1 KB
tnsnames.ora	2/3/2023 8:25 AM	ORA File	2 KB
truststore.jks	2/3/2023 8:25 AM	JKS File	4 KB
Wallet_ADWPTR.zip	2/3/2023 8:23 AM	Compressed (zipp	27 KB

If your on-premises database requires a wallet or additional configuration, be sure to update your tnsnames.ora, sqlnet.ora, or other configuration files accordingly.

The credentials are now available, and you can continue with the configuration of your specific Microsoft tool.

### 2.2 Setting Up Oracle Autonomous Database

Download your database credentials and unzip the content onto your client machine.

In order to use Oracle Client for Microsoft Tools (OCMT), Autonomous Database (ADB) must already be provisioned.

You need access to the Oracle Cloud Console that has access to your ADB instance.

- 1. Go to the cloud console screen for the ADB instance you connect to.
- 2. Start your ADB instance.
- 3. Click Database Connection.
- 4. Click Download Wallet.
- 5. Supply the wallet password. Confirm the password, and click **Download**.
- 6. Download the ADB credentials zip file to the machine that has your Microsoft tool installed.

OCMT uses these credential files (cwallet.sso, tnsnames.ora, and sqlnet.ora) to connect your Microsoft tool to ADB.



ORACLE Cloud	Search for resources and services	
Autonomous Database » Autonomous	Database Details	
	ADWPTR	Database Connection Help Close
	DB Connection Perform	You will need the client credentials and connection information to connect to your database. The client credentials include the wallet, which is required for all types of connections.
		Download Client Credentials (Wallet)
	Autonomous Database	To download your client credentials, select the type of wallet, then click Download Wallet. You will be asked to create a password for the wallet.
	General Inform	Wallet Type () Instance Wallet
AVAILABLE	Database Name: ADWP Workload Type: Data Wa	Download Wallet Rotate Wallet
	Compartment: oraclepar OCID: _zdbxmq Show	Wallet last rotated: -
	Created: Thu, Mar 12, 20 OCPU Count: 1	Close

**7.** Unzip the credentials, and place them on your Windows machine into a directory. Note the directory location.

For example, C:\data\wallet.

		-	
Name	Date modified	Туре	Size
Wallet ADWPTR.zip	2/3/2023 8:23 AM	Compressed (zipp	27 KB

- 8. If you are connecting to one ADB instance:
  - a. From the credentials directory, open sqlnet.ora in a text editor.
  - b. Locate the following line: WALLET\_LOCATION = (SOURCE = (METHOD = file) (METHOD\_DATA = (DIRECTORY=?/network/admin)))
  - c. Set the DIRECTORY value to the ADB wallet directory.

For example,

```
WALLET_LOCATION = (SOURCE = (METHOD = file) (METHOD_DATA =
  (DIRECTORY=C:\DATA\WALLET)))
```

- 9. If you are connecting to multiple ADB instances:
  - a. Ensure that each ADB instance is set up with a different wallet.
  - b. In each wallet location, add the parameter WALLET\_LOCATION to each connect descriptor in tnsnames.ora.
  - c. After making your changes, save the file.

For example:

```
adwptr_high =
 (description=(retry_count=20)(retry_delay=3)(address=(protocol=tcps)
 (port=1522)(host=host name))
 (connect data=(service name=service name))
```



```
(security=(ssl_server_dn_match=yes)
(WALLET LOCATION=C:\DATA\WALLET\ADWPTR)))
```

```
adwbi_high =
(description=(retry_count=20)(retry_delay=3)(address=(protocol=tcps)
(port=1522)(host=host name))
(connect_data=(service_name=service_name))
(security=(ssl_server_dn_match=yes)
(WALLET_LOCATION=C:\DATA\WALLET\ADWBI)))
```

**10.** Continue with the configuration of your specific Microsoft tool.

#### Note:

See Connecting with Microsoft Tools for more detailed information.

## 3 Connecting with Microsoft Tools

Learn about connecting Oracle databases to Microsoft tools, including configuration steps.

- Microsoft Power BI Desktop
   Configure Microsoft Power BI Desktop to connect to Oracle Database.
- Microsoft Power BI Service
   Configure Microsoft Power BI Service to connect to Oracle Database.
- Performance Tuning for Large Data Retrievals Recommendations for improving Oracle database retrieval performance with Microsoft tools.

### 3.1 Microsoft Power BI Desktop

Configure Microsoft Power BI Desktop to connect to Oracle Database.

Microsoft Power BI Desktop uses **unmanaged Oracle Data Provider for .NET (ODP.NET)** for data access. You can configure Microsoft Power BI Desktop to access on-premises database and both dedicated and serverless ADB. The instructions for on-premises databases setup also apply to Oracle Database Cloud Services and Oracle Exadata Cloud Service.

#### Overview

The general steps to set up Oracle database connectivity with Microsoft Power BI Desktop are:

- 1. Provision Oracle database or ADB.
- 2. Download database credentials to Windows client. (See Database Client Configuration Files.)
- 3. Install Power BI on Windows client.
- 4. Install and configure ODP.NET on Windows client with OCMT. (See Installing and Configuring Oracle Client for Microsoft Tools.)
- 5. Validate Power BI connects to Oracle database or ADB.

This section covers how to complete step 5, and assumes you have already completed steps 1-4. Database Client Configuration Files covers step 2. Installing and Configuring Oracle Client for Microsoft Tools covers step 4.

Validating Power BI Connects to Oracle DB
 Validate the Power BI Desktop connection to Oracle Database by setting up the connection from Power BI Desktop.

### 3.1.1 Validating Power BI Connects to Oracle DB

Validate the Power BI Desktop connection to Oracle Database by setting up the connection from Power BI Desktop.



- 1. Open Power BI Desktop.
- 2. On the menu bar, click Get data, More....



3. Select Database, Oracle database, Connect.



4. In the **Server** text box, enter your database net service name or an Easy Connect (Plus) string.

If you are using a tnsnames.ora file with your Oracle database, open the file to see which ADB or database net service names you can connect to. The screenshot shows three different ones: adwptr\_high, adwptr\_low, and adwptr\_medium. Use one of these values for the server name.

	tnsnames
File Edit Format View Help	
<pre>adwptr_high = (description= (retry_count=20)(retry_delay=3)(address=(protocol=tcps)(port=20)</pre>	l522)(host=a
adwptr_low = (description= (retry_count=20)(retry_delay=3)(address=(protocol=tcps)(port=15	522)(host=ad
adwptr_medium = (description= (retry_count=20)(retry_delay=3)(address=(protocol=tcps)(port	:=1522)(host

Oracle database			×
Server			
adwptr_low	]		
Data Connectivity mode ①			
O Import			
<ul> <li>DirectQuery</li> </ul>			
Advanced options			
	1		
	0	OK Cancel	

- 5. Set any other Power BI settings needed on this screen.
- 6. Click OK.
- 7. Select Database and enter your database credentials.

	Oracle database	$\times$
Windows	adwptr_low	
Database	User name admin	
	Password	
	Back Connect Cancel	

Note: Oracle Autonomous Database Serverless, new Oracle Database 19c release updates, and Oracle Database 23c support Microsoft Entra ID/Azure Active Directory connections.

8. Click Connect.



9. To continue, select the schema objects needed for your Microsoft Power BI Desktop file (.pbix) and load the data.

	Q	SALES				La la
isplay Options *	D	ID	REGION	SALES	CLIENTS	
D GGSYS		1	APAC	11834000	1300	
I GSMADMIN_INTERNAL	~	2	EMEA	51321000	7000	
D d GSMCATUSER				13621000	3500	
🛛 📫 GSMUSER			NORTH AMERICA	15005271	5257	
D EBACSYS						
MDDATA						
DI OMLSPROXY			A			
D CRACLE_OCM			0			
D CRDS_METADATA						
DRDS_PUBLIC_USER						
4 📁 PTR [2]						
ADMIN_EMP						
M 📰 SALES						
REMOTE_SCHEDULER_AGENT						
Þ 🐖 SH						
⊳ 📕 SSB						
▷ 📶 SYS\$UMF						
SYSBACKUP						
sysdg						
D 🐖 SYSKM	~					

Congratulations! Powder BI Desktop is connected to ADB or an on-premises Oracle database. For information on performance tuning for large data retrievals, see Performance Tuning for Unmanaged ODP.NET.

### 3.2 Microsoft Power BI Service

Configure Microsoft Power BI Service to connect to Oracle Database.

Microsoft Power BI Service runs in the Microsoft 365 cloud. Power BI service uses an on-premises data gateway, also known as **Power BI gateway**, to connect the Power BI service to Oracle databases. The gateway is hosted on Windows, either on-premises or in a cloud virtual machine, such as in Oracle Cloud Infrastructure or Azure.

These instructions use **64-bit unmanaged Oracle Data Provider for .NET (ODP.NET)** for data access. They work for on-premises database and both dedicated and serverless ADB. The instructions for on-premises databases setup also apply to Oracle Database Cloud Services and Oracle Exadata Cloud Service.

#### Overview

These are the general steps to setup Oracle database connectivity with Microsoft Power BI Desktop:

1. Provision Oracle database or ADB.



- 2. Download database credentials to Windows client. (See Database Client Configuration Files.)
- 3. Create Power BI service in Microsoft 365 Cloud.
- 4. Install and configure Power BI gateway.
- 5. Install and configure ODP.NET on Windows client with OCMT. (See Installing and Configuring Oracle Client for Microsoft Tools.)
- 6. Validate Power BI service connects to Oracle database or ADB.

This section covers how to complete steps 4 and 6, and assumes you have already completed all other steps. Database Client Configuration Files covers step 2. Installing and Configuring Oracle Client for Microsoft Tools covers step 5.

- Installing and Configuring Power BI Gateway Download Power BI Gateway from the Power BI website.
- Validating Power BI Connects to Oracle DB
   Configure and validate the Power BI Service connection to Oracle Database.

### 3.2.1 Installing and Configuring Power BI Gateway

Download Power BI Gateway from the Power BI website.

To install and configure Power BI Gateway:

1. Sign on to the Power BI website with your Microsoft 365 account.

III Pe	ower BI Home	¥	5				,0 Search 0 @ ±	7 🔤
ш			Premium Per User Unlock more with Premium		the Premium pricetag. Learn more			Try free
A Horn	me							
st Favo	orites	2						
① Rece	ant	0	Good morning, Pedro				≡~ +	New report
+ Crea	ate		Select a tile to find and share data-d	lriven insights				
O Data	lasets							
9 Gea	alti		Recommended					< >
EP App	14							
R <sup>R</sup> Shar	red with me		<sup>22</sup> Getting started with Power BI	Explore this data story	Explore this data story	P2 Getting started with Power 81	Explore this data story	[c] Exp
🛙 Lear	m			100	A Date of the second se	Concept Concept	Aufling Same Ap Region of Stationary for Say Station	Easter for survey
Wor	rkspaces	>	🗖 🤞 🗖	And the second s				and the second s
C My	workspace	~	Ø BP					
			Explore basic Power BI concepts	Explore the 100 most useful productivit	Cancer statistics in the USA	Intro-What is Power 81?	Sports ranked by degree of difficulty, c	Exploring

2. From the Power BI web console, click Menu, Download, Data Gateway.



	Trial: 48 days le	eft 🔎 Search	8
		♀ Notifications	
		र्ें Settings	>
	Power BI Desktop	eq Download	>
	Data Gateway	? Help & Suppor	rt >
	Paginated Report Builder	😳 Feedback	>
	Power BI for Mobile		
ower	Analyze in Excel updates	ory 🖟	Explore t
Rest of the second seco	Autority Sports by Degree of Difficulty for Key Skills		CONTRACTORY  CONT

3. Click Download standard mode.

Connect to on-premises data sources with a Power BI gateway
Keep your dashboards and reports up to date by connecting to your on-premises data sources without the need to move the data. Query large datasets and take advantage of your existing investments. Get the flexibility you need to meet individual needs, and the needs of your organization.
Download standard mode > Download personal mode > Learn more >

- 4. After the gateway installation file downloads, run **GatewayInstall.exe**.
- 5. Select the installation directory location, and accept the terms.



? X

Please review <u>minimum</u> requirements may resul	requirements for installing the On-premises data gat t in performance bottlenecks.	eway. Not meeting these
nstall to		0.72
C:\Program Files\O	n-premises data gateway	

- 6. Complete your registration of the Power BI gateway:
  - a. Enter the email address of your Power BI service account.

On-premises data gateway	?	×
Almost done.		
Installation was successful!		
Email address to use with this gateway:		
pedro.p.torres@oracle.com		

Sign in	Cancel

- b. Sign in.
- c. Select Register a new gateway on this computer.

? ×

#### G-On-premises data gateway

You are signed in as pedro.p.torres@oracle.com and are ready to register the gateway.

Register a new gateway on this computer.

- O Migrate, restore, or takeover an existing gateway.
  - Move a gateway to a new computer
     Recover a damaged gateway
     Take ownership of a gateway

  - The old gateway will be disconnected.

Next	Cancel

- d. Click Next.
- Name the gateway, provide the recovery key, and confirm the key. е. You use the gateway name when creating a Power BI Data Source.

? X

#### On-premises data gateway

You are signed in as pedro.p.torres@oracle.com and are ready to register the gateway.

New on-premises data gateway name

gateway

Add to an existing gateway cluster Learn more

Recovery key (8 character minimum)

.....

() This key is needed to restore the gateway and can't be changed. Record it in a safe place.

Confirm recovery key

.....

We'll use this region to connect the gateway to cloud services: West US <u>Change Region</u> <u>Provide relay details</u> By default, Azure Relays are automatically provisioned

Configure Cancel

#### f. Click Configure.

The gateway is now online and ready to use.





### 3.2.2 Validating Power BI Connects to Oracle DB

Configure and validate the Power BI Service connection to Oracle Database.

1. Log into the Power BI website with your Microsoft 365 account.

	Power BI Home	1	8				<i>μ</i> 0 search 0 ⊚ ±	7 0 (
=			R Premium Per User Unlock more with Premium I					Try free X
@ 1	Home							
ψ F	Favorites	2						
0	Recent	>	Good morning, Pedro				≡~ +	New report
+ 0	Create		Select a tile to find and share data-d	lriven insights				
0 4	Datasets							
2	Soals		Recommended					< >
æ,	Арря							
1 <sup>8</sup> 5	Dhared with me		F <sup>22</sup> Getting started with Power BI	Explore this data story	Explore this data story	P <sup>1</sup> Getting started with Power BI	D Explore this data story	(i) Exp
0	learn		•	100		and a line of	Andrey Lawrence Tables of California and State	
	Workspaces	>	🗖 🧃 🗖				Andrewski standard and an	
0	My workspace	~	Ø B					
			Explore basic Power BI concepts	Explore the 100 most useful productivit	Cancer statistics in the USA	IntroWhat is Power 81?	Sports ranked by degree of difficulty, c	Exploring

- 2. Navigate to a Power BI Premium or Power BI Pro workspace.
- 3. Click New, Dataflow.





4. On the Start creating your dataflow screen, select Add new tables.



5. Select Oracle database.



Data internet							
Cicul excluses	Fine Factor	E now	D 10	Target	Manaharat Boldar File	The Sector	
🕞 📶	Contract Contract	Amazon Nachlich Danatare	Georgie Rigiliumy Deteinen	invites	♦ 121.	MySQL database	
Cracke database Definition	Pertyrel/Q. database	LAP (M Application Server Constant	SAF BW Message Server	INF HARA defailers	10 Mills Server database Destinat	Constant	
Sylven didahase Database	Tetadota database Detebase	V linter	Abute Binks	Altare Outa Explorer (Fusite) Anne	Adven Data Lake Horage Gand Anne	Aure HOrought la	
Ature 101. database	Atom Synapse Analytics (SQL 0	Anne Tables	Microsoft Eachange Dolma	Crime amine	Salastista seporta Golea seniore	Sharafhait Gebra A Orina annan	
Constatuet	R <sup>R</sup> Active Directory	🔶	Cities	8.0 mm	Shawhold list	to South	
0 mm AM	0 the set	Communicate territe the percent Process Testions	P Preser & Salations Inser Tation	Prove Partners detailores	Elant lubb One	D first pary	

- 6. Provide the entries to connect to your data source:
  - a. Server Enter the database net service name.

For example, adwptr\_high, adwptr\_low, or the Easy Connect (Plus) configuration.

For more information, see Setting Up On-Premises Databases.

**b.** Data gateway - the Power BI gateway name.

For more information, see Installing and Configuring Power BI Gateway.

- c. Authentication kind Basic
- d. Username and Password Your ADB or on-premises database user credentials

Power Query		
Connect to data source		
Oracle database Database Learn more	Connection settings	
	adwptr_high	
	<ul> <li>&gt; Advanced options</li> <li>Connection credentials</li> <li>Data gateway *</li> </ul>	
	[On-premises] gateway	U
	Authentication kind	
	Basic	
	Username	
	admin	
	Password	

7. Click **Next** to complete the connection.



8. To continue, select the schema objects needed for your Microsoft Power BI application and load the data.



Congratulations! Power BI Service now connects to Oracle Database. You can now view the schema objects by selecting the objects from the tree control. For information on performance tuning for large data retrievals, see Performance Tuning for Unmanaged ODP.NET.

### 3.3 Performance Tuning for Large Data Retrievals

Recommendations for improving Oracle database retrieval performance with Microsoft tools.

Typically, BI and ETL applications retrieve large amounts of data from a source database for further processing. The ODP.NET **FetchSize** setting determines the amount of data ODP.NET fetches into its internal cache upon each database round trip. You can improve performance by an order of magnitude by significantly increasing FetchSize when retrieving large result sets.

- Performance Tuning for Unmanaged ODP.NET Improve performance for unmanaged ODP.NET by increasing FetchSize in the Windows Registry.
- Performance Tuning for Managed ODP.NET
   Improve performance for managed ODP.NET by increasing the FetchSize in the .NET machine.config file.

#### 3.3.1 Performance Tuning for Unmanaged ODP.NET

Improve performance for unmanaged ODP.NET by increasing FetchSize in the Windows Registry.

This method works for tools that use unmanaged ODP.NET, including Microsoft Power BI Desktop, Microsoft Power BI Service, and Microsoft SQL Service Analysis Services.

To increase FetchSize in the Windows Registry:

1. Launch the Windows Registry editor (regedit.exe).



- 2. Go to the following Registry key: HKEY\_LOCAL\_MACHINE\SOFTWARE\Oracle\ODP.NET\4.122.19.1
- 3. Add the String Value FetchSize and set it to a value larger than the default (131072), such as 4194304 (4 MB).

FetchSize can be set as large as int.MaxValue.

4. Restart the Microsoft tool and run your queries with the new setting.

#### 3.3.2 Performance Tuning for Managed ODP.NET

Improve performance for managed ODP.NET by increasing the FetchSize in the .NET machine.config file.

This method works for tools that use managed ODP.NET, including Microsoft SQL Server Data Tools, Microsoft SQL Service Integration Services, and Microsoft SQL Server Reporting Services.

To increase FetchSize in the .NET machine.config file:

- 1. Locate the .NET machine.config file. This file is generally located in one of two directories. The file you need to modify depends on whether you are running 32-bit or 64-bit processes.
  - For 32-bit, the location is C:\Windows\Microsoft.NET\Framework\v4.0.30319\Config
  - For 64-bit, the location is
     C:\Windows\Microsoft.NET\Framework64\v4.0.30319\Config

Modifying the machine.config file requires Windows Administrator privileges.

 Add an <oracle.manageddataaccess.client> section in the machine.config file for managed ODP.NET. This section should be placed within the <configuration> section and after <configSections></configSections>.

This example sets FetchSize to 4 MB. New configuration additions are in bold.

```
<configuration>
    <configSections>
    ...
    </configSections>
    <oracle.manageddataaccess.client>
        <version number="4.122.19.1">
        <settings>
            <settings>
            <setting name="FetchSize" value="4194304" />
            </settings>
            </settings>
            </version>
        </oracle.manageddataaccess.client>
</configuration>
```

3. Restart the Microsoft tool and run your queries with the new setting.



## Glossary



## Index

