# **Prerequisites**

This document assumes that an ADB, such as Autonomous Data Warehouse (ADW) or Autonomous Transaction Processing (ATP), or Autonomous JSON Database (AJD) was provisioned and Power BI Desktop is installed on a Windows machine (local, in Azure, or OCI).

Autonomous Database	Autonomous	Databases in	PEDROTO	R Compartment					
Autonomous Database	Create Autonomous D	atabase							
Dedicated Infrastructure (i)	Display Name	Database Name	State	Dedicated Infrastructure	OCPU Count	Storage (TB)	Workload Type	Created	•
	ADWPTR	ADWPTR	Available	No	1	1	Data Warehouse	Thu, Mar 12, 2020, 16:26:11 UTC	
Autonomous Container Database								Displaying 1 Autonomous Database	< Page 1
List Scope Compartment PEDROTOR oraclepartnersas (root//Team/PEDROTOR	ß								
Filters Workload Type									

\*Note: Please check here for the Oracle documentation to provision ADW.

Power BI may use managed ODP.NET or unmanaged ODP.NET for its ADB connectivity. This tutorial was tested with Power BI's May 2021 version, which requires unmanaged ODP.NET for Oracle database connectivity. It is possible that Microsoft will update Power BI to use managed ODP.NET in a future version. This tutorial guides you on using either unmanaged or managed ODP.NET with Power BI.

### **Installation and Setup Steps**

1. Download the corresponding Oracle ADB credentials zip file to the system that has or will have Power BI Desktop installed. These credential files will be used to connect Power BI Desktop to ADB.

	Search for resources and services				
Autonomous Database » Autonomous D	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.			
ипи		Download Client Credentials (Wallet)			
RUN	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			
	Database Name: ADWP1				
	Compartment: oraclepar	Download Wallet Rotate Wallet			
	OCID:zdbxmq Show	Wallet last rotated: -			
	Created: Thu, Mar 12, 20				
	OCPU Count: 1	Close			

\*Note: Also check Downloading Client Credentials (Wallets).

2. Open Power BI Desktop and create a project.



11. In the Windows environment variables dialog, create the TNS\_ADMIN variable. Set its value to the directory location where you unzipped the ADB wallet contents.

Variable	Value			
Path	C:\Users\Ptorresr\	AppData\Local\Micro	osoft\WindowsAp	ops;
TEMP	C:\Users\Ptorresr\	AppData\Local\Temp		
TMP	C:\Users\Ptorresr\	AppData\Local\Temp	D	
TNS_ADMIN	C:\instantclient_19	9_11		
		New	Edit	Delete
stem variables		New	Edit	Delete
stem variables Variable	Value	New	Edit	Delete
stem variables Variable ComSpec	Value C:\Windows\syste	New	Edit	Delete
stem variables Variable ComSpec DriverData	Value C:\Windows\syste C:\Windows\Syste	New m32\cmd.exe m32\Drivers\DriverD	Edit	Delete
stem variables Variable ComSpec DriverData NUMBER_OF_PROCESSORS	Value C:\Windows\syste C:\Windows\Syste 2	New m32\cmd.exe m32\Drivers\DriverD	Edit	Delete
stem variables Variable ComSpec DriverData NUMBER_OF_PROCESSORS OS	Value C:\Windows\syste C:\Windows\Syste 2 Windows_NT	New m32\cmd.exe m32\Drivers\DriverD	Edit	Delete
stem variables Variable ComSpec DriverData NUMBER_OF_PROCESSORS OS Path	Value C:\Windows\syste C:\Windows\Syste 2 Windows_NT C:\Windows\syste	New m32\cmd.exe m32\Drivers\DriverD m32;C:\Windows;C:\	Edit ata Windows\System	Delete
stem variables Variable ComSpec DriverData NUMBER_OF_PROCESSORS OS Path PATHEXT	Value C:\Windows\syste C:\Windows\Syste 2 Windows_NT C:\Windows\syste .COM;.EXE;.BAT;.C	New m32\cmd.exe m32\Drivers\DriverD m32;C:\Windows;C:\ :MD;.VBS;.VBE;JS;JSE	Edit ata Windows\System ;;WSF;:WSH;:MSC	Delete
stem variables Variable ComSpec DriverData NUMBER_OF_PROCESSORS OS Path PATHEXT PROCESSOR ARCHITECTURE	Value C:\Windows\syste C:\Windows\Syste 2 Windows_NT C:\Windows\syste .COM;.EXE;.BAT;.C AMD64	New m32\cmd.exe m32\Drivers\DriverD m32;C:\Windows;C:\ MD;.VBS;.VBE;.JS;JSE	Edit ata Windows\System ;.WSF;.WSH;.MSC	Delete

\*Note: The tnsnames.ora net service names will be used to connect to ADB's.

If you are connecting to multiple ADBs from the same machine with a different wallet for each one, add the parameter MY\_WALLET\_DIRECTORY to the connect descriptor with each descriptor's specific wallet location. For example:

### adwptr\_high = (description=

```
(retry_count=20)(retry_delay=3)(address=(protocol=tcps)(port=1522)(host=adb.us-phoenix-
1.oraclecloud.com))(connect_data=(service_name=bk8ui2h_adwptr_high.adwc.oraclecloud.com))(security=(s
sl_server_cert_dn="CN=adwc.uscom-east-1.oraclecloud.com, OU=Oracle BMCS US, O=Oracle Corporation,
L=Redwood City, ST=California, C=US")(MY_WALLET_DIRECTORY=C:\DATA\WALLET\Wallet_ADWPTR)))
```

adwbi\_low = (description= (retry\_count=20)(retry\_delay=3)(address=(protocol=tcps)(port=1522)(host=adb.usphoenix-

1.oraclecloud.com))(connect\_data=(service\_name=bk8uqvi2h\_adwbi\_low.adb.oraclecloud.com))(security=(ssl \_server\_cert\_dn="CN=adwc.uscom-east-1.oraclecloud.com, OU=Oracle BMCS US, O=Oracle Corporation, L=Redwood City, ST=California, C=US")(MY\_WALLET\_DIRECTORY=C:\DATA\WALLET\Wallet\_ADWBI)))

12. Open the TNSNAMES.ora file in the wallet directory to see which ADB net service names are available to connect to. Below you see three different ones: adwptr\_high, adwptr\_low, and adwptr\_medium. Your ADB net service names will likely be named differently.



REGION	SALES	CLIENTS
EMEA	51,321,000.00	7,000.00
NORTH AMERICA	15,003,271.00	5,257.00
LATAM	13,621,000.00	3,500.00
APAC	11,834,000.00	1,300.00
Total	91,779,271.00	17,057.00

# **Performance Tuning for Large Data Retrievals**

Typically, BI and ETL applications retrieve large data amounts from a source database for further processing. To speed up Oracle data retrieval via Power BI Desktop, the ODP.NET FetchSize can be increased from its default 128K value (131,072 bytes) to as large as int.MaxValue. The FetchSize determines the amount of data ODP.NET fetches into its internal cache upon each database round trip. It's possible to improve performance by an order of magnitude by significantly increasing FetchSize when retrieving large result sets.

### Unmanaged ODP.NET Instructions

To increase the 32-bit or 64-bit unmanaged ODP.NET's FetchSize, launch the Windows Registry editor (regedit.exe) and go to the following Registry key:

### HKEY\_LOCAL\_MACHINE\SOFTWARE\Oracle\ODP.NET\4.122.19.1

Add the String Value "FetchSize" and set it to a value larger than the default (131072), such as 4194304 (4 MB).

Restart Power BI Desktop and run your queries with the new setting.

#### Managed ODP.NET Instructions

To increase managed ODP.NET's FetchSize, modify the .NET machine.config file. Modifying the machine.config requires Windows Administrator privileges. This file is generally located in the following directory: C:\WINDOWS\Microsoft.NET\Framework\v4.0.30319\Config.

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 the <configSections> </configSections>. Here's an example setting the FetchSize to 4 MB:

<configuration> <configSections>

</configSections>

<oracle.manageddataaccess.client>

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

</configuration>

Once done, restart Power BI Desktop so that ODP.NET will use the new setting.