

Using the Oracle Client Development Tools to Connect Private Autonomous Database Using OCI Bastion Service – Part 1

Development Tools – Oracle Support Services

May, 2024, Version **[1.0]**

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Public

Purpose Statement

This document provides the instructions necessary to configure the Oracle Autonomous Database in an OCI Private Subnet(as a private end point) and access it using Bastion service to connect with below Oracle Development Client tools and applications.

Part 1

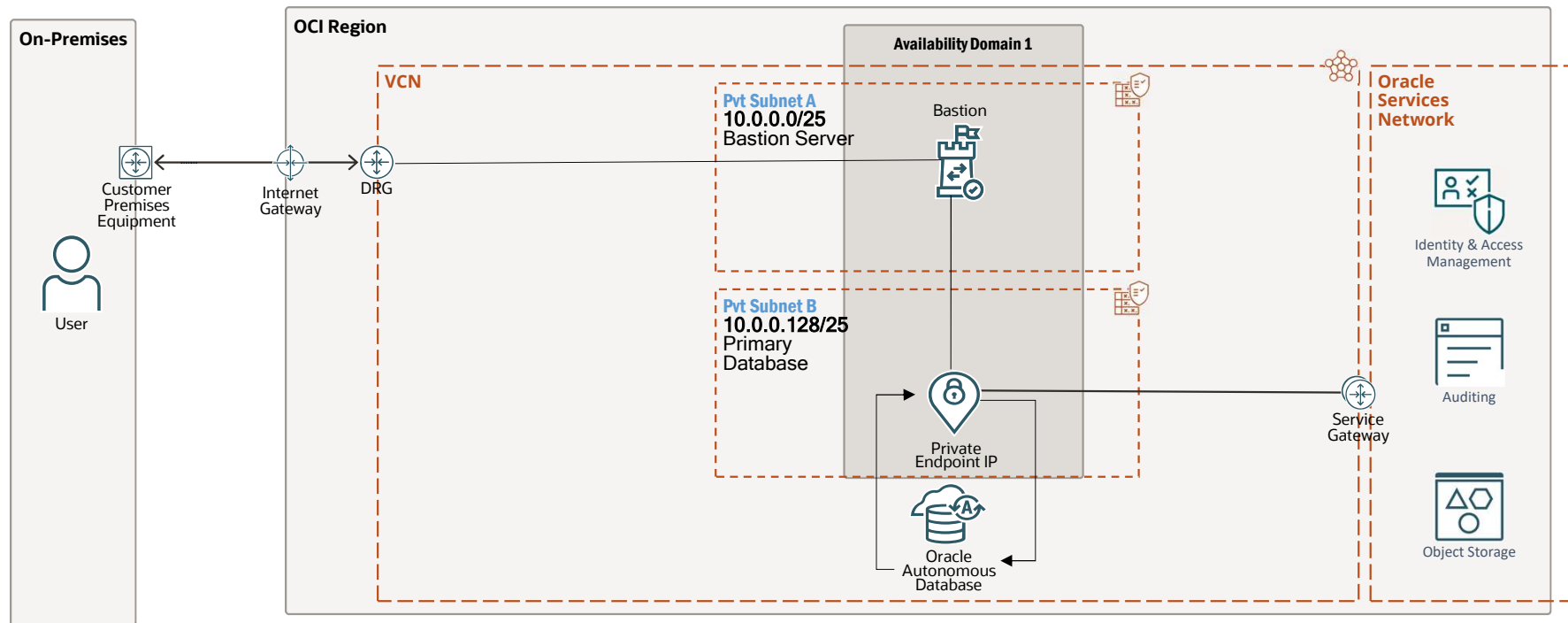
- SQLplus
- SQL Developer
- SQL Developer for VS Code
- SQLcl

Part 2

- Oracle APEX
- ORDS(Oracle REST Database Service)
- Database Actions(Formerly SQL Developer Web)

It is assumed the tools above are used with the latest version available as of May-2024 and you have full access to the OCI console and compartments and IAM policies is already created.

Reference OCI Architecture



Use case

In a best designed OCI architecture all the Production databases are deployed in a Private Subnet with minimal and restricted access within the VCN network itself. From a production security standpoint, this is a typical setup but it is not easy for the Developers or Administrators to connect with the database for maintenance or short time development activity.

Such scenarios can be overcome at no cost by a OCI Bastion service, which is a fully managed service providing secured access to the private OCI resource. Prior to Bastion, a normal access setup would be to use a jump host at extra cost and that can lead to a weaker security for mission critical databases.

Now with the fast-growing OCI Autonomous Database which is a fully Oracle managed database service that is integrated with Generative AI, Analytics, and all types of production workloads built into a single service. The Developer and Administrator must access the databases for their activity. Oracle provides multiple Database Development tools for such activities. With a secured Autonomous database let us see how can we connect to the database using Bastion which is a time-bound, ephemeral SSH session service.

For more details on the OCI bastion service - <https://www.oracle.com/security/cloud-security/bastion/>

VCN – OCI Virtual Cloud Network

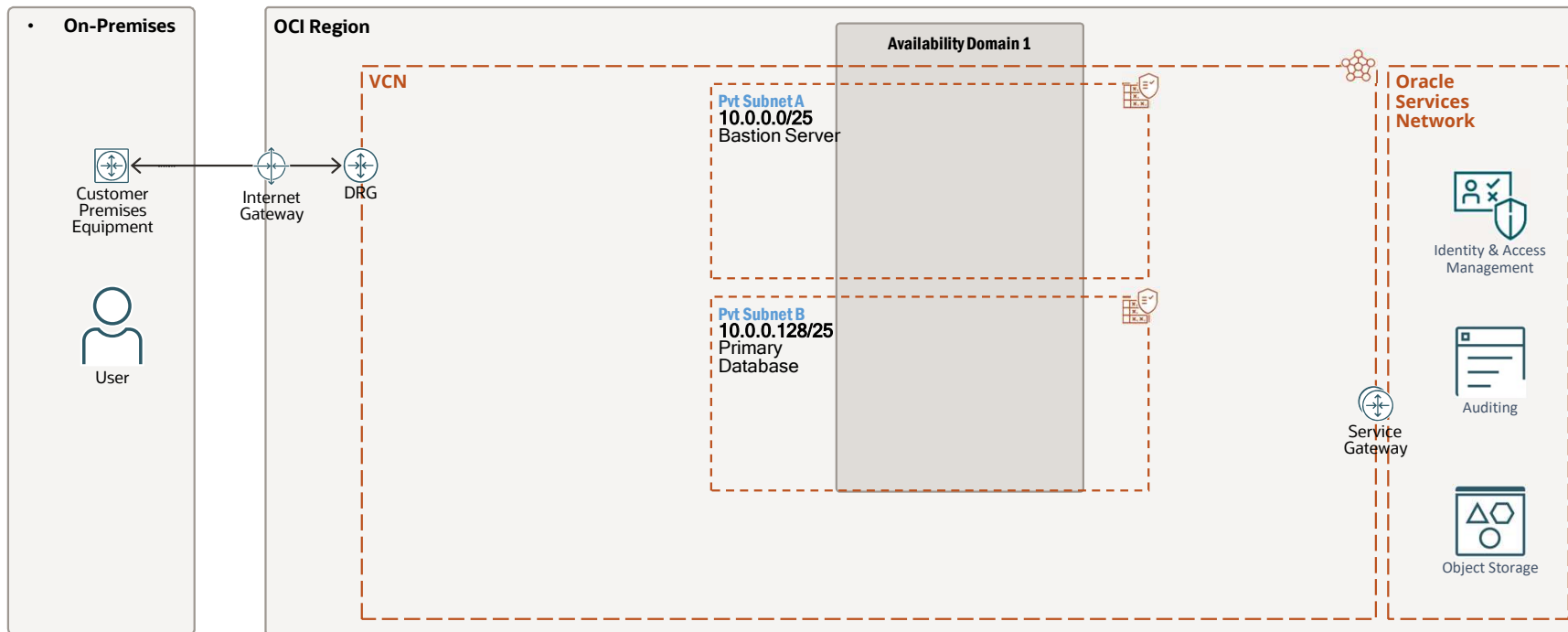


VCN – OCI Virtual Cloud Network

First let us create a Private Subnet(Private Regional) in a VCN. This means the IP address generated in the subnet will not have any access outside the subnet or Public network. Let us use a most common Private subnet CIDR **10.0.0.0/24** and create 2 private subnet as below.

Subnet Name	Subnet address	Range of addresses	Useable IPs	Hosts	Divide	Join	
PvtSubnet A	10.0.0.0/25	10.0.0.0 - 10.0.0.127	10.0.0.1 - 10.0.0.126	126	Divide	/25	/24
PvtSubnet B	10.0.0.128/25	10.0.0.128 - 10.0.0.255	10.0.0.129 - 10.0.0.254	126	Divide	/25	

VCN Reference Architecture



Use the “Create VCN” under **Networking→Virtual Cloud networks** and ensure to choose the right compartment that has been provisioned. Enter the Ipv4 CIDR Blocks as 10.0.0.0/24 and click on “Create VCN”

Oracle Cloud Cloud Classic > Search resources, services, documentation, and Marketplace Japan East (Tokyo) < > ?

Networking

- Overview
- Virtual cloud networks**
- Web Application Acceleration
- Load balancers
- DNS management
- Customer connectivity
- Cluster Placement Groups
- IP management
- Network Command Center

Virtual Cloud Networks in

Virtual Cloud Networks (VCNs) are private virtual networks that you can create in your Oracle Cloud account. They are used to connect your resources to the Internet or to other VCNs.

Create VCN **Start VCN Wizard**

Name	State

Create a Virtual Cloud Network [Help](#)

Name: adb-vcn-1

Create In Compartment: [Redacted]

IPv4 CIDR Blocks

i You can assign up to 5 IPv4 CIDR blocks to a VCN. There must be at least one IPv4 CIDR block assigned to a VCN. [Learn more.](#)

IPv4 CIDR Blocks: 10.0.0.0/24 x

IPv4 Example: 10.0.0.0/16

DNS Resolution

☒ Use DNS hostnames in this VCN

Required for instance hostname assignment if you plan to use VCN DNS or a third-party DNS. This choice cannot be changed after the VCN is created. [Learn more.](#)

DNS Label

adbvcn1

Generated from virtual cloud network name if not specified.

DNS Domain Name *Read-only*

adbvcn1.oraclevcn.com

Generated from virtual cloud network name if not specified.

Create VCN **Save as stack** [Cancel](#)

Resources: 0 (0 total logs) ⓘ
Logs enabled: 0
Logs not enabled: 0

[Manage logs](#)

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The page will be redirected to the VCN that is created and verify there are no additional Resources created except the default Route Tables, Security Lists and DHCP Options.

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Japan East (Tokyo) ▼

Networking > Virtual cloud networks > Virtual Cloud Network Details



AVAILABLE

adb-vcn-1

Move resource

Add tags

Delete

VCN Information

Tags

Compartment: [REDACTED]

Created: Fri, Apr 26, 2024, 12:57:38 UTC

IPv4 CIDR Block: 10.0.0.0/24

IPv6 Prefix: -

OCID: ...csqnka Show Copy

DNS Resolver: adb-vcn-1

Default Route Table: Default Route Table for adb-vcn-1

DNS Domain Name: adbvcn1.oraclevcn.com

Resources

Subnets (0)

CIDR Blocks/Prefixes (1)

Route Tables (1)

Internet Gateways (0)

Dynamic Routing Gateways Attachments (0)

Network Security Groups (0)

Security Lists (1)

DHCP Options (1)

Subnets in [REDACTED] compartment

Create Subnet

Name	State	IPv4 CIDR Block	IPv6 Prefixes	Subnet Access	Created
No items found.					

Showing 0 items < 1 of 1 >

Click on Create Subnet and create Subnet “PvtSubnetA” with **SubnetType = Regional**, **IPv4 CIDR Block = 10.0.0.0/25** and **Subnet Access = Private Subnet** and use defaults for other options

The screenshot displays the Oracle Cloud console interface for creating a subnet. The left sidebar shows the navigation menu with 'Subnets (0)' selected. The main content area is titled 'Create Subnet' and contains the following fields and options:

- Name:** PvtSubnetA
- Create In Compartment:** [Redacted]
- Subnet Type:** Regional (Recommended) [Selected], Availability Domain-specific
- IPv4 CIDR Block:** 10.0.0.0/25 (Specified IP addresses: 10.0.0.0-10.0.0.127 (128 IP addresses))
- IPv6 Prefixes:** [Warning: Maximum amount of 0 IPv6 prefixes per Subnet. IP ranges of the IPv6 prefixes must not overlap. Learn more.]
- Route Table Compartment in:** [Redacted] (Change compartment)
- Default Route Table for adb-vcn-1:** [Redacted]

At the bottom of the form, there are buttons for 'Create Subnet' and 'Cancel'.

Click on **Create Subnet**

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Japan East (Tokyo)     

Networking > Virtual cloud networks > Virtual Cloud Network Details > Subnets



AVAILABLE

adb-vcn-1

Move resource

Add tags

Delete

VCN Information

Tags

Compartment:

Created: Fri, Apr 26, 2024, 12:57:38 UTC

IPv4 CIDR Block: 10.0.0.0/24

IPv6 Prefix: -

Subnets in DevTools-For

Create Subnet

Name	State

Resources

Subnets (0)

CIDR Blocks/Prefixes (1)

Route Tables (1)

Internet Gateways (0)

Dynamic Routing Gateways Attachments (0)

Network Security Groups (0)

Security Lists (1)

DHCP Options (1)

Local Peering Gateways (0)

NAT Gateways (0)

Create Subnet

Subnet Access

Private Subnet

Prohibit public IP addresses for Instances in this Subnet

✓

Public Subnet

Allow public IP addresses for Instances in this Subnet

DNS Resolution

☒ Use DNS hostnames in this Subnet

Allows assignment of DNS hostname when launching an Instance.

DNS Label

PvtSubnetA

Only letters and numbers, starting with a letter. 15 characters max.

DNS Domain Name

Read-only

<dns-label>.adbvcn1.oraclevcn.com

Dhcp Options Compartment in

(Change compartment)

Default DHCP Options for adb-vcn-1

Security Lists

You can associate up to 5 network security lists with the subnet.

Security List Compartment in

(Change compartment)

Default Security List for adb-vcn-1

+ Another Security List

Resource logging

Enable resource logging to allow resource tracking, troubleshooting, and data insights

Create Subnet

Cancel

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Follow the same steps above to create another Private Subnet with CIDR Range as **10.0.0.128/25**

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Networking > Virtual cloud networks > Virtual Cloud Network Details > Subnets



AVAILABLE

adb-vcn-1

Move resource

Add tags

Delete

VCN Information

Tags

Compartment: 

OCID: ...csqnka [Show](#) [Copy](#)

Created: Fri, Apr 26, 2024, 12:57:38 UTC

DNS Resolver: [adb-vcn-1](#)

IPv4 CIDR Block: 10.0.0.0/24

Default Route Table: [Default Route Table for adb-vcn-1](#)

IPv6 Prefix: -

DNS Domain Name: adbvcn1.oraclevcn.com

Resources

Subnets (2)

CIDR Blocks/Prefixes (1)

Route Tables (1)

Internet Gateways (0)

Dynamic Routing Gateways Attachments (0)

Network Security Groups (0)

Security Lists (1)

DHCP Options (1)

Local Peering Gateways (0)

NAT Gateways (0)

Subnets in  compartment

Create Subnet

Name	State	IPv4 CIDR Block	IPv6 Prefixes	Subnet Access	Created
PvtSubnetB	 Available	10.0.0.128/25	-	Private (Regional)	Fri, Apr 26, 2024, 13:40:15 UTC
PvtSubnetA	 Available	10.0.0.0/25	-	Private (Regional)	Fri, Apr 26, 2024, 13:35:58 UTC

Showing 2 items < 1 of 1 >

Create a Network Security Group to allow common resource access(firewall)

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Create Network Security Group [Help](#)

1 Basic Info

2 Security Rules

First, provide basic information about the group. Next, you will add security rules

Name ⓘ

AllowbastionNSG

Create In Compartment

 [Show advanced options](#)

Next

Cancel

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Create a Security Rule to allow Bastion host to access the Autonomous Database over TCP/1522

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Create Network Security Group

Help

1 Basic Info

2 Security Rules

Add Security Rules

Optionally add one or more rules to the network security group. [Learn more about security rules.](#)

Rule

☐ Stateless ⓘ

Direction

Ingress

Source Type ⓘ

CIDR

Source CIDR ⓘ

10.0.0.0/25

Specified IP addresses: 10.0.0.0-10.0.0.127 (128 IP addresses)

IP Protocol ⓘ

TCP

Source Port Range Optional ⓘ

All

Destination Port Range Optional ⓘ

1522

Allows: Allows TCP traffic 1522

Description Optional

AllowBastionToAccessADB

Maximum 255 characters

+ Another Rule

Previous

Create

Cancel

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Now the NSG will have one Security Rule and later the rules can be added when required.

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Networking > Virtual cloud networks > adb-vcn-1 > Network Security Group Details

NSG

AVAILABLE

Resources

Security Rules

VNICs

Filters

Direction

☒ Egress

☒ Ingress

AllowbastionNSG

Edit

Move resource

Add tags

Terminate

Network Security Group Information

Tags

OCID: ...ggppra [Show](#) [Copy](#)

Compartment: [REDACTED]

Created: Fri, Apr 26, 2024, 14:15:54 UTC

Security Rules

These security rules apply to all VNICs in this network security group. You can filter the list by ingress or egress. There can be other security rules that apply to a given VNIC in this group: from any other network security groups the VNIC is in, and any security lists associated with the VNIC's subnet. [Learn more about security rules.](#)

Add Rules

Edit

Remove

☐	Direction ⓘ	Source or Destination ⓘ	Protocol ⓘ	Details ⓘ	Description ⓘ
☐	Direction: Ingress	Source Type: CIDR Source: 10.0.0.0/25	TCP	Source Port Range: All Destination Port Range: 1522 Allow: TCP tra... Show	AllowBastionToAccessADB
☐	Stateless: No				

0 selected

Showing 1 item < 1 of 1 >

Autonomous Database



Create a Autonomous Database with Workload Type as **Transaction Processing**

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Create Autonomous Database [Help](#)

Provide basic information for the Autonomous Database

Compartment

Display name

adb-demo-1

A user-friendly name to help you easily identify the resource.

Database name

adborcl

The name must contain only letters and numbers, starting with a letter. Maximum of 30 characters.

Choose a workload type

Data Warehouse

Built for decision support and data warehouse workloads. Fast queries over large volumes of data.



Transaction Processing

Built for transactional workloads. High concurrency for short-running queries and transactions.

JSON

Built for JSON-centric application development. Developer-friendly document APIs and native JSON storage.

APEX

Built for Oracle APEX application development. Creation and deployment of low-code applications, with database included.

Choose a deployment type

Serverless

Run Autonomous Database on serverless architecture.



Dedicated infrastructure

Run Autonomous Database on Dedicated Exadata Infrastructure.

Configure the database

Create Autonomous Database

Save as stack

[Cancel](#)

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Choose the database version and ECPU/Storage as per the need.

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Create Autonomous Database

Help

Configure the database

Always Free ⓘ
☐ Show only Always Free configuration options

Choose database version
19c

ECPU count ⓘ
2
Select an ECPU count.

Storage (TB)
5
The amount of storage to allocate. Max storage allowed is 384 TB.

Show advanced options

☒ Compute auto scaling
Allows system to expand up to three times the specified ECPU count as demand increases. [Learn more](#) about auto scaling.

☐ Storage auto scaling
Allows system to expand up to three times the reserved storage.

Backup retention

Automatic backup retention period in days
60
1 60

!

Automatic backups are managed by Oracle. Backup storage is billed separately and in addition to database storage. When a backup ages beyond the backup retention setting, it is deleted. [Learn more](#).

Create Autonomous DatabaseSave as stackCancel

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Enter the Admin passwords and choose the Network access as Private endpoint access only” and VCN as adb-vcn-1, Subnet as **PvtSubnetB** and Create Autonomous Database.

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Create Autonomous Database [Help](#)

Create administrator credentials ⓘ

Username *Read-only*

ADMIN

ADMIN username cannot be edited.

Password

Confirm password

Choose network access

Access type

Secure access from everywhere

Allow users with database credentials to access the database from the internet.

Secure access from allowed IPs and VCNs only

Restrict access to specified IP addresses and VCNs.

Private endpoint access only

Restrict access to a private endpoint within an OCI VCN. ✓

Virtual cloud network in

adb-vcn-1

[\(Change compartment\)](#)

Subnet in

PvtSubnetB

[\(Change compartment\)](#)

 [Show advanced options](#)

Create Autonomous Database

Save as stack

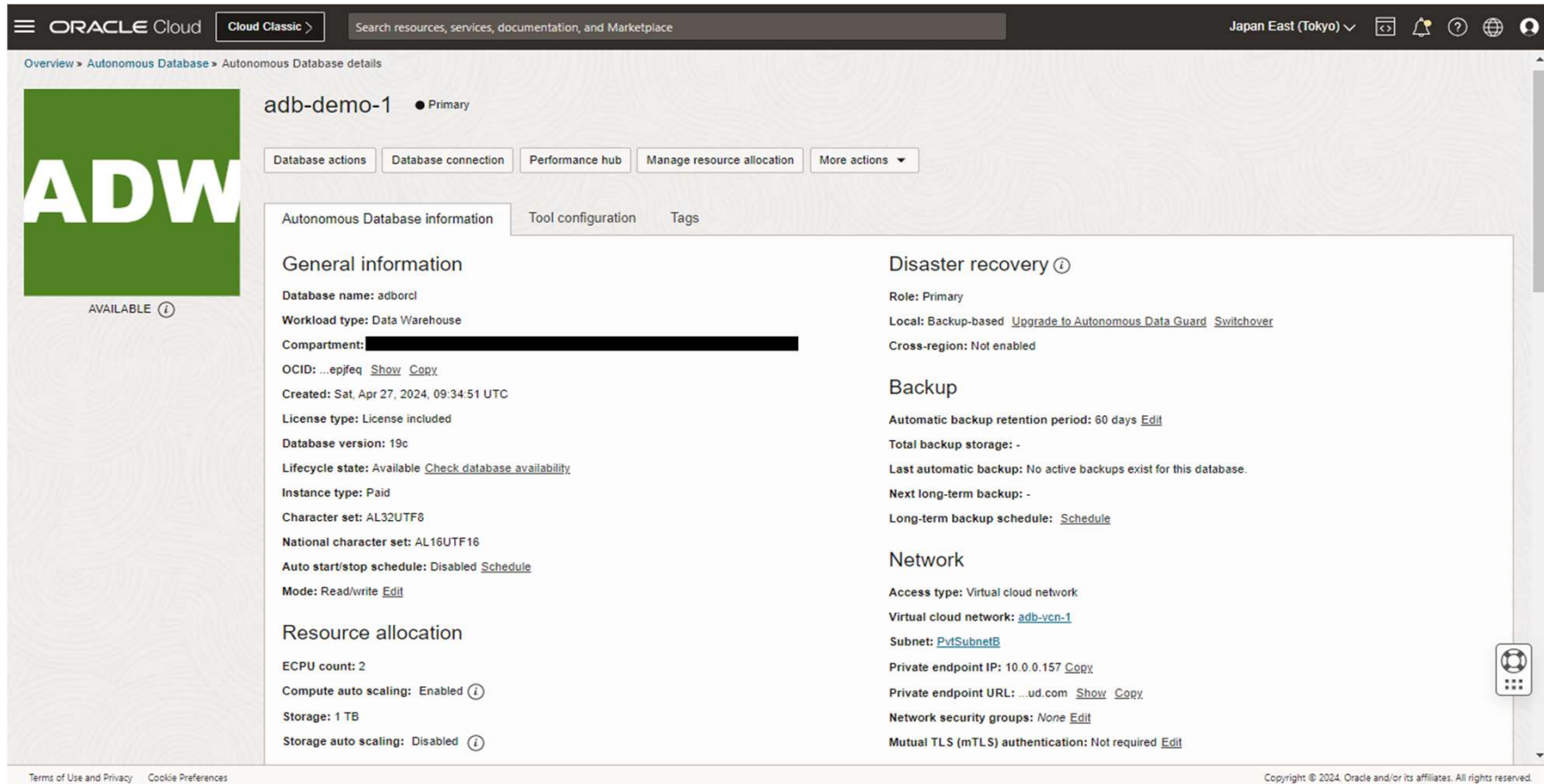
[Cancel](#)

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Now check the Autonomous Database is created with Private endpoint IP under PvtSubnetB and no Public Address assigned.



The screenshot displays the Oracle Cloud console interface for an Autonomous Database (ADB) instance. The top navigation bar includes the Oracle Cloud logo, a search bar, and the region "Japan East (Tokyo)". The breadcrumb trail shows "Overview > Autonomous Database > Autonomous Database details".

The main content area is titled "adb-demo-1" with a "Primary" status indicator. It features a sidebar with a large "ADW" logo and a status indicator "AVAILABLE". The main panel is divided into several sections:

- Database actions:** Includes buttons for "Database actions", "Database connection", "Performance hub", "Manage resource allocation", and a "More actions" dropdown.
- Autonomous Database information:** Contains tabs for "General information", "Tool configuration", and "Tags".
- General information:** Lists key details about the database:
 - Database name: adborcl
 - Workload type: Data Warehouse
 - Compartment: [Redacted]
 - OCID: ...epifeq [Show](#) [Copy](#)
 - Created: Sat, Apr 27, 2024, 09:34:51 UTC
 - License type: License included
 - Database version: 19c
 - Lifecycle state: Available [Check database availability](#)
 - Instance type: Paid
 - Character set: AL32UTF8
 - National character set: AL16UTF16
 - Auto start/stop schedule: Disabled [Schedule](#)
 - Mode: Read/write [Edit](#)
- Resource allocation:** Shows resource specifications:
 - ECPU count: 2
 - Compute auto scaling: Enabled [i](#)
 - Storage: 1 TB
 - Storage auto scaling: Disabled [i](#)
- Disaster recovery:** Includes information about the role and backup settings:
 - Role: Primary
 - Local: Backup-based [Upgrade to Autonomous Data Guard](#) [Switchover](#)
 - Cross-region: Not enabled
- Backup:** Details backup retention and storage:
 - Automatic backup retention period: 60 days [Edit](#)
 - Total backup storage: -
 - Last automatic backup: No active backups exist for this database.
 - Next long-term backup: -
 - Long-term backup schedule: [Schedule](#)
- Network:** Specifies network configuration:
 - Access type: Virtual cloud network
 - Virtual cloud network: [adb-vcn-1](#)
 - Subnet: [PvtSubnetB](#)
 - Private endpoint IP: 10.0.0.157 [Copy](#)
 - Private endpoint URL: ...ud.com [Show](#) [Copy](#)
 - Network security groups: None [Edit](#)
 - Mutual TLS (mTLS) authentication: Not required [Edit](#)

The footer contains links for "Terms of Use and Privacy" and "Cookie Preferences", along with a copyright notice: "Copyright © 2024, Oracle and/or its affiliates. All rights reserved."

Assign the created NSG to the Autonomous Database to follow the security rules created.

The screenshot displays the Oracle Cloud console interface. At the top, the Oracle Cloud logo and navigation tabs are visible. The main content area shows the details of an Autonomous Database instance named 'adb-demo-1'. A modal dialog titled 'Update network access configuration' is open, providing instructions on how to assign Network Security Groups (NSGs) to the database. The dialog includes a text box for selecting an NSG, with 'AllowbastionNSG' currently selected. Below the text box is a button to add another NSG. The background shows the 'General info' section of the database instance, including details like database name, workload type, compartment, OCID, creation date, license type, and database version. The 'Resource allocation' section shows CPU count, auto scaling settings, and storage. The 'Network' section shows access type, virtual cloud network, subnet, private endpoint IP, and URL.

Oracle Cloud Cloud Classic > Search resources, services, documentation, and Marketplace Japan East (Tokyo)

Overview > Autonomous Database > Autonomous Database details

adb-demo-1

Database actions

ADW

AVAILABLE

Update network access configuration [Help](#)

The Autonomous Database belongs to the network security groups (NSGs) you specify. An NSG has a set of security rules that control allowed types of inbound and outbound traffic. The rules apply only to the resources in the group. Contrast this with a security list, where rules apply to all the resources in any subnet that uses the list. [Learn more](#) about security rules.

Network security groups (NSGs)

Network security groups in Optional [\(Change compartment\)](#)

AllowbastionNSG

+ Another network security group

Save [Cancel](#)

General info

Database name: adb-demo-1

Workload type: Data Warehouse

Compartment: coefficient

OCID: ocid1.adb.oc4..epjfeq... [Show](#)

Created: Sat, Apr 27, 2024

License type: License Included

Database version: 23.3.0

Lifecycle state: Available [Check database availability](#)

Instance type: Paid

Character set: AL32UTF8

National character set: AL16UTF16

Auto start/stop schedule: Disabled [Schedule](#)

Mode: Read/write [Edit](#)

Resource allocation

ECPU count: 2

Compute auto scaling: Enabled

Storage: 1 TB

Storage auto scaling: Disabled

Network

Access type: Virtual cloud network

Virtual cloud network: adb-vcn-1

Subnet: PvtSubnetB

Private endpoint IP: 10.0.0.157 [Copy](#)

Private endpoint URL: ...ud.com [Show](#) [Copy](#)

Network security groups: AllowbastionNSG [Edit](#)

Mutual TLS (mTLS) authentication: Not required [Edit](#)

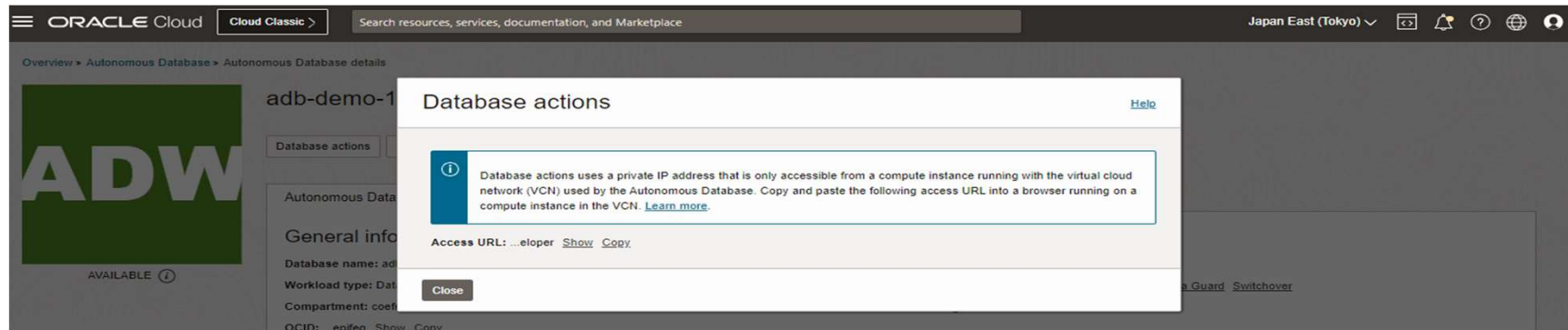
Last automatic backup: Wed, May 1, 2024, 15:49:08 UTC

Next long-term backup: -

Long-term backup schedule: [Schedule](#)

[Guard](#) [Switchover](#)

Click on **Database Actions** and a pop-up appears with Warning. Copy the Access URL and run in a browser



It is expected a 404 Error occurs for the Database actions and it confirms the database is not accessible over Internet.



Error code: 404
 **Not Found**
The page you are trying to access does not exist.
Request ID: [redacted]

Click on Database connection and choose Wallet type as **Instance wallet**. Enter the wallet password when the prompt appears and download the wallet.

The screenshot displays the Oracle Cloud console interface. The top navigation bar includes the Oracle Cloud logo, a 'Cloud Classic' toggle, a search bar, and the region 'Japan East (Tokyo)'. The breadcrumb trail shows 'Overview > Autonomous Database > Autonomous Database details'. The main content area is titled 'Database connection' and features a 'Help' link. On the left, a sidebar for 'adb-demo-1' (Primary) lists 'Database actions' and 'Database connection'. The 'Autonomous Database information' section includes 'General information' (Database name: adborcl, Workload type: Data Warehouse, Compartment: [redacted], OCID: ...epjfeq, Created: Sat, Apr 27, 2024, 09:34:51 UTC, License type: License included, Database version: 19c, Lifecycle state: Available, Instance type: Paid, Character set: AL32UTF8, National character set: AL16UTF16, Auto start/stop schedule: Disabled, Mode: Read/write) and 'Resource allocation' (ECPU count: 2, Compute auto scaling: Enabled, Storage: 1 TB, Storage auto scaling: Disabled). The 'Database connection' section contains an information box about TLS authentication, a 'Download client credentials (Wallet)' section with a 'Wallet type' dropdown set to 'Instance wallet' and buttons for 'Download wallet' and 'Rotate wallet', and a 'Connection strings' section with a table of TNS names and connection strings.

Database connection

Connections to your Autonomous Database are secured, and can be authorized using TLS or mTLS authentication options. TLS authentication is easier to use, provides better connection latency, and does not require you to download client credentials (wallet) if any of these is true for your connections:

- You are using JDBC Thin Client (version 12.2.0.1 or higher) with JDK 8(u163+) or higher.
- You are using the Python python-oracledb driver.
- You are using ODP.NET version 19.14 (or higher), or 21.5 (or higher).
- You are using an Oracle Call Interface based driver with Oracle Client libraries version 19.14 (or higher), or 21.5 (or higher).

[Learn more](#) about TLS authentication and how to enable it.

Download client credentials (Wallet)

To download your client credentials, select the wallet type, and click Download wallet. You then enter a password for the wallet. This client credential download only contains information for mTLS connections. You do not need a wallet for TLS connections.

Wallet type
Instance wallet

Download wallet Rotate wallet

Wallet last rotated: -

Connection strings

Use the following connection strings or TNS names for your connections. See the [documentation](#) for details.

TLS authentication
Mutual TLS

TNS name	Connection string
adborcl_high	...security=(ssl_server_dn_match=no))) Show Copy
adborcl_low	...security=(ssl_server_dn_match=no))) Show Copy

Close

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Bastion Service

To allow any PC to access the bastion service 0.0.0.0/0 is used in this demo.

To create a SSH session click on “Create session” in the bastion that is created, enter the following details and Create session.

Choose the Session type - SSH port forwarding session.

Update the Session name

Choose the Connect to the target host – IP address

IP address – Enter the IP address of the Autonomous Database machine.

Port – 1522

Choose to Generate SSH key pair or if already key exists Choose SSH key file

The screenshot displays the Oracle Cloud console interface. On the left, a sidebar shows the navigation menu with 'Security > Bastion > adbdebastion' selected. The main content area is divided into two panels. The left panel, titled 'adbdebastion', shows the bastion's status as 'ACTIVE' and provides details such as its OCID, creation time, target virtual cloud network, and target subnet. The right panel, titled 'Create session', contains a form for creating a new session. The form includes fields for 'Bastion name' (adbdebastion), 'Session type' (SSH port forwarding session), 'Session name' (ssh1for1522), 'Connect to the target host by using' (IP address), 'IP address' (10.0.0.157), and 'Port' (1522). Below these fields is a section for 'Add SSH key' with three options: 'Choose SSH key file' (selected), 'Paste SSH key', and 'Generate SSH key pair'. A file upload area is shown with a dashed border and a 'Drop file here' prompt. A file named 'keybastion22.pub' is currently selected. At the bottom of the form, there are 'Create session' and 'Cancel' buttons. The footer of the console shows 'Terms of Use and Privacy' and 'Cookie Preferences' on the left, and 'Copyright © 2024. Oracle and/or its affiliates. All rights reserved.' on the right.

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Security > Bastion > adbdebastion

adbdebastion

Edit Add tags Move resource Delete

Bastion information Tags

OCID: ...vvueukayiq Show Copy

Created: Sat, 27 Apr 2024 10:28:48 UTC

Target virtual cloud network: adb-vcn-1

Target subnet: PvtSubnetA

Maximum session time-to-live (TTL): 3 hours

ACTIVE

Resources

Sessions

Create session

Name Session type

Create session

Cancel

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A new SSH session will be create for 3 hours and the state should be Active. Click on the Kebab menu (3 vertical dots) right corner of the SSH session to show options and click on “**View SSH command**”.

ORACLE Cloud

Cloud Classic

Search resources, services, documentation, and Marketplace

Japan East (Tokyo)

Security > Bastion > adbdemobastion

B

ACTIVE

adbdemobastion

EditAdd tagsMove resourceDelete bastion

Bastion information

Tags

OCID: ...vvueukayiq

ShowCopy

Created: Sat, 27 Apr 2024 10:28:48 UTC

Target virtual cloud network: [adb-vcn-1](#)

Target subnet: [PvtSubnetA](#)

Maximum session time-to-live (TTL): 3 hours, 00 minutes

CIDR block allowlist: 0.0.0.0/0

Compartment:

Private endpoint IP address: 10.0.0.27

Bastion type: Standard

FQDN support: Disabled

SOCKS5 support: Disabled

Resources

Sessions

Metrics

State

State

Any state

Sessions

Create session

Name	Session type	Target resource	Target port	Username	State	Session TTL	Started
ssh1for1522	Port forwarding	10.0.0.157	1522	-	Active	3 hours, 00 minutes	Sat, Apr 27, 2024, 13:13:36 UTC

Showing 1 item < 1 of 1 >

View SSH command

[Help](#)

SSH command *Read-only*

```
ssh -i <privateKey> -N -L <localPort>:10.0.0.157:1522 -p 22 ocid1.bastionsession.oc1.ap-tokyo-1
1 @host.bastion.ap-tokyo-1.oc1.oraclecloud.com
```

[Copy](#)

When you use this command to establish an SSH connection to the target host, replace the placeholder text appropriately. For managed SSH sessions, replace the placeholder with the path to the private key (from the SSH key pair used to create the session). For SSH port forwarding sessions, replace the placeholders with the path to the private key and the local port on the machine from which you plan to run the SSH commands, respectively.

[Close](#)

ADB Connection with SQLplus

Before we make a database connection using the wallet, take a backup of the Autonomous Database wallet. Make the changes as below in the tnsnames.ora file. The actual host name of the Autonomous Database is replaced with **localhost**.

For this demonstration purpose, low service type connect string is used.

From

```
adborcl_low = (description=
(retry_count=20)(retry_delay=3)(address=(protocol=tcps)(port=1522)(host=XXXXXXXXX.adb.ap-tokyo-
1.oraclecloud.com))(connect_data=(service_name=XXXXXXXX_adborcl_low.adb.oraclecloud.com))(security=(ssl_s
erver_dn_match=no)))
```

To

```
adborcl_low = (description=
(retry_count=20)(retry_delay=3)(address=(protocol=tcps)(port=1522)(host=localhost))(connect_data=(service_na
me= XXXXXXXX_adborcl_low.adb.oraclecloud.com))(security=(ssl_server_dn_match=no)))
```

By default the SSH command available from the OCI bastion is below

```
ssh -i <privateKey> -N -L <localPort>:10.0.0.157:1522 -p 22 ocid1.bastionsession.oc1.ap-tokyo-1.XXXXXXXXXXX@host.bastion.ap-tokyo-1.oci.oraclecloud.com
```

Replace the values to match the local machine details and capture addition details -v for debugging.

```
ssh -o ConnectTimeout=7200 -i <privateKey> -v -N -L 1522:10.0.0.157:1522 -p 22 ocid1.bastionsession.oc1.ap-tokyo-1.XXXXXXXXXXX@host.bastion.ap-tokyo-1.oci.oraclecloud.com
```

Running the above command should be forwarding the session to localhost with port 1522.

```
debug1: Authentication succeeded (publickey).  
Authenticated to host.bastion.ap-tokyo-1.oci.oraclecloud.com ([REDACTED]:22).  
debug1: Local connections to LOCALHOST:1522 forwarded to remote address 10.0.0.157:1522  
debug1: Local forwarding listening on ::1 port 1522.  
debug1: channel 0: new [port listener]  
debug1: Local forwarding listening on 127.0.0.1 port 1522.  
debug1: channel 1: new [port listener]  
debug1: Entering interactive session.  
debug1: pledge: filesystem full
```

Run SQLplus with TNS_ADMIN pointing to the Autonomous Database wallet.

```
C:\Windows\System32>set TNS_ADMIN=XXXXXXXXXX\Wallet_adborcl
```

```
C:\Windows\System32>sqlplus admin@adborcl_low
```

```
SQL*Plus: Release 21.0.0.0.0 - Production on Mon May 6 19:55:22 2024 Version 21.3.0.0.0
```

```
Copyright (c) 1982, 2021, Oracle. All rights reserved.
```

```
Enter password:
```

```
Last Successful login time: Mon May 06 2024 19:46:16 +05:30
```

```
Connected to:
```

```
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
```

```
Version 19.23.0.1.0
```

```
SQL>
```

```
C:\Windows\System32>set TNS_ADMIN=XXXXXXXXXX\Wallet_adborcl
```

```
C:\Windows\System32>sqlplus admin@adborcl_low
```

```
SQL*Plus: Release 21.0.0.0.0 - Production on Mon May 6 19:55:22 2024
```

```
Version 21.3.0.0.0
```

```
Copyright (c) 1982, 2021, Oracle. All rights reserved.
```

```
Enter password:
```

```
Last Successful login time: Mon May 06 2024 19:46:16 +05:30
```

```
Connected to:
```

```
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
```

```
Version 19.23.0.1.0
```

```
SQL>
```

ADB Connection with SQL Developer

Download the latest SQL Developer, create a new connection with the below details and click “Test” to check the connection.

Connection Name: admin@oci

Authentication Type: Default

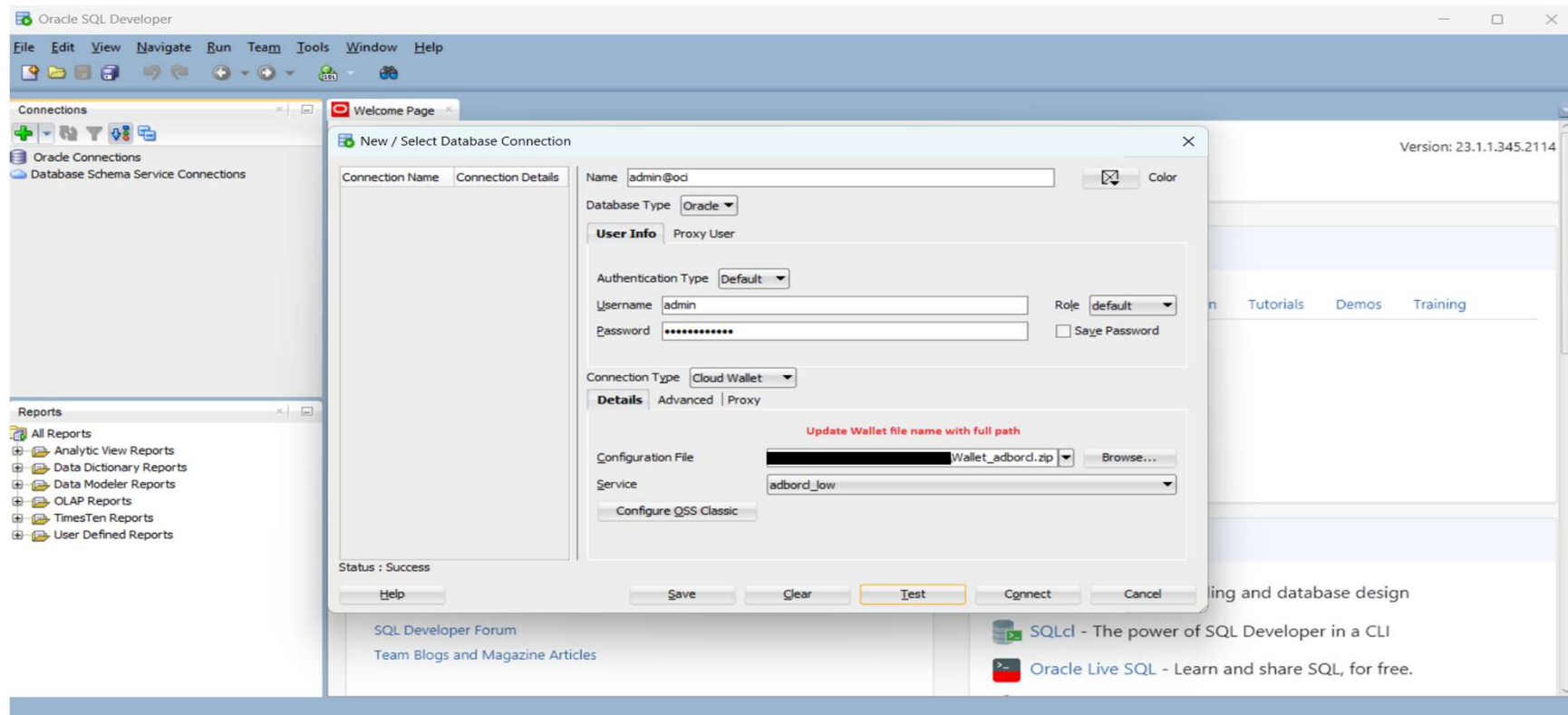
Username: admin

Password:

Connection Type: Cloud Wallet

Under Details → Configuration File → Update the modified Autonomous database wallet filename with full path.

Service – ADB service name



Connect to the database and check the ADB services available to confirm the Autonomous database connection.

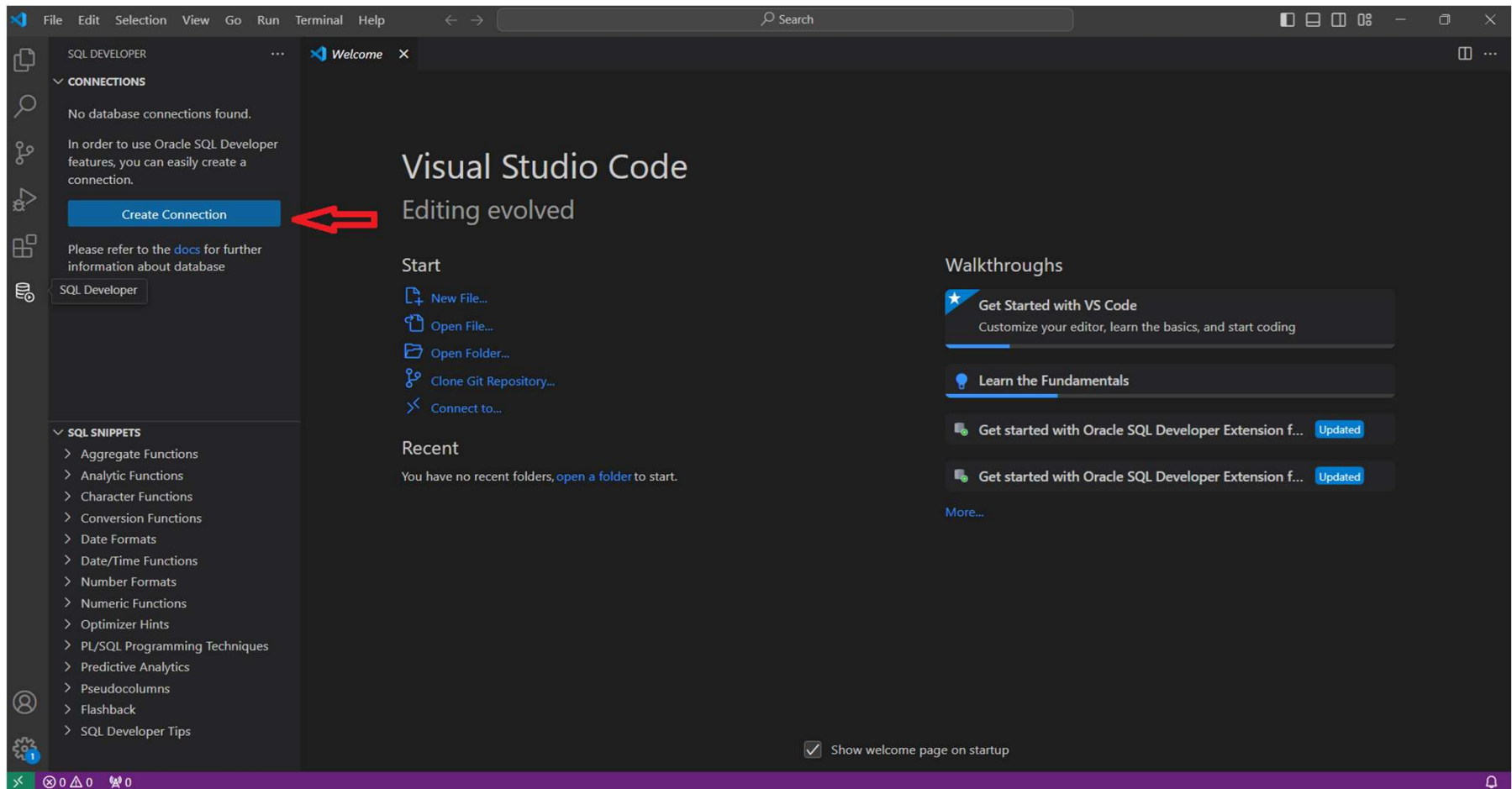
The screenshot displays the Oracle SQL Developer application window. The title bar reads "Oracle SQL Developer : admin@oci". The menu bar includes File, Edit, View, Navigate, Run, Source, Team, Tools, Window, and Help. The left sidebar contains two panels: "Connections" and "Reports". The "Connections" panel shows "Oracle Connections" with "admin@oci" selected, and "Database Schema Service Connections". The "Reports" panel shows "All Reports" with sub-items: "Analytic View Reports", "Data Dictionary Reports", "Data Modeler Reports", "OLAP Reports", "TimesTen Reports", and "User Defined Reports". The main workspace is divided into a "Worksheet" and a "Query Builder". The "Worksheet" contains two SQL queries:
1. `select value from v$parameter where name = 'pdb_lockdown';`
2. `select name from cdb_services order by name;`
The "Query Result" panel at the bottom shows the results of the second query. It indicates "All Rows Fetched: 4 in 0.166 seconds". The results are as follows:

	NAME
1	ADBORCL
2	ADBORCL_high.adb.oraclecloud.com
3	ADBORCL_low.adb.oraclecloud.com
4	ADBORCL_medium.adb.oraclecloud.com

The status bar at the bottom right shows "Line 3 Column 45", "Insert", "Modified", and "Windows: C".

ADB Connection with SQL Developer for VS Code

In this demonstration it is assumed, the VS code is installed and SQL Developer plugin is already configured. Click on “**Create Connection**”



Create a new connection with the below details and click “Test” to check the connection.

Connection Name: admin@ociADB

Authentication Type: Default

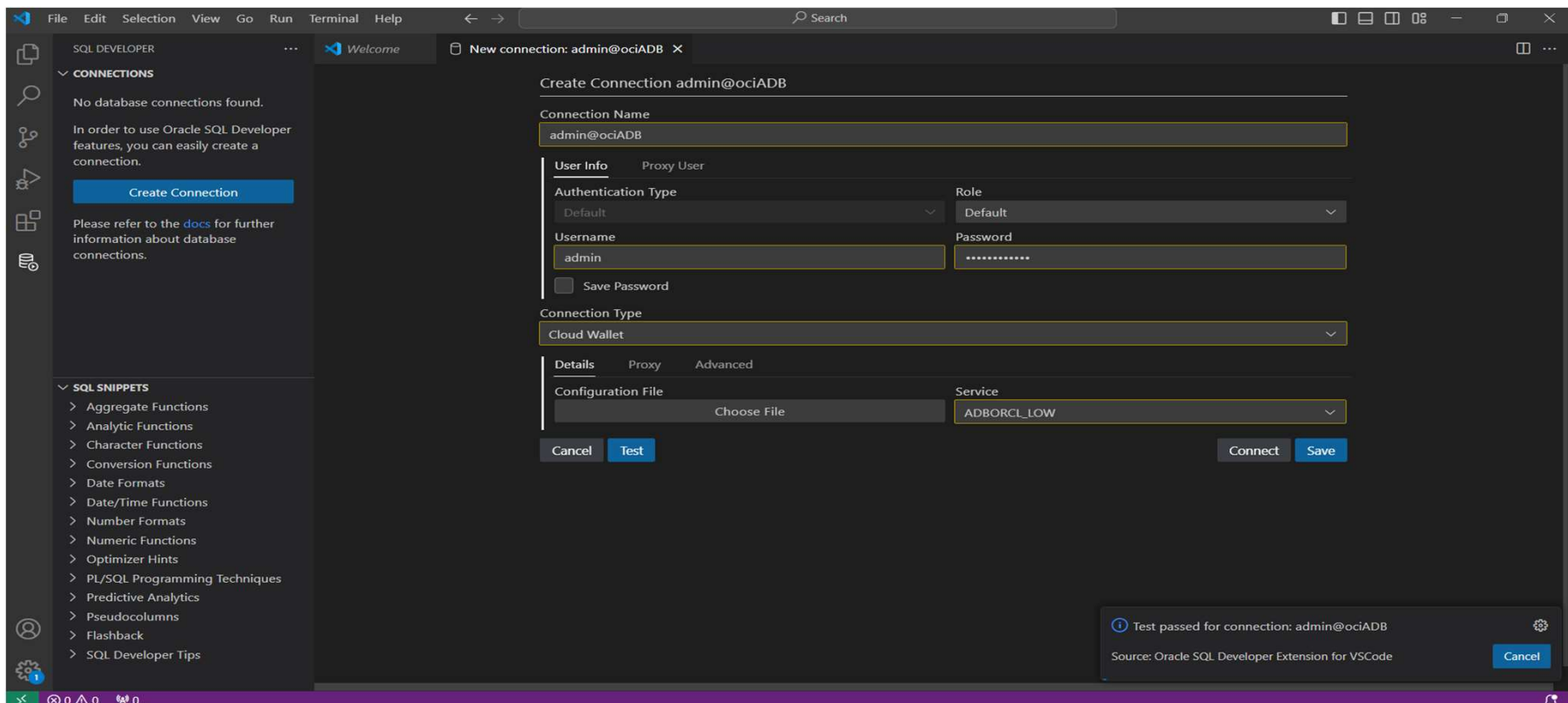
Username: Admin

Password:

Connection Type: Cloud Wallet

Under Details → Configuration File → Update the modified Autonomous database wallet filename with full path.

Service – ADB service name



Save the connection and connect to the database. Run the SQL to check the connection with the Autonomous database

The screenshot displays the SQL Developer application interface. On the left, the 'CONNECTIONS' pane shows a connection named 'admin@ociA...' which is currently selected. Below it, the 'SQL SNIPPETS' pane is visible. The main editor window contains the SQL query: `select name from cdb_services order by name;`. The bottom pane shows the 'QUERY RESULT' tab, indicating that 4 rows were fetched in 0.215 seconds. The results are displayed in a table with a single column named 'NAME'.

	NAME
1	ADBORCL
2	ADBORCL_high.adb.oraclecloud.com
3	ADBORCL_low.adb.oraclecloud.com
4	ADBORCL_medium.adb.oraclecloud.com

The status bar at the bottom indicates the current cursor position is at Line 1, Column 45 (44 selected), with 4 spaces, UTF-8 encoding, CRLF line endings, and the PL/SQL language.

ADB Connection with SQLcl

Download and install the latest SQLcl version. Test the connection type of wallet using **set cloudconfig** command

Microsoft Windows [Version 10.0.22631.3447]

(c) Microsoft Corporation. All rights reserved.

```
C:\Users \<username>> set JAVA_HOME=D:\Soft\Java\jdk-11.0.15_windows-x64_bin\jdk-11.0.15
```

```
C:\Users \<username>> set PATH=%JAVA_HOME%\bin
```

```
C:\Users \<username>> cd D:\Soft\Sqlcl\sqlcl-24.1.0.087.0929\sqlcl\bin
```

```
C:\Users\<username>>d:
```

```
D:\Soft\Sqlcl\sqlcl-24.1.0.087.0929\sqlcl\bin>sql /nolog
```

```
SQLcl: Release 24.1 Production on Fri May 10 20:09:51 2024
```

Copyright (c) 1982, 2024, Oracle. All rights reserved.

```
SQL> set cloudconfig <Update full wallet PATH here>\Wallet_adborcl.zip
```

```
SQL> connect admin@adborcl_low
```

```
Password? (*****?) *****
```

```
Connected.
```

```
SQL> select name from cdb_services order by name;
```

NAME

```
XXXXXXXXXXXXXXXXXX_ADBORCL
```

```
XXXXXXXXXXXXXXXXXX _ADBORCL_high.adb.oraclecloud.com
```

```
XXXXXXXXXXXXXXXXXX _ADBORCL_low.adb.oraclecloud.com
```

```
XXXXXXXXXXXXXXXXXX _ADBORCL_medium.adb.oraclecloud.com
```

```
C:\WINDOWS\system32\cmd. X + v
Microsoft Windows [Version 10.0.22631.3447]
(c) Microsoft Corporation. All rights reserved.

C:\Users\[redacted]>set JAVA_HOME=D:\[redacted]\jdk-11.0.15_windows-x64_bin\jdk-11.0.15
C:\Users\[redacted]>set PATH=%JAVA_HOME%\bin
C:\Users\[redacted]>cd D:\[redacted]\Sqlcl\sqlcl-24.1.0.087.0929\sqlcl\bin
C:\Users\[redacted]>d:
D:\[redacted]\Sqlcl\sqlcl-24.1.0.087.0929\sqlcl\bin>sql /nolog

SQLcl: Release 24.1 Production on Fri May 10 20:09:51 2024

Copyright (c) 1982, 2024, Oracle. All rights reserved.

SQL> set cloudconfig D:\[redacted]\Wallet_adborcl.zip
SQL> connect admin@adborcl_low
Password? (*****?) *****
Connected.
SQL> select name from cdb_services order by name;

NAME
-----
[redacted]_ADBORCL
[redacted]_ADBORCL_high.adb.oraclecloud.com
[redacted]_ADBORCL_low.adb.oraclecloud.com
[redacted]_ADBORCL_medium.adb.oraclecloud.com
```

References

Overview of VCNs and Subnets

[https://docs.oracle.com/en-us/iaas/Content/Network/Tasks/Overview of VCNs and Subnets.htm](https://docs.oracle.com/en-us/iaas/Content/Network/Tasks/Overview_of_VCNs_and_Subnets.htm)

Bastion

<https://docs.oracle.com/en-us/iaas/Content/Bastion/home.htm>

Provision Autonomous Database

<https://docs.oracle.com/en/cloud/paas/autonomous-database/serverless/adbsb/autonomous-provision.html#GUID-0B230036-0A05-4CA3-AF9D-97A255AE0C08>

Connect to Autonomous Database Using Oracle Database Tools

<https://docs.oracle.com/en/cloud/paas/autonomous-database/serverless/adbsb/connect-tools.html#GUID-CF6C7E1B-D0D4-4641-BADA-5C57DEA7C73B>