



OCI Cost Governance and Performance Insights Solution for private subnet deployment

Installation Guide - Private Subnet

Version: 1.0
Release Date: September, 2021

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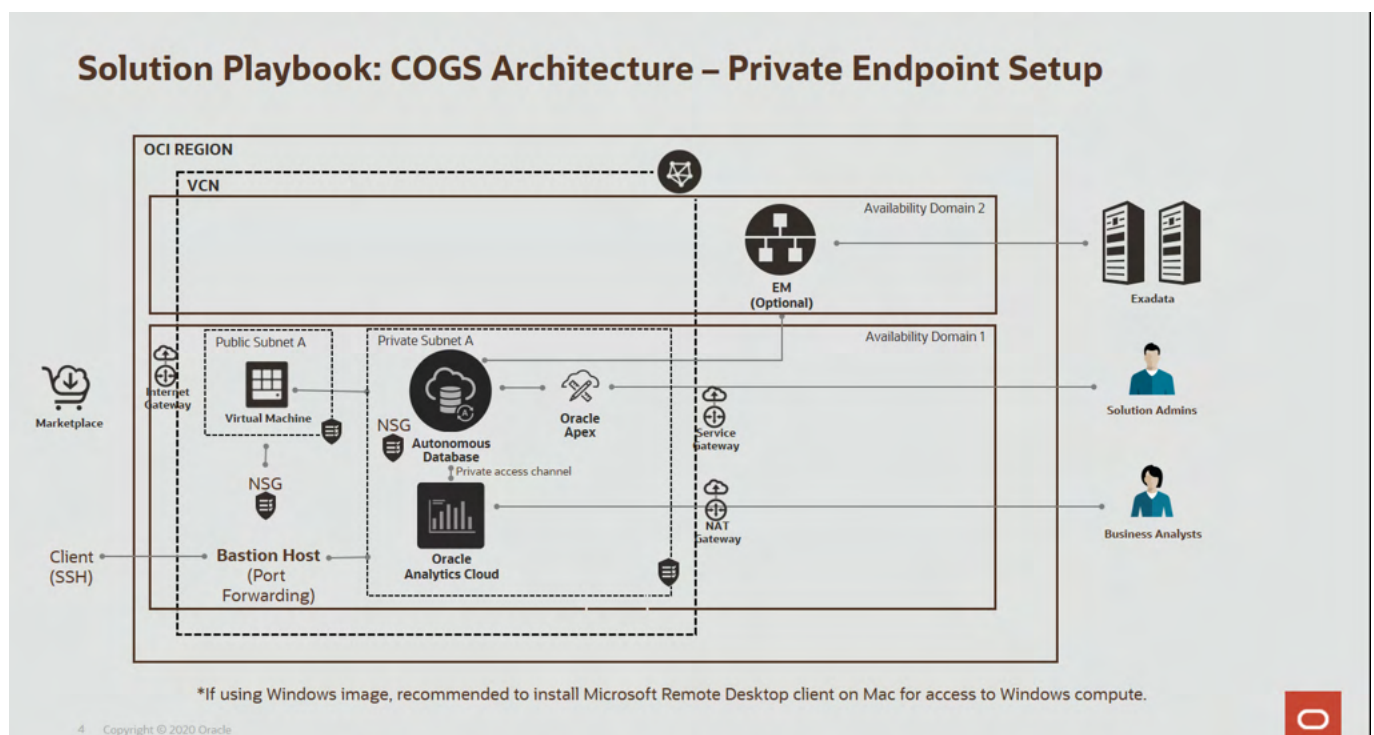
Section 1 Introduction

Cost Governance built using **Oracle Analytics Cloud**, **Autonomous Data Warehouse** and **Oracle APEX**, the OCI Cost Governance & Performance Insights solution provides customers:

- granular understanding of their spend and utilization of Oracle Cloud Infrastructure (OCI).
- Dashboards provide cost by OCI Resources, PaaS and IaaS services and can be grouped by application and department for budgetary purpose and chargeback.
- Additionally, performance monitoring and utilization matrices are available for applications running on OCI Virtual Machines.
- It is ideal for self-service analysis and allows users to build their own visualizations and enrich the analysis by bringing in their own data (e.g. departmental budgets).

The Cost Governance & Performance Insights solution (*or COGS for short*) is available as an OCI Marketplace application which can be deployed to your tenancy with a few easy steps (see [installation guide in Section 2](#)).

The overall architecture of the solution is as follows:



Components of the solution are as follows:

- **Autonomous Data Warehouse (ADW)** instance (deployed in a private subnet) is used to store the raw and calculated log, audit and performance data from OCI tenancies and from Enterprise Manager instances.
- **Oracle Analytics Cloud (OAC)** instance (deployed in a private subnet) is used to view, modify and create visualizations for performance, usage and cost for all resources in your tenancy.
- **Oracle Application Express (APEX)** instance (deployed in a private subnet) is used to administer, manage and configure the solution.
- **Bastion Host** instance is used to connect to the ADW, OAC, OEM instances in the private subnet over the internet. Bastion host is deployed in a public subnet.

This document is an installation/Support Guide for those users who are planning to deploy this solution within a **Private Subnet** on OCI.

NOTE: Analysis contained in this solution are presented as general guidance on utilization. This solution is not meant as replacement of Oracle's official Cost Analysis insights available on OCI Console.

Data presented in this application may not match 100% to OCI console or Oracle Official invoice due to delays in upstream system, rounding or other differences.

Prerequisites

To successfully deploy this solution, following items are needed:

- An Oracle Cloud Infrastructure (OCI) Tenancy
- Appropriate access rights granted via OCI Policies by Tenancy Administrator. For help see: [link](#).

Access Rights Policies

Specific Access Rights are required in OCI for users who will be deploying the Cost Governance solution.

These rights can be granted via [OCI policies](#). In order to make these policies work, you will need to [add the OCI user who will be deploying/managing the solution to a group](#) in OCI Identity and Access Management (IAM) and then assign the policies listed below to this group.

```
# OCI Policies
# Substitute the actual name of the group which the user is added to in your
# tenancy everywhere
# that you see <group_name> below

# Policy needed to create Stack and deploy all components
Allow group <group_name> to manage orm-stacks in tenancy
Allow group <group_name> to manage orm-jobs in tenancy

# Policy needed to manage Autonomous Data Warehouse instances in tenancy
Allow group <group_name> to manage autonomous-database-family in tenancy

# Policy needed to manage Autonomous Data Warehouse instances in tenancy
Allow group <group_name> to manage autonomous-database-family in tenancy

# Policies needed to manage Analytics Cloud instances and network resources in
# tenancy
Allow group <group_name> to manage analytics-instances in tenancy
Allow group <group_name> to manage analytics-instance-work-requests in tenancy
Allow group <group_name> to READ compartments in tenancy
Allow group <group_name> to manage virtual-network-family in tenancy

# Policies needed to manage Compute instances in tenancy
Allow group <group_name> to manage instance-family in tenancy

# Policies to allow users to read cost and usage data from tenancy
define tenancy usage-report as
ocid1.tenancy.oc1..aaaaaaaaned4fkpkisbwjlr56u7cj63lf3wffbilvqknstgtvzub7vhqkggq
endorse group <group_name> to read objects in tenancy usage-report
```

For more information, please see OCI Identity and Access Management documentation: <https://docs.oracle.com/en-us/iaas/Content/Identity/Concepts/overview.htm>

- **[Optionally]** *If you plan to report on cost/usage data for ExaCS and ExaCC instances, you will need:*
 - Permissions to create Oracle Enterprise Manager with Cloud Management Pack

You will also need the following:

- PEM Keys. For help see: [link](#)
- SSH Keys for secure installation. [HINT: Navigate Compute > Create Instance > Generate SSH Keys, download both public and private keys] For help see [link](#)
- IDCS Access Token. For help see: [link](#)
- Tenancy OCID, User OCID and User Fingerprint. For help see [link](#)

Note: The dashboards and insights in this solution depends heavily on resource tagging on OCI. For best results, customers are encouraged to follow [OCI Tagging and resource compartmentalization best practices](#).

Additional Resources:

OCI Tagging: [link](#)

Managing Compartments: [link](#)

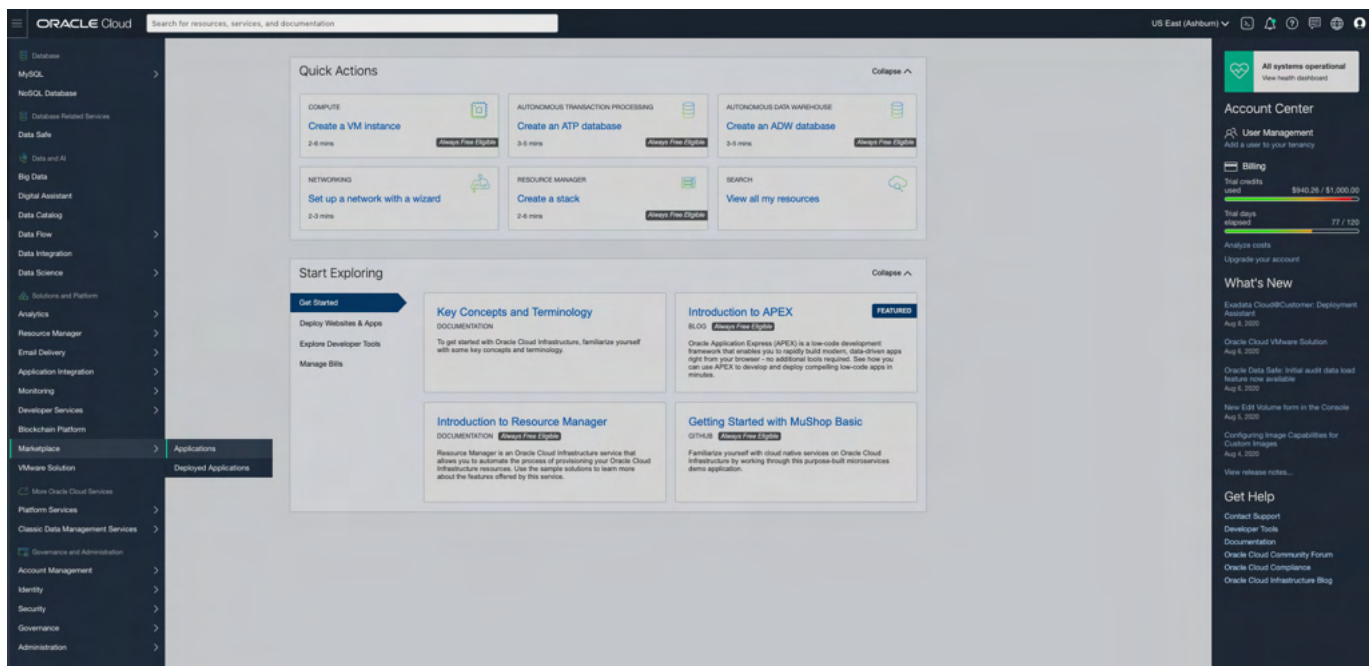
Section 2 Installation

The installation process involves:

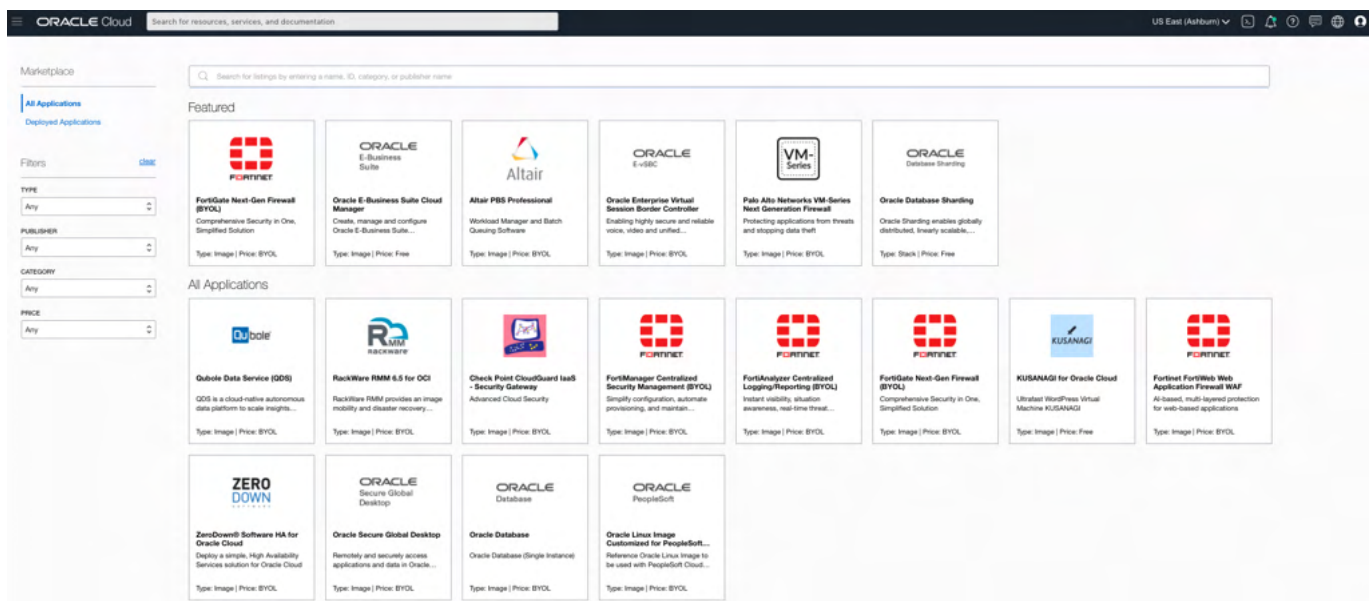
- **Section 2.1** - Launch App: Launch app from Oracle Marketplace, initiate Resource Manager Stack to create the necessary infrastructure and services for the Application.
- **Section 2.2** - Configuration Variables
- **Section 2.3** - Application Installation

Section 2.1 Launch App

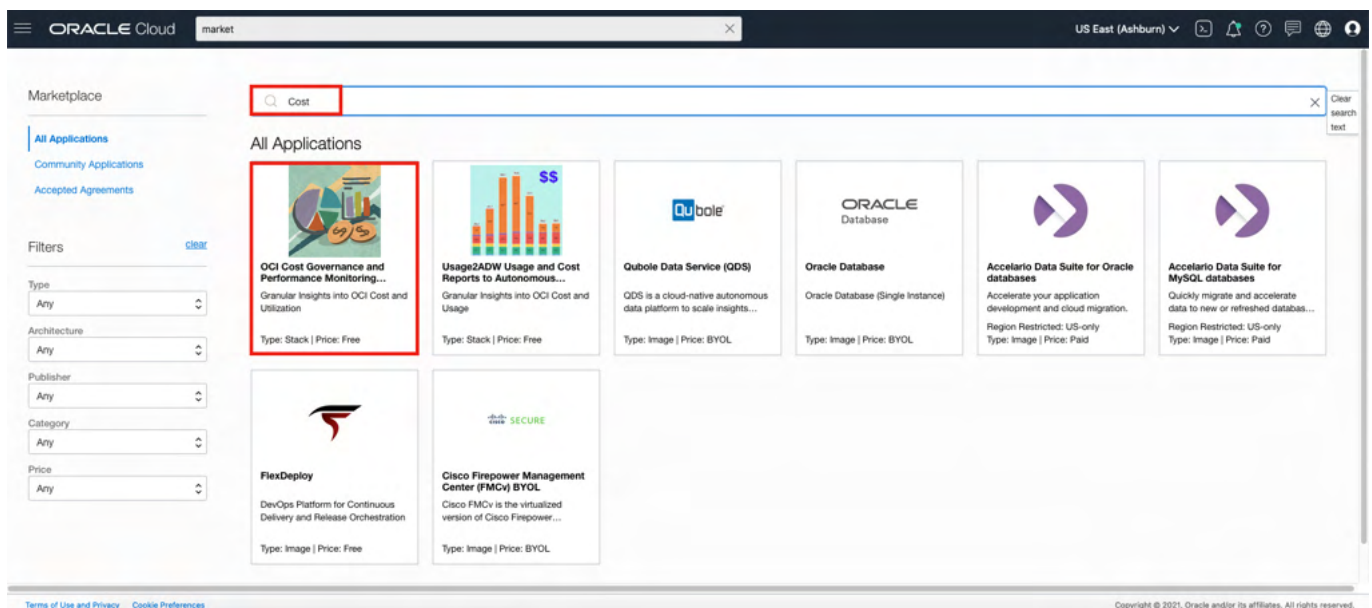
- Step 1: Log in to your OCI Tenancy. Navigate to **Marketplace** and click on **All Applications**



- Step 2: Search for **OCI Cost Governance & Performance Insights Solutions (on Private Subnet)**. Click to open the Application page.




- Step 3: Download the **Analytics: OCI Cost Governance & Performance Insights** files on to your local machine. [Hint: Files are located under the Related Documents Section on this page.]



- Step 4: From the Launch Stack Section [Hint: Upper Right Corner], Choose the **Compartment** where the Resource Manager stack should be deployed and choose **Terraform Version 1** from the drop down.

Marketplace • OCI Cost Governance and Performance Monitoring Solution



OCI Cost Governance and Performance Monitoring Solution

Granular Insights into OCI Cost and Utilization

Built on Oracle Analytics Cloud, Autonomous Database and Oracle APEX, OCI Cost Governance and Performance Monitoring solution provides customers granular understanding of their spend and utilization of Oracle Cloud Infrastructure (OCI).

Categories: Cloud Management, Business Applications

Software Price per OCPU

\$0.00/hr

There are additional fees for the infrastructure usage.

[Oracle Standard Terms and Conditions](#)

Launch Stack

Type: Stack

Version: 1.1 - default

Compartment: Search compartments

- classicaldemo (root)
- Africa
- Asia
- APNTesting
- CostGovernance
- Europe
- ManagedCompartment
- NorthAmerica
- Oceania
- SouthAmerica

Overview Provider More Apps

App by Oracle

Built on Oracle Analytics Cloud, Autonomous Database and Oracle APEX, OCI Cost Governance and Performance Monitoring solution provides customers granular understanding of their spend and utilization of Oracle Cloud Infrastructure (OCI). Dashboards show cost by OCI Resources, PaaS and IaaS services and can be grouped by application and department (via OCI resource Tagging) for budgetary purpose and chargeback. Additionally, performance monitoring and utilization matrices are available for application running on OCI Virtual Machines.

OCI Cost Governance and Performance Monitoring solution is ideal for self-service analysis and allows users to build their own visualizations and enrich the analysis by bringing in their own data (e.g. departmental budgets).

Customers leverage a Management Module to securely retrieve their tenancy cost and usage data. The module can be configured to retrieve multiple OCI tenancies data for analysis.

Note: Analysis contained in this solution are presented as general guidance on OCI cost and utilization. This solution is not meant as a replacement of Oracle's official Cost Analysis available on OCI Console. Data presented in this application may not match 100% to OCI console or Oracle Official invoice due to delays in upstream system, rounding or other errors.

Support

Contacts:
Oracle Support (1-800-223-1171)

Links:
[Oracle Support](#)

Version Details

Version: 1.0
Release Date: Aug 17, 2020, 00:00 UTC

This version of the solution includes:

- Cost for all OCI Gen2 native services at individual instance level
- Cost for all other OCI services (e.g. PSM deployed) at Service Level
- CPU and Memory utilization for OCI Gen2 Compute Instances



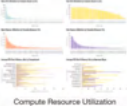
Tags

Cost Management, OCI Cost, OCI Performance, Cost Governance, OCI Management, OAC, ADW, APEX, OCI Monitoring, Oracle Analytics Cloud, Autonomous Database

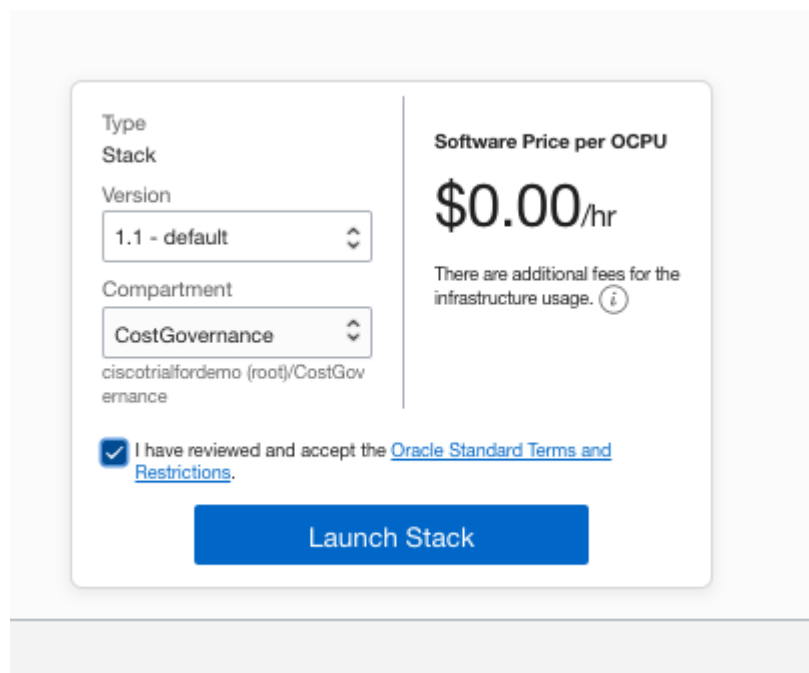
Languages

English

Screenshots

- Step 5: Choose the latest version of the Application. Review and accept Oracle Standard Terms and Restrictions by enabling the check box and click **Launch Stack**



The screenshot shows a configuration panel for launching a stack. On the left, under 'Type', 'Stack' is selected. Under 'Version', '1.1 - default' is selected. Under 'Compartment', 'CostGovernance' is selected, with the full path 'ciscotrialfordemo (root)/CostGovernance' displayed below. On the right, the 'Software Price per OCPU' is '\$0.00/hr'. Below this, a note states 'There are additional fees for the infrastructure usage.' with an information icon. At the bottom left, a checkbox is checked, followed by the text 'I have reviewed and accept the [Oracle Standard Terms and Restrictions](#).' A large blue 'Launch Stack' button is at the bottom center.

Type
Stack

Version
1.1 - default

Compartment
CostGovernance
ciscotrialfordemo (root)/CostGovernance

Software Price per OCPU
\$0.00/hr

There are additional fees for the infrastructure usage. ⓘ

☒ I have reviewed and accept the [Oracle Standard Terms and Restrictions](#).

Launch Stack

- Step 6: Keep the name of the Stack as "OCI Cost Governance and Performance Insights Solution".
 - Update description as appropriate and choose a compartment the Resource Manager Stack is to be deployed.

Create Stack

- Stack Information
- Configure Variables
- Review

Stack Information

OCI Cost Governance and Performance Monitoring Solution

Working Directory
The OCI Cost Governance and Performance Monitoring Solution_v23 folder is being used as the working directory.

Name *Optional*
OCI Cost Governance and Performance Monitoring Solution_v23-20210705163952

Description *Optional*
Built using Oracle Analytics Cloud, Oracle Autonomous Database and Oracle APEX, the OCI Cost Governance and Performance Monitoring solution provides customers granular understanding of their spend and utilization of Oracle Cloud Infrastructure resources.

Create in compartment
CostGovernance
ciscotrialfordemo (root)/CostGovernance

Terraform version
1.0.x

Support for Terraform version 0.11.x ends in May 2021.

Tags
Tagging is a metadata system that allows you to organize and track resources within your tenancy. Tags are composed of keys and values that can be attached to resources.
[Learn more about tagging](#)

Tag Namespace	Tag Key	Value
None (add a free-form tag)	<input type="text"/>	<input type="text"/>

IMPORTANT: Do NOT change Stack name in the "Name" field. Changes to this field result in errors during installation.

Choose Terraform version 1 from the drop down menu.

- Step 7: Add **tags** for your Stack based on best practices and as required by your tenancy policy.

TAGS

Tagging is a metadata system that allows you to organize and track resources within your tenancy. Tags are composed of keys and values that can be attached to resources.

[Learn more about tagging](#)

TAG NAMESPACE	TAG KEY	VALUE	
CostGov	enable	true	×

- Step 8: Click **Next**

Section 2.2 Configuration Variables

Section 2.2.1 General Settings

- Step 1: Choose **Region** and **Compartment** where resources will be provisioned. Updated Display Name Prefix for the application as desired.

Configure the variables for the infrastructure resources that this stack will create when you run the apply job for this execution plan.

General Settings

Region

us-ashburn-1

The region in which to create all resources.

Stack Compartment

CostGovernance

Choose the compartment where all the provisioned resources will be deployed.

Display Name Prefix *Optional*

CostGovernance

Enter the Display name for the application.

Section 2.2.2 Network Configuration for Private Subnet

Network Configuration for deploying to a private subnet consist of the following:

- Optional: Select **Show Advanced Options** to configure a specific network for your Stack.

Network Configuration

☐ **Show Advanced Options**
 Enable advanced options for network.

NOTE: Advance options allows application to be deployed into specific CIDR range. Otherwise all necessary network components and permissions will be created as required by the application.

Section 2.2.3 Database Configuration

- Step 1: In Database Configuration, enter the required fields and choose the appropriate database license type:
 - DATABASE NAME
 - Free Autonomous Database instance "True" provisions ADB in OCI Free tier with options to upgrade to paid tier later. For more on OCI Free Tier see [Link](#)
 - Choose the appropriate Database License
 - DB_ADMIN_PASSWORD - Please see password restrictions.
 - DB_WALLET_PASSWORD - Please see password restrictions.

Autonomous Database Configuration**Database Name**

Provide Database name. Constraints: 12 alphanumeric characters only. No Spaces.

Do you want a always Free Oracle Autonomous Database instance?

Provision Always Free Oracle Autonomous Database instance (1 OCPU 20 GB Storage)?

Provision Paid Oracle Autonomous Database instance (2 OCPU 1 TB Storage) - License Included or BYOL?

Note: This configuration can be changed later from the OCI console.

Database Admin Password**Enter the password**

Provide admin password. Constraints: 12 - 30 characters. At least one uppercase letter, one lowercase letter, and one number. No special characters. Cannot Contain "Cost", "CostGov", or "Gov".

Re-enter the password**Database Wallet Password****Enter the password**

Provide database wallet password. Must be a minimum 12 characters, contain at least one uppercase letter, one lowercase letter, one number. Do not include special characters.

Re-enter the password

NOTE: Please save this information for use later in the application configuration process.

Section 2.2.4 OAC Configuration

- Step 1: Choose **Analytics Instance Name** and **OCPUs** for Oracle Analytics Instance (Hint: This can be changed later)
- Step 2: Enter **OAC Instance Type**, **OAC License Type** and enter **IDCS access token**. [Hint: Open IDCS token in a text editor, copy and paste the entire token into the IDCS ACCESS TOKEN field.]

NOTE: Uncheck the text box if you would like to skip provisioning a new Oracle Analytics (OAC) instance and use an existing instance within your tenancy. Using existing OAC instance may require custom configuration not covered in this installation guide.

Oracle Analytics Cloud Configuration

☒ Provision Analytics instance?
Uncheck if you want to use an existing Analytics instance

Analytics Instance Name

OracleAnalyticsInstance

Enter a unique name for this instance. The name provided must start with a letter, contain only alphanumeric characters, no spaces and span up to 30 characters in total.

Analytics Instance Capacity

2

Provide the number of OCPUs for the Analytics Instance.

Analytics Instance Type

OAC Standard Edition

Choose the Analytics Product Type.

Analytics License

BRING_YOUR_OWN_LICENSE

Choose your Oracle Analytics Cloud License Type.

IDCS Access Token

{"app_access_token":"eyJ4NXQjUzI1NiI6IklFcHFJR09XbkF0aGJCOHplQ2ltTkJtTXJoOEVWLXhhUmNCSzRTZEIWOW8iLCJ4NXQjOiJHeL

Provide IDCS Access token. See Pre-req section in the Installation Document.

Compute Instance Configuration

Instance Configuration Hostname

CostGovernance

Provide Instance Hostname. The name of the hostname must start with a Letter not a Number.

NOTE: IDCS user must have the appropriate privileges required to install components needed for this application. For help creating IDCS Access token see [link](#)

Section 2.2.5 Compute Instance Configuration

- Step 1: Enter **Public SSH Key** and the **VM Shape** for the application. [HINT: From the main menu, Navigate to Compute > Create Instance. See option for generating SSH Keys. Download both public and private keys. For help see [link](#)
 - The Terraform script will also install a VNC Server on the Compute Instance to allow access to the Analytics Cloud and Autonomous Database Cloud instances in the private subnet via the Linux VM.
 - In the **Ssh_private_key** field, specify the private key to use with the Public SSH Key you specified above.

Compute Instance Configuration

Instance Configuration Hostname

CostGovernance

Provide Instance Hostname. The name of the hostname must start with a Letter not a Number.

Shape

VM.Standard.E3.Flex

Choose an available instance shape for the VM.

Flex Shape OCPUs *Optional*

1

Provide the number of OCPU for the compute instance. You can choose between 1-64.

SSH Public Key

☒ Choose SSH Key File

☐ Paste SSH Key

Drop a file. [Browse](#)

SSH public key (.pub) file only.

Use public key to secure your VM.

Vncpasswd *Optional*

HelloWorld123

Ssh_private_key *Optional*

./ssh_keys/id_rsa

- Step 2: Click **Next**
- Step 3: Verify configuration details on the next screen. Leave "Run Apply" unchecked to run terraform plan job first. This will give you a chance to ensure there aren't any errors before running apply. Click **Create**.

NOTE: If you are sure of the configuration options chose thus far, Check 'Run Apply' box to run the plan immidiately and Skip Step 4 below.

- Step 4: Run Terraform Apply to start application installation

Search for resources, services, and documentation

US East (Ashburn)

OCI Cost Governance and Performance Monitoring Solution-20210518080514

Plan
Apply
Destroy
Edit
More Actions

Stack Information
Tags

To connect to the application running on this stack, see the Usage Instructions.
View Usage Instructions

Description: Oracle Cost Governance on Oracle Cloud Infrastructure

OCID: ...qwdaeq
Show
Copy

Created: Tue, May 18, 2021, 12:07:30 UTC

Compartment: ciscotrialfordemo (root)/CostGovernance

Terraform Configuration File (.zip): Uploaded
Upload New File
Download

Terraform version: 0.12.x

18 / 53

Section 2.3 Application Installation

- Step 1: State will indicate **In Progress**. Allow the job to run. (Hint: Provisioning all components of the app may take up to an hour.)

The screenshot shows the 'Job Details' page for a job with ID 'ormjob20200820022257'. The job status is 'In Progress', indicated by an orange 'RMJ' logo and the text 'IN PROGRESS'. The job type is 'Apply'. The start time is 'Thu, Aug 20, 2020, 02:22:57 UTC'. The compartment is 'ciscotrainingdemo (prod)/CostGovernance'. The plan job ID is 'Automatically approved'. The working directory is 'Not specified'. The end time is 'N/A'. The job information section includes a note: 'While this job is running, only partial logs are available. You can get a complete log when the job is finished.' The logs section shows a 'Download Logs' button and a 'Show Timestamps' button.


- Step 2: Confirm the Apply job was **successful**.

The screenshot shows the 'Job Details' page for a job with ID 'ormjob20200820030825'. The job status is 'SUCCEEDED', indicated by a green 'RMJ' logo and the text 'SUCCEEDED'. The job type is 'Apply'. The start time is 'Thu, Aug 20, 2020, 03:08:25 UTC'. The compartment is 'ciscotrainingdemo (prod)/CostGovernance'. The plan job ID is 'Automatically approved'. The working directory is 'Not specified'. The end time is 'Thu, Aug 20, 2020, 03:36:31 UTC'. The job information section includes a note: 'To connect to the application running on this stack, see the Usage Instructions.' The logs section shows a 'Download Logs' button and a 'Show Timestamps' button.

Note: If the Job fails, review error logs for the issue. Common issues may be: insufficient user privileges, invalid SSH keys, expired or invalid IDCS token, tenancy service limits etc.) Please note that the password for the VNC Server set up on the Compute Instance is **passw0rd**

- Step 3: Navigate to **Autonomous Databases** and select the *Compartment* in which you deployed the solution. The ADW instance is deployed to the public subnet and must be moved over to a private subnet.
 - Click on the name of the ADW instance which was created by the Terraform script
 - On the *Details* page, click on **More Actions** --> **Update Network Access**

Overview » Autonomous Database » Autonomous Database Details



OCI Cost governance

DB Connection
Performance Hub
Service Console
Scale Up/Down
More Actions ▼

Autonomous Database Information
Tools
Tags

General Information

Database Name: COGSdatabaseeX

Workload Type: Data Warehouse

Compartment: [REDACTED]

Stop
Restart
Restore
Create Clone
Update Network Access

- On the *Update Network Access* page:
 - Select **Virtual cloud network** under "Access Type"
 - Select the VCN that was created by the Cost Governance Stack for "Virtual cloud network"
 - Select the private subnet created as part of the VCN you selected above under "Subnet". It should have the word **pvt** in it
 - Select **adw_network_security_group** under "Network Security Groups" and click the **Update** button

Update Network Access

Choose network access

Access Type

Allow secure access from everywhere
You can restrict access to specific IP addresses and VCNs.
Virtual cloud network
Private access only, using a VCN.

Virtual cloud network in [REDACTED] (Change Compartment)

CostGovernance-vcn

Subnet in [REDACTED] (Change Compartment)

CostGovernance-pvt_subnet

Host name prefix: Optional

The name can contain only letters and numbers and a maximum of 63 characters.

Network security groups (NSGs) ⓘ

Network Security Groups in [REDACTED] (Change Compartment)

adw_network_security_group

+ Another Network Security Group

- Step 4: Once the *Update Network Access* process has completed and the ADW instance is in the **Available** state again, note down and copy the **Fully Qualified Domain Name (FQDN)** of the ADW instance under *Network*. The FQDN value is listed under the label **Private Endpoint URL** on the ADW instance details page.



- ## Edit Private Sources

(2/30 DNS zones)

Section 3 Configure Management Module in APEX

Before you can log in to the CostGov APEX application, please complete the steps in the following section:

Setup Compute Instance and start CostGov APEX application.

Since you are deploying the CostGov solution to a private endpoint, you will need to first log in to the Compute Instance set up in [Section 2.3 above](#) using VNC and then run the Cost Gov Manager application.

PLEASE NOTE The APEX and the APEX application URLs are ***only accessible from the Compute Instance on the public subnet and not from any other network***. Both the Autonomous Data Warehouse and Oracle Analytics Cloud instances are now on a private subnet.

Logging into Compute Instance using VNC

In Order to log into the Compute Instance, you will need the following:

- Your Private SSH key that you created in [Section 2.2.5](#) above
- The IP Address of the Compute Instance you created in [Section 2.2.5](#) above
- A VNC Client installed on your local laptop/desktop (such as [RealVNC](#))
- SSH installed on your local laptop/desktop (Download from here: <https://www.ssh.com/download/>)

Once you have the VNC Client and SSH installed, carry out the following steps:

- Start a terminal window on your local computer with the following command:

```
ssh -L 5901:[xxx.xxx.xxx.xxx]:5901 opc@[xxx.xxx.xxx.xxx] -i
<location_of_private_ssh_key>
```

where [xxx.xxx.xxx.xxx] is the Public IP Address of the Compute VM

- The above command will set up a ssh connection with the Compute VM
- Start the VNC client application on your local computer and connect to the following IP Address:
localhost:5901
- The VNC client will then connect to the ssh session on the local port **5901** and will prompt you for a VNC password, please enter the following:

VNC password: **passw0rd**

You will then be logged into the remote desktop of the OCI Compute Instance via VNC Client.

Once you are logged in to the Compute Instance via VNC, continue as follows:

- Go to the OCI Console, Navigate to the ADW instance provisioned for the Cost Governance Solution and the details page, click on the **Instance Name** link under the **APEX Instance** section

Autonomous Database Information

General Information

Database Name: COGSdatabaseeX

Workload Type: Data Warehouse

Compartment: XXXXXXXXXXXXXXXXXXXX (ro

OCID: ...6x7dlq [Show](#) [Copy](#)

Created: Sun, Sep 19, 2021, 20:21:54 UTC

OCPU Count: 1

Auto Scaling: Disabled ⓘ

Storage: 1 TB

License Type: License included

Database Version: 19c

Lifecycle State: Available

Instance Type: Paid

Mode: Read/Write [Edit](#)

Operations Insights ⓘ

Status: Not Enabled [Enable](#)

APEX Instance

Instance Name: [OCI Cost governance](#)

- On the *Apex Instance Details* page, click on the link **Launch APEX**

[APEX Application Development](#) » [APEX Instances](#) » APEX Instance Details



OCI Cost governance

[Launch APEX](#)[Launch Database Actions](#)[View Database Details](#)[Add Tags](#)

- On the *Oracle Application Express* Access URL page, copy the entire URL under **Access URL**

Oracle Application Express

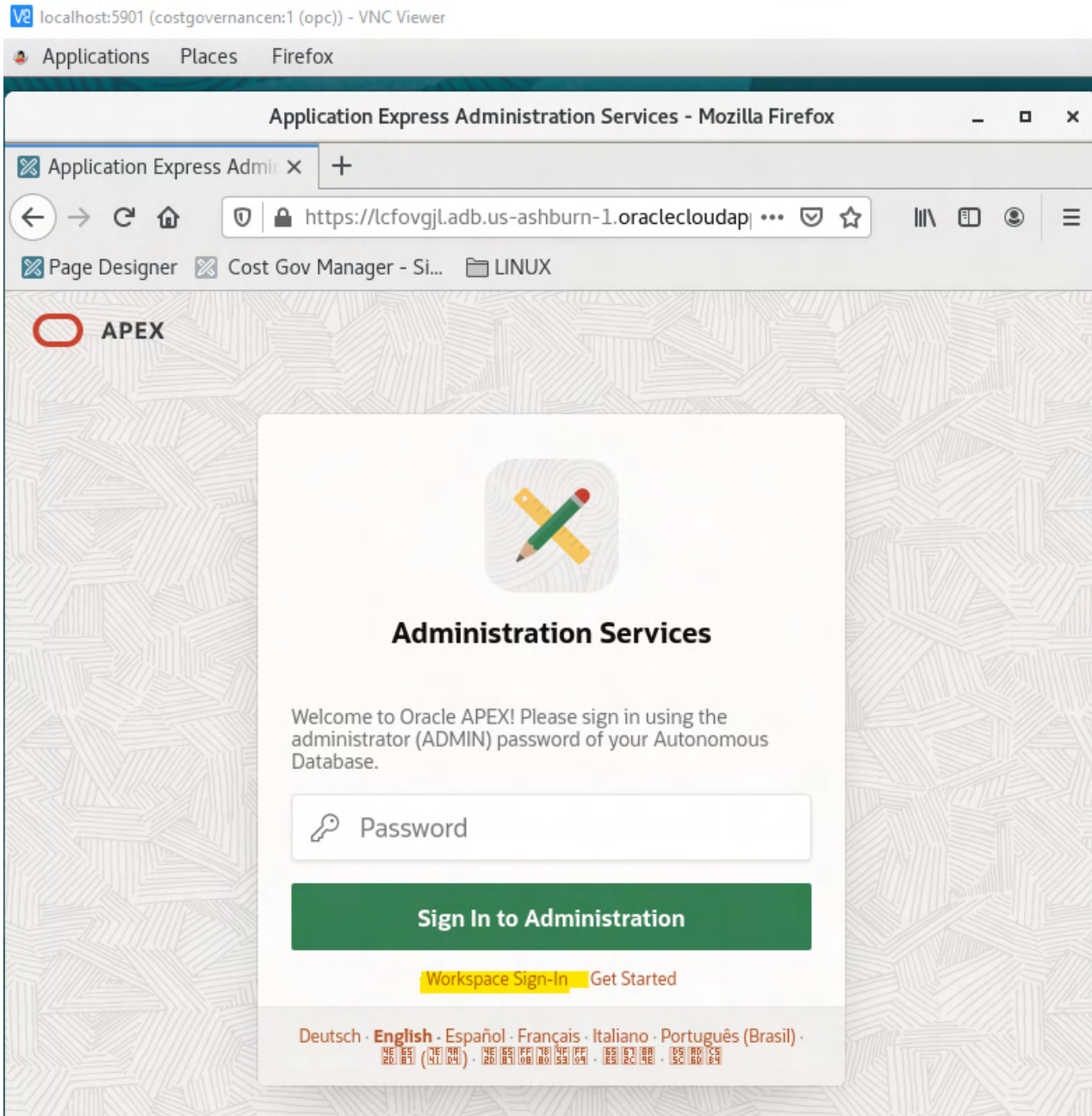
[Help](#)

Oracle Application Express uses a private IP address that is only accessible from a Compute instance running with the virtual cloud network (VCN) used by the Autonomous Database. Copy and paste the following access URL into a browser that is running on a Compute instance in the VCN. [Learn more](#).

Access URL: <https://lcfvgjl.adb.us-ashburn-1.oraclecloudapps.com/ords/apex> [Show](#) [Copy](#)

[Close](#)

- On the Compute Instance remote desktop, start a Firefox browser and navigate to the URL copied in the previous step.
- On the *APEX Administration Services* page, click on the link for **Workspace Sign-In**



- On the APEX *Workspace Sign-In* page, enter **costgov** as the *Workspace Name*, **costgov** as the *Username* and enter the ADW Database Administrator password that you set up in **Section 2.2.3** above and click **Sign In**

Application Express - Sign x

https://lcfvgjl.adb.us-ashburn-1.oraclecloudap...

Page Designer Cost Gov Manager - Si... LINUX

APEX

Oracle Application Express

costgov ✓

costgov ✓

..... ✓

☒ Remember workspace and username ?

Sign In

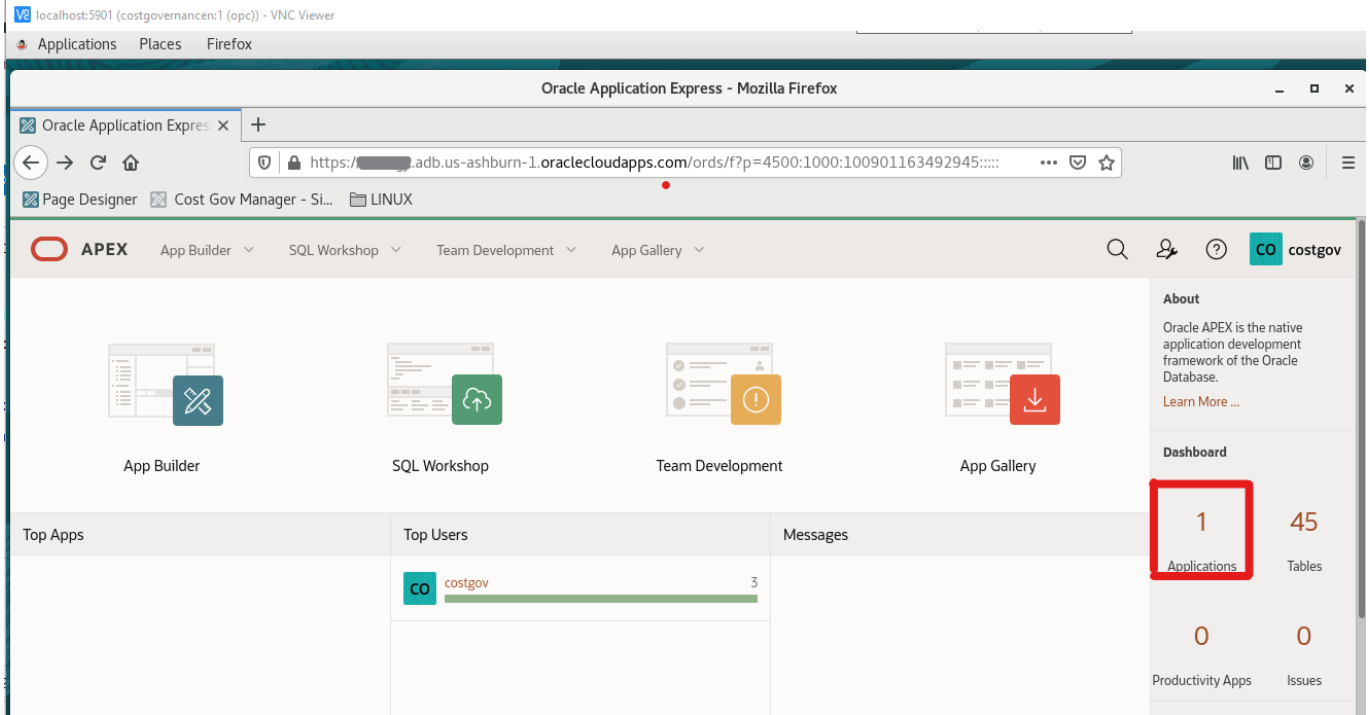
[Administration Services](#) [Get Started](#)

Deutsch · **English** · Español · Français · Italiano · Português (Brasil) ·

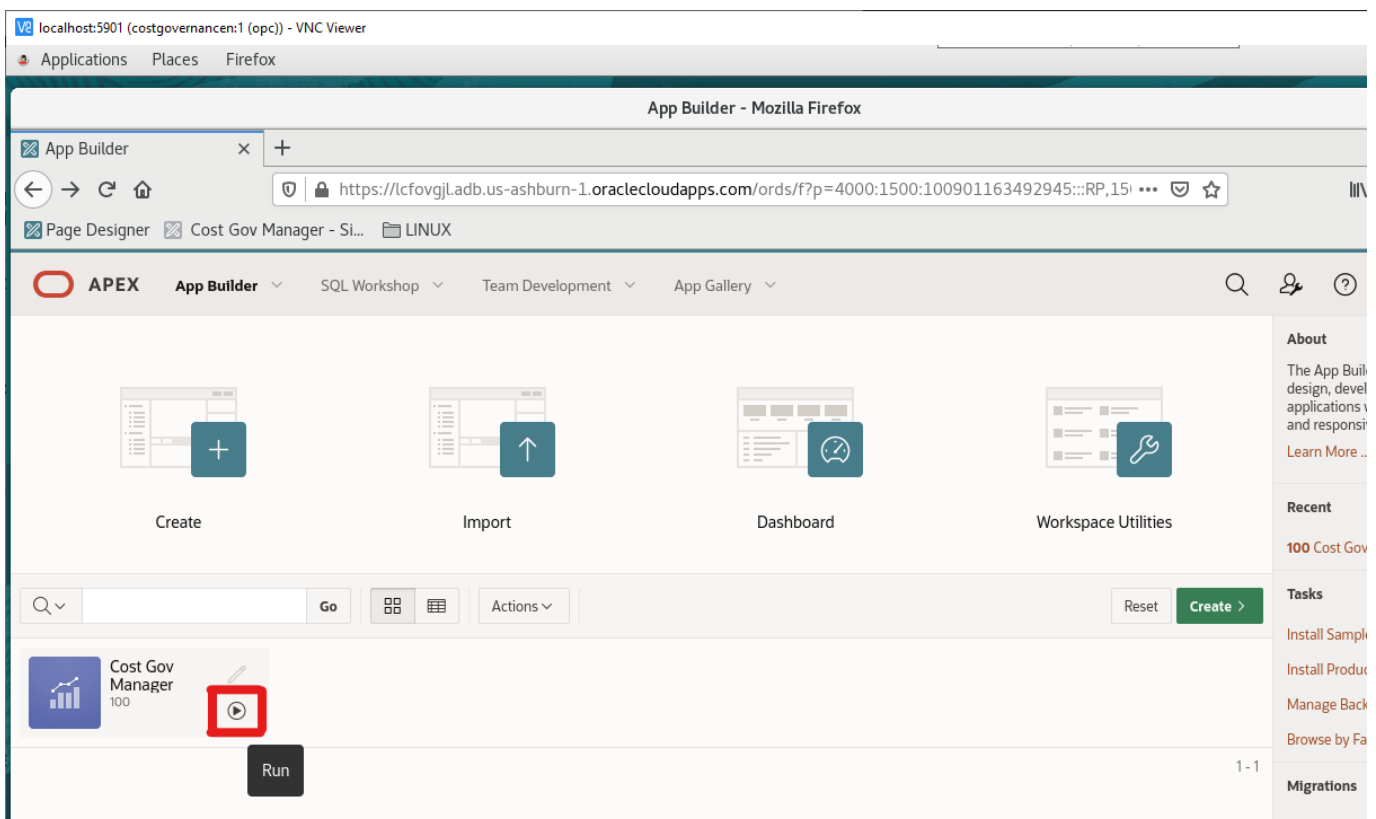
4E 65 7E 9A 20 81 41 04 4E 65 FF 78 4F FF 65 67 8A 05 8D C5 20 81 08 80 53 05 65 2C 9E 5C 60 65

- Once logged in as **costgov** and when you can see the main screen, click on the link for the Application under **Dashboard**. The link is shown in the red rectangle below

Cost Governance

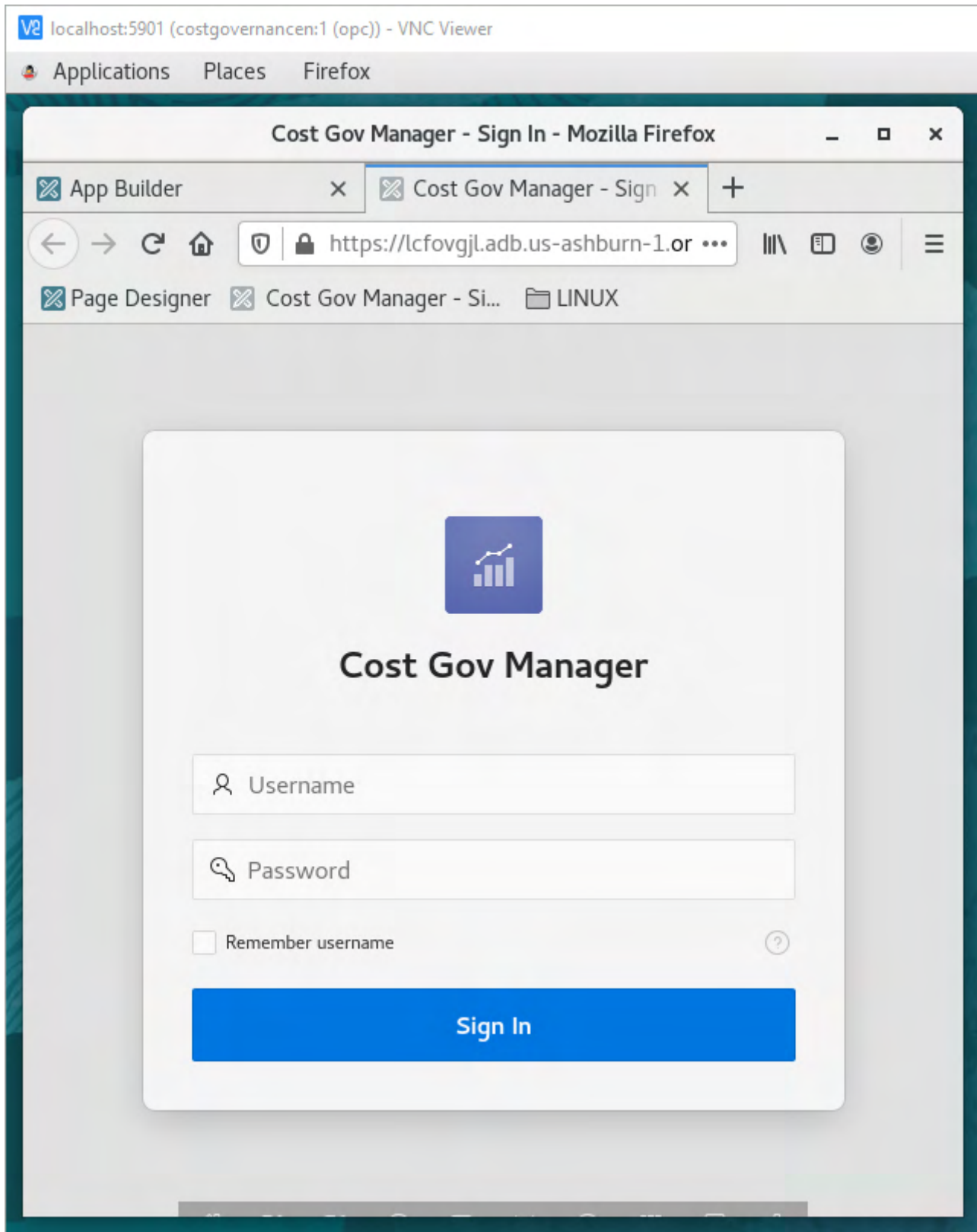


- On the page, you should see the **Cost Gov Manager** as the only application available. Hover over the application icon and it should show a **Start** button to **Run** the application. Click on the **Run** button to start the Cost Gov Manager application. The button to click is shown in the red rectangle below



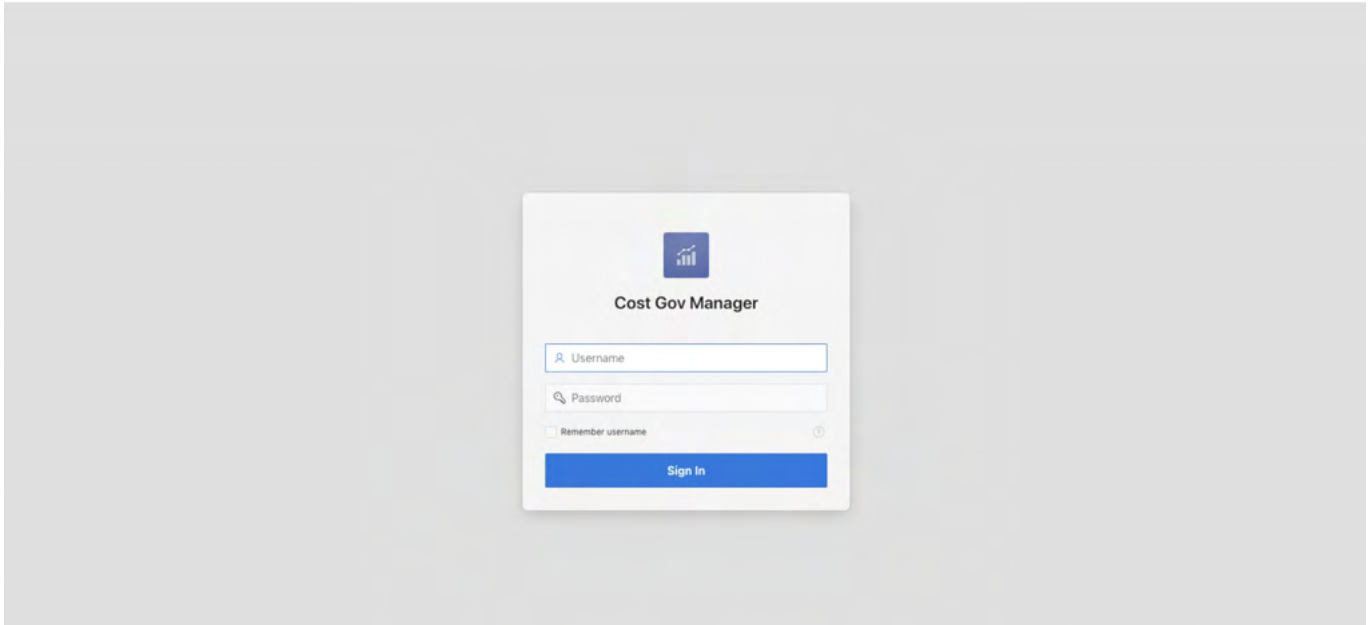
- Once you can see the screen below, you can continue with the Cost Gov configuration set up in Section 3.

NOTE: Please Bookmark the Cost Gov Manager link to the Firefox browser on the VNC Server so that you can easily find it again without having to do steps 6 through 9 above again

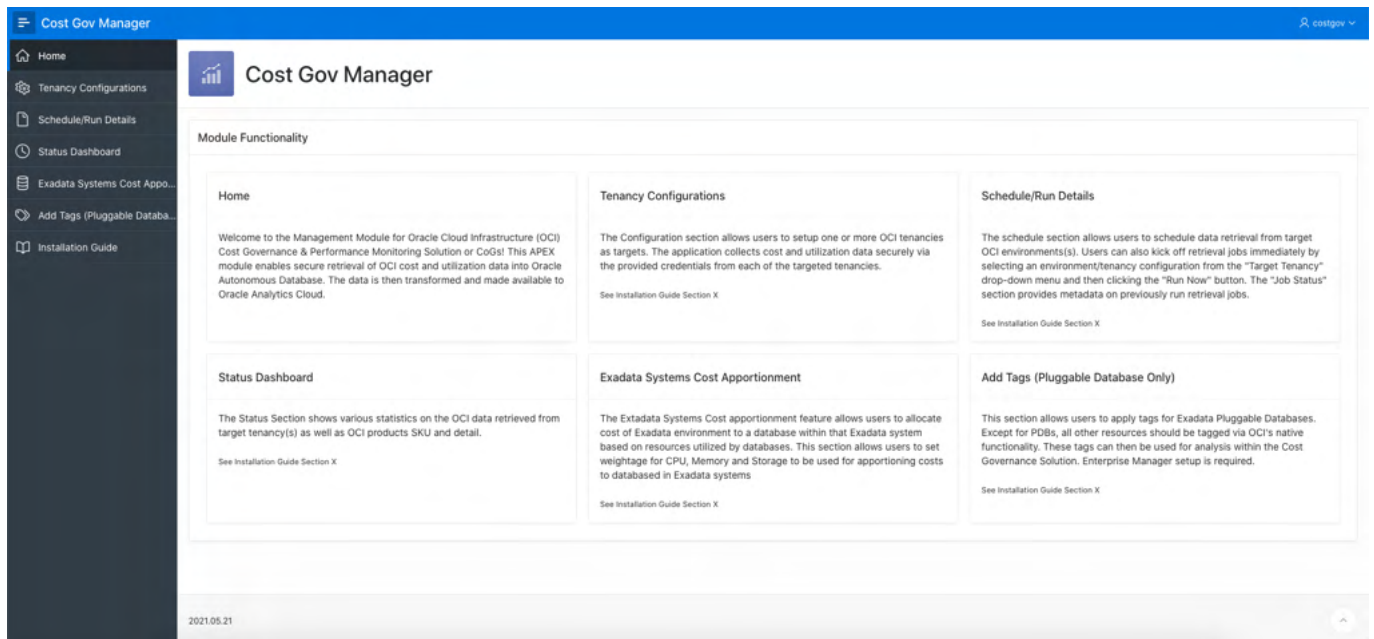


Section 3.1 Log In to the Cost Governance Solution Manager

- Step 1: Log in to the application **Cost Gov Manager**. Enter your **Username - COSTGOV** and **Password** (Hint: Database password created earlier) and click **Sign In**.

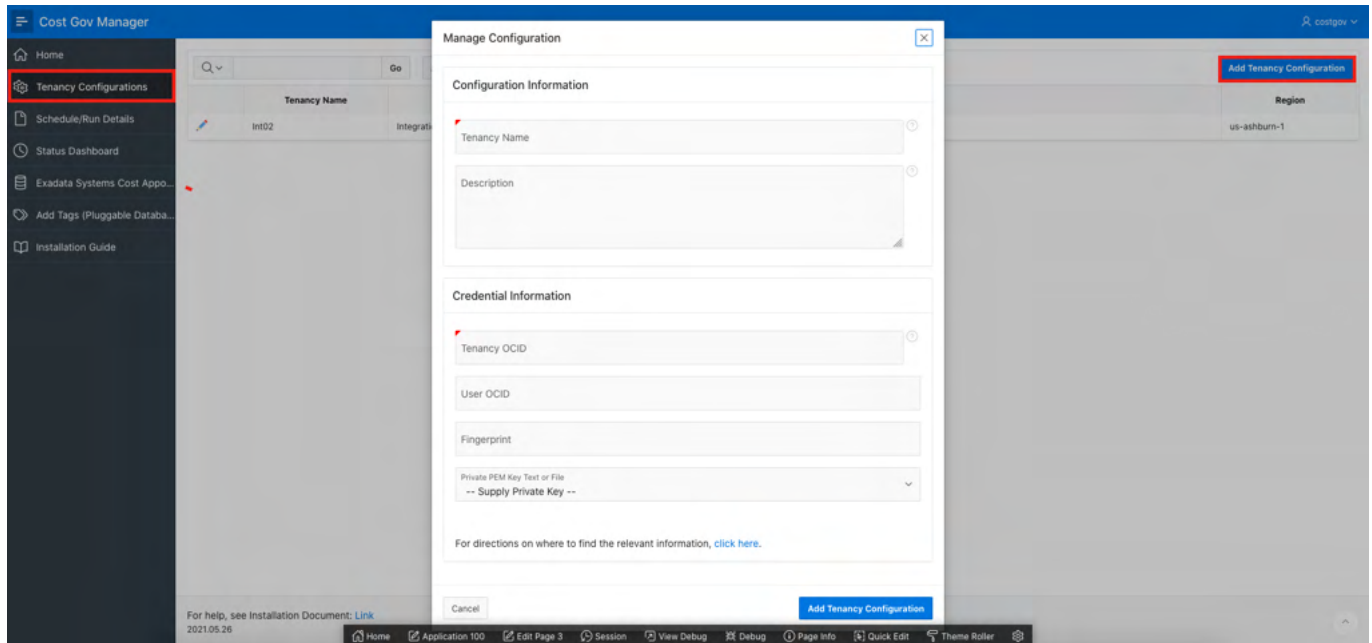


Welcome the Management Module!



Section 3.2 Configure Cost Governance Solution Manager

- Step 1: Navigate to Configurations tab by clicking **Tenancy Configurations** on the left-hand menu.
- Step 2: Click the **Create Tenancy Configuration** button (Hint: Located on the top-right).

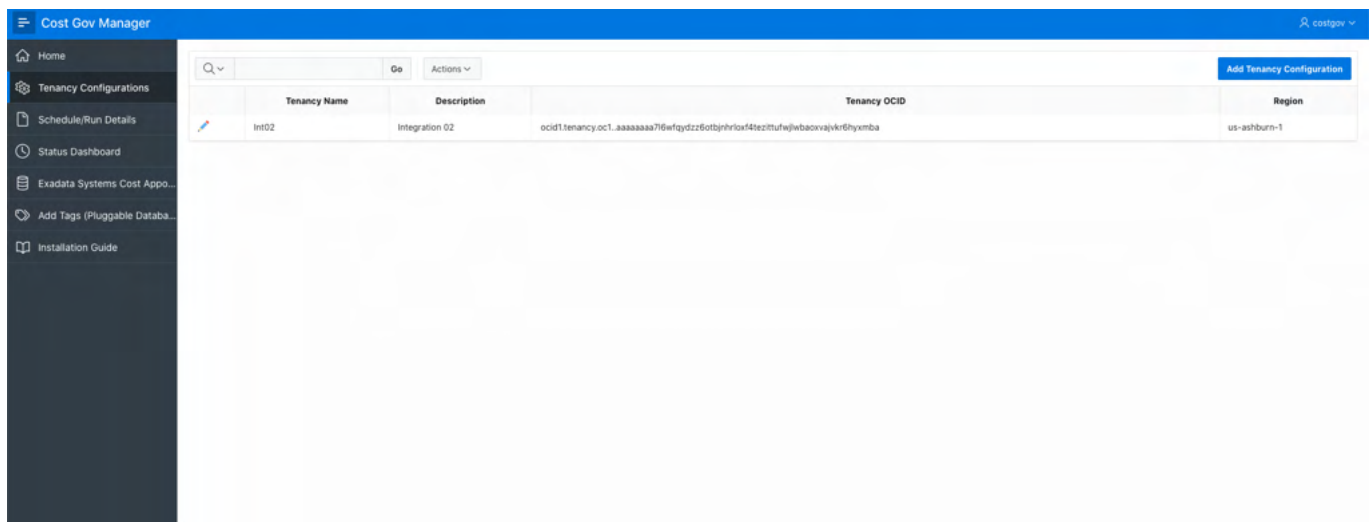


Fill in:

- Config Name - (Hint: Choose any name)
- Description (Optional)
- Tenancy OCID
- User OCID - (Hint: User must have sufficient privileges)
- Fingerprint
- Private Key Text - (Hint: Downloaded earlier along with the public key.)

For more on how to locate aforementioned information see [link](#).

- Step 3: Click **Add Tenancy Configuration** to complete environment configuration.



Note: The Management module allows data retrieval from multiple OCI Tenancies. For each OCI Tenancy, a separate configuration setup is needed. Repeat steps in Section 3.2 to configure each separate OCI Tenancy.

- Step 4: Navigate to **Schedule/Run Details** tab, select Tenancy from the **Configuration drop-down menu** and click **Run Now** (Hint: This will kick off data retrieval from the configured OCI Instance into the Autonomous Data Warehouse. First time data retrieval may take several hours.)

IMPORTANT:

Single Tenancy configuration: Allow the First Run/Schedule Job to complete before moving to Section 4.3 Analytics Dashboard Setup. Step 5 shows how to confirm status of data retrieval jobs.

Multi-Tenancy configuration: Multiple tenancies may be configured in this module, however, it is important not to run or schedule concurrent data retrieval jobs. Also, allow at least one Run jobs per tenancy to complete before proceeding to Section 4.3 Analytics Dashboard Setup.

- Step 5: From the left-hand menu, navigate to **Status Dashboard**, then **Select Tenancy Configuration** to review status of data retrieval jobs. Please proceed with the rest of the configuration while the data retrieval runs in the background. (Hint: First time retrieval of OCI cost and monitoring data may take several hours to complete.)

The screenshot displays the 'Cost Gov Manager' interface. On the left is a dark sidebar with navigation links: Home, Tenancy Configurations, Schedule/Run Details, Status Dashboard (selected), Exadata Systems Cost Appo..., Add Tags (Pluggable Databa..., and Installation Guide. The main content area is titled 'Status Dashboard' and features a dropdown menu 'Select Tenancy Configuration --' with 'INT02' selected. Below this is a 'Statistics' section with eight cards arranged in two rows. The first row contains 'Earliest Cost Date' (orange), 'Latest Cost Date' (orange), 'Earliest Compute Metrics Date' (light blue), and 'Latest Compute Metrics Date' (light blue). The second row contains 'Number of Tenancies' (pink), 'Total Files Available' (pink), 'Total Files Processed' (pink), and 'Total SKUs Count' (green). All cards show a value of '0'. At the bottom, there is a search bar with a magnifying glass icon and a footer with the date '2021.05.26' and a series of utility links: Home, Application 100, Edit Page 10, Session, View Debug, Debug, Page Info, Quick Edit, and Theme Roller.

Statistics			
Earliest Cost Date	Latest Cost Date	Earliest Compute Metrics Date	Latest Compute Metrics Date
-	-	-	-
Number of Tenancies	Total Files Available	Total Files Processed	Total SKUs Count
0	0	0	0

Section 3.3 Schedule OCI data retrieval

- Step 1: Navigate to the **Schedule/Run Details** tab.
- Step 2: Click the pencil under **Edit Schedule** tab next to configuration just created.

Cost Gov Manager

Home

Tenancy Configurations

Schedule/Run Details

Status Dashboard

Exadata Systems Cost Appo...

Add Tags (Pluggable Databa...

Installation Guide

Current Server Time
27-may-2021 04:19:41

Run Now

Tenancy Name
Int02

Run Now

Job Schedule

Edit Schedule	Tenancy Name	Job Name	Repeat Interval	State	Last Start Date	Next Run Date	Run Count
	Int02	-	-	-	-	-	-

Job History - Last 30 Days

Q v Go

Tenancy Name	Job Name	Status	Req Start Date	Actual Start Date	Run Duration	Cpu Used	Additional Info
Int02	COSTGOV_W9KABK4XN7_RUN_NOW	STOPPED	26-MAY-2021 14:54:50	26-MAY-2021 14:54:56	+000000000 03:02:32.000000000	+000000000 00:00:00.000000000	ORA-01014: ORACLE shutdown in progress

2021.05.26

Home Application 100 Edit Page 4 Session View Debug Debug Page Info Quick Edit Theme Roller

- Step 3: Schedule OCI Cost and Monitoring Data retrieval by choosing a suitable job interval frequency and start time
 - Job Interval - Hourly cadence, Daily or Weekly
 - Start Date - Use the date picker to choose a start date and time. Click **Close** to confirm your selection. [Hint: Time is in Universal Time Coordinated (UTC)]

Schedule Manager

Scheduler Details

No schedule exists.

Create / Update Schedule

Job Interval
Daily

Start Date

Cancel

Create / Update

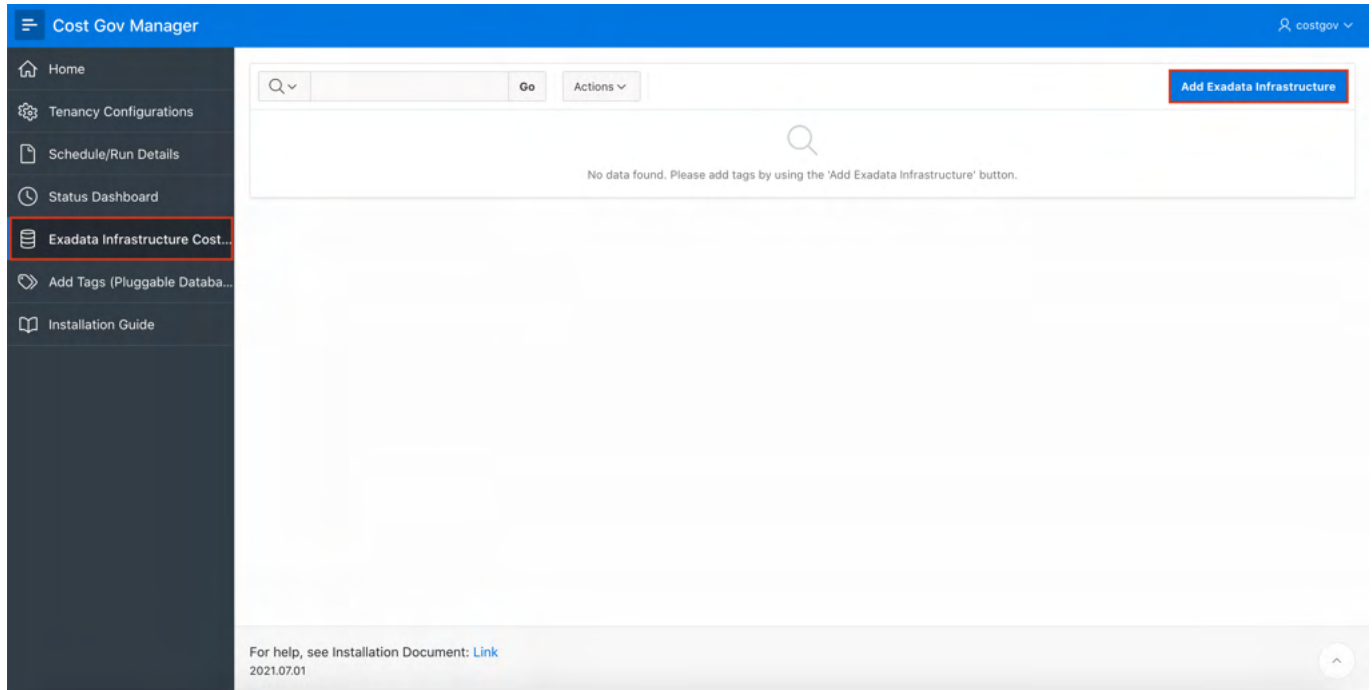
- Step 4: Click **Create/Update**.

(Hint: This selection will be disabled if a data retrieval job is running. Wait for the job to finish and then schedule job frequency.)

Section 3.4 Exadata Infrastructure Cost Apportionment

Cost Apportionment allows users to set proportions for storage and CPU usage. These values are used in calculations for the Exadata Dashboards mentioned in Section 4.7.

- Step 1: Click on Exadata Infrastructure Cost Apportionment, then click **Add Exadata Infrastructure**



- Step 2: Enter tenancy and Exadata names. Then in the cost apportionment Ratio, enter percentage of usage for CPU and storage in your Exadata infrastructure.

Add Exadata System Cost Apportionment Ratio

Tenancy Name

Exadata Infrastructure Name

Cost Apportionment Ratio

CPU
0

Storage
0

Total
0

For help, see Installation Document [Link](#)

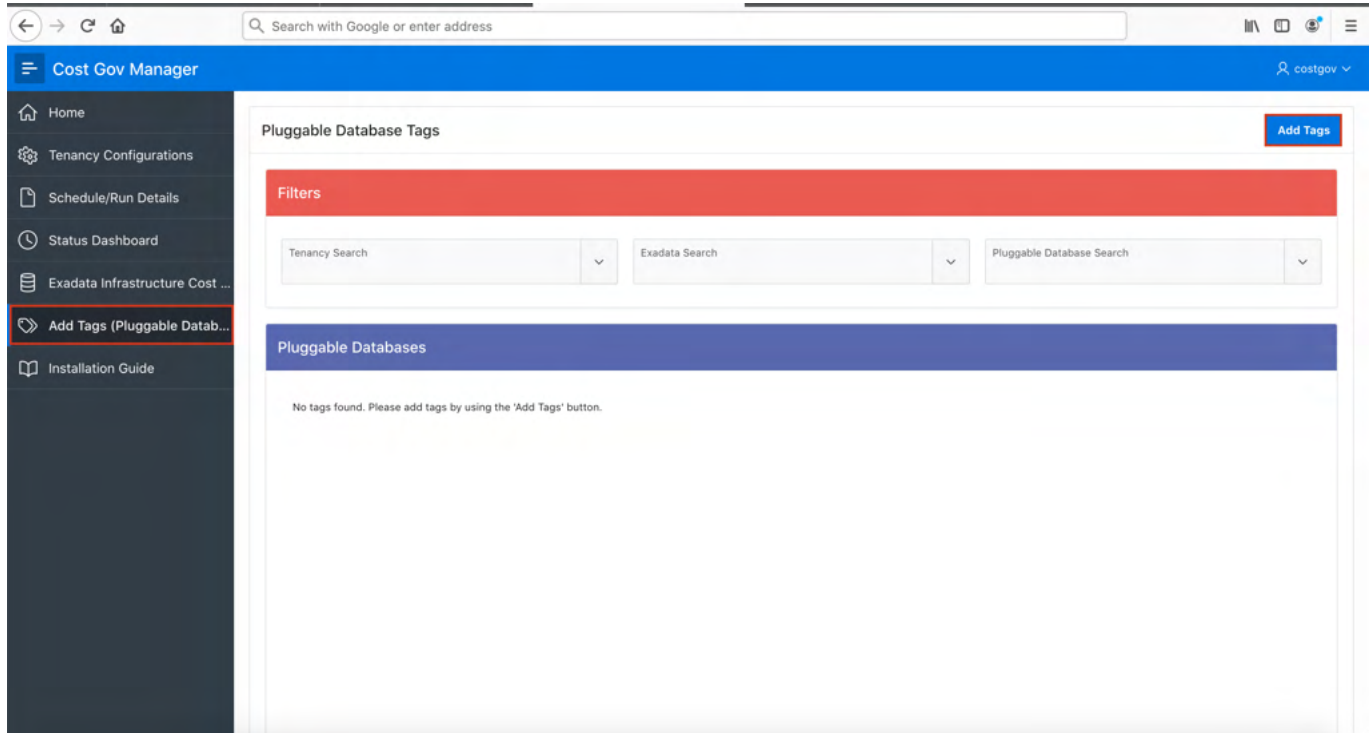
Cancel

Add

Section 3.5 Add Pluggable Database Tags

The ability to add pluggable database tags is an *optional* feature for those who have an Exadata system being monitored by Oracle Enterprise Manager. By tagging a pluggable database, more granular metrics will be recorded for that database.

- Step 1: Navigate to Add Tags (Pluggable Database) then click on **Add Tags**



- Step 2: After clicking on **Add Tags** fill out form to tag a pluggable database (PDB) from an exadata system. The visualizations for the added databases will be created in the **Tag Insights** dashboard talked about in Section 4.7

Edit Pluggable Database Tags



Tenancy Name



Exadata Systems Name



Pluggable Database Name



Tag Name



Tag Value



Start Time

7/2/2021

End Time


**Create**

Section 4 Oracle Analytics Cloud

Section 4.1 Navigate to Oracle Analytics Cloud

- Step 1: Navigate to your Oracle Analytics Cloud Instance by clicking **Analytics URL** (Hint: Oracle Analytics URL is located in Application Information tab on Stack Detail page).

Resource Manager » Stacks » Stack Details » Job Details



SUCCEEDED

apply-job-20200807001139

Edit Job Download Terraform Configuration Download Terraform State Add Tags

Job Information Tags Application Information

ORACLE
Ezbase

Oracle Cost Governance

Oracle Cost Governance on Oracle Cloud Infrastructure

Application

Instructions: ...g provisioning. [Show](#) [Copy](#)

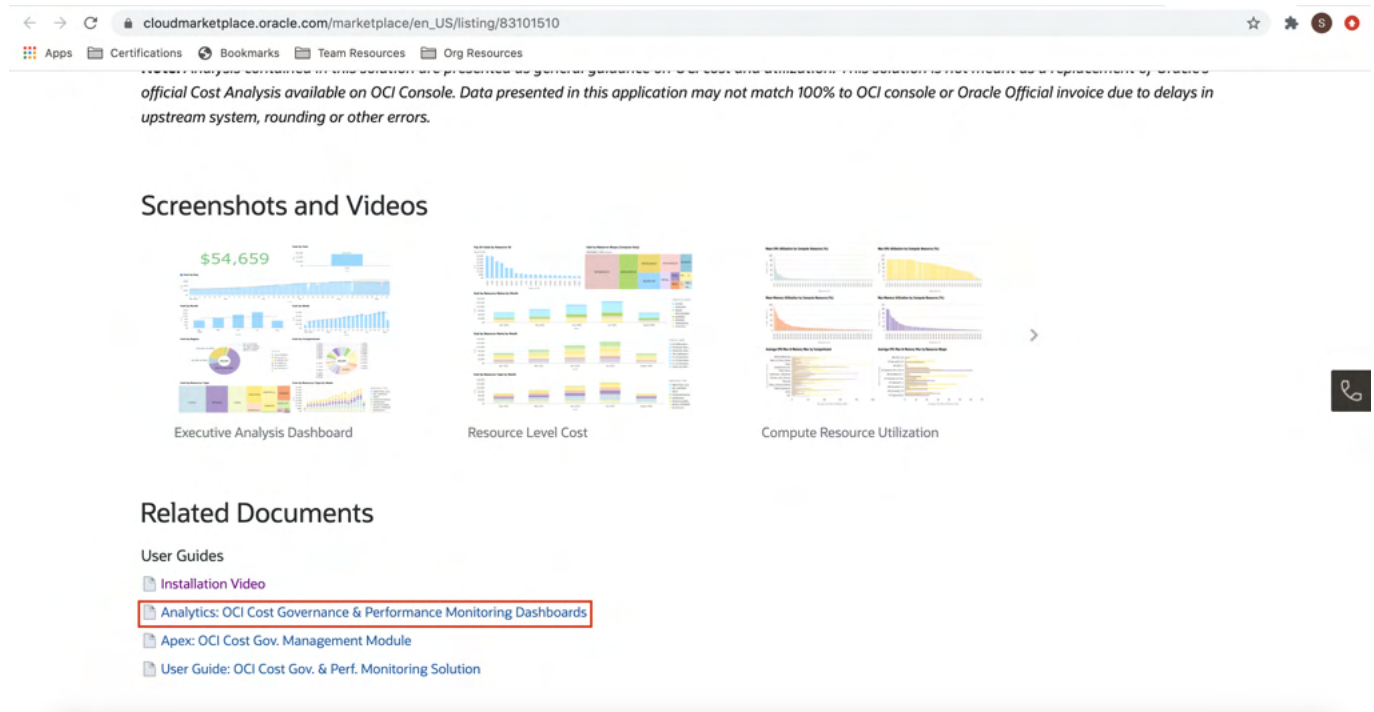
Analytics URL: ...lecloud.com/ui/ [Show](#) [Copy](#)

Apex URL: ...s.com/ords/apex [Show](#) [Copy](#)

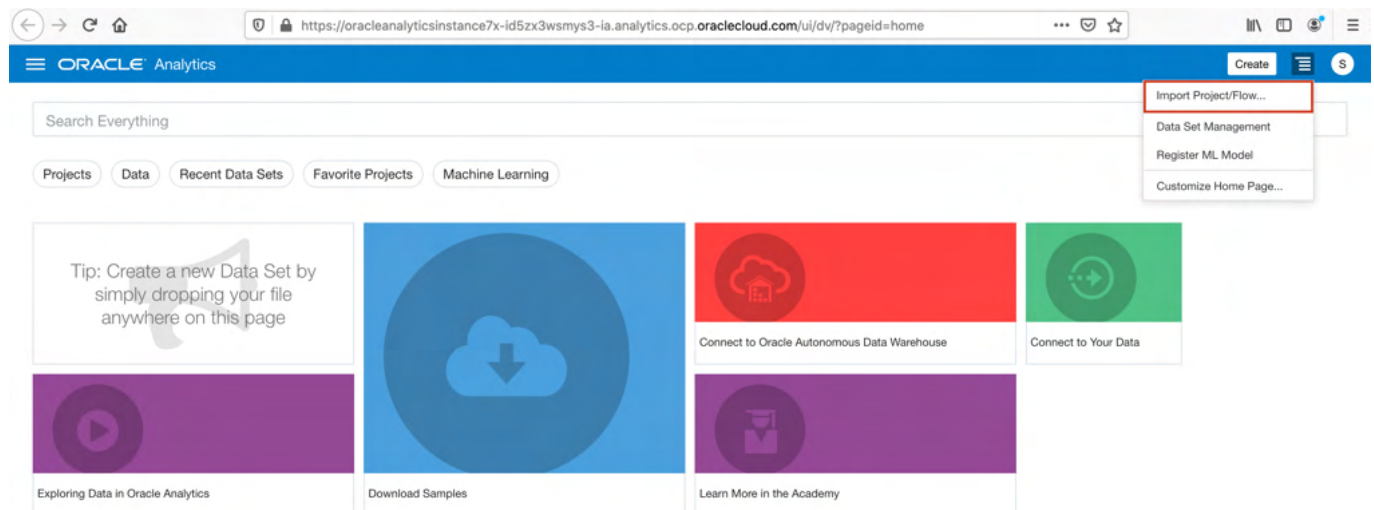
[View Instructions](#)

Section 4.2 Import the Analytics: OCI Cost Governance & Performance Insights Dashboards file into the OAC Instance

- Step 1: Navigate to the Cost Governance & Performance Insights Project OCI Marketplace listing [link](#) and **Download:Analytics: OCI Cost Governance & Performance Insights Dashboards**



- Step 2: From OAC Home page, click on the Right Hamburger Menu icon and select **Import Project/Flow**.



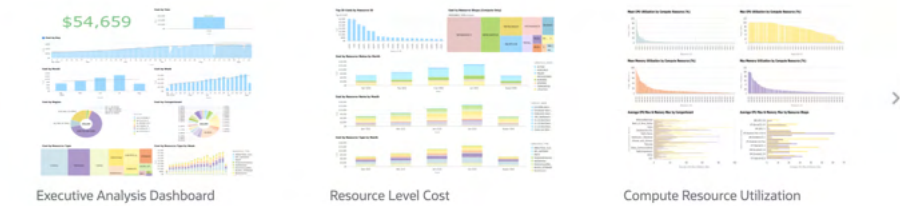
- Step 3: In the Import Project/Flow dialog, click **Select File** or drag the Analytics: OCI Cost Governance & Performance Insights Dashboards file (Costgov_Analytics_v2.dva) project onto the dialog, then click **Import**. (Hint: For help visit [link](#))

cloudmarketplace.oracle.com/marketplace/en_US/listing/83101510

Apps Certifications Bookmarks Team Resources Org Resources

official Cost Analysis available on OCI Console. Data presented in this application may not match 100% to OCI console or Oracle Official invoice due to delays in upstream system, rounding or other errors.

Screenshots and Videos



Executive Analysis Dashboard Resource Level Cost Compute Resource Utilization

Related Documents

User Guides

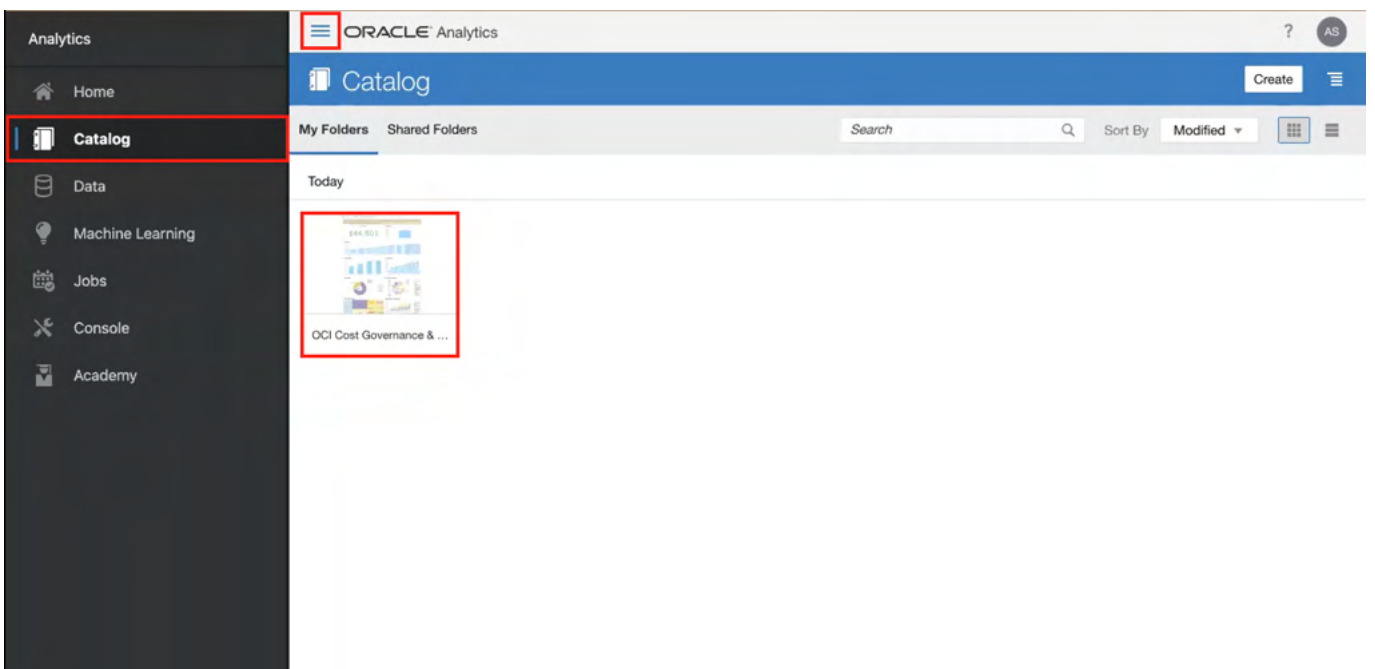
- Installation Video
- Analytics: OCI Cost Governance & Performance Monitoring Dashboards
- Apex: OCI Cost Gov. Management Module
- User Guide: OCI Cost Gov. & Perf. Monitoring Solution

- Step 4: After project has been successfully imported Click **OK** (Note: This may take a few minutes).

Section 4.3 Access OCI Cost Governance & Performance Insights Project

- Step 1: From the OAC Home page, click on Left Hamburger Menu and select **Catalog**.
- Step 2: Verify that the project named **OCI Cost Governance and Performance Insights - v2** has been imported. We will navigate back to this page later.

Note: Do not open the catalog.



Analytics

Home

Catalog

Data

Machine Learning

Jobs

Console

Academy

ORACLE Analytics

Catalog

Create

My Folders Shared Folders

Search

Sort By Modified

Today

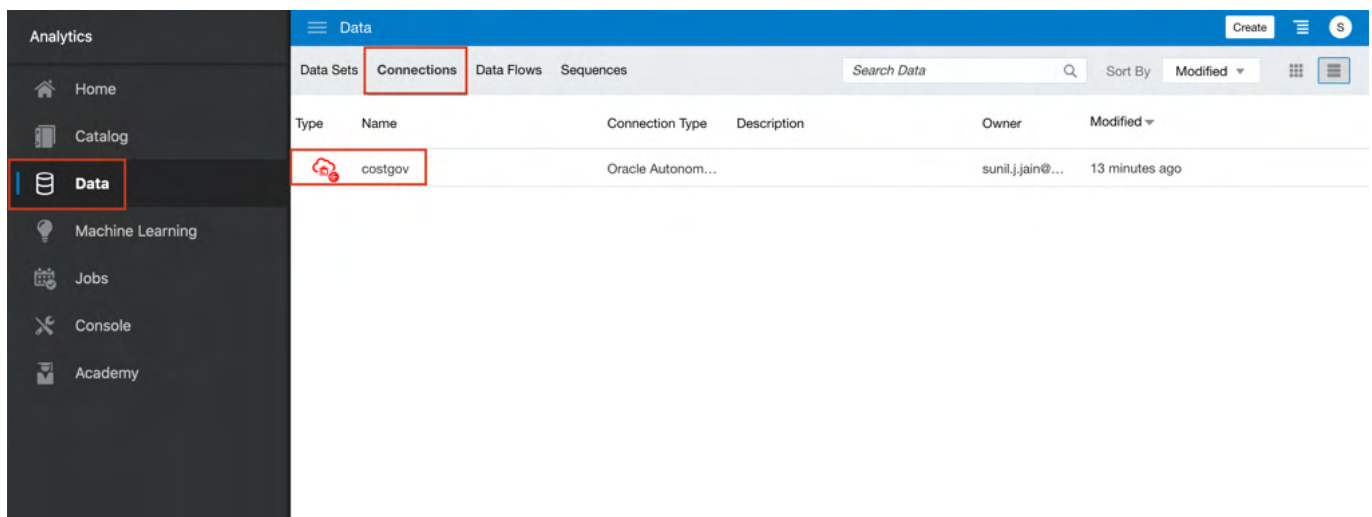
OCI Cost Governance & ...

Section 4.4 Establish Connection Between ADW and OCI Cost Governance Project

- Step 1: Download the wallet file from your Autonomous Data Warehouse. Autonomous Database URL is located in **Application Information** tab on Stack Detail page (Hint: For detailed instructions regarding these steps see [link](#)).

Note: User Name is admin and password is the password that was set during the application build process.

- Step 2: From your Oracle Analytics Cloud instance Home page, click the top left hamburger menu and select **Data**.
- Step 3: Navigate to the tab labeled **Connections** and locate the **Data Connection** called **costgov**.



- Step 4: Right-Click on the connection labeled **costgov** and select **Inspect**.
- Step 5: In the General page, enter the following:
 - Connection Name: **costgov**
 - Description - Add description as needed
 - Service Name - Auto-populated with Step 6 below
 - Username: **costgov**
 - Client Credentials - Auto-populated with Step 6 below
 - Password - (Hint: Database Password provided during stack creation)

Oracle Analytics

Data

costgov Connection

Save Close

Create

Data Sets Connections Data Flows Sequences

Type Name

costgov

General

Access

Oracle Autonomous Data Warehouse

* Connection Name costgov

Description

* Service Name costgovdb3107_high

* Client Credentials ☒ cwallet.sso Select...

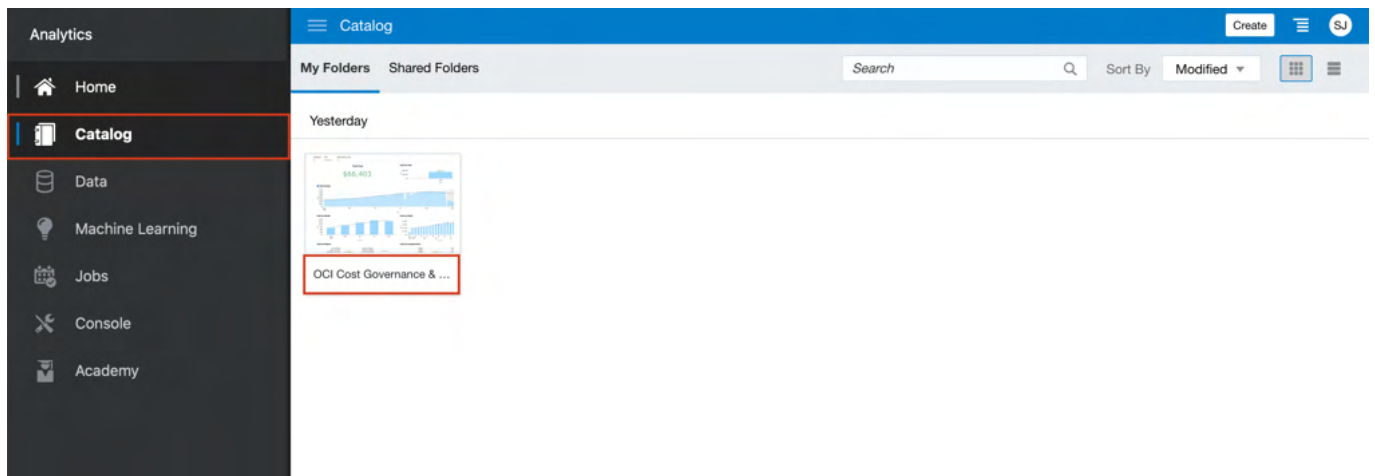
* Username costgov

* Password

- Step 6: For Client Credentials, click the **Select...** box and choose the appropriate ADW Wallet File downloaded earlier in Step 1. This will populate both the Client Credentials field and the Service Name.
- Step 7: Click **Save** and then click **Close**.

Section 4.5 Access your Cost Gov Project

- Step 1: Navigate back to your OAC **Catalog**.
- Step 2: Click on the project named **OCI Cost Governance & Performance Insights - V2** to open it.



- Step 3: You can navigate between canvases by clicking on the different tabs below. If the charts do not populate automatically, click the **refresh** button located near the top-right of each canvas.

Section 4.6 Troubleshooting: Canvases or Charts not loading

Initially, certain canvases or charts may not load or may show as data not available/empty.

Causes:

- First time data retrieval may take hours to complete. To confirm data has been loaded, please check the **Cost and Monitoring Statistics** dashboard.
- Tags may not be setup on the target tenancy per OCI guidelines. For more on OCI tags visit [LINK](#).
- Analysis and views may be impacted or partially available if Compartments and Sub-compartments are not set up per OCI guidelines.

If the problem persists, please try the following:

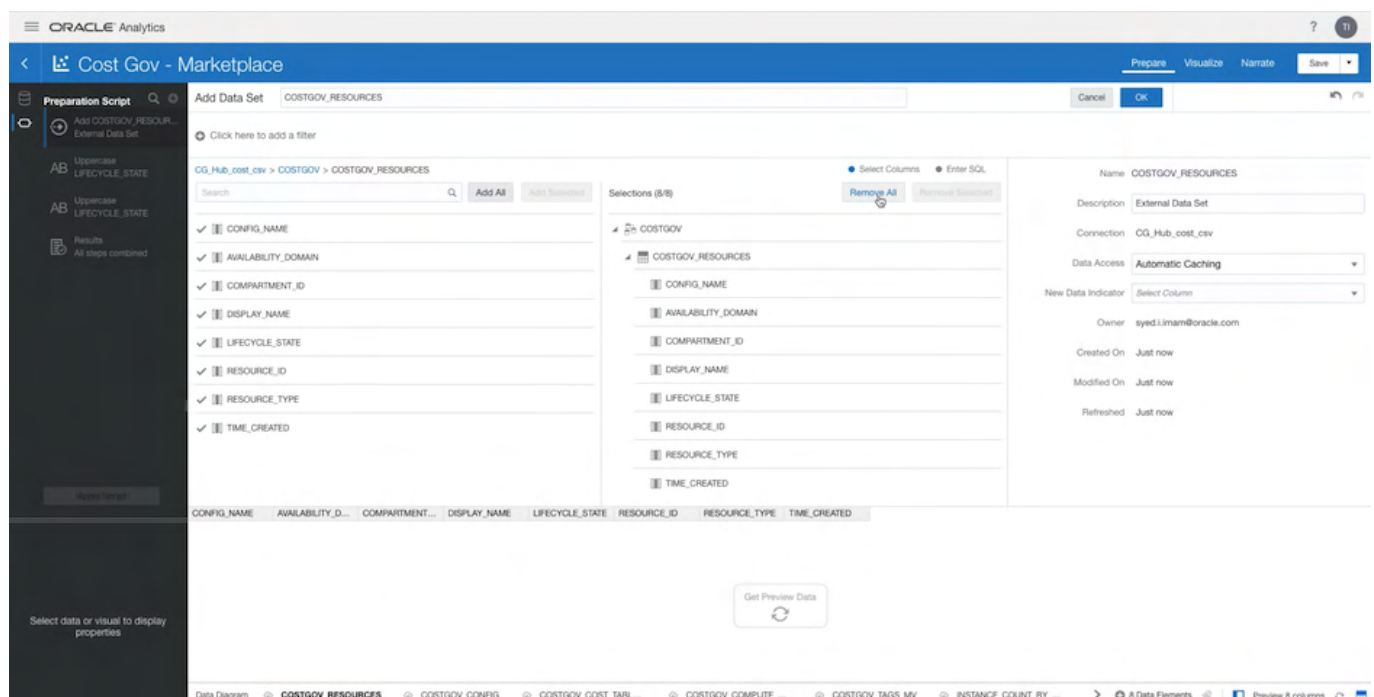
Tip 1:

Navigate to the **Data** tab. For each data set click the pencil icon, then click the Profile button at the center of the screen to see a sample of the retrieved data.

Tip 2:

Follow the steps below if you experience issues with data retrieval:

- After clicking the pencil icon, click on **Edit Definition**.
- Click **Remove All** (Hint: All columns should have been removed)



- Click **Add All** (Hint: All columns will be re-added)
- Click **OK**

You will need to repeat these four steps for each of the datasets listed across in the Data tab.

Cost Governance

Dataset	Join	Dataset
INSTANCE_COUNT_BY_BIN_LAST_30_DAYS	No	INSTANCE_COUNT_BY_BIN_LAST_60_DAYS
		INSTANCE_COUNT_BY_BIN_LAST_90_DAYS
		COSTGOV_COST_RESOURCES_MV
		COSTGOV_METRICS_RESOURCES_MV
		COSTGOV_COST_TAGS_MV
		COST_METRICS_STATISTICS_DASHBOARD
		SKU_STATISTICS_DASHBOARD
INSTANCE_COUNT_BY_BIN_LAST_60_DAYS	No	INSTANCE_COUNT_BY_BIN_LAST_90_DAYS
		COSTGOV_COST_RESOURCES_MV
		COSTGOV_METRICS_RESOURCES_MV
		COSTGOV_COST_TAGS_MV
		COST_METRICS_STATISTICS_DASHBOARD
		SKU_STATISTICS_DASHBOARD
INSTANCE_COUNT_BY_BIN_LAST_90_DAYS	No	COSTGOV_COST_RESOURCES_MV
		COSTGOV_METRICS_RESOURCES_MV
		COSTGOV_COST_TAGS_MV
		COST_METRICS_STATISTICS_DASHBOARD
		SKU_STATISTICS_DASHBOARD
COSTGOV_COST_RESOURCES_MV	CONFIG_NAME DAY RESOURCE_ID	COSTGOV_METRICS_RESOURCES_MV
	CONFIG_NAME	COSTGOV_COST_TAGS_MV
		COST_METRICS_STATISTICS_DASHBOARD
COSTGOV_METRICS_RESOURCES_MV	CONFIG_NAME DAY RESOURCE_ID	SKU_STATISTICS_DASHBOARD
		COSTGOV_COST_TAGS_MV
	CONFIG_NAME	COST_METRICS_STATISTICS_DASHBOARD
COSTGOV_COST_TAGS_MV	CONFIG_NAME	SKU_STATISTICS_DASHBOARD
		COST_METRICS_STATISTICS_DASHBOARD
COST_METRICS_STATISTICS_DASHBOARD	CONFIG_NAME	SKU_STATISTICS_DASHBOARD

After removing and re-adding all of the columns for all tables, navigate to the **Visualize** tab to see your Cost Governance data populated in the dashboards.

Section 4.7 Dashboard Descriptions

OCI Cost Governance & Performance Insights project comes with a default set of dashboards. Users can customize these dashboards or create new ones based on existing/additional data sources (e.g. departmental budget). Each canvas has universal filters (except for **Resource Utilization Trends** dashboard) at the top that can be used to slice and dice canvas insights. Additionally, dynamic filtering enables users to filter by any element on a chart (e.g. Compartment name) by right-clicking and choosing **Keep Selected**.

Cost and Utilization Statistics Dashboard

- This Dashboard contains metadata on OCI cost and usage information stored in the application's database. Information includes earliest and latest cost dates, earliest and latest utilization dates, number of days for which the data has been processed, SKU information etc.

Executive Insights

- The Executive Insights dashboard provides spending insights at a high level, meant for Executives review. The visuals on this dashboard showcase overall cost, daily/weekly/monthly cost breakdowns, cost by different Oracle Cloud Infrastructure (OCI) services, cost by compartments and more. Universal filters provide means to slice the data by OCI Environments/Tenancies (in case of multi-tenancy deployment), by date range, and by resource/service types. Dynamic filtering allows users to filter by any component (right-click > **Keep Selected**) within the dashboard. Users can bring in more data elements and customize the dashboard further. The export feature allows the export of this dashboard for external presentation.

Tag Insights

- The Tags Insight dashboard shows resource costs (Database and non-database) based on Tags. In OCI, customers can Tag resources based on Lines of Business, Applications, Projects or other business groupings. For more on OCI tags visit [LINK](#).

Resource-Level Insights

- The Resource-Level Insights dashboard showcases spending by Resource ID, resource shape, resource lifecycle state, and resource type. Shows costs and count values for compute and all other resource types (Hint: A Resource ID is a unique ID assigned to a resource in Oracle Cloud Infrastructure (OCI)).

Compute Resource Utilization Insights

- Compute Resource Utilization Insights provides details on resource utilization. Matrices include Average CPU, Max CPU, Average Memory and Max Memory.

Resource Utilization Insights

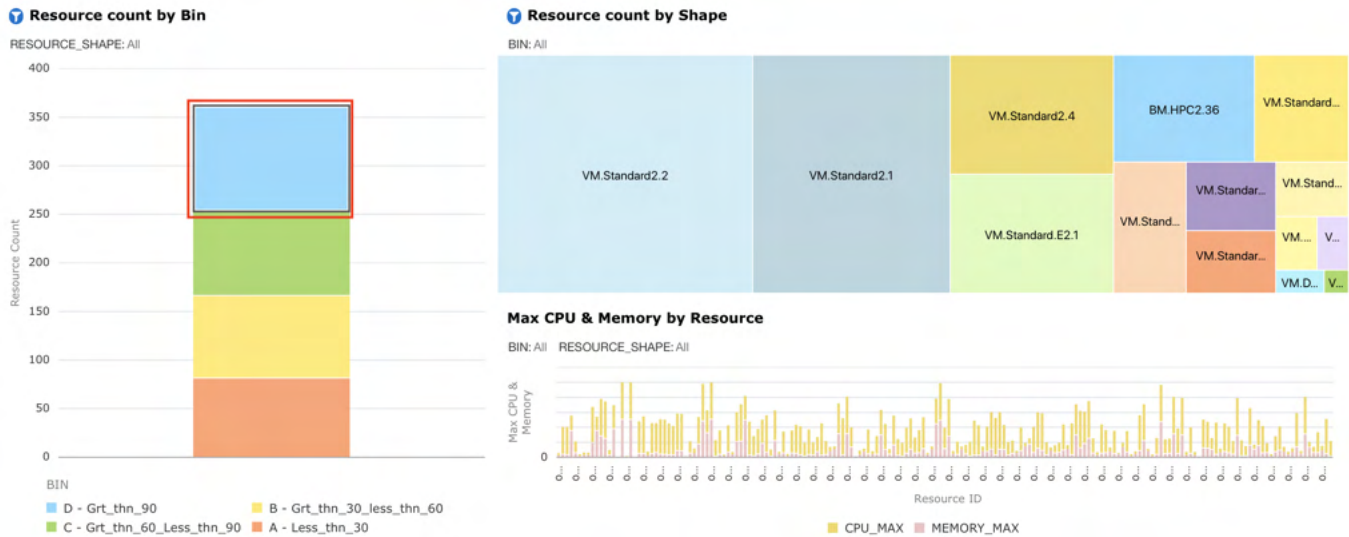
- Resource Utilization Insights showcases all resources that fall under four manually created bins/groups based on their hourly utilization in the last 7, 14, 30, 60, 90, and 180 days. The four bins in this analysis are:
 - utilization < 30%
 - 30% <= utilization < 60%
 - 60% <= utilization < 90%
 - utilization >= 90%
- This dashboard enables decision-makers to see which resources are either constantly under-utilized and may need to be scaled down or over-utilized and may need to be scaled up. Here utilization = Max (Max CPU, Max Memory).

Note: Utilization details shown on this dashboard should only be one of the considerations when deciding whether or not to increase or decrease capacity. Please consult application owners, users and other relevant stakeholders before making any decisions, e.g. an application may have been deliberately over-provisioned due to anticipated demand.

- **Navigation:**

- For **Resource Utilization – Last 30 days** section:
 - Step 1: Select **Timeline** from global filters at the top of dashboard. Click on any bin (red/yellow/green/blue box) inside the *Count - Resource Utilization Bin* chart (as shown in the red highlighted area in the image below). Once selected, *Count - Resource Shape* automatically adjusts to show the number of resources by compute shape within the bin. [Hint: The latest configuration of VMs are considered in this insight.]

Similarly, the *Max CPU % & Max Memory % - Resource ID* chart will automatically adjust to show resources and their respective Max CPU and Max Memory values over the selected timeline in that bin.



- Step 2: To further drill down into this analysis, click on any of the blocks (VM Shape) within *Count - Resource Shape* chart. Based on the selection, the *Max CPU % & Max Memory % - Resource ID* chart will automatically update to show resources and their respective Max CPU and Max Memory values for the selected timeline.



- Step 3: To undo your action, simply click on the undo button in the top-right corner of the dashboard or just click on any white space inside the *Count - Resource Utilization Bin* and *Count - Resource Shape* visualizations.

Exadata Cost Insights

- Exadata Cost Insights shows enabled cores by Exadata system, database count by Exadata system, and database apportioned cost by day, month, and compartment.

Exadata CPU & Memory Insights

- Exadata CPU & Memory Insights gives utilization statistics by Exadata system. Also shows CPU and Memory Utilization by Exadata system.

Database Metric Insights

- Database Metric Insights gives CPU % and Storage (GB) utilization for each database in an Exadata system.

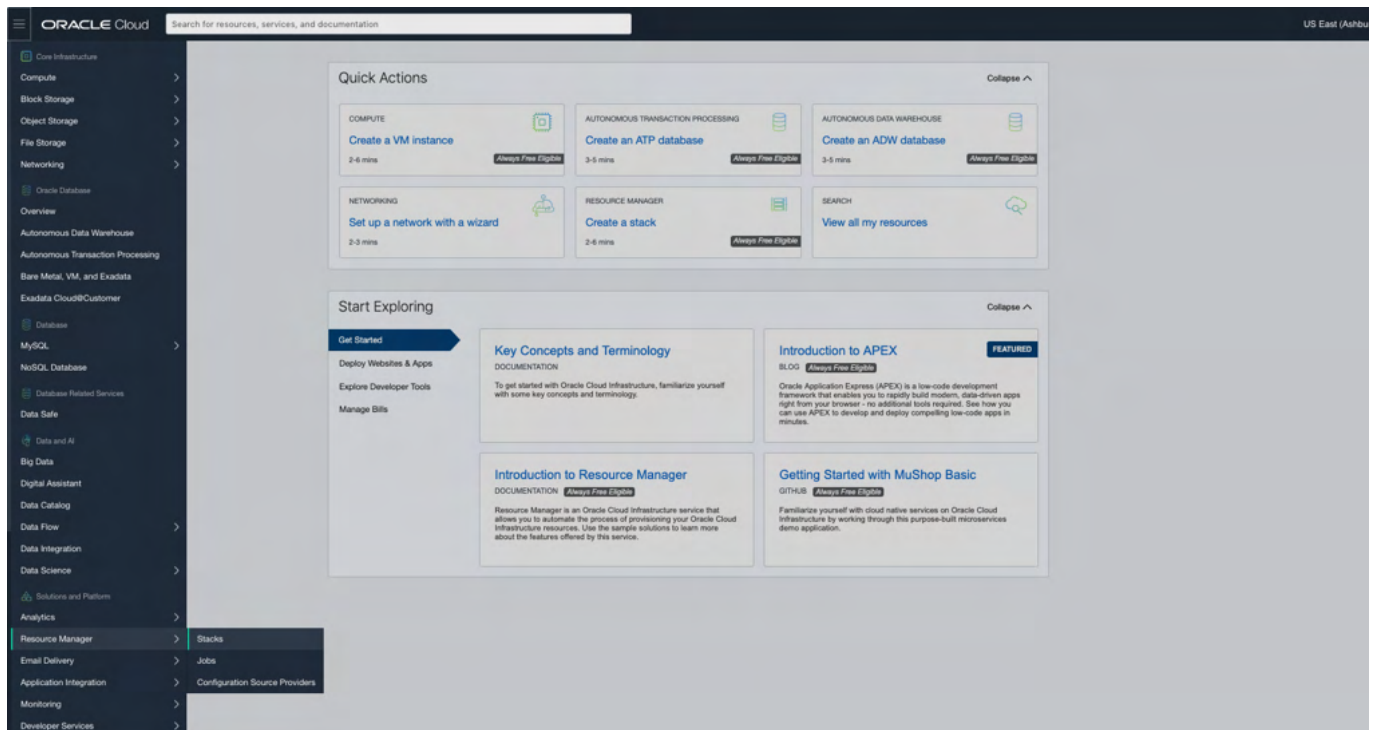
Section 4.8 How to uninstall this application and delete all data

Follow the steps below to remove OCI Cost Governance & Performance Insights application.

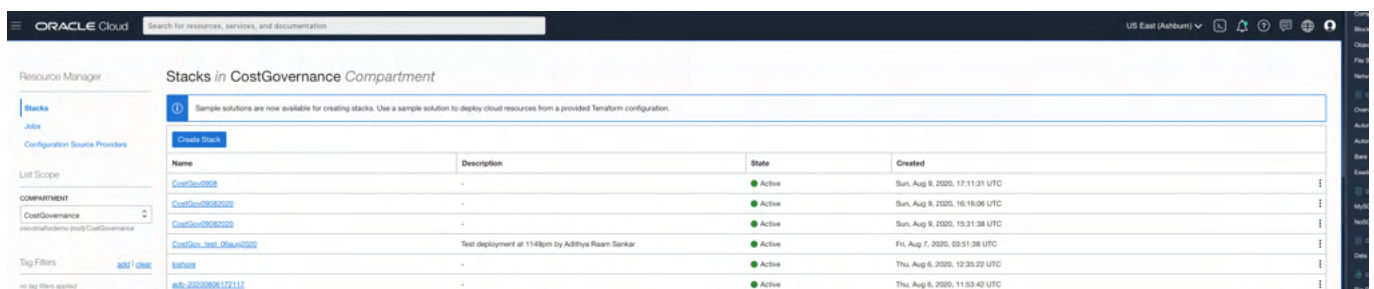
Warning: All data, application components and objects, including OAC, ADB, APEX application and network configurations will be removed after following the steps below. Once executed, components and data will be permanently deleted and cannot be restored.

Section 4.8.1 Resource Manager Stack

- Step 1: From OCI Console main Hamburger menu (Top Left), Navigate to **Resource Manager** and click on **Stacks**.

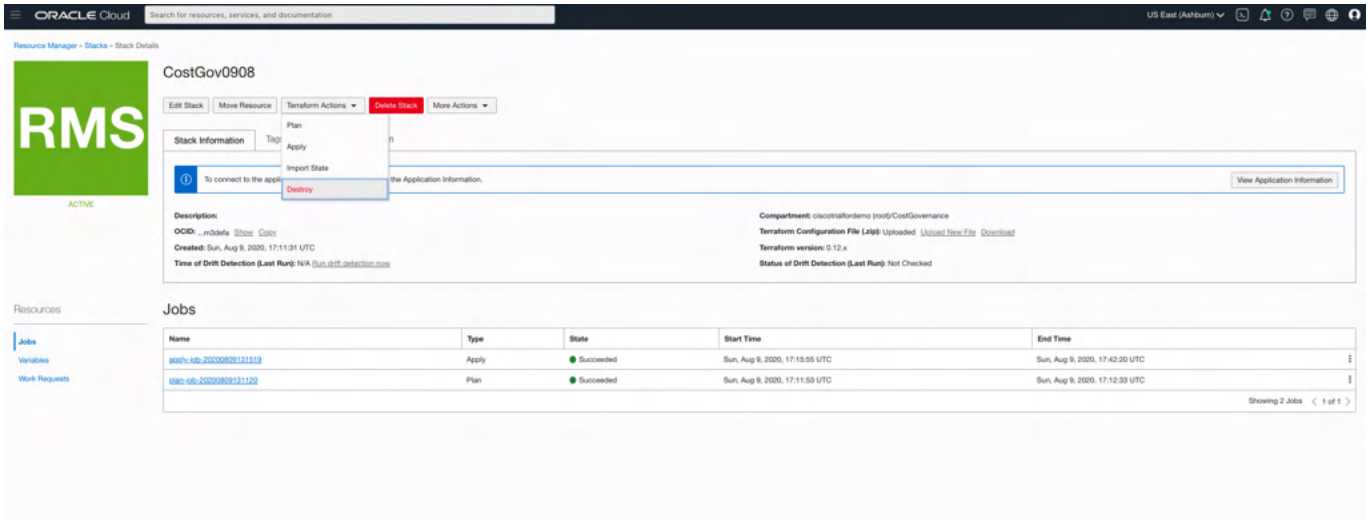


- Step 2: Select the **Compartment** and locate the original stack used to create the Cost Governance and Performance Monitoring application.



- Step 3: Click to open the application **Stack**. (Hint: Stack should show as Active and last job should be an Apply job with a Green Succeeded status under State)

- Step 4: Navigate to **Terraform Actions** dropdown menu and Select **Destroy**.



CostGov0908

Stack Information

OCID: ...ndata

Created: Sun, Aug 9, 2020, 17:11:31 UTC

Time of Drift Detection (Last Run): N/A

Compartment: ciscotrafordemo (root)/CostGovernance

Terraform Configuration File (Laz): Uploaded

Terraform version: 0.12.x

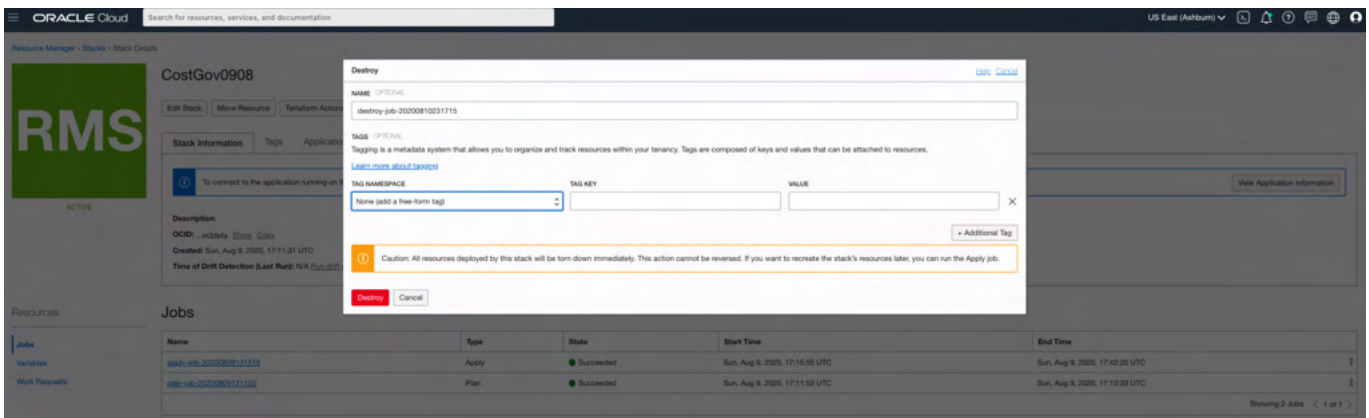
Status of Drift Detection (Last Run): Not Checked

Jobs

Name	Type	State	Start Time	End Time
destroy-job-20200809131129	Apply	Succeeded	Sun, Aug 9, 2020, 17:15:55 UTC	Sun, Aug 9, 2020, 17:42:20 UTC
destroy-job-20200809131129	Plan	Succeeded	Sun, Aug 9, 2020, 17:11:53 UTC	Sun, Aug 9, 2020, 17:12:33 UTC

Warning: All data, application objects and components will be permanently deleted. If you are unsure, STOP and BACKUP the data and dashboards.

- Step 5: Enter the required **Tags** and Click **Destroy**.



CostGov0908

Destroy

NAME: OPTIONAL

destroy-job-20200810231715

TAG: OPTIONAL

Tagging is a metadata system that allows you to organize and track resources within your tenancy. Tags are composed of keys and values that can be attached to resources.

Tags more about tags

TAG NAME/SPACE

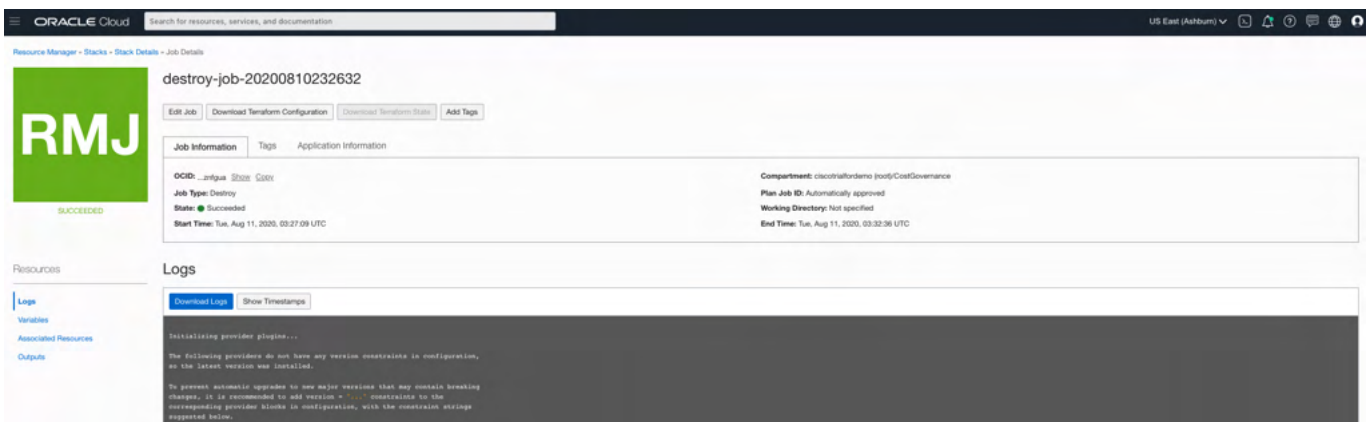
TAG KEY

VALUE

Caution: All resources deployed by this stack will be torn down immediately. This action cannot be reversed. If you want to recreate the stack's resources later, you can run the Apply job.

Destroy Cancel

- Step 6: The process will take time. Once completed, Job Information State will show **Succeeded**.



RMJ

destroy-job-20200810232632

Job Information

OCID: ...anfus

Job Type: Destroy

State: Succeeded

Start Time: Tue, Aug 11, 2020, 03:27:09 UTC

Compartment: ciscotrafordemo (root)/CostGovernance

Plan Job ID: Automatically approved

Working Directory: Not specified

End Time: Tue, Aug 11, 2020, 03:32:36 UTC

Logs

Download Logs Show Timestamps

Initializing provider plugins...

The following providers do not have any version constraints in configuration, so the latest version was installed.

To prevent automatic upgrades to new major versions that may contain breaking changes, it is recommended to add version = ... constraints to the corresponding provider blocks in configuration, with the constraint strings suggested below.

Section 5 Create connection from Oracle Enterprise Manager to Cost Governance Application

This sections is for customers who would like to apportion the cost of their Exadata Database Systems to each containarized and pluggable databases with based on the poportions of CPU and Storage utilized by the databases.

To create a link to ADB, the Databases being monitored must be added to the chargeback module in OEM. This will allow OEM to push CPU and Storage utilization numbers from targets to the Cost Governance & Performance Insights solution, see [Link](#) for more details. The database link will also feed data from the Host Metrics into Cost Governance Solution. More information on working with host metrics in OEM can be found [Link](#) on this page.

Section 5.1 One Time Integration Scripts

- Step 1: Download the One Time Integration Scripts from **Related Documents -> User Guides** in [Link](#)

Section 5.2 Uploading Scripts to Oracle Enterprise Manager

- Step 1: Upload scripts downloaded in Section 5.1 to the Oracle Enterprise Manager (OEM) instance you wish to connect to CostGov App

```
scp -r (OneTimeScripts_Repository_File_Path) (user)@(OEM Public IP Address):/tmp
```

This will copy your files to the specified location in the OEM instance. If a **Permission denied (publickey,gssapi-keyex,gssapi-with-mic)** error occurs, then your local host might not have access to your SSH key and is denied permission to upload files to the OEM instance. This can be fixed by adding the ssh key to your agent.

- Step 2: Login to OEM instance

```
ssh -i (ssh private key filepath) (user)@(OEM IP Adress)
```

- Step 3: Login as oracle user

```
sudo su - oracle
```

- Step 4: Make directory in /home/oracle (cd /home -> cd oracle) named **OneTimeScripts**. To use a different name, the files previously downloaded will need to be edited to reflect a different directory name.

```
mkdir OneTimeScripts
```

- Step 5: Copy files from /tmp or wherever else was specified in step 1.

```
cp /tmp/EM_OMR_* OneTimeScripts/
```

- Step 6: Go to the OneTimeScripts/ directory and make sure the uploaded files (EMR_OMR_OneTime_Parameter.txt, EM_OMR_OneTime_Script_Part1, ...Part2, and ...Part3) all are there.

```
cd OneTimeScripts/
ls -l
```

Section 5.3 Uploading ADB Wallet File to OEM

- Step 1: Log out of OEM instance back to local user. Upload ADB Wallet File downloaded previously to the instance you wish to connect to CostGov App

```
scp -r (ADB_Wallet_Zip_File_Path) user@(OEM IP Address):/tmp
```

This will copy your files to the specified location in the OEM instance. If a **Permission denied (publickey,gssapi-keyex,gssapi-with-mic)** error occurs, then your local host doesn't have access to your SSH key and is denied permission to upload files to the OEM instance. This can be fixed either by specifying filepath to your SSH key or adding the ssh key to your agent.

- Step 2: Login to OEM instance

```
ssh -i (ssh private key filepath) (user)@(OEM IP Address)
```

- Step 3: Login as oracle user

```
sudo su - oracle
```

- Step 4: Make a new directory and copy the wallet zip file into it.

```
mkdir myadbwallet
cp /tmp/(wallet_file_name.zip) (wallet_directory_name)/
```

- Step 5: CD to directory where wallet file was copied to and unzip wallet file

```
unzip (wallet_file_name.zip)
```

Section 5.4 Configuring Parameters for One Time Scripts

- Step 1: Navigate to the OneTimeScripts directory created earlier
- Step 2: Use vi editor to open EM_OMR_OneTime_Parameter.txt

```
vi EM_OMR_OneTime_Parameter.txt
```

- Step 3: Update the information in the form in order to execute the Scripts.

In #1, the connection string data can be found mostly in tnsnames.ora file found in the adbwallet zip file. The only variable that is not there is my_wallet_directory.

The my_wallet_directory variable should equal the location where the ADB wallet zip file was unzipped earlier

Ex. /home/oracle/myadbwallet

```
# 1. Download the ADB wallet file, put it on the OEM instance, construct the CONNECTION_STRING in the same format as the follow:
#   CONNECTION_STRING='(description= (retry_count=20)(retry_delay=3)(address=(protocol=tcps)(port=1522)
#       (host=adb.us-ashburn-1.oraclecloud.com))(connect_data=(service_name=abcdefgijklmnopq_low.adwc.oraclecloud.com))
#       (security=(my_wallet_directory=/home/oracle/wallet_folder)
#       (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")))'
]
[CONNECTION_STRING='(description= (retry_count=20)(retry_delay=3)(address=(protocol=tcps)(port=1522)
(host=adb.us-ashburn-1.oraclecloud.com))(connect_data=(service_name=gniaruldttaeivc_testdb1_medium.adb.oraclecloud.com))
security=(my_wallet_directory=/home/oracle/Wallet_testdb1)(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")))'
]
[#CONNECTION_STRING="test"
]

# 2. Specify the path to costgov.sql on this OEM instance,
# for example: COSTGOV_SQL_PATH="/home/oracle/costgov.sql"
COSTGOV_SQL_PATH="/home/oracle/OneTimeScripts/costgov.sql"

# 3. Specify the login information for OEM's repository database
# in this format: username/password@jdbc_connection_string
# the default username is SYSMAN, for example: db_login='sysman/Password_123@DB.example.com:1521/oe'
```

- Step 4: Follow steps #2-#6 within EMR_OMR_OneTimeScripts.txt paste paste following at the end of the form:

```
LD_LIBRARY_PATH=/u01/app/oracle/database/product/lib

TNS_ADMIN=/u01/app/oracle/database/product/network/admin
```

```
PATH=/u01/app/oracle/database/product/bin:/u01/app/oracle/em/middleware_134/bin:/u01/app/oracle/em/middleware_134/OMSPatcher/:$PATH
```

Section 5.5 Running OEM One Time Scripts

- Step 1: Run EM_OMR_OneTime_Script_Part1
- Step 2: Run EM_OMR_OneTime_Script_Part2
- Step 3: Run EM_OMR_OneTime_Script_Part3

Calculation - Database Cost Apportionment These scripts create a DB Link from OEM to ADW and setup temporary tables to facilitate a data copy. Using the copied data, which contains the CPU and storage utilization by database, the proportion of either CPU or Storage per database across the rack will be computed. This value will then be multiplied by the respective resource value divided by 100 (This value is entered by user in Apex Exadata Cost Apportionment section), and then multiply that figure by the total cost of the rack.

Cost Apportionment Per Resource (Storage or CPU) = Apportionment Value * (Database Resource Utilization / Sum of resource utilization in rack) * Rack Total Cost