



Automatización en OCI

Herramientas para agilizar despliegues en OCI

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Beneficios de Automatización

- Productividad/Menos tiempo gastado del talento
- Colaboración / Empoderamiento
- Ahorro de Costos (Recurso innecesario)
- Reusabilidad
- Reducir complejidad
- Errores / Confiabilidad
- Simultaneidad, Volumen (Migraciones)
- Continuidad



“Una buena herramienta mejora la forma en que **trabajas**.
Una gran herramienta mejora la forma en que **piensas**.”
-Jeff Duntemann

Agenda

Prerequisitos

Acceso a Cuenta

- Creación del perfil
- Generación del keypair

Acceso a la Nube

- API
- Ansible
- SDK/CLI
- Resource Manager

Terraform

- Archivos
- Variables
- Componentes
- Avanzados OCI: Backend, Atributos, comandos

Características de Resource Manager

Demo usando CLI

Demo usando Terraform con Git

Demo usando Resource Manager



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Pre-requisitos

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Prerequisites

Cuenta en OCI, por ejemplo, <https://www.oracle.com/cloud/free/>

OCI CLI: <https://docs.oracle.com/en-us/iaas/Content/API/SDKDocs/cliinstall.htm>

JQ, JSON Parser: <https://stedolan.github.io/jq/download/>

Terraform: <https://www.terraform.io/downloads>

SDK, Optional:

Python 3: <https://www.python.org/downloads/>

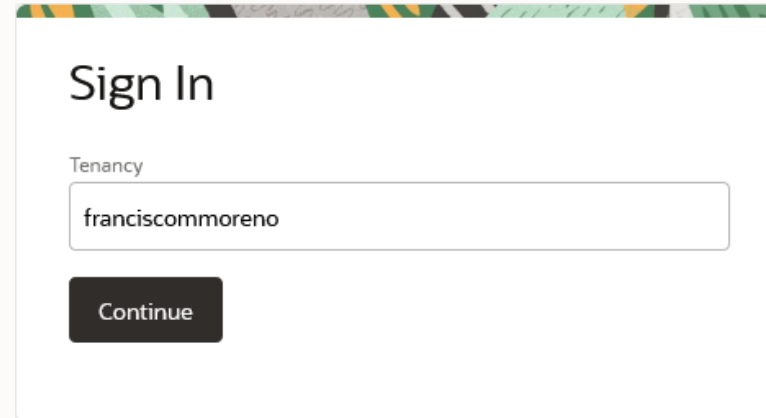
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Acceso a Cuenta

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Perfiles



Sign In

Tenancy

franciscoomoreno

Continue

Navegadores: Chrome, Firefox o Safari (Mac)

OCI Always Free Account:

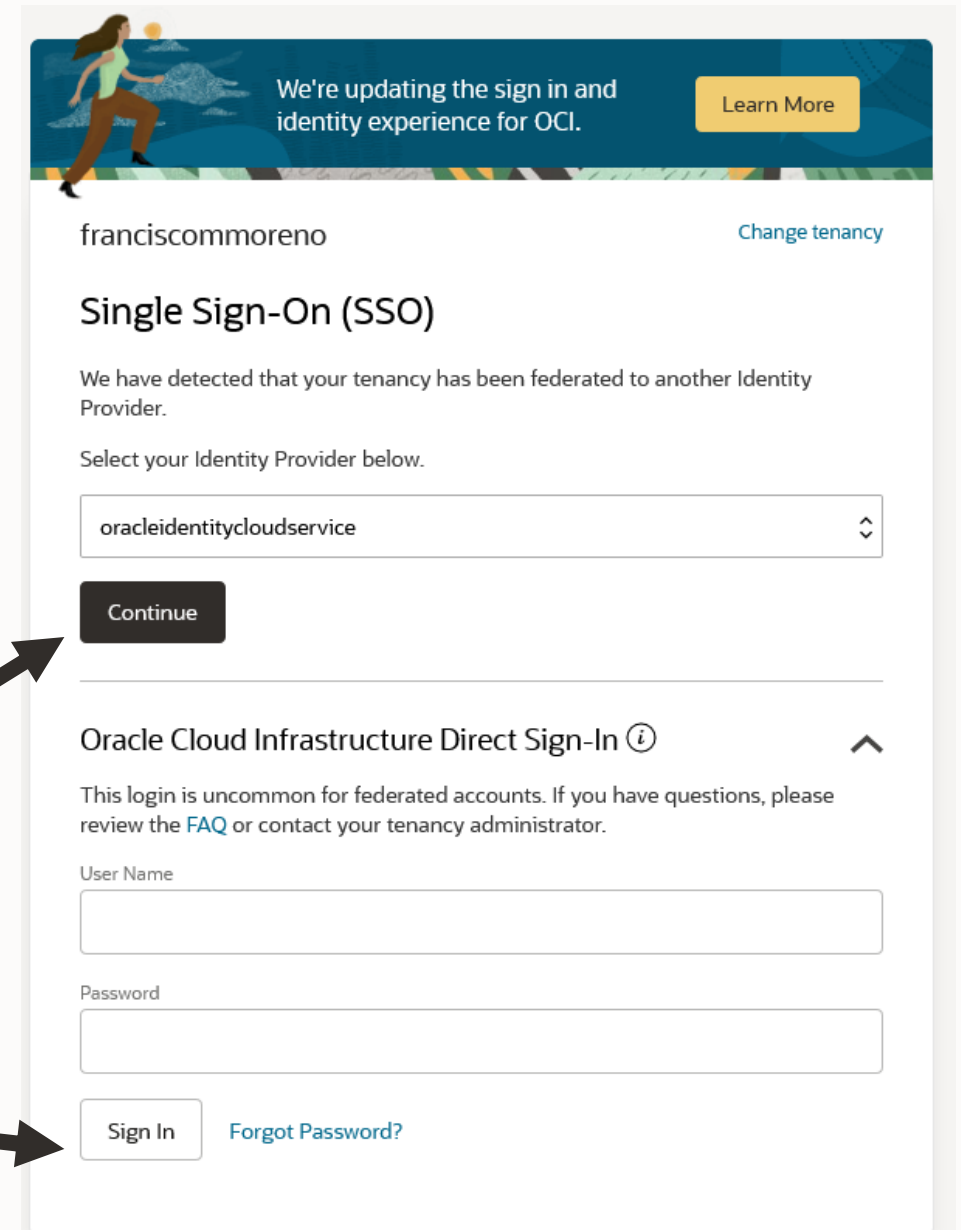
<https://www.oracle.com/cloud/free/>

Oracle Account:

<https://cloud.oracle.com>

<https://cloud.oracle.com/?tenant=<Nombre>>

Tipos Login: SSO or Direct Sign-In.



We're updating the sign in and identity experience for OCI. [Learn More](#)

franciscoomoreno [Change tenancy](#)

Single Sign-On (SSO)

We have detected that your tenancy has been federated to another Identity Provider.

Select your Identity Provider below.

oracleidentitycloudservice

Continue

Oracle Cloud Infrastructure Direct Sign-In ⓘ

This login is uncommon for federated accounts. If you have questions, please review the [FAQ](#) or contact your tenancy administrator.

User Name

Password


Sign In [Forgot Password?](#)


Keypair


ORACLE Cloud


Search resources, services, documentation, ;


US East (Ashburn) ▾











ACTIVE

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

Created: Fri, Jul 23, 2021, 20:27:03 UTC

Multi-factor authentication: Disabled

Email: -

Capabilities

Local password: No

API keys: Yes

Auth tokens: Yes

Profile

[oracleidentitycloudservice/francisco.m.moreno@oracle.com](#)

Tenancy: [franciscommoreno](#)

1

User Settings

[Console Settings](#)

[Sign Out](#)

Customer secret keys: Yes

OAuth 2.0 Client Credentials: Yes

Database Passwords: Yes

Resources

Groups

2

API Keys

[Auth Tokens](#)

[Customer Secret Keys](#)

[Database Passwords](#)

[OAuth 2.0 Client Credentials](#)


[SMTP Credentials](#)

API Keys

3

Add API Key

Fingerprint	Created
No items found.	
No API Key to display	



Keypair

Add API Key

[Help](#)

Note: An API key is an RSA key pair in PEM format used for signing API requests. You can generate the key pair here and download the private key. If you already have a key pair, you can choose to **1** load or paste your public key file instead. [Learn more](#)

☒ Generate API Key Pair☐ Choose Public Key File☐ Paste Public Key

Public Key



Download the private key. It will not be shown again. After you download it, [change the file permissions](#) **2** only you can view it.



Download Private Key



[Download Public Key](#) **3**

Download both to ~/.oci/

Add

[Cancel](#)

Options:

*Auto

Upload file

Paste file

>Last 2 imply manual activities on your PC

Resources

Groups

API Keys

Auth Tokens

Customer Secret Keys

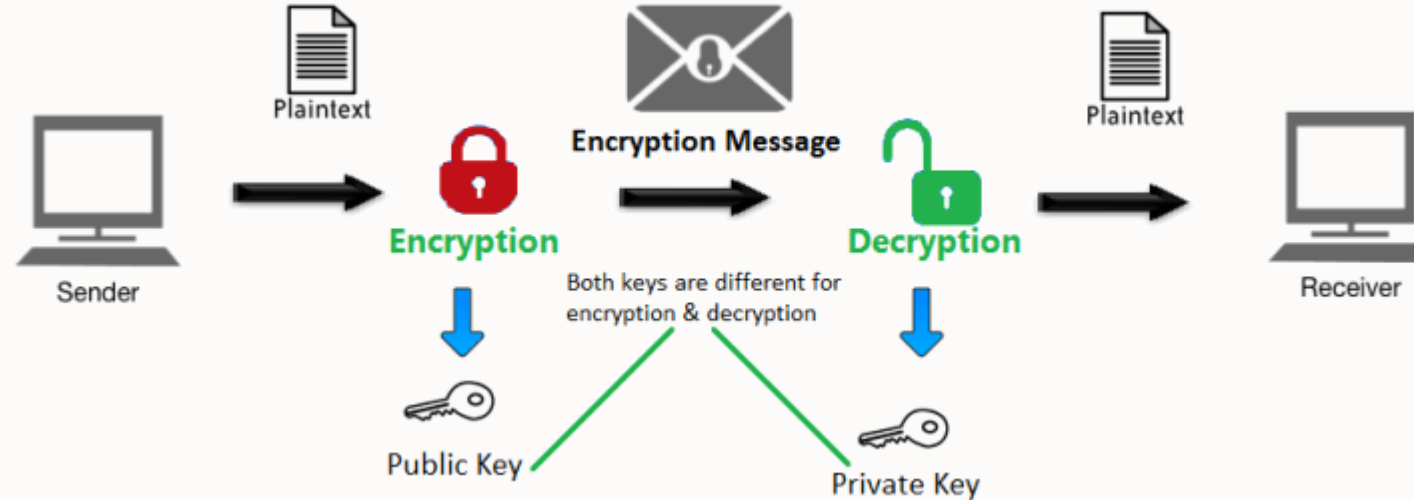
Database Passwords

OAuth 2.0 Client Credentials

SMTP Credentials



Modo Funcionamiento – Llaves Publicas/Privadas



Mas información:

<https://docs.oracle.com/en-us/iaas/Content/GSG/Tasks/creatingkeys.htm>

Keypair

Configuration File Preview

[Help](#)

Note: This configuration file snippet includes the basic authentication information you'll need to use the SDK, CLI, or other OCI developer tool. Paste the contents of the text box into your `~/.oci/config` file and update the `key_file` parameter with the file path to your private key. If you already have a **Default** profile in your config profile, you'll need to perform some additional steps. [Learn more](#)

Select API Key Fingerprint

1d:6d:f7:0e:d4:dd:ce:a7:67:00:83:fa:e6:df:ac:76

Configuration File Preview *Read-Only*

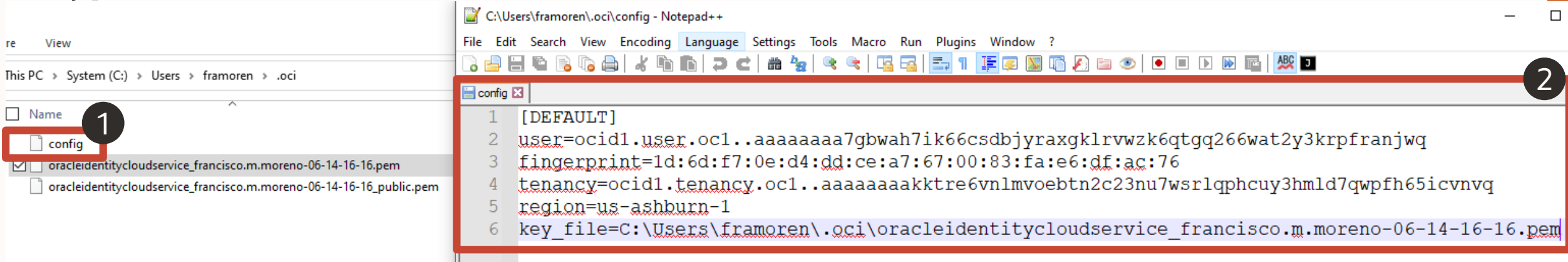
```
[DEFAULT]
user=ocid1.user.oc1..aaaaaaa7gbwah7ik66csdbjyraxgklrwzk6qtgq266wat2y3krp
franjwq
fingerprint=1d:6d:f7:0e:d4:dd:ce:a7:67:00:83:fa:e6:df:ac:76
tenancy=ocid1.tenancy.oc1..aaaaaaaakktre6vnlmvoebtn2c23nu7wsrlqphcuy3hml
7qwpfh65icvnvq
region=us-ashburn-1
key_file=<path to your private keyfile> # TODO
```

Paste the contents of the text box into your `~/.oci/config` file. [Copy](#)

Close



Keypair



En ~/.oci/, crear un archivo config (sin extension) y pegar de la ventana anterior.
Es necesario enrutar key_file con el archivo descargado de Private Key

```
Command Prompt
C:\Users\framoren>oci os ns get
{
  "data": "idpebqr1ceyl"
}
```

En un CLI, escribir
oci os ns get
Para comprobar acceso

Opciones:

[Autocompletar \(en PS\).](#)
[Pasos Detallados en Ingles \(Blog\)](#)

Mas information en
<https://docs.oracle.com/en-us/iaas/Content/API/Concepts/cliconcepts.htm>



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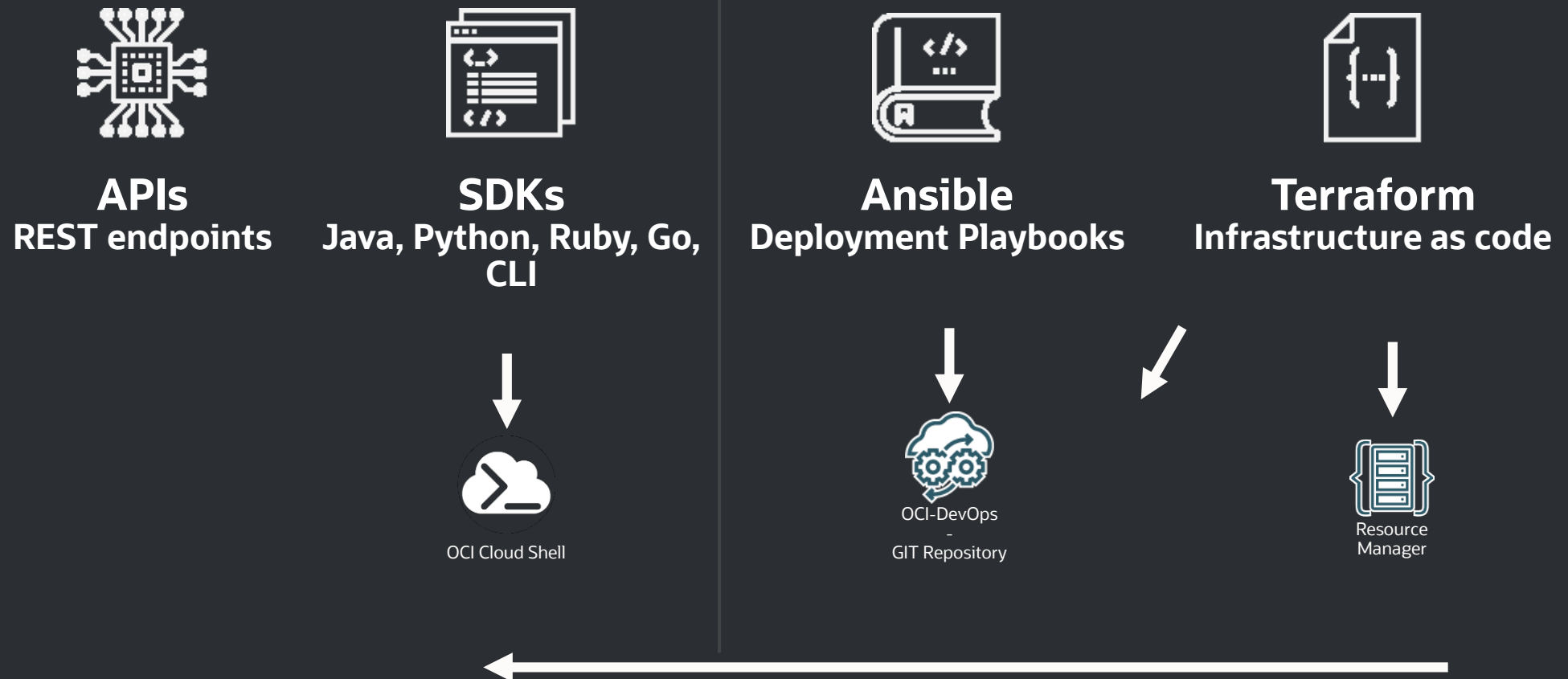
Acceso a Nube

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Acceso

Developer Tools and Resources



Atributos JSON para solicitud y respuesta

[https://docs.oracle.com/en-us/iaas/api/
https://docs.oracle.com/en-
us/iaas/api/#/en/iaas/20160918/Vcn/CreateVcn](https://docs.oracle.com/en-us/iaas/api/#/en/iaas/20160918/Vcn/CreateVcn)



Authentication
Encryption
Digital Signature

The screenshot shows the Postman interface with a REST client setup. The endpoint is `https://identity.us-ashburn-1.oci.oraclecloud.com/20160918/compartments?compartmentId=ocid1.tenancy.oc1.aaaaa...` with the method `GET`. The `Params` tab is active, showing a query parameter `compartmentId` with the value `ocid1.tenancy.oc1.aaaaaakktre6vnlmvoebtn2c...`. The `Body` tab is also visible, showing a JSON response snippet:

```
[
  {
    "compartmentId": "ocid1.tenancy.oc1.aaaaaakktre6vnlmvoebtn2c23nu7wsrlqphcuy3hml7qwpfh65icvnl",
    "id": "ocid1.compartment.oc1.aaaaaaaq3wolunv5ud2qpwynjzuvpfe12yrxa5t2ktp53gyy2ezbng2bxq",
    "name": "ManagedCompartmentForPaaS",
    "description": "idcs-e3d63af536384f72b5b841f6115509988|23738367|francisco.m.moreno@oracle.com-893",
    "timeCreated": "2021-07-23T20:37:02.354Z",
    "freeformTags": {},
    "definedTags": {},
    "lifecycleState": "ACTIVE"
  },
  ...
]
```

On the right, the `OCI_Environment` panel is open, showing a table of variables:

VARIABLE	INITIAL VALUE	CURRENT VALUE
tenancyId	ocid1.tenancy.oc1.aaaaaaaal32hpbj5vofrsbblgamixhhhlvisnafefmmfdeybpbgwec4zlsq	ocid1.tenancy.oc1.aaaaaaaakktre6vnlmvoebtn2c23nu7wsrlqphcuy3hml7qwpfh65icvnlq
authUserId	ocid1.user.oc1..aaaaaaaev3zmjvz6g3st6wgypwjuj5alxpwcwtrs4sc7cmnwzdsim4xeuiq	ocid1.user.oc1..aaaaaaa7gbwah7ik66csdbjyragxklrvwk6qtgq266wat2y3krpfranjwq
keyFingerprint	3c:4f:e5:d2:96:a1:3e:55:3c:a6:f9:cc:25:33:72:d0	1d:6d:f7:0e:d4:dd:ce:a7:67:00:83:fa:e6:df:ac:76

Below the table, the `Globals` section is visible, showing a variable `jsrsasign` with a value that includes a license notice.

SDK

Llamadas al API desde diferentes lenguajes, con librerías OCI

Por ejemplo,

<https://docs.oracle.com/en-us/iaas/api/#/en/iaas/20160918/Vcn/CreateVcn>

docs.oracle.com/en-us/iaas/api/#/en/iaas/20160918/NetworkSecurityGroup/CreateNetworkSecurityGroup

IPSecConnection

IPSecConnectionDeviceConfig

IPSecConnectionDeviceStatus

IPSecConnectionTunnel

IPSecConnectionTunnelErrorDetails

IPSecConnectionTunnelSharedSecret

Ipv6

LetterOfAuthority

LocalPeeringGateway

MeasuredBootReport

NatGateway

NetworkingTopology

NetworkSecurityGroup

NetworkSecurityGroupReference

ChangeNetworkSecurityGroupCompartment

CreateNetworkSecurityGroup

DeleteNetworkSecurityGroup

GetNetworkSecurityGroup

ListNetworkSecurityGroups

UpdateNetworkSecurityGroup

NetworkSecurityGroupVnic

PeerRegionForRemotePeering

PrivateIp

PublicIp

PublicIpPool

RemotePeeringConnection

RouteTable

Java SDK Python SDK Go SDK TypeScript SDK .NET SDK Ruby SDK

```
# This is an automatically generated code sample.
# To make this code sample work in your Oracle Cloud tenancy,
# please replace the values for any parameters whose current values do not fit
# your use case (such as resource IDs, strings containing 'EXAMPLE' or 'unique_id', and
# boolean, number, and enum parameters with values not fitting your use case).

import oci

# Create a default config using DEFAULT profile in default location
# Refer to
# https://docs.cloud.oracle.com/en-us/iaas/Content/API/Concepts/sdkconfig.htm#SDK_and_CLI_Configuration_File
# for more info
config = oci.config.from_file()

# Initialize service client with default config file
core_client = oci.core.VirtualNetworkClient(config)

# Send the request to service, some parameters are not required, see API
# doc for more info
create_network_security_group_response = core_client.create_network_security_group(
    create_network_security_group_details=oci.core.models.CreateNetworkSecurityGroupDetails(
        compartment_id="ocid1.test.oc1..
```

Responses



SDK – Ejemplo Python

Requisitos:

Tener un SDK, ejemplo, Java, Python, Go, etc.
Tener configurado el Perfil OCI

Tips:

Existen un cantidad de scripts para ejecutar
Oficiales:

<https://github.com/oracle/learning-library>

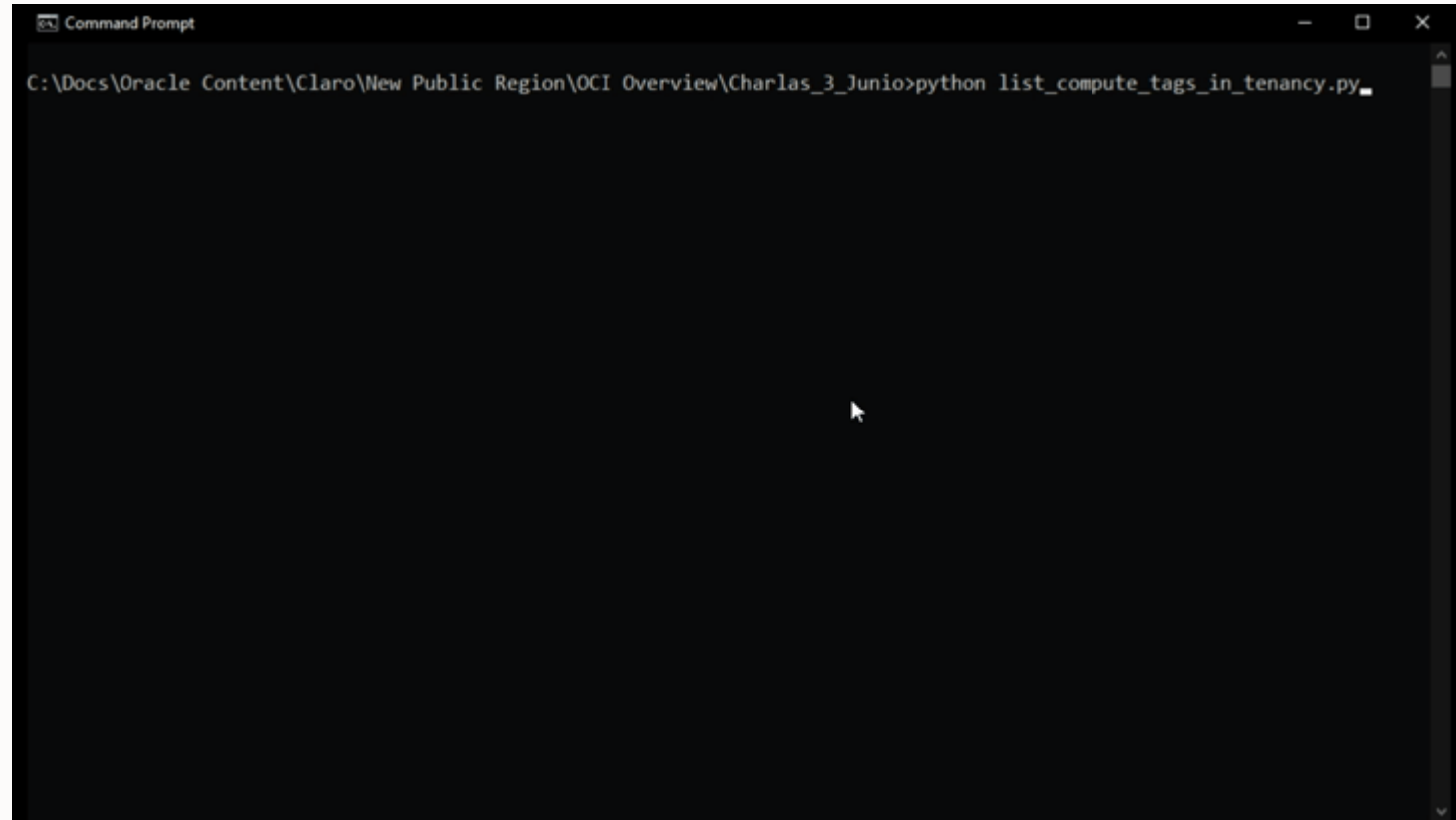
<https://github.com/oracle/oci-python-sdk>

Blogs:

<https://www.oc-blog.com/oci-scripts-and-example-code/>

Este ejemplo es de

https://github.com/oracle/oci-python-sdk/tree/master/examples/list_resources_in_tenancy



The screenshot shows a Windows Command Prompt window with the title bar 'Command Prompt'. The command prompt displays the following text: `C:\Docs\Oracle Content\Claro\New Public Region\OCI Overview\Charlas_3_Junio>python list_compute_tags_in_tenancy.py`. The cursor is positioned at the end of the command line. The background of the command prompt is black, and the text is white.

CLI

Requisitos:

Tener instalado el OCI CLI

Tener configurado el perfil OCI

Tips:

Usar variables de entorno

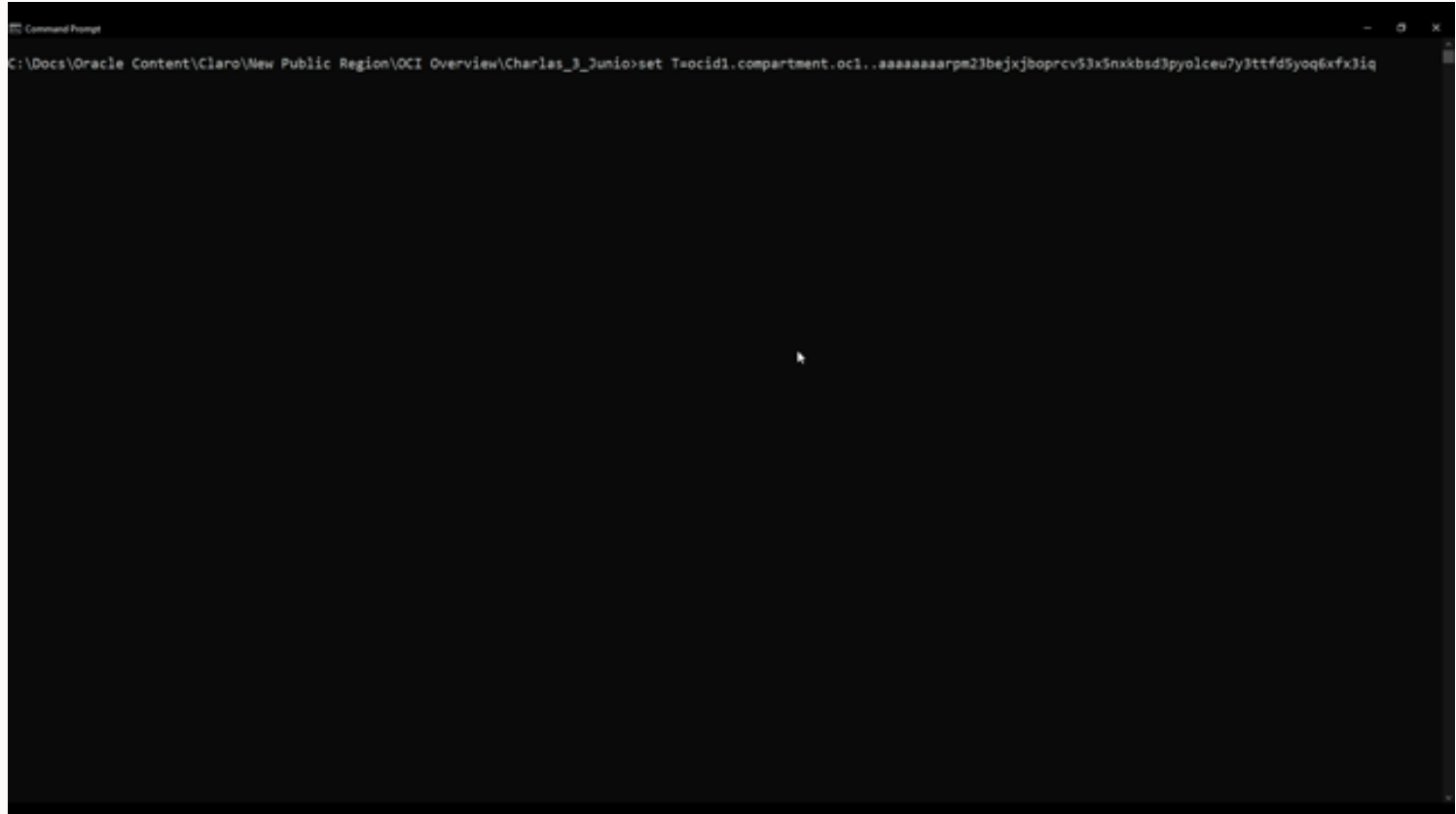
Usar cadenas de ejecución –si aplica–

>> Variables de Entorno

>> Variables parseadas de JSON

Ejemplo, en Windows (CLI):

```
oci iam compartment list|jq ".data[] | select( .name | contains(\"TestTerraform\"))\"|jq .\"id\" > TempFile
set /p T= < TempFile
oci compute instance list -c %T%
```



CLI

1. Categoría
2. Componente
3. Comandos
4. Opciones del Comando

Mas información en

https://docs.oracle.com/en-us/iaas/tools/oci-cli/2.12.11/oci_cli_docs/index.html

docs.oracle.com/en-us/iaas/tools/oci-cli/2.12.11/oci_cli_docs/cmdref/compute/instance.html

Docs » compute » instance

instance

Description

A compute host. The image used to launch the instance determines its operating system and other software. The shape specified during the launch process determines the number of CPUs and memory allocated to the instance. For more information, see [Overview of the Compute Service](#).

To use any of the API operations, you must be authorized in an IAM policy. If you're not authorized, talk to an administrator. If you're an administrator who needs to write policies to give users access, see [Getting Started with Policies](#).

Warning: Oracle recommends that you avoid using any confidential information when you supply string values using the API.

Available Commands

- action
- attach-vnic
- change-compartment
- detach-vnic
- get
- get-windows-initial-creds
- launch
- list
- list-vnics
- terminate
- update

Previous Next

Docs » compute » instance » get

get

Description

Gets information about the specified instance.

Usage

```
oci compute instance get [OPTIONS]
```

Required Parameters

--instance-id [text]

The OCID of the instance.

Optional Parameters

--from-json [text]

Provide input to this command as a JSON document.

The **--generate-full-command-json-input** option can be used with this command option. The key names are pre-processed names (converted to camelCase format, e.g. compartment-id) of the keys need to be populated by the user before using the command. For any command option that accepts multiple values, the JSON array.

Options can still be provided on the command line. If both the command line and the command line specification are used, the command line specification takes precedence.



Cloud Shell

Requisitos:

Iniciar la Consola Web

Características:

Oracle Linux – Última Versión

Muchas Dev Tools – Python, Kubectl, etc

IP Pública

5 GB en sesión – Borrado 6 meses

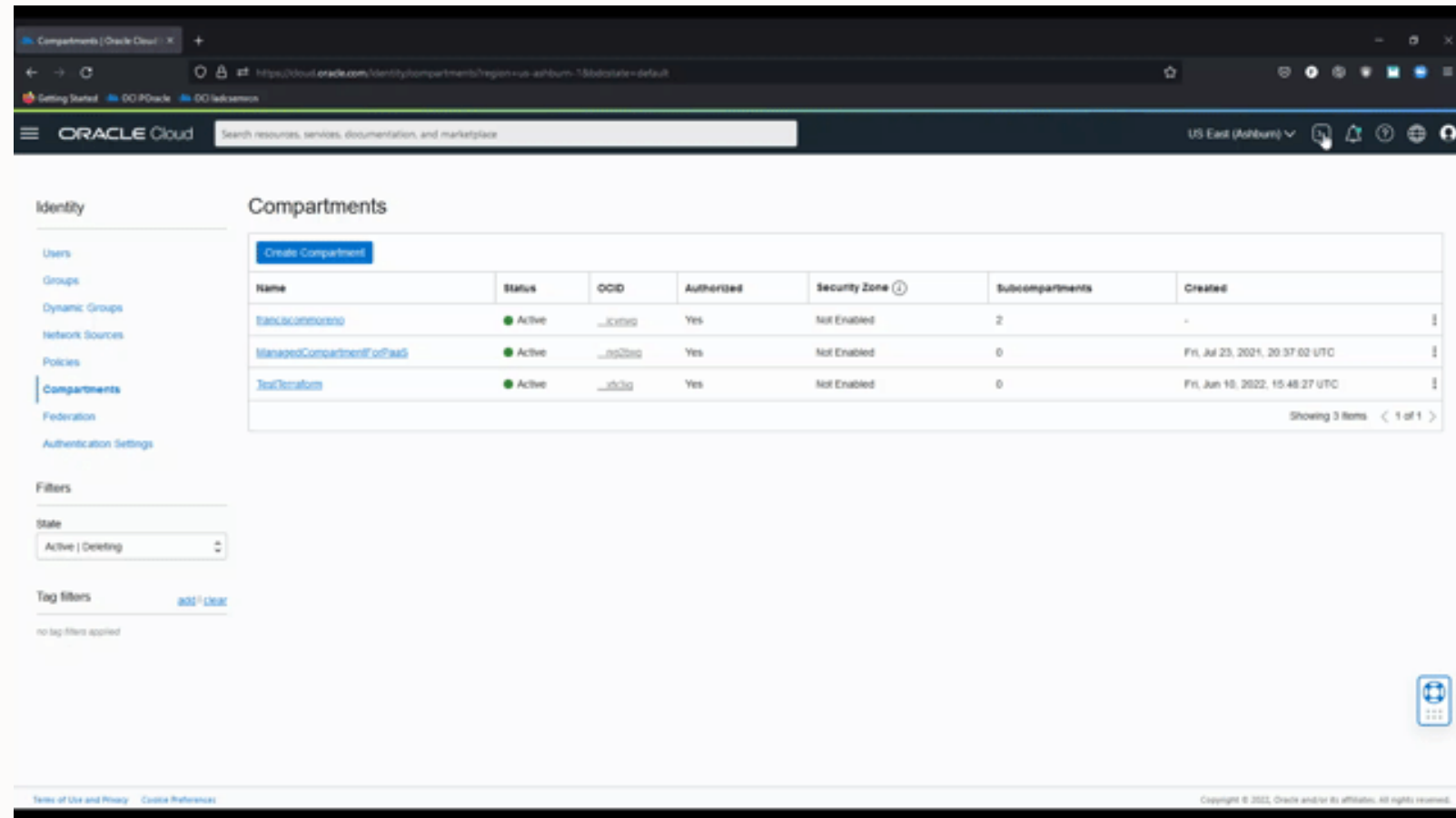
Tips:

Usar variables de entorno

Usar cadenas de ejecución –si aplica-

>> Variables de Entorno

>> Variables parseadas de JSON



The screenshot shows the Oracle Cloud Identity Compartments console. The left sidebar contains navigation links for Identity, Users, Groups, Dynamic Groups, Network Sources, Policies, Compartments (selected), Federation, and Authentication Settings. The main area displays a table of compartments with columns: Name, Status, OCID, Authorized, Security Zone, Subcompartments, and Created. Three compartments are listed: 'transcompartments', 'ManagedCompartmentForProd', and 'TestOrcatform'. The bottom of the page includes links for Terms of Use and Privacy, and a Copyright notice for 2021.

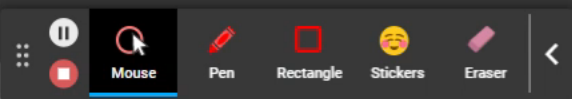
Name	Status	OCID	Authorized	Security Zone	Subcompartments	Created
transcompartments	Active	ocid1.compartments...crtmg	Yes	Not Enabled	2	-
ManagedCompartmentForProd	Active	ocid1.compartments...p2mg	Yes	Not Enabled	0	Fri, Jul 23, 2021, 20:37:02 UTC
TestOrcatform	Active	ocid1.compartments...p2mg	Yes	Not Enabled	0	Fri, Jun 18, 2022, 15:48:27 UTC

Conceptos

Herramienta	Hashicorp Terraform	Redhat Ansible	Diferencias
	Infrastructure-as-a-Code IaC	Configuration Management	
Enfoque	Orquestación de despliegue	Enfocado en configuración y parchado	
Objetivo Principal	Despliega y retira provisión de recursos completos de nube	Instala software y despliegue de aplicaciones sin agentes	
Programación	Declarativo	Imperativo	Declarativo: Se especifica el resultado. Imperativo: Secuencia de operaciones.
Infraestructura	Immutable	Mutable	Mutable: Actualiza o modifica Immutable: No permite actualización, se tiene que volver a desplegar.
Idempotencia	Si	Si	No duplica recursos la misma acción.
Ciclo de vida	Si	No	

ANSIBL

```
francisco_@cloudshell:ansible-example (us-ashburn-1)$ ansible-playbook sample.yaml
```



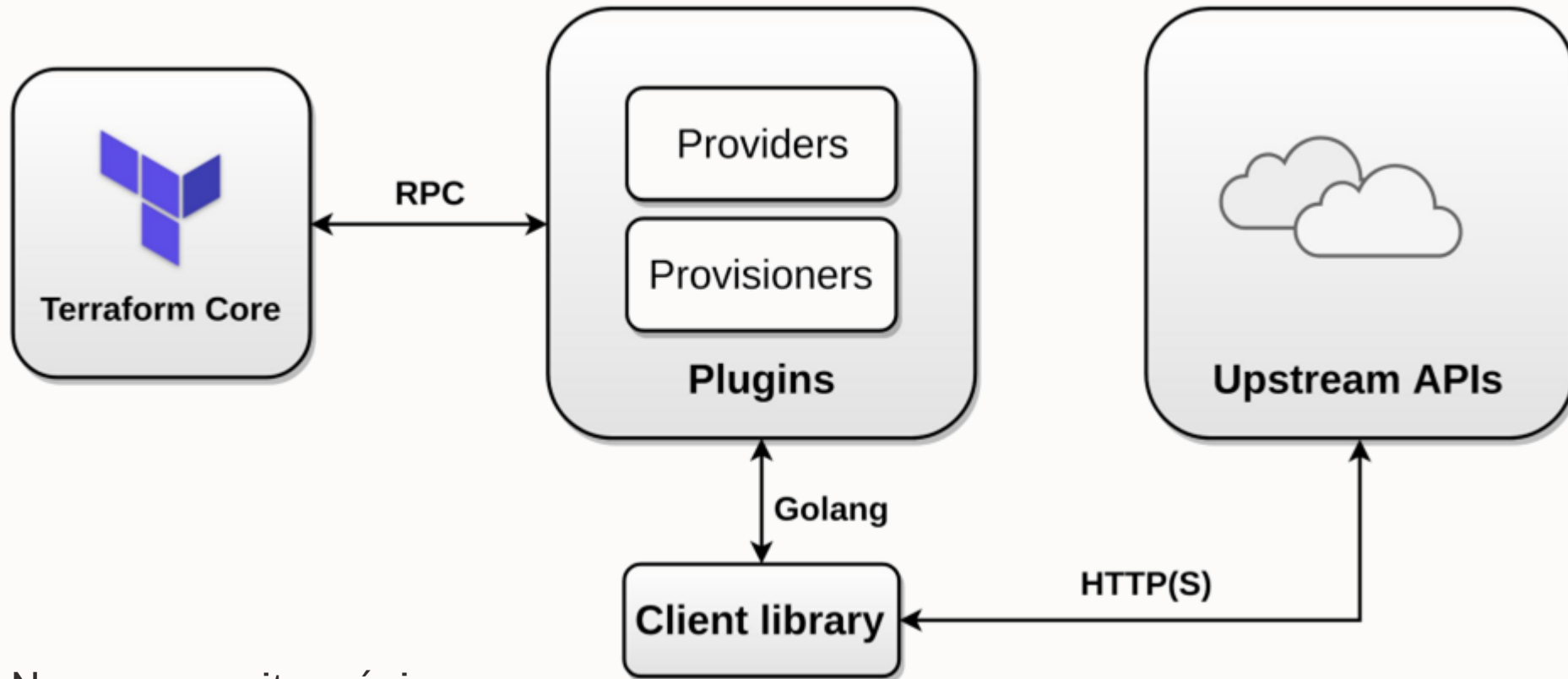
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Terraform

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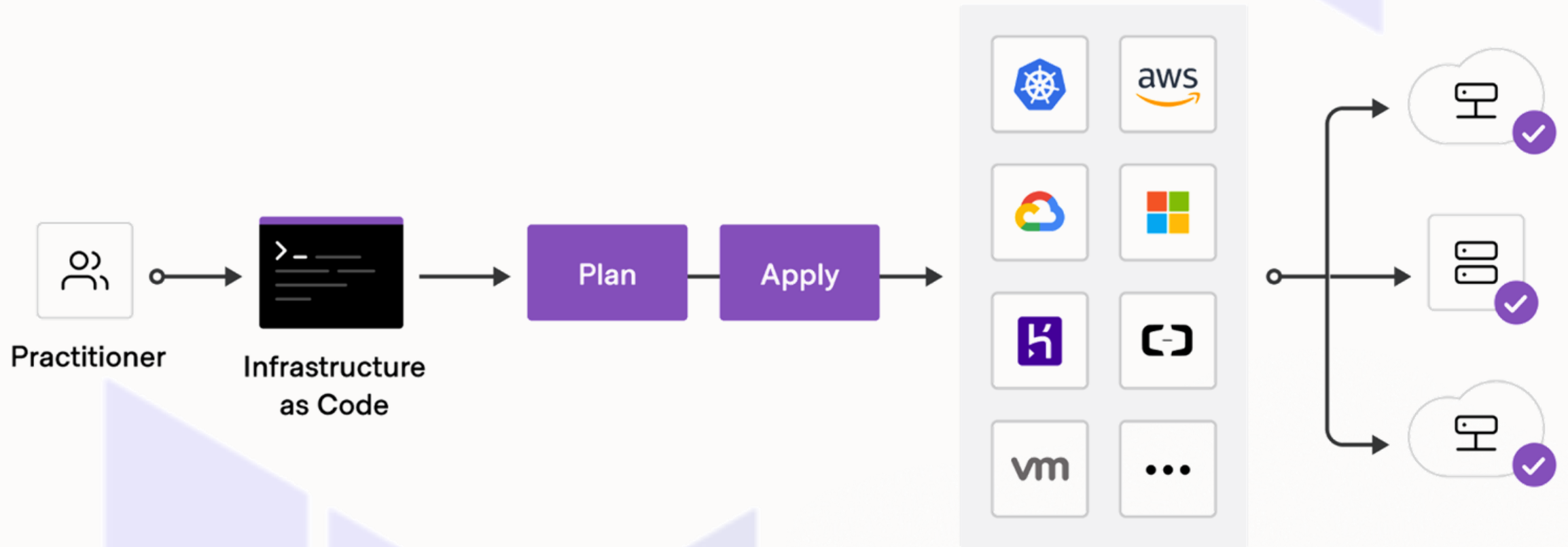
Terraform – Herramienta Agnóstica de Nube *



* No es una varita mágica.
Provee un lenguaje común para orquestar recursos nube y/o otros proveedores.

HashiCorp

Terraform



Archivos

terraform.state
ARCHIVO ESTADO



VARIABLES
terraform.tfvars

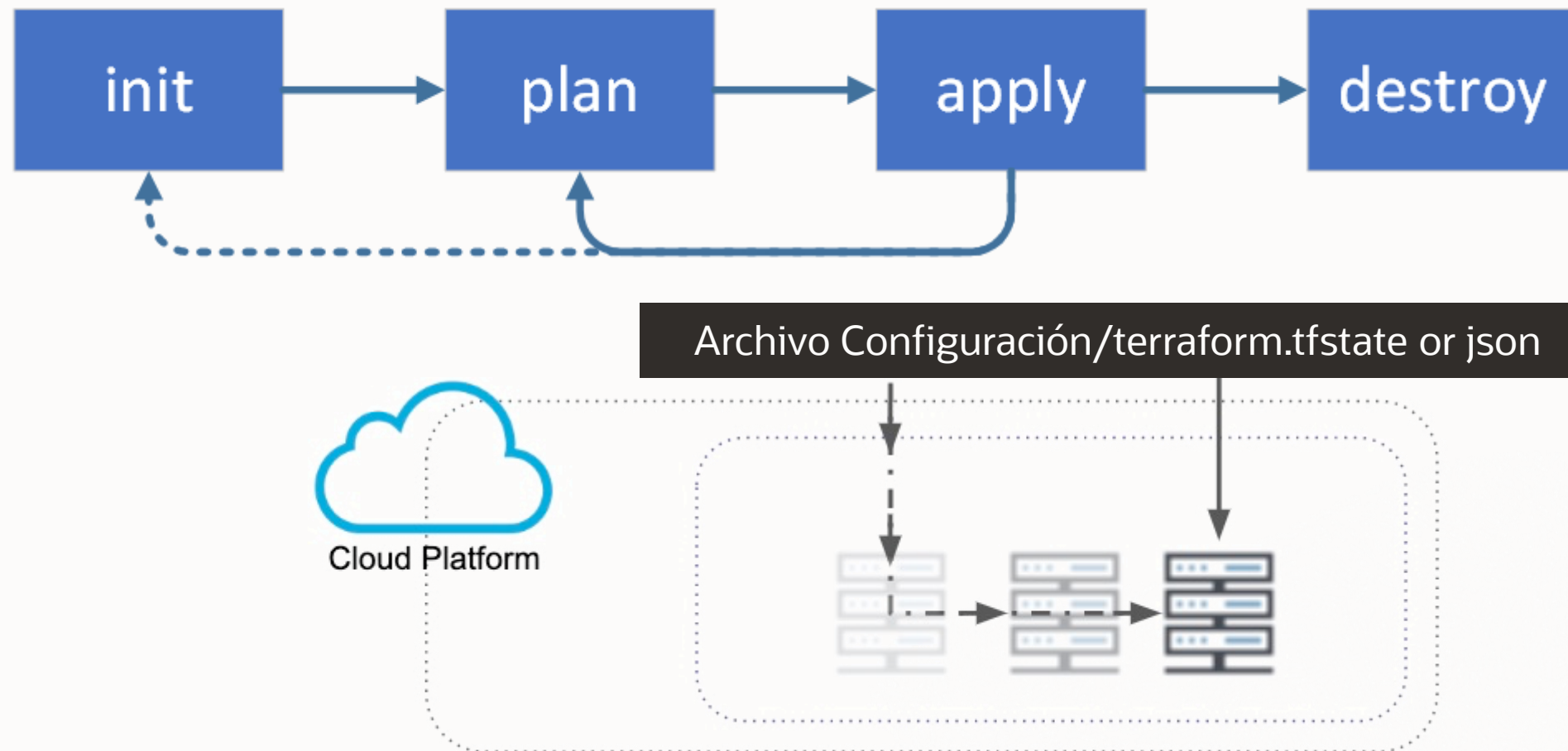
terraform-provider.tf

CODIGO

terraform- instances.tf



Terraform – Simple Flujo de trabajo



Variables

ENTRADA

Definición variables: desde el CLI, archivo, variables de entorno.

Tipos de variables:

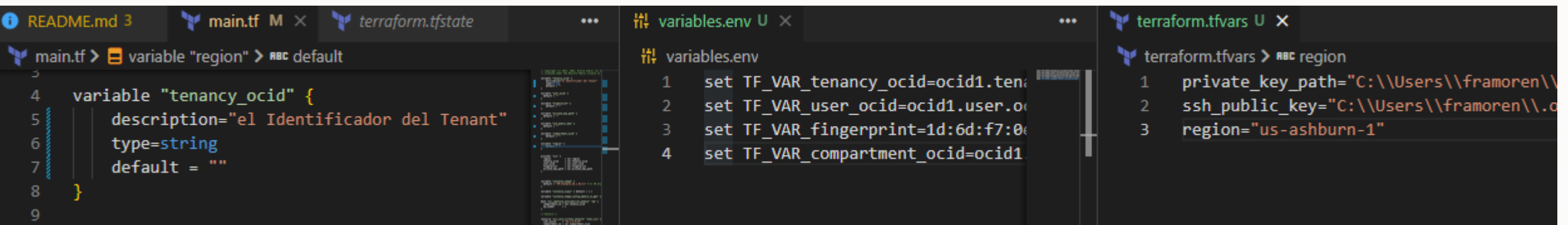
- Simples: string, number, bool

- Construidas: list, set, map, object, tuple.

Validación de ingreso: regexp, nulos,

SALIDA

Atributos: sensible



The screenshot displays three open files in a code editor:

- main.tf**: Shows a Terraform variable definition for `tenancy_ocid`.

```
variable "tenancy_ocid" {  
  description = "el Identificador del Tenant"  
  type = string  
  default = ""  
}
```
- variables.env**: Shows environment variable assignments for Terraform variables.

```
set TF_VAR_tenancy_ocid=ocid1.ten  
set TF_VAR_user_ocid=ocid1.user.oc  
set TF_VAR_fingerprint=1d:6d:f7:0e  
set TF_VAR_compartment_ocid=ocid1
```
- terraform.tfvars**: Shows specific variable values for a region.

```
private_key_path="C:\\Users\\framoren\\  
ssh_public_key="C:\\Users\\framoren\\  
region="us-ashburn-1"
```



Componentes

```
provider "oci" {  
  region      = var.region  
  tenancy_ocid = var.tenancy_ocid  
  user_ocid   = var.user_ocid  
  fingerprint = var.fingerprint  
  private_key_path = var.private_key_path  
}  
# See https://docs.oracle.com/iaas/images/  
data "oci_core_images" "test_images" {  
  compartment_id = var.compartment_ocid  
  operating_system = "Oracle Linux"  
  operating_system_version = "8"  
  shape = var.instance_shape  
  sort_by = "TIMECREATED"  
  sort_order = "DESC"  
}  
/* Network */  
resource "oci_core_virtual_network" "test_vcn" {  
  cidr_block = "10.1.0.0/16"  
  compartment_id = var.compartment_ocid  
  display_name = "testVCN"  
  dns_label = "testvcn"  
}  
output "Public_IP_LoadBalancer" {  
  value = "http://${oci_load_balancer_load_balancer.free_ip_address}"  
}
```

variable
provider
data
resource
output

Module

Carpeta con código y tiene entrada y salida similar

Terraform solo accede a los archivos TF de la carpeta actual, no ingresa a los valores internos

Conceptos Avanzados

Remote Backend

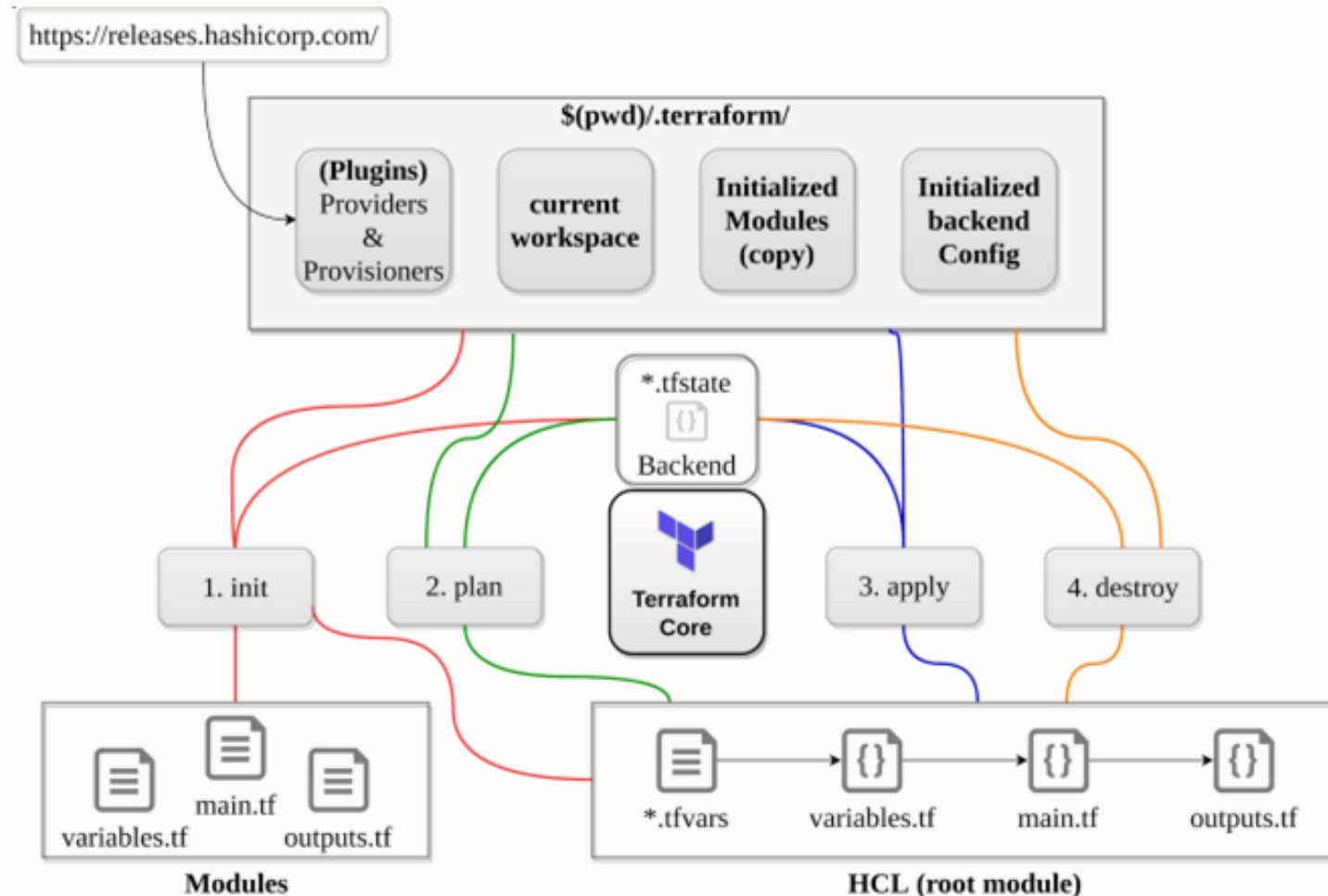
Providers: Local y Remote

Comandos: fmt, validate, taint, import, lock

Opciones: parallelism

Workspaces

Anidación: Export/Import state files





ORACLE

Resource Manager

Francisco Moreno



Vista General

Que es?

- Terraform como Servicio
- Usa IaC para automatizar aprovisionamiento de todos los recursos OCI
- Soporte completo CLI, SDK y Consola

Que problemas solucionar?

- Administración del estado de la infraestructura
- La ejecución paralela puede conducir a resultados de infraestructura indeseables
- Controles de acceso limitados en torno a la ejecución de comandos Terraform

Beneficios

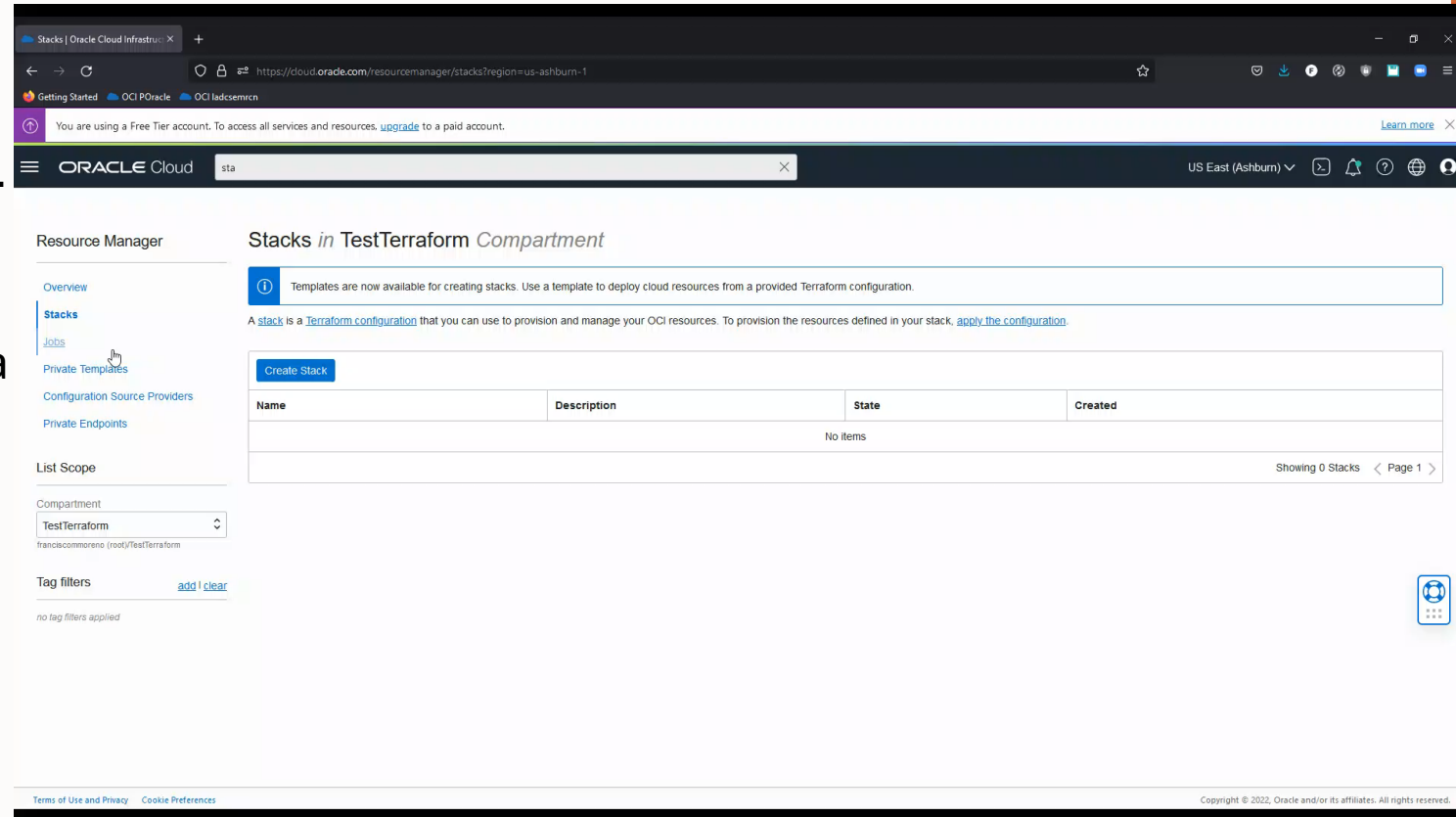
- Automatica y estandarice su infraestructura y replique fácilmente los entornos
- Integración profunda con OCI (es decir, identidad, etiquetado, etc.)
- Administre sin problemas los archivos de estado y mejore la colaboración en equipo

Diferenciador Oracle

- Sin bloqueo, migraciones simples desde y hacia nubes privadas y de terceros
- Construido sobre software de código abierto sin modificar de Terraform para IaC en Oracle Cloud y On Premises
- Soporte local 100% - 1 día para los nuevos servicios y características de OCI

Términos Resource Manager

- Un **stack** representa un conjunto de recursos de OCI que se crean en el tenant.
- Cada stack se asigna a un **configuration** de Terraform y un **state file**.
- Un **job** realiza las acciones definidas en la configuración.
- Las posibles acciones son **Plan**, **Apply**, **Destroy** e **Import State**



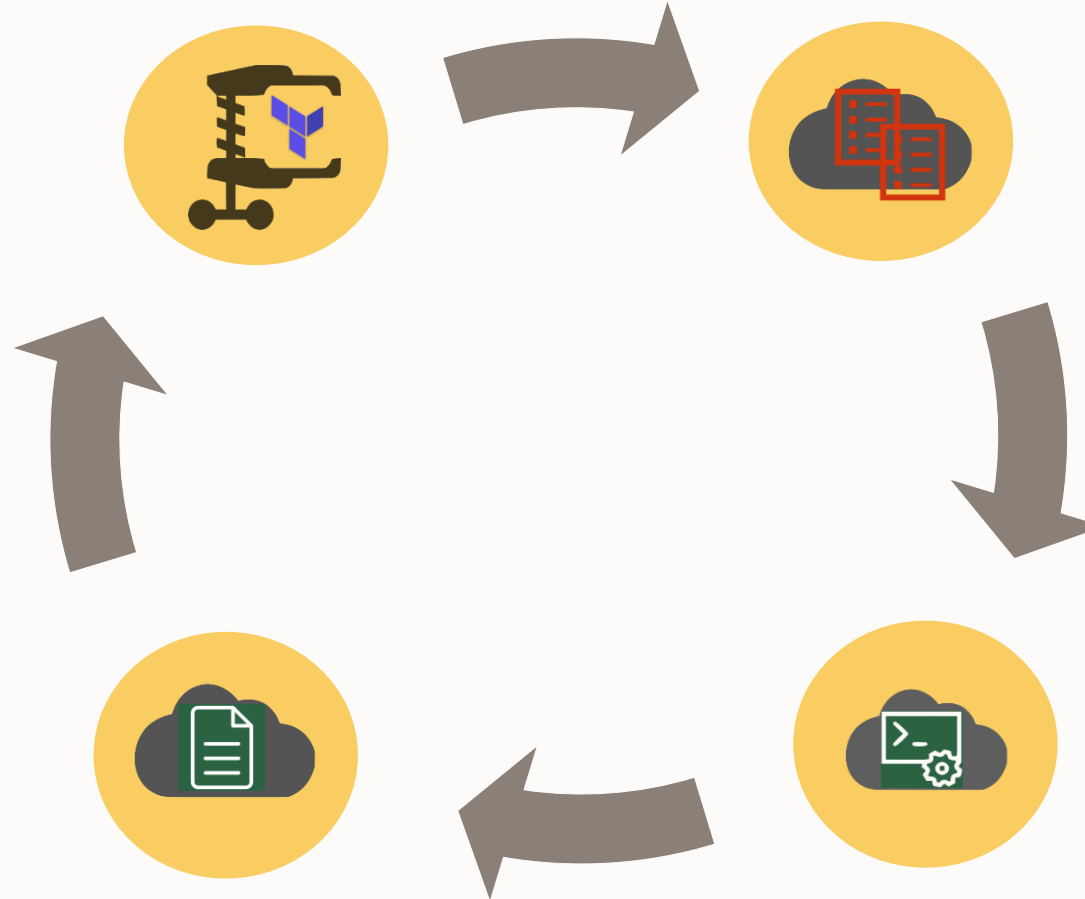
The screenshot displays the Oracle Cloud Resource Manager interface. The left sidebar shows the 'Resource Manager' menu with options like Overview, Stacks, Jobs, Private Templates, Configuration Source Providers, and Private Endpoints. The 'Stacks' section is selected. The main content area shows 'Stacks in TestTerraform Compartment'. A message states: 'Templates are now available for creating stacks. Use a template to deploy cloud resources from a provided Terraform configuration.' Below this, a 'Create Stack' button is visible. A table with columns 'Name', 'Description', 'State', and 'Created' is shown, but it contains no items. The footer includes 'Terms of Use and Privacy' and 'Cookie Preferences' links, and a copyright notice for 2022.

Como funciona?

Codifica/Actualiza

- Archivos Terraform (Zip)
- Sample templates
- Private templates
- Importar infraestructura
- Repositorio Código Fuente
- Asistente (Wizard)

- Visualiza estado
manejado y recursos
aprovisionados
- Detect Drift



Crea/Actualiza Stack
usando

- Console Web
- SDK
- CLI

Ejecuta Job

- Plan/
 - Apply/
 - Destroy/
 - Import State
- Para aprovisiona y
manejar recursos



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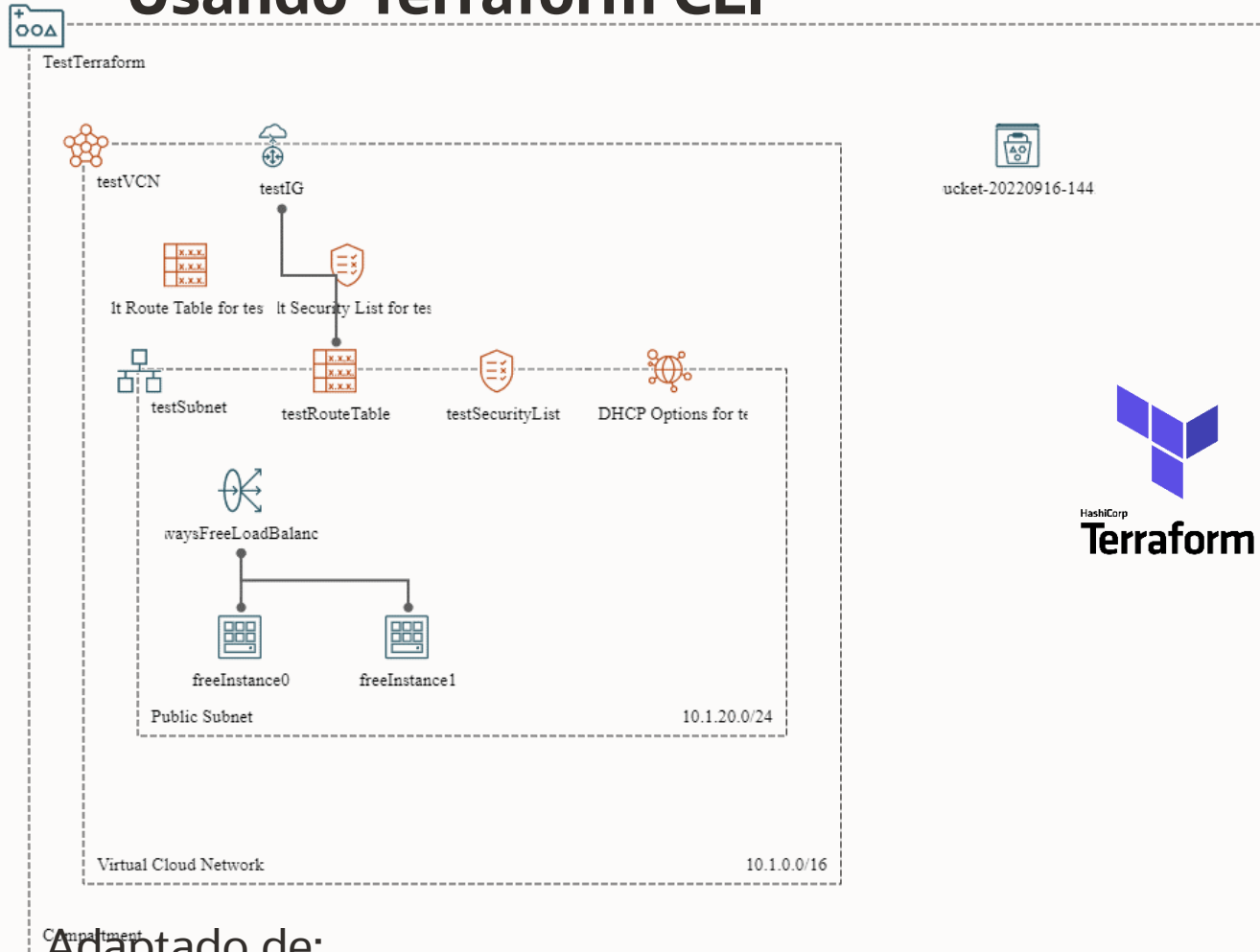
Demos

Francisco Moreno

https://github.com/fmorenod81/OCI_TF



Usando Terraform CLI



Pasos

(Solo Local)

1. Configurar OCI CLI
 2. Configurar Terraform
- (Todos)
3. Descargar código
 4. Cambiar a Desde_CLI
 5. Desplegar desde Terraform

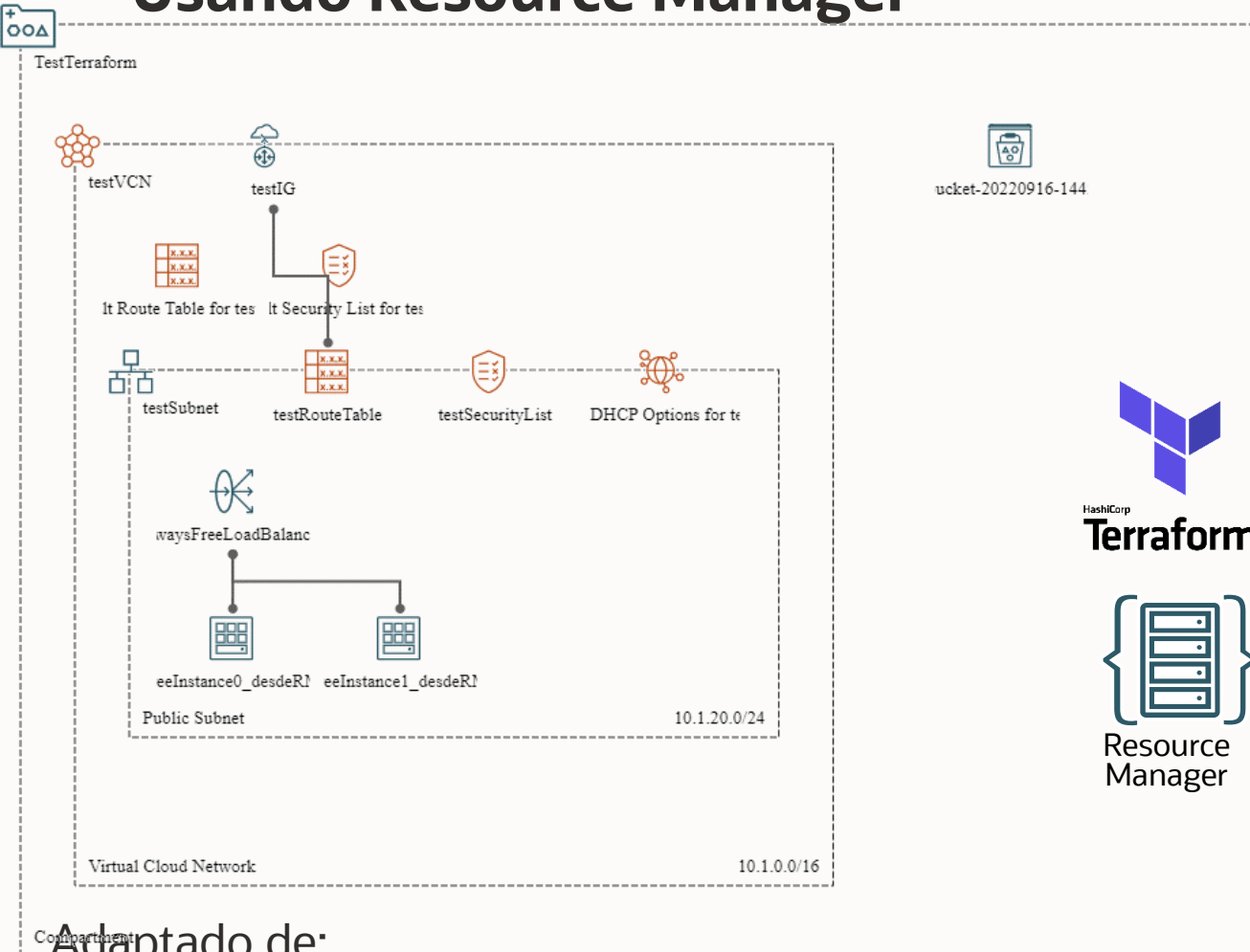
Adaptado de:

https://github.com/oracle/terraform-provider-oci/blob/master/examples/always_free/main.tf

y de:

<http://www.brokedba.com/2020/07/terraform-for-dummies-launch-instance.html>

Usando Resource Manager



Pasos

1. Descargar ZIP
2. Copiar el cloud-init
3. Asignar la llave publica
4. Ejecutar el Resource Manager

Adaptado de:

https://github.com/oracle/terraform-provider-oci/blob/master/examples/always_free/main.tf

y de:

<http://www.brokedba.com/2020/07/terraform-for-dummies-launch-instance.html>

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(Consumo desde Postman)

https://github.com/ashishksingh/postman_collection_for_oci_rest

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