

# DBRE

## Database Reliability Engineering

Designing and operating resilient database systems



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# About Our Live Sessions

**What is DBRE?**

**IaC**

**Basics**

**1<sup>st</sup> Deploy – Compute Instances**

**2<sup>nd</sup> Deploy – DB with DG**

**Performance ADB**

**Basics**

**Benchmarks**





# What is DBRE?

Database Reliability Engineering is a subfield of SRE.

The way SRE holistically deals with the reliability of all the systems for a company, DBRE deals with all the systems of the data infrastructure of a company.

- Service-Level Management
- Risk Management
- Operational Visibility
- Infrastructure Engineering
- Infrastructure Management
- Backup & Recovery
- Release Management
- Security
- Data Storage, Indexing, Replication





# laC

## Infrastructure-as-code

# Infrastructure-as-Code → Terraform

## ➤ Terraform

- Open Source
- Cloud Agnostic Tool
- Build versioned Infra
- Declarative Configuration
- Deploy Faster
- Ideal for repetitive tasks

## ➤ OCI Resource Manager

## ➤ OCI Cloud Shell

## ➤ Provision of OCI Resources

### Example:

- Networks
- Compute instances
- Databases

# Terraform Basics

**init** - command is used to initialize a working directory containing Terraform configuration files. This is the first command that should be run after writing a new Terraform configuration or cloning an existing one from version control. It is safe to run this command multiple times.

**plan** - The terraform plan command is used to create an execution plan. Terraform performs a refresh, unless explicitly disabled, and then determines what actions are necessary to achieve the desired state specified in the configuration files.

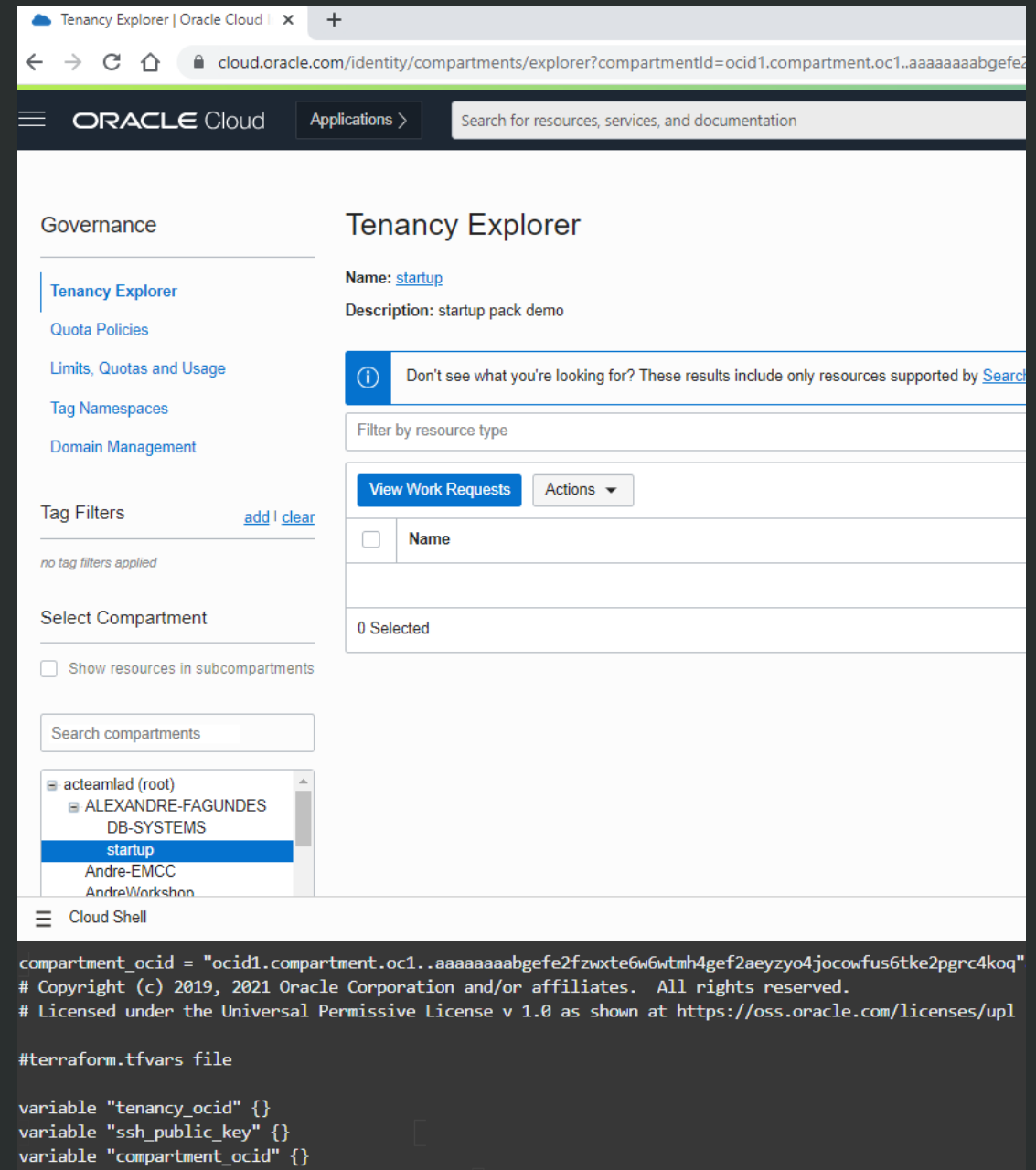
**apply** - The terraform apply command is used to apply the changes required to reach the desired state of the configuration, or the pre-determined set of actions generated by a terraform plan execution plan.

**destroy** - The terraform destroy command is used to destroy the Terraform-managed infrastructure.

<https://www.terraform.io/docs/commands/>

# How can we do that?

# DEMO



Tenancy Explorer | Oracle Cloud | x +

cloud.oracle.com/identity/compartments/explorer?compartmentId=ocid1.compartment.oc1..aaaaaaaabgefe2

ORACLE Cloud Applications > Search for resources, services, and documentation

### Governance

- Tenancy Explorer
- Quota Policies
- Limits, Quotas and Usage
- Tag Namespaces
- Domain Management

Tag Filters [add](#) | [clear](#)

no tag filters applied

Select Compartment

☐ Show resources in subcompartments

Search compartments

- acteamlad (root)
  - ALEXANDRE-FAGUNDES DB-SYSTEMS
  - startup
  - Andre-EMCC
  - AndreWorkshop

Cloud Shell

### Tenancy Explorer

Name: [startup](#)

Description: startup pack demo

Don't see what you're looking for? These results include only resources supported by [Search](#)

Filter by resource type

[View Work Requests](#) [Actions](#) ▼

<input type="checkbox"/>	Name
0 Selected	

```
compartment_ocid = "ocid1.compartment.oc1..aaaaaaaabgefe2fzwxte6w6wtmh4gef2aeyzo4jocowfus6tke2pgrc4koq"
# Copyright (c) 2019, 2021 Oracle Corporation and/or affiliates. All rights reserved.
# Licensed under the Universal Permissive License v 1.0 as shown at https://oss.oracle.com/licenses/upl

#terraform.tfvars file

variable "tenancy_ocid" {}
variable "ssh_public_key" {}
variable "compartment_ocid" {}
```





Tenancy Explorer | Oracle Cloud

cloud.oracle.com/identity/compartments/explorer?compartmentId=ocid1.compartment.oc1..aaaaaaaabgefe2fzwxt6w6wtmh4gef2aeyzo4jocowfus6tke2pgrc4koq&region=sa

ORACLE Cloud

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add | clear

no tag filters applied

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DB-SYSTEMS

startup

Andre-EMCC

AndreWorkshop

Breno

BrenoBDS

Cloud Shell

Tenancy Explorer

Name: startup

Description: startup pack demo

Don't see what you're looking for? These results include only resources supported by Search. Updates made to resources might not immediately appear in your results.

Filter by resource type

View Work Requests

Actions

<input type="checkbox"/>	Name	Compartment
<input type="checkbox"/>	<a href="#">Web-Server-02 (Boot Volume)</a>	acteamlad (root)/ALEXANDRE-FAGUNDES/startup
<input type="checkbox"/>	<a href="#">Web-Server-01 (Boot Volume)</a>	acteamlad (root)/ALEXANDRE-FAGUNDES/startup
<input type="checkbox"/>	subnet.subnet.oraclevcn.com	acteamlad (root)/ALEXANDRE-FAGUNDES/startup
<input type="checkbox"/>	0.10.in-addr.arpa	acteamlad (root)/ALEXANDRE-FAGUNDES/startup
<input type="checkbox"/>	Default DHCP Options for subnet	acteamlad (root)/ALEXANDRE-FAGUNDES/startup
<input type="checkbox"/>	subnet	acteamlad (root)/ALEXANDRE-FAGUNDES/startup
<input type="checkbox"/>	<a href="#">Web-Server-02</a>	acteamlad (root)/ALEXANDRE-FAGUNDES/startup
<input type="checkbox"/>	<a href="#">Web-Server-01</a>	acteamlad (root)/ALEXANDRE-FAGUNDES/startup
<input type="checkbox"/>	subnet.igw	acteamlad (root)/ALEXANDRE-FAGUNDES/startup

```
oci_core_instance.web-02: Still creating... [20s elapsed]
oci_core_instance.web-01: Still creating... [30s elapsed]
oci_core_instance.web-02: Still creating... [30s elapsed]
oci_core_instance.web-01: Still creating... [40s elapsed]
oci_core_instance.web-02: Still creating... [40s elapsed]
oci_core_instance.web-01: Creation complete after 46s [id=ocid1.instance.oc1.sa-saopaulo-1.antxeljr-fwbk1macrdd3kjfyinvqaxmvjyk7t3xsawppvo35gjk161bi7ehq]
oci_core_instance.web-02: Creation complete after 46s [id=ocid1.instance.oc1.sa-saopaulo-1.antxeljr-fwbk1macq6v13xaluw5quvaxd455tvrhemqihooouhapesbtwkxq]

Apply complete! Resources: 7 added, 0 changed, 0 destroyed.
```

# 1<sup>st</sup> sample Deployment

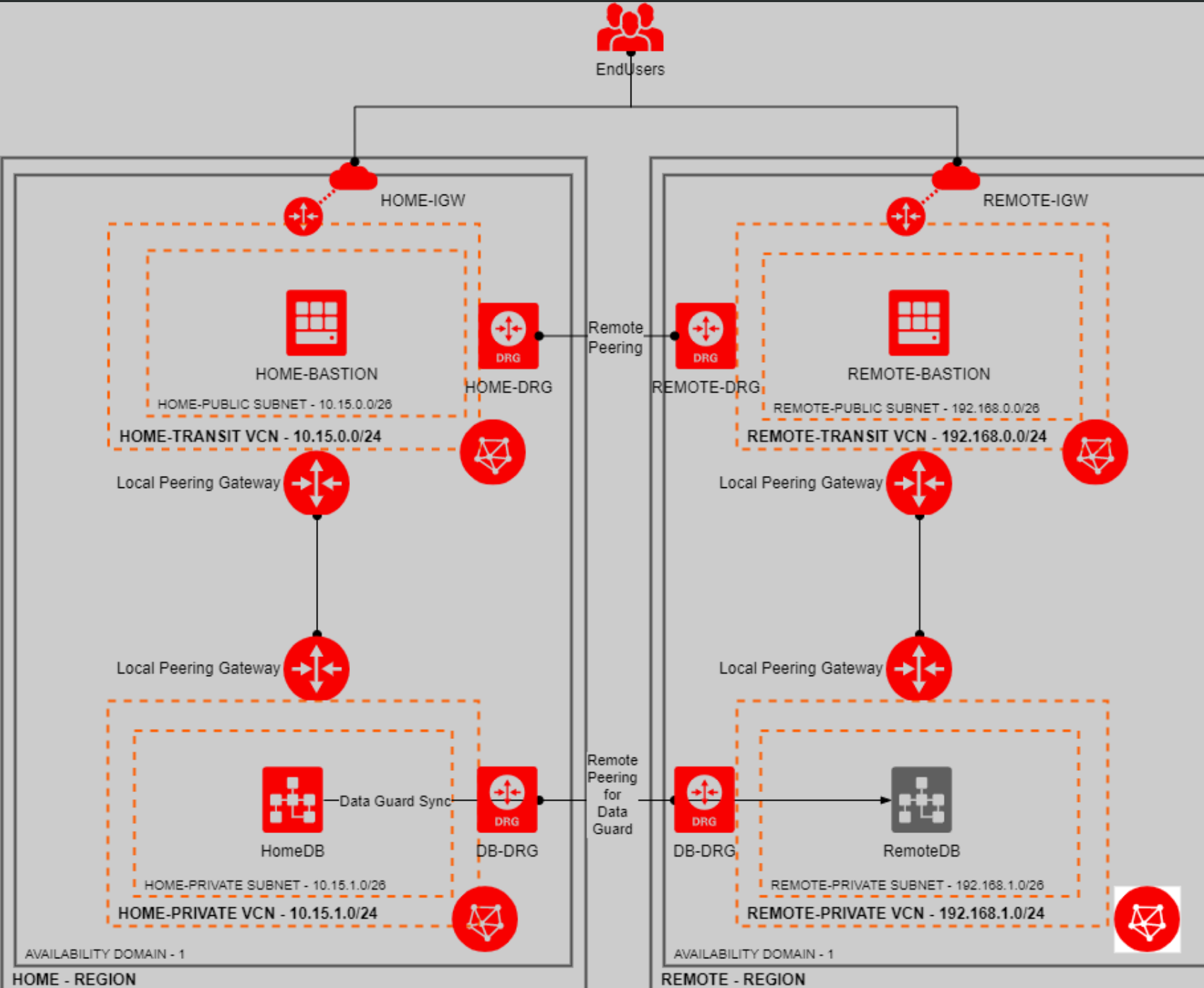
VCN  
 Subnet  
 Security List  
 Route Table  
 Internet Gateway  
 Boot Volumes  
 vNICs  
 Compute instances



# DB with DG Association

## 2<sup>nd</sup> Deployment

- 2 VCNs
- 2 Subnets
- 2 Security Lists
- 2 Route Table
- 2 Internet Gateway
- 2 Boot Volumes
- 4 vNICs
- 2 Compute instances
- 1 Primary DB
- 1 Stand-by DB (Different Region)
- Dataguard Association



# Wrap Up – Deploying Resources

## Using IaC & Cloud Shell

**Rapidly  
Easily  
If necessary, repeatedly**

### **1<sup>st</sup> deploy**

<https://github.com/alefagun/code>

### **2<sup>nd</sup> deploy**

<https://github.com/alefagun/startup>

—



# Performance

# Performance

## Oracle Autonomous Database through good Database Design

### Benchmarks

- The total transactions per second achieved (TPS)
- The average elapsed time in seconds across the 8 benchmark sessions (ELA)
- A cumulative breakdown of where the 8 sessions utilized the elapsed time



# Performance Benchmarks

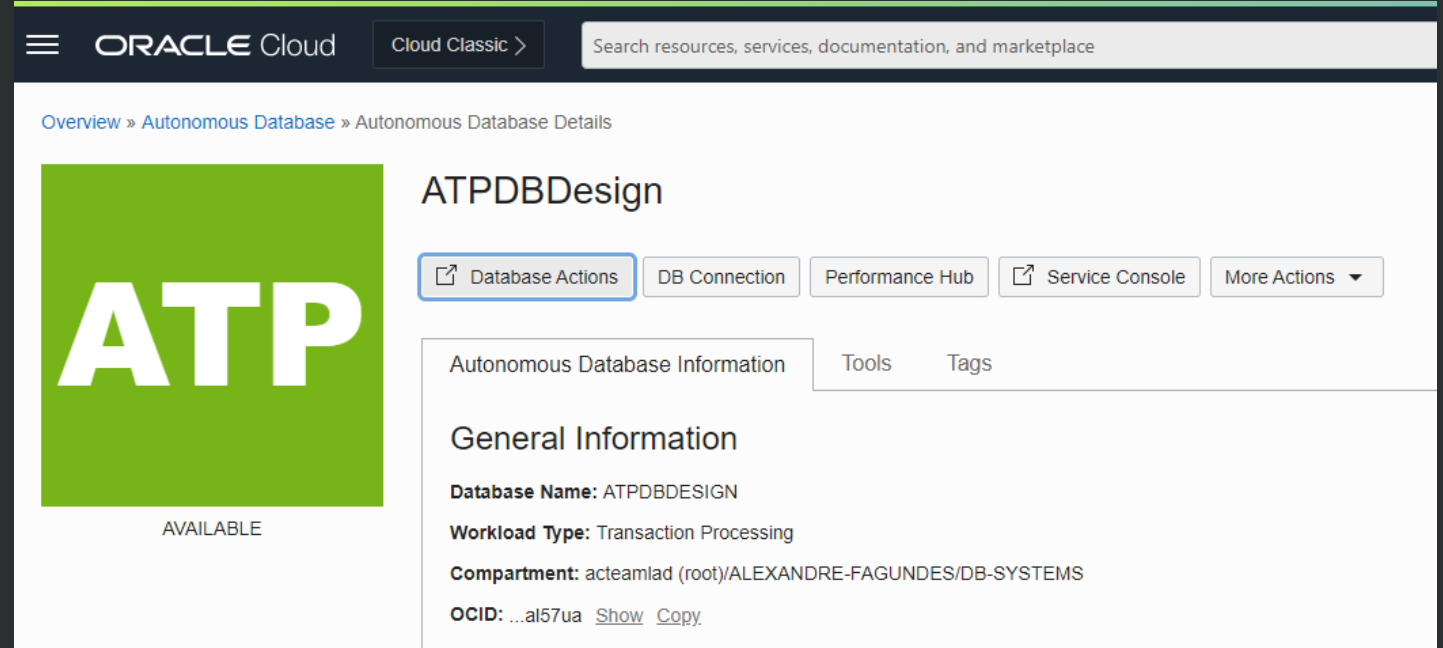
**Benchmark 1:** Launches 8 parallel sessions

**Benchmark 2:** 1 + Reduces DML triggers (table creation with DEFAULT ON NULL)

**Benchmark 3:** 2 + Improve sequences CACHE, drop few indexes

**Benchmark 4:** 3 + Partitioning

# How can we do that?



The screenshot displays the Oracle Cloud console interface for an Autonomous Database instance named ATPDBDesign. The top navigation bar includes the Oracle Cloud logo, a 'Cloud Classic' link, and a search bar. The breadcrumb trail indicates the path: Overview » Autonomous Database » Autonomous Database Details. On the left, a large green square contains the white text 'ATP', with the word 'AVAILABLE' centered below it. To the right of the ATP logo, the instance name 'ATPDBDesign' is displayed. Below the name is a row of action buttons: 'Database Actions' (highlighted with a blue border), 'DB Connection', 'Performance Hub', 'Service Console', and 'More Actions' with a dropdown arrow. Further down, there are tabs for 'Autonomous Database Information' (selected), 'Tools', and 'Tags'. Under the 'Autonomous Database Information' tab, the 'General Information' section lists the following details: 'Database Name: ATPDBDESIGN', 'Workload Type: Transaction Processing', 'Compartment: acteamlad (root)/ALEXANDRE-FAGUNDES/DB-SYSTEMS', and 'OCID: ...al57ua' with links to 'Show' and 'Copy'.

# DEMO



# Thank you



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