

ORACLE

# DBRE

## Database Reliability Engineering

Designing and operating resilient database systems



Alexandre Fagundes

Cloud Architect, Oracle Latin America

## Safe Harbor Statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

# Outline

- **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

### 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..aaaaaaaabgefe2fzwxte6w6wtmh4gef2aeyzyo4jocowfus6tke2pgrc4koq"
# 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..aaaaaaaabgefe2fzwte6w6wtmh4gef2aeyzo4jocowfus6tke2pgrc4koq8&region=sa

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
    - Breno
    - BrenoBDS

### 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.iaw	acteamlad (root)/ALEXANDRE-FAGUNDES/startup

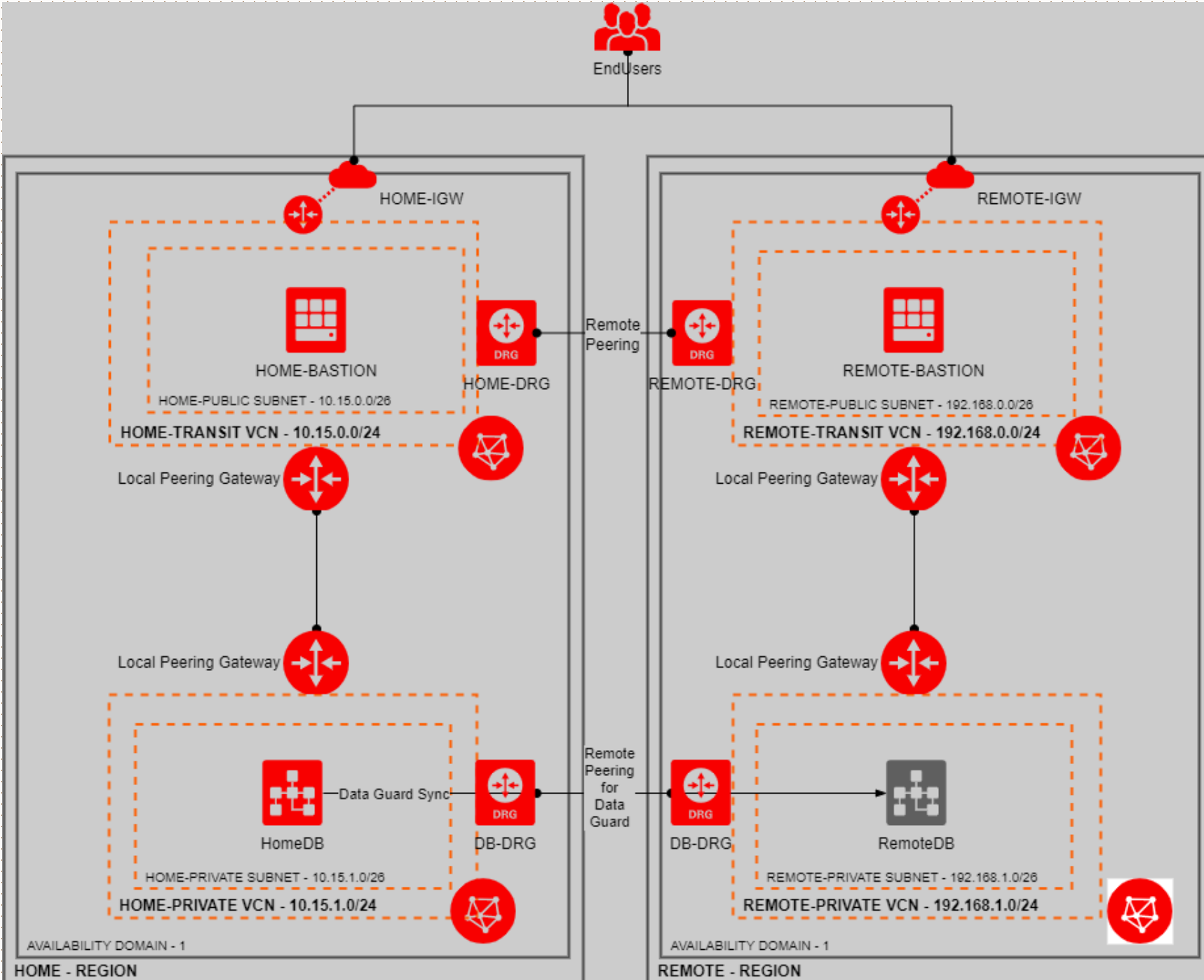
Cloud Shell

```
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-fwbk1macrdd3kjfyinvgaxmvjyk7t3xsawppvo35gjk161bi7ehq]
oci_core_instance.web-02: Creation complete after 46s [id=ocid1.instance.oc1.sa-saopaulo-1.antxeljr-fwbk1macq6v13xaluw5qvuaXd455tvrhemqihoouohapesbtw1kxq]
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





## 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

# 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**


**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

# DEMO

 ORACLE Cloud

Cloud Classic >

Search resources, services, documentation, and marketplace

[Overview](#) » [Autonomous Database](#) » Autonomous Database Details

AVAILABLE

ATPDBDesign

Database Actions

DB Connection

Performance Hub

Service Console

More Actions ▾

Autonomous Database Information

Tools

Tags

General Information

**Database Name:** ATPDBDESIGN**Workload Type:** Transaction Processing**Compartment:** acteamlad (root)/ALEXANDRE-FAGUNDES/DB-SYSTEMS**OCID:** ...al57ua [Show](#) [Copy](#)

...



# Stay Connected with the Latin America Partner Community!

Information, collaboration and training all in a single spot.

The [LAD Partner Community](#) is a space dedicated to our partners in Latin America, where you can find information and stay up to date on what OPN has to offer.

In the Community, you will find all the information that we communicate to our ecosystem by email.

- Explore [Categories](#): organized by grouping publications on a same topic;
- Access the [Recent Discussions](#) tab to check the latest posts published;
- Take part in [Groups](#) and interact with Oracle Experts and other partners.

**Important:** An Oracle SSO account is required to access the Community and other OPN resources. If you don't have this account yet, access [this link](#) or the QR code below.

Access the Community:



Create your SSO account:

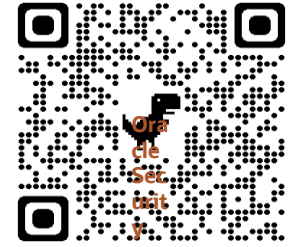




# Thank you



**Alexandre Fagundes**  
**Cloud Architect, Oracle Latin America**



Visit Oracle Security



Sign up for OCI Free Trial