ORACLE

Automation in Oracle Cloud Infrastructure

April 2020

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Agenda

- Infrastructure as Code with Terraform
- CLI to manage your OCI resources
- Auto stopping and starting of OCI resources

OCI Automation

- More Abstraction
- Built with Python SDK
- Windows, Linux, Mac
- Easy to use
- Procedural

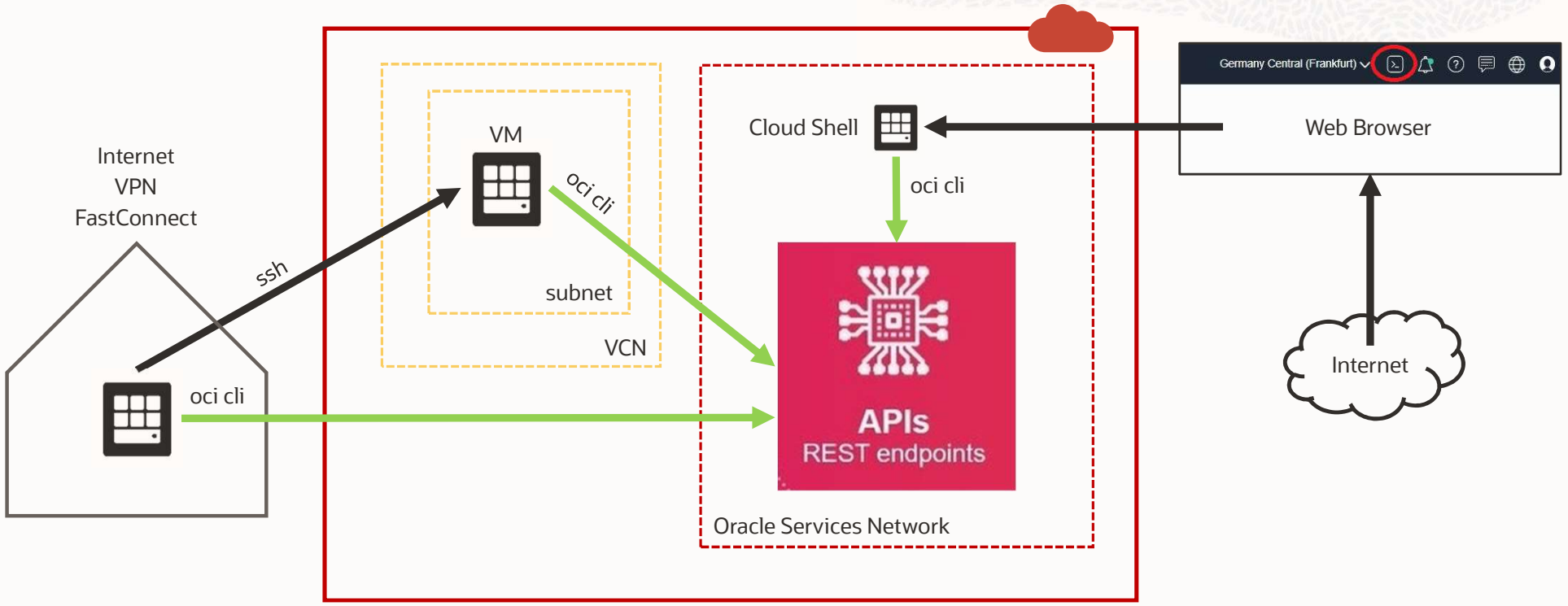
- Abstraction Layer
- Programming

- All UI operations
- and more...

- Descriptive (JSON)
- Create & Destroy
  - No actions
- Idempotent
- Multi-Cloud

```
resource "oci_database_autonomous_database" "ATPdemo" {
  admin_password  = "OClautodb__11"
  compartment_id  = var.compartment_ocid
  cpu_core_count = 1
  data_storage_size_in_tbs = 1
  db_name = "ATPdemo"
  db_workload  = "OLTP"
  display_name = "ATPdemo"
  is_auto_scaling_enabled = false
}

terrform [plan | apply | destroy]
```

Cloud Tooing (oci, SDK, API) | Your **FIRST** Choice



Cloud Shell: https://docs.oracle.com/en-us/iaas/Content/API/Concepts/cloudshellintro.htm

> oci | Your **FIRST** Choice

```
[opc@automation ~]$ oci db node soft-reset --db-node-id ocid1.dbnode.oc1.eu-fr
{
  "data": {
    "additional-details": null,
    "backup-vnic-id": null,
    "db-system-id": "ocid1.dbsystem.oc1.eu-frankfurt-1.abtheljrrfumspf2n54eqor
    "fault-domain": "FAULT-DOMAIN-2",
    "hostname": "dbcs03",
    "id": "ocid1.dbnode.oc1.eu-frankfurt-1.abtheljrufx4ej3nsamxccpumjvj5v2znpc
    "lifecycle-state": "STOPPING",
    "maintenance-type": null,
    "software-storage-size-in-gb": 200,
    "time-created": "2020-12-10T10:26:26.461000+00:00",
    "time-maintenance-window-end": null,
    "time-maintenance-window-start": null,
    "vnic-id": "ocid1.vnic.oc1.eu-frankfurt-1.abtheljrfzfbeqd75wvi2bqyxhzbtse
  },
  "etag": "5ebc72e5",
  "opc-work-request-id": "ocid1.coreservicesworkrequest.oc1.eu-frankfurt-1.abt
}
[opc@automation ~]$
```

CLI reference: https://docs.oracle.com/en-us/iaas/tools/oci-cli/2.19.0/oci_cli_docs/index.html

ExaCC Local CLIs

> dbaasapi

- Create/Delete non-CDB databases
  - **not** recommended
- Create/Delete databases on a subset of the nodes
  - **not** recommended

> dbaascli

Commands not (yet) available with OCI CLI/Rest API

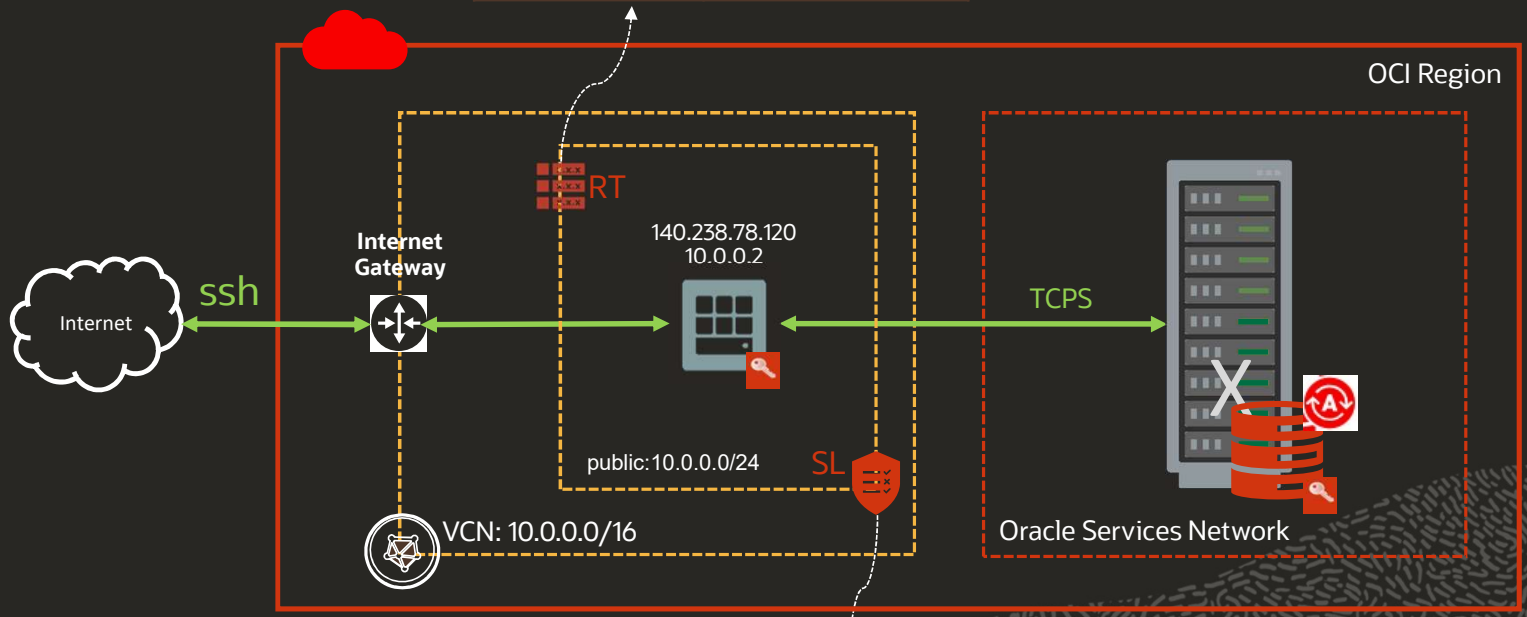
- Scale up/down OCPUs in disconnected mode
- Download and list available software images
- Managing pluggable databases (PDBs) – use SQL alternatively
- Rotating the TDE master encryption key – use SQL alternatively
- Starting and stopping the Oracle Net listener – use lsnrctl alternatively
- Managing databases created via dbaasapi on a subset of the nodes
  - **not** recommended

> exacli

- Subset of on-premises Exadata cellcli commands

Architecture

Destination	Target
0.0.0.0/0	Internet Gateway



Rule	Stateless	Source/Dest
Ingress Egress	No No	0.0.0.0/0 0.0.0.0/0

OCI | Automation Tools

Example | OCI SDK in Python

```
import oci
import os
compartment_id = 'ocid…'
signer = oci.auth.signers.InstancePrincipalsSecurityTokenSigner()

object_storage_client = oci.object_storage.ObjectStorageClient(config={}, signer=signer)
print(object_storage_client.get_namespace().data)
print(object_storage_client.list_buckets(namespace_name=object_storage_client
     .get_namespace().data, compartment_id=compartment_id).data)
```

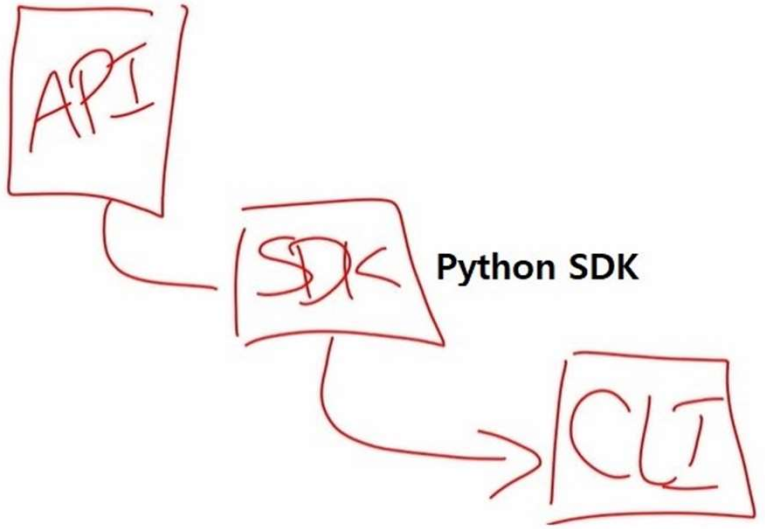
Example | OCI SDK in Java

```
import com.oracle.bmc.Region;
import com.oracle.bmc.auth.AuthenticationDetailsProvider;
import com.oracle.bmc.auth.ConfigFileAuthenticationDetailsProvider;
import com.oracle.bmc.objectstorage.ObjectStorage;
import com.oracle.bmc.objectstorage.ObjectStoarageClient;
import com.oracle.bmc.objectstorage.model.GetBucketRequest;

public class ObjectStorageGetBucketExample {
  public static void main(String[] args) throws Exception {
    String configurationFilePath = "~/.oci/config";
    String profile = "DEFAULT";

    AuthenticationDetailsProvider provider =
          new ConfigFileAuthenticationDetailsProvider(configurationFilePath, profile);

    ObjectStorage client = new ObjectStorageClient(provider);
    client.setRegion(Region.US_PHOENIX_1);
```

OCI CLI

The CLI is an essential tool for managing your OCI resources. It provides much of the same functionality found in the console and sometimes offers extended capabilities. When combined with PowerShell or Bash scripts it can provide power automation capabilities.

- Built with the Python SDK
- Compatible with Python 2.7.5+ or 3.5+
- Works on Mac, Windows, and Linux
- Direct OCI API interactions



Demo - CLI

Demo - Teraform

Automation Tools | Basic Capabilities

	APIs	SDKs	Terraform	Ansible
Programming	Yes		No	
Provisioning	Yes		Yes	
Monitoring	Yes		No	
Actions	Yes		No	
Multi-Cloud	No		Yes	

Automation Tools | Comparison

	CLI	Chef	Ansible	Terraform
Type	Task Automation	Config Mgmt	Config Mgmt+	Orchestration
Infrastructure	Mutable	Mutable	Mutable	Immutable
Code Type	Bash / PowerShell	YAML	YAML	HCL / JSON
Method	Procedural	Procedural	Procedural	Declarative
Architecture	Client only	Client/Server	Client only	Client only

WHEN:	USE:
Automating simple, repeatable actions	→ OCI CLI
Managing app deployment and configuration	→ Ansible / Chef
Creating / destroying complex application architectures	→ Terraform

Common Terminology

- **Idempotent:** this means a change or other action is not applied more than once. Some tools validate whether a task has been completed before applying and will avoid duplicating efforts. This saves cycles and limits potential impact to running resources.
- **Immutable:** is a common term referring to a type of infrastructure or service. It means you don't ever make changes to it. When it comes time to troubleshoot or upgrade, just replace the resource.
- **Ephemeral:** a term used to refer to impermanent resources or temporary resource assignments.
- **Stateless (Application)**: The notion that an application is constructed in such a way as to avoid reliance on any single component to manage transactional or session-related information. Often times a stateless application may leverage immutable instances as part of the deployment strategy.
- **Infrastructure as Code (IaC)**: The process of managing and provisioning cloud resources and services through machine-readable definition files, rather than physical hardware configuration or interactive configuration tools.

Thank you

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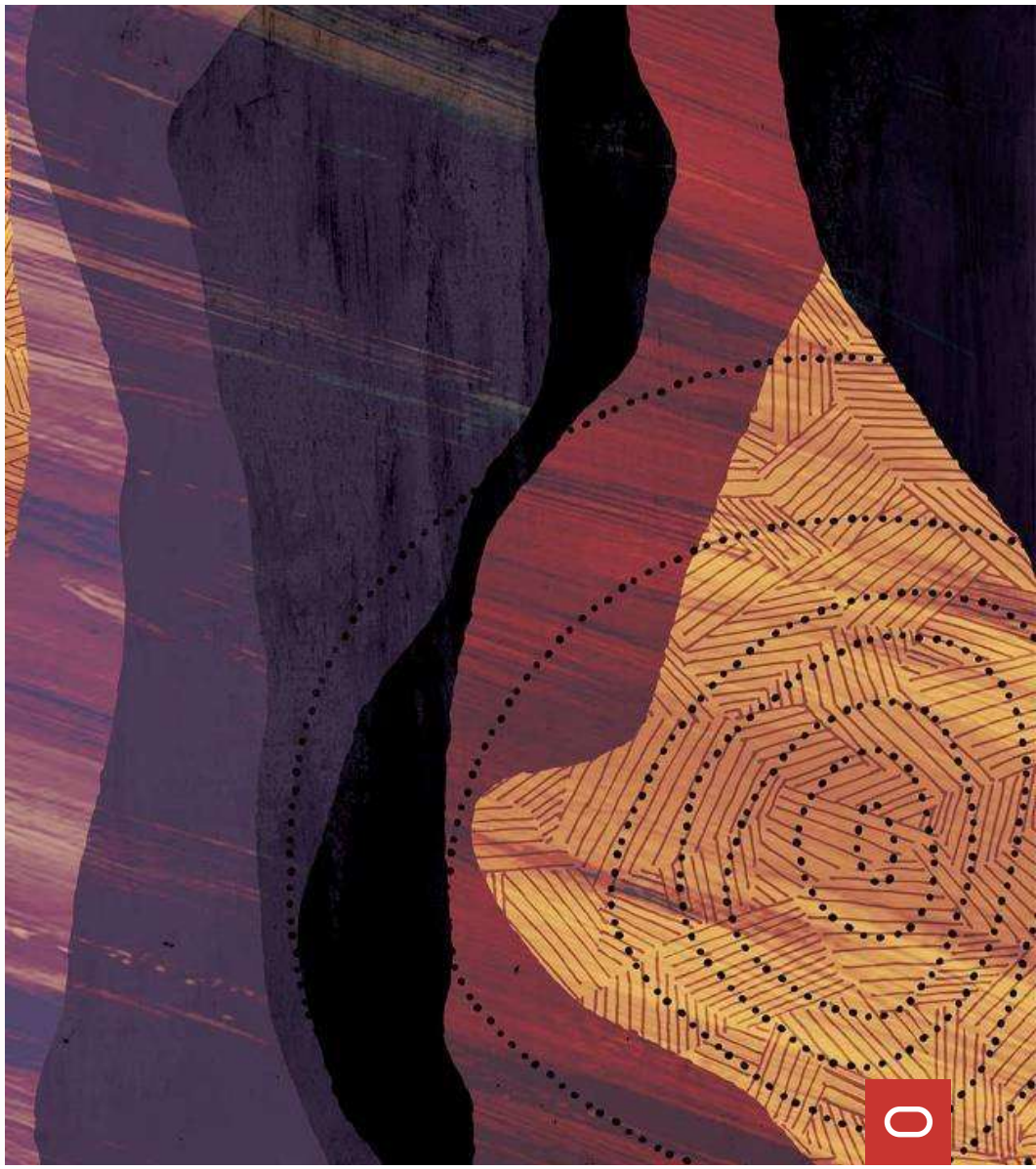


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