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HOCHSCHULE DARMSTADT
UNIVERSITY OF APPLIED SCIENCES

fbi

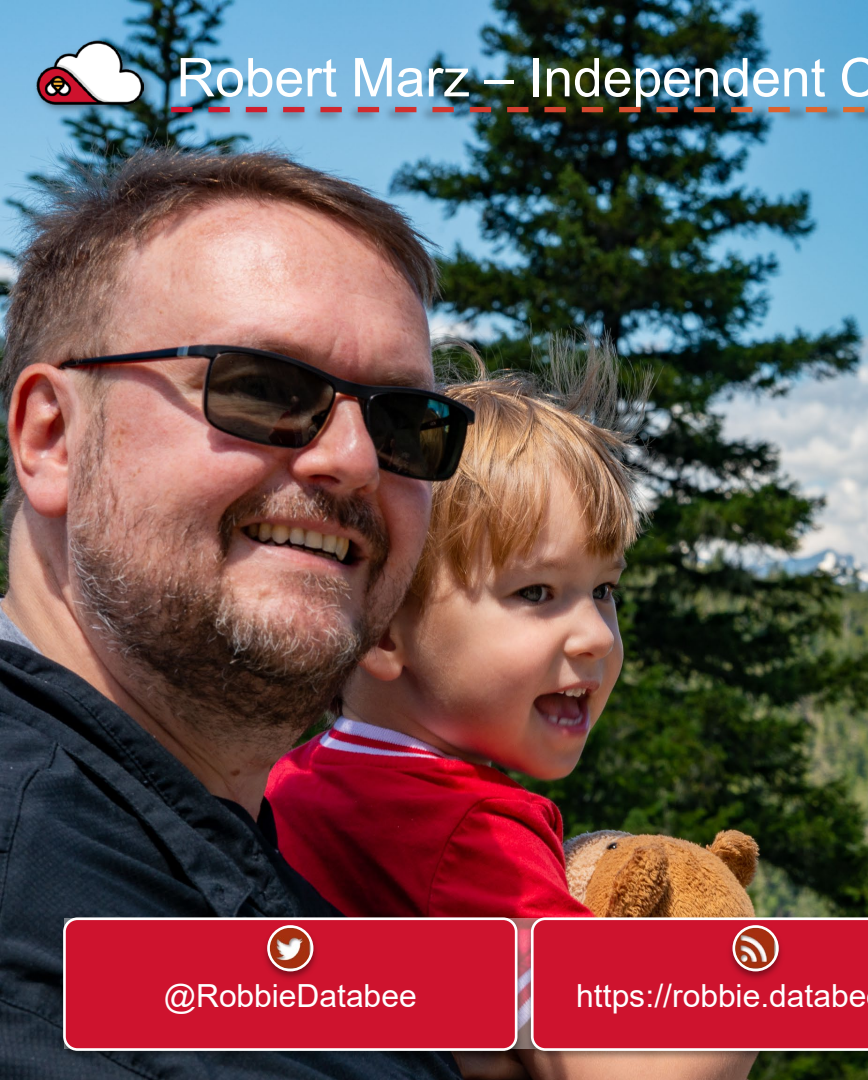
FACHBEREICH INFORMATIK

Robert Marz
DATABEE
Die IT-Architekten

Einführung in die (Oracle) Cloud

Montag, 26. März 10:00

Robert Marz – Independent Consultant



Primary Role

Senior Technical Architect
with database centric view of the world

DOAG (German Oracle User Group)

Active Member of Database Community
Responsible for Cloud Topics

Databees.

DATABEE
Die IT-Architekten

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https://robbie.databee.org

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Oracle ACE Pro

Oracle ACE Program

500+ technical experts helping peers globally

The **Oracle ACE Program** recognizes and rewards community members for their technical and community contributions to the Oracle community

3 membership tiers

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Cloud: Definitions

Cloud?

Begriffsbestimmung Cloud

"Cloud Computing ist ein **Modell**, das es erlaubt **bei Bedarf**, **jederzeit** und überall bequem über ein Netz auf einen geteilten Pool von konfigurierbaren **Rechnerressourcen** […] zuzugreifen, die **schnell** und mit minimalem Managementaufwand oder **geringer Serviceprovider-Interaktion** zur Verfügung gestellt werden können."

BSI (basierend auf der NIST-Definition von 2011)

Cloud Computing

Cloud Computing bezeichnet
das **dynamisch** an den Bedarf **angepasste**, **hochautomatisierte**

- Anbieten
- Nutzen
- Abrechnen

von IT-Dienstleistungen über ein Netz.

BSI (basierend auf der NIST-Definition von 2011)

Cloud: Charakteristische Eigenschaften

On-demand Self Service	Die Provisionierung der Ressourcen (z. B. Rechenleistung, Storage) läuft automatisch ohne Interaktion mit dem Service Provider ab.
Broad Network Access	Die Services sind mit Standard-Mechanismen über das Netz verfügbar und nicht an einen bestimmten Client gebunden.
Resource Pooling	Die Ressourcen des Anbieters liegen in einem Pool vor, aus dem sich viele Anwender bedienen können (Multi-Tenant Modell). Dabei wissen die Anwender nicht, wo die Ressourcen sich befinden, sie können aber vertraglich den Speicherort, also z. B. Region, Land oder Rechenzentrum, festlegen.
Rapid Elasticity	Die Services können schnell und elastisch zur Verfügung gestellt werden, in manchen Fällen auch automatisch. Aus Anwendersicht scheinen die Ressourcen daher unendlich zu sein.
Measured Services	Die Ressourcennutzung kann gemessen und überwacht werden und entsprechend bemessen auch den Cloud-Anwendern zur Verfügung gestellt werden.

Cloud Geschmacksrichtungen

Public Cloud

Im Internet

von jedem buchbar

- Amazon AWS
- MS Azure
- Google Cloud
- Oracle Cloud

Private Cloud

Betrieb on premises

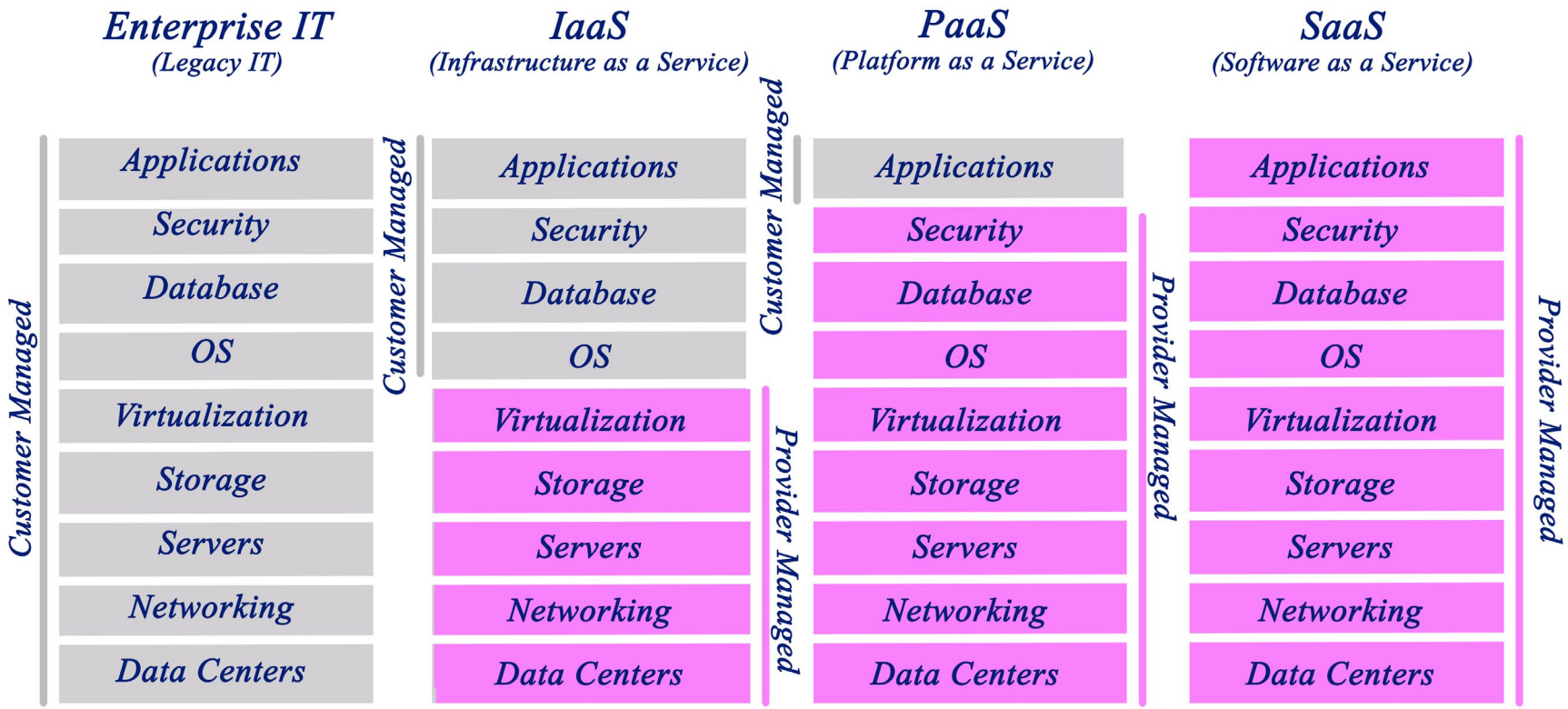
alle Cloud Eigenschaften

- OpenStack
- Oracle Cloud Machine
- MS Azure Stack

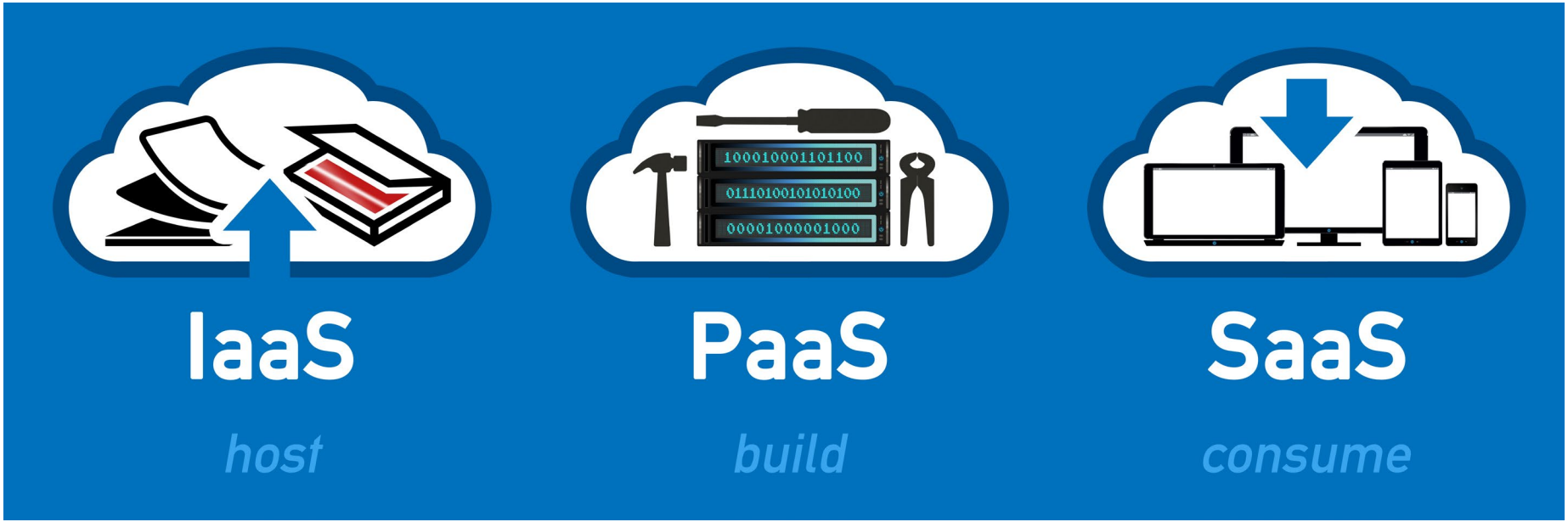
Multi-Cloud

Mischung von Public Clouddiensten verschiedener Anbieter

Cloud Service Models



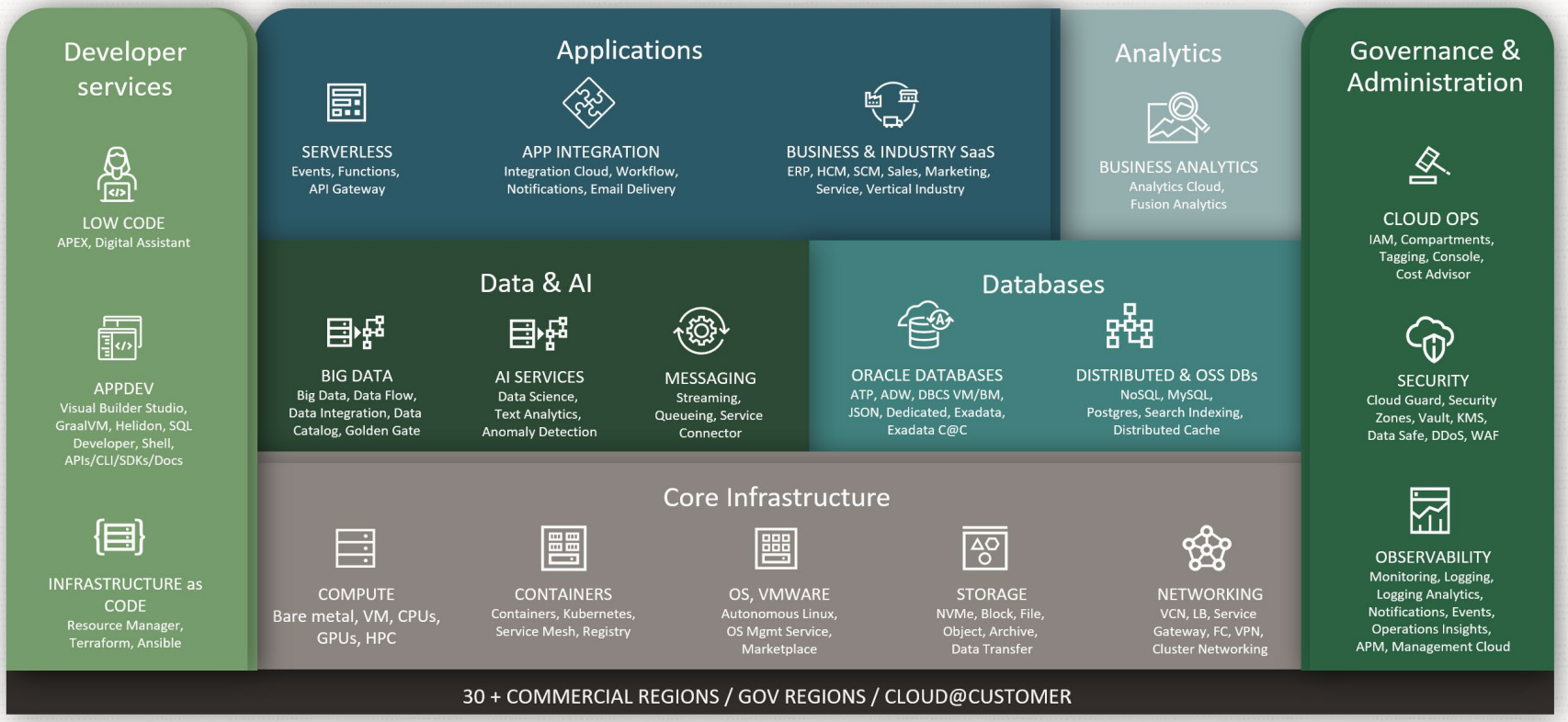
Cloud Service Models



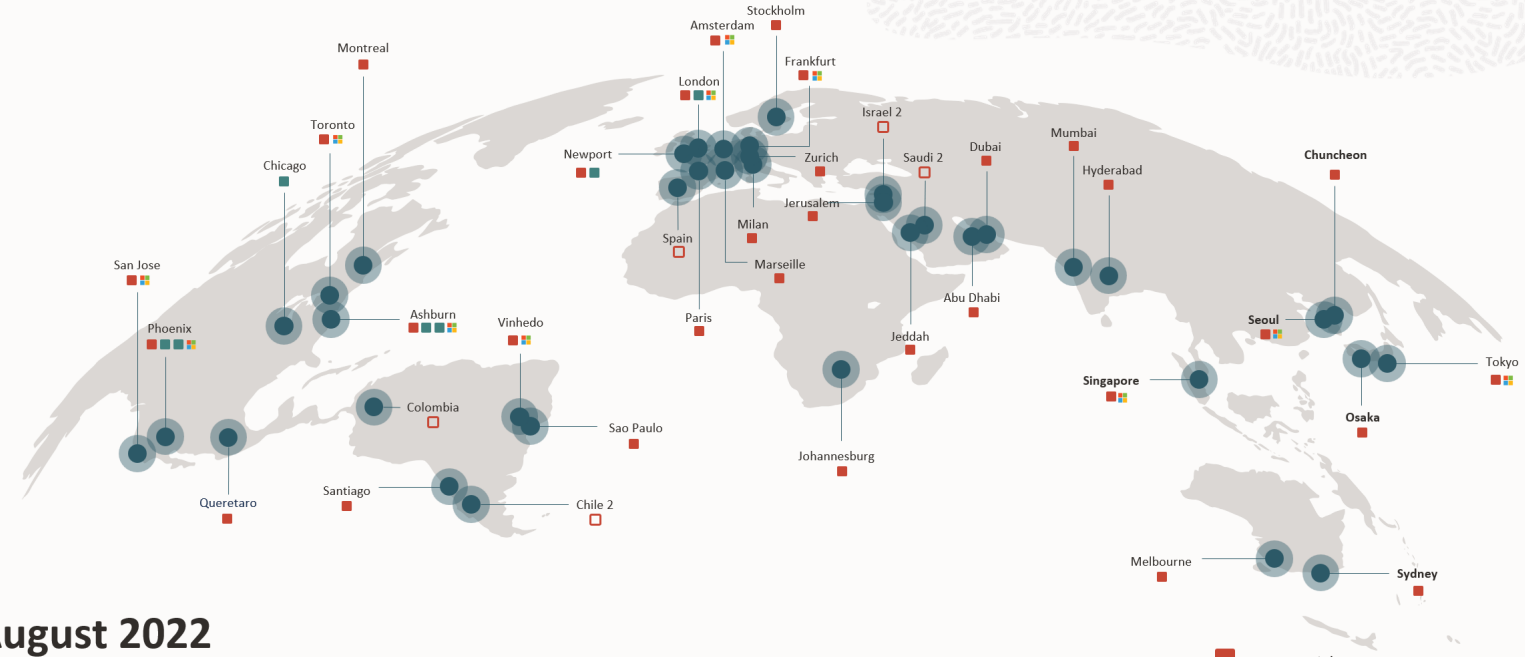
Virtual Machines	Oracle APEX	Subscribed Apps
Storage	Autonomous Database	Rented Services

Oracle Cloud Infrastructure (OCI)

Complete cloud capabilities



Oracle Cloud Infrastructure Global Locations



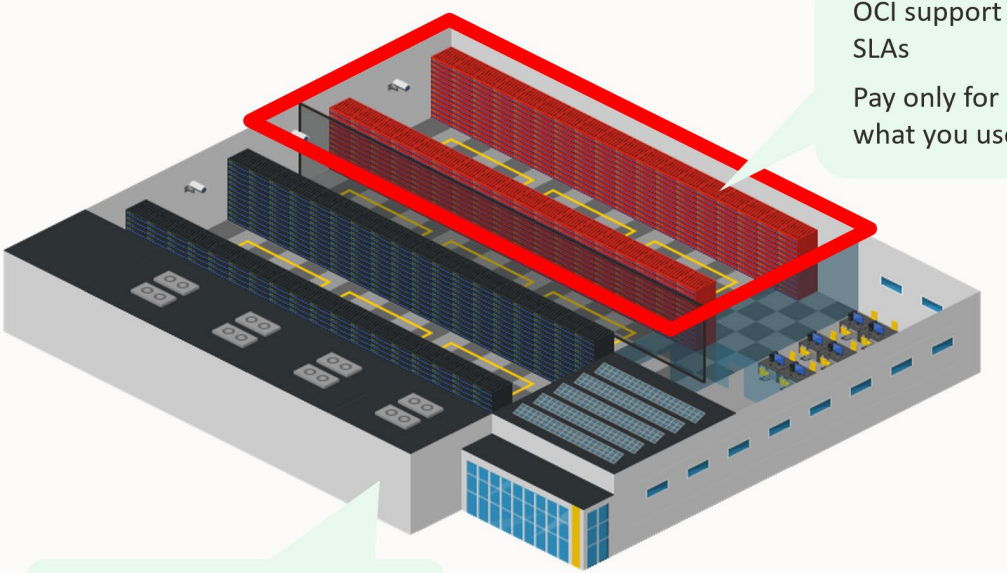
August 2022

39 regions; 5 more planned

11 Azure Interconnect Regions

Oracle Dedicated Region Cloud@Customer

All the capabilities of an Oracle public cloud region, delivered on-premises



OCI support & SLAs

Pay only for what you use

Installed and operated at customer site by OCI

80+ OCI CLOUD SERVICES

Latest compute, storage, networking, security services

Modernize Data Platform: Autonomous Database, Exadata, MySQL + Heatwave, Object Storage Data Lake, Big Data services like Spark, Data Science

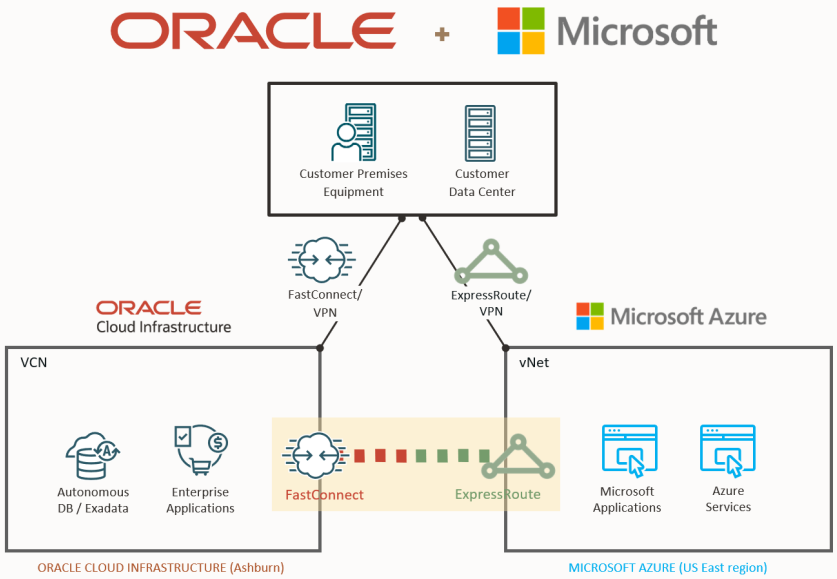
Optimize Apps: Observability and Management

Modernize Applications: Developer Services like Container Engine, Kubernetes, DevOps

SaaS in your own data center: Oracle Cloud Applications like ERP, HCM, ACX

Oracle Cloud + Microsoft Azure Interconnect

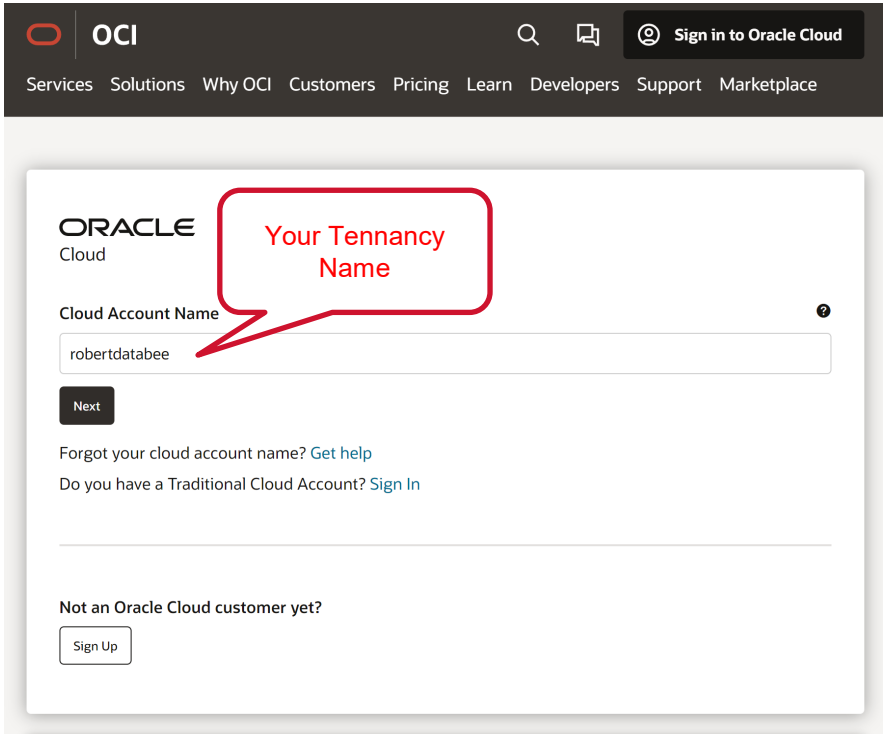
Multicloud solution

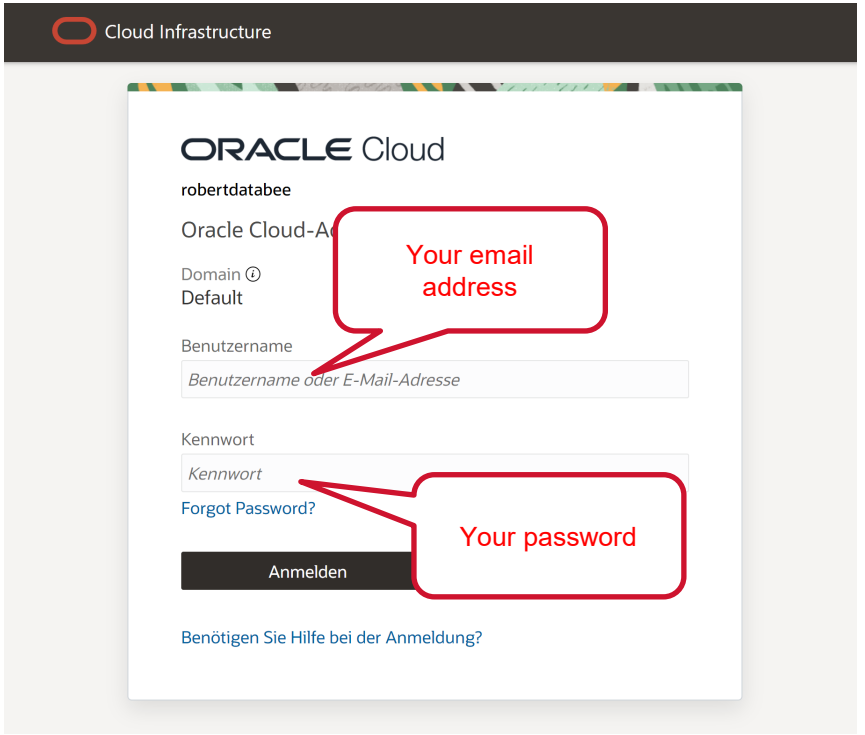


- ✓ Microsoft Azure and Oracle Cloud are **interconnected today**, so you can migrate and run mission-critical enterprise workloads across clouds
- ✓ **FastConnect and ExpressRoute** direct connection with 2 millisecond latency and no intermediate service provider required
- ✓ **Unified identity and access** management via single sign-on with automated user provisioning to easily manage resources across clouds
- ✓ **Collaborative support** of workloads across clouds, for example, custom and Oracle Applications on Azure with Oracle Database cloud services – connect best-in-class services across clouds
- ✓ **Available Now:** Ashburn, San Jose, Vinhedo, Toronto, London, Frankfurt, Amsterdam, Tokyo
- ✓ **Coming Soon:** Government, Asia, Europe regions

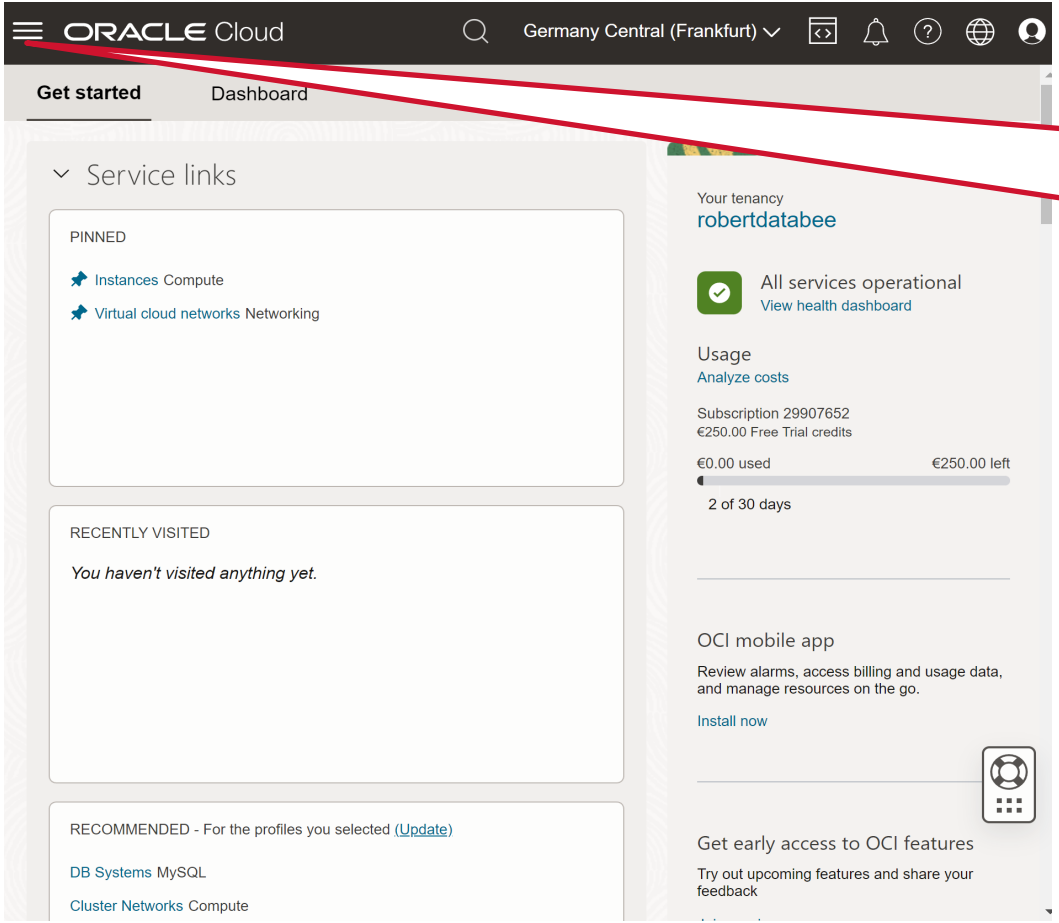
OCI Demo 01: Login

Open https://cloud.oracle.com in your Browser



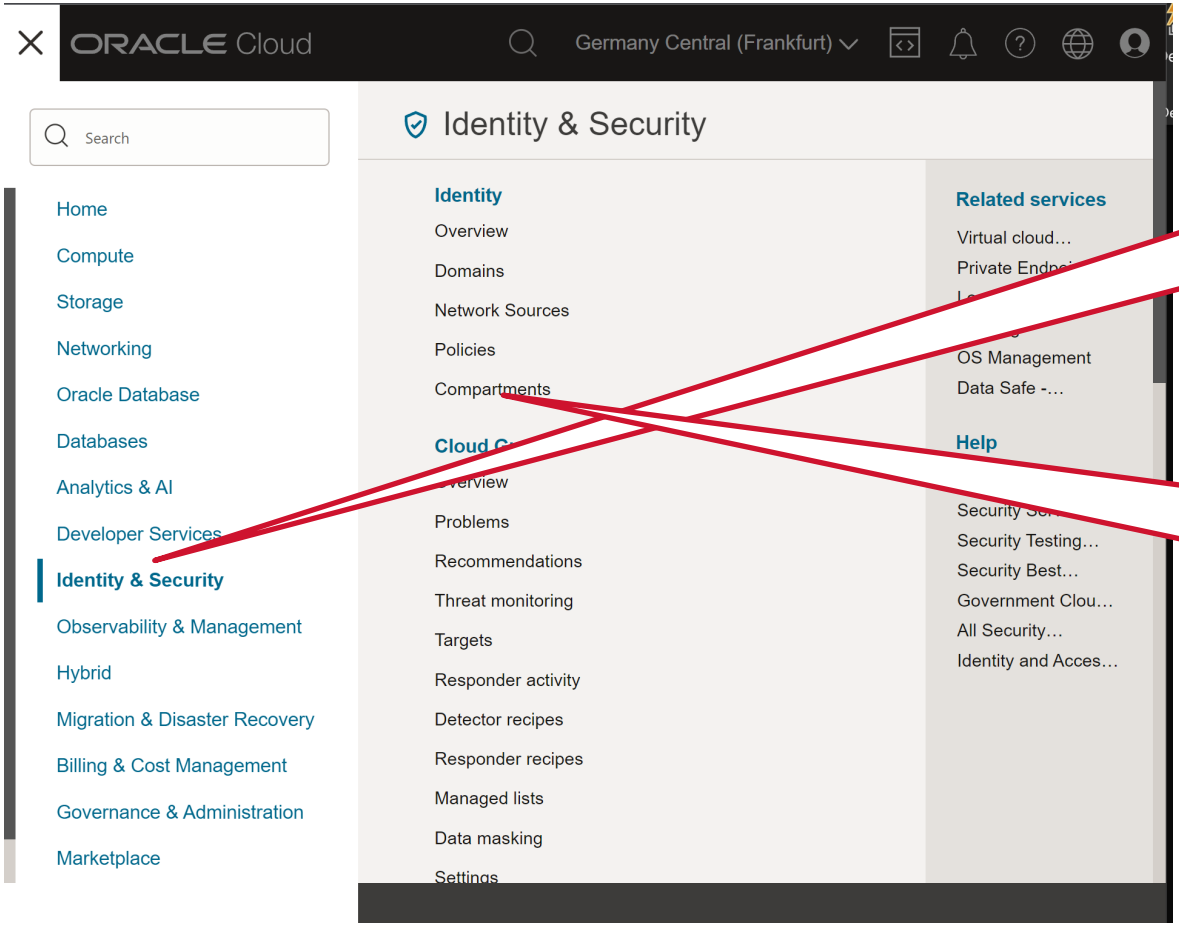


OCI Demo 02: OCI Dashboard



Click on Hamburger Menu

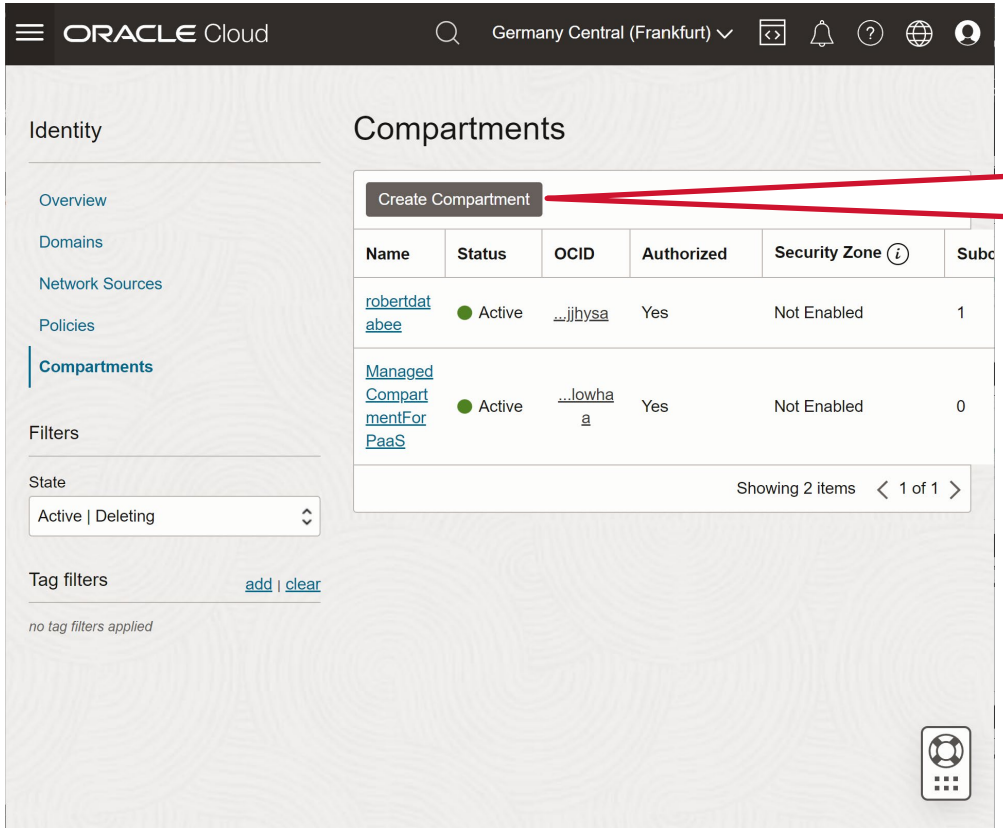
OCI Demo 03: Hamburger Menu – Identity & Security - Compartments



Click „Identity & Security“

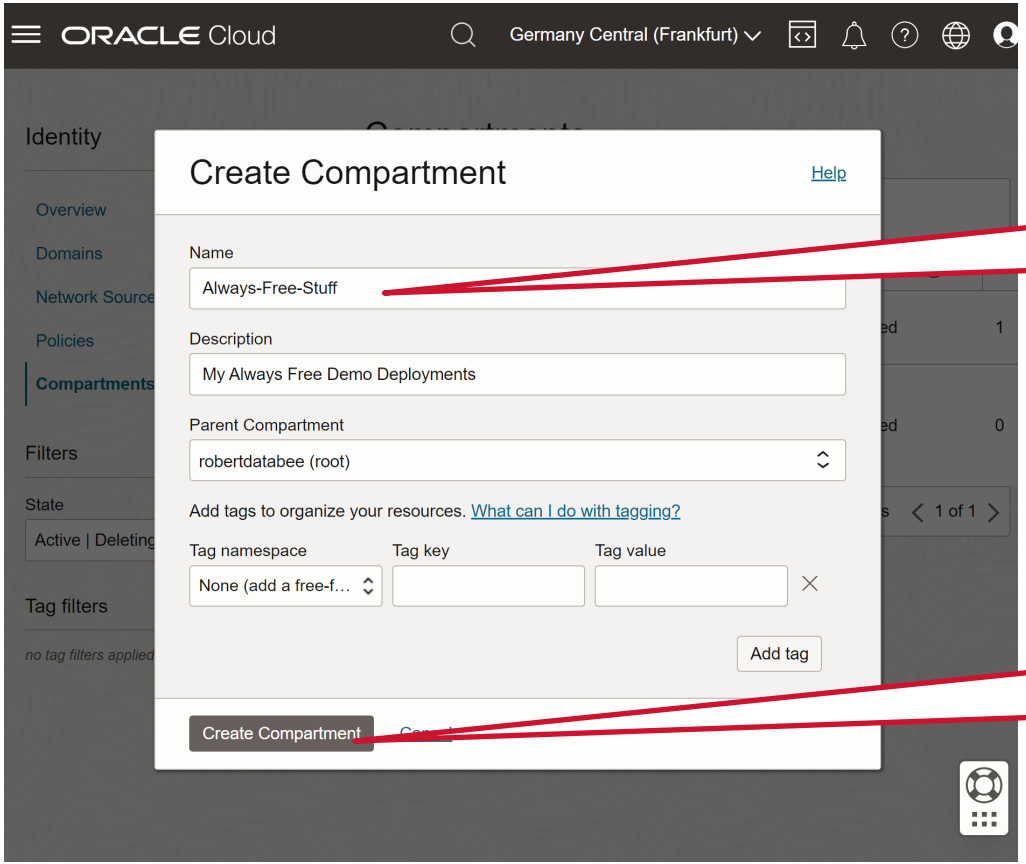
Click „Compartments“

OCI Demo 04: Compartments – create new Compartment



Click „Create Compartments“

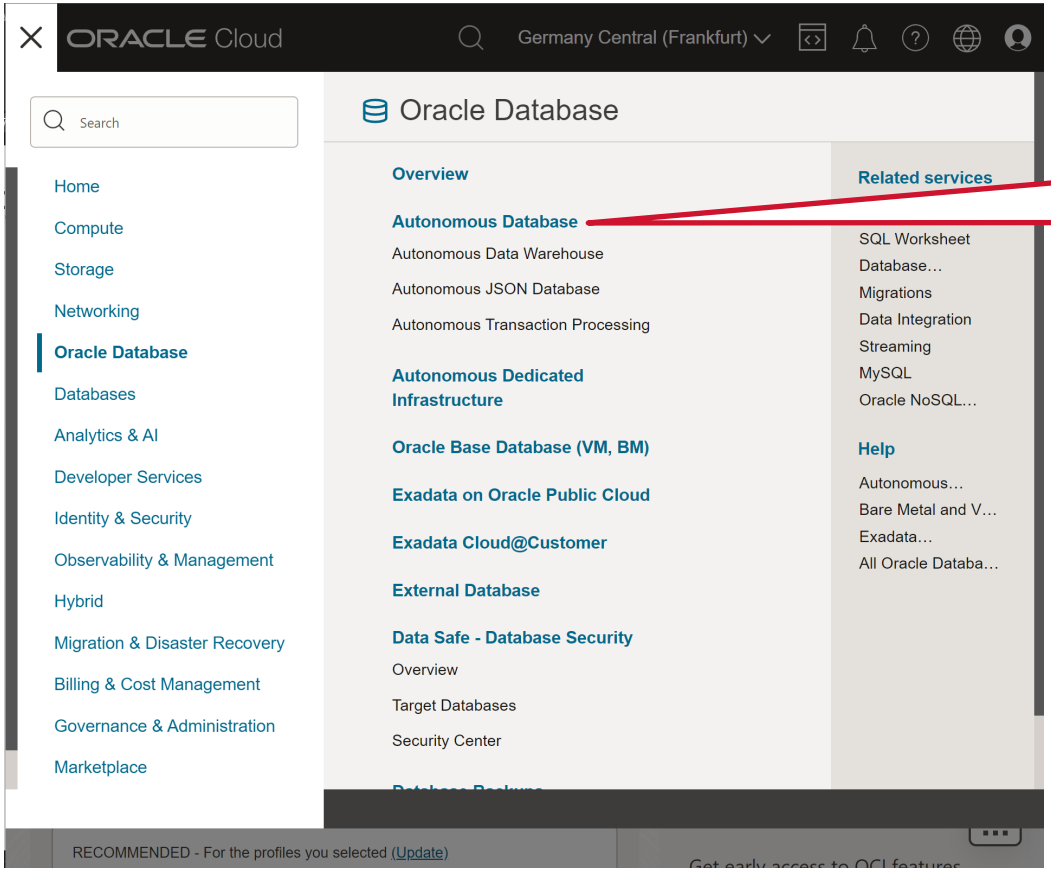
OCI Demo 05: Create Compartment



Enter meaningfull Name & Description

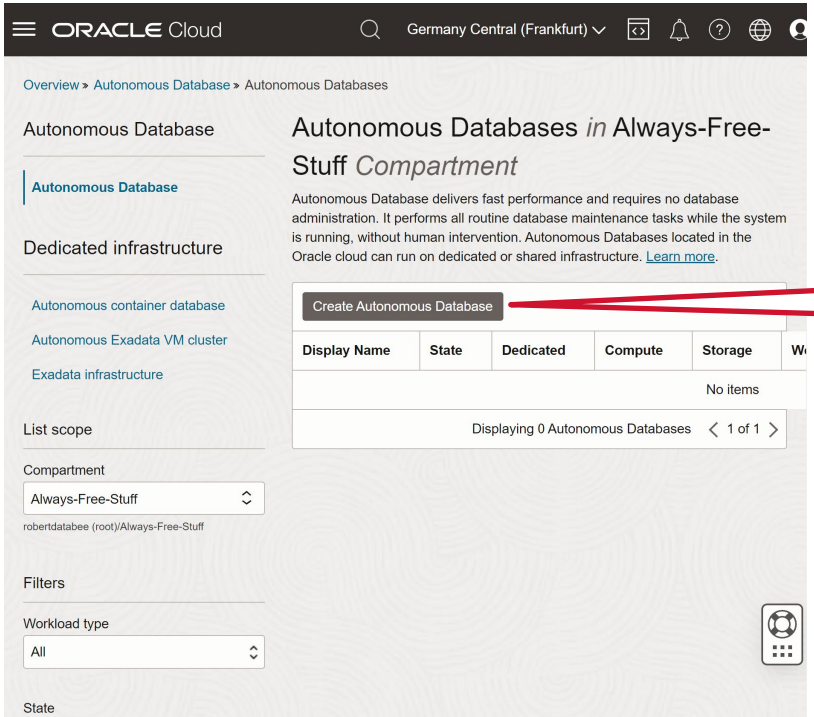
Click „Create Compartment“

OCI Demo 06: open Hamburger Menu – Oracle Databases



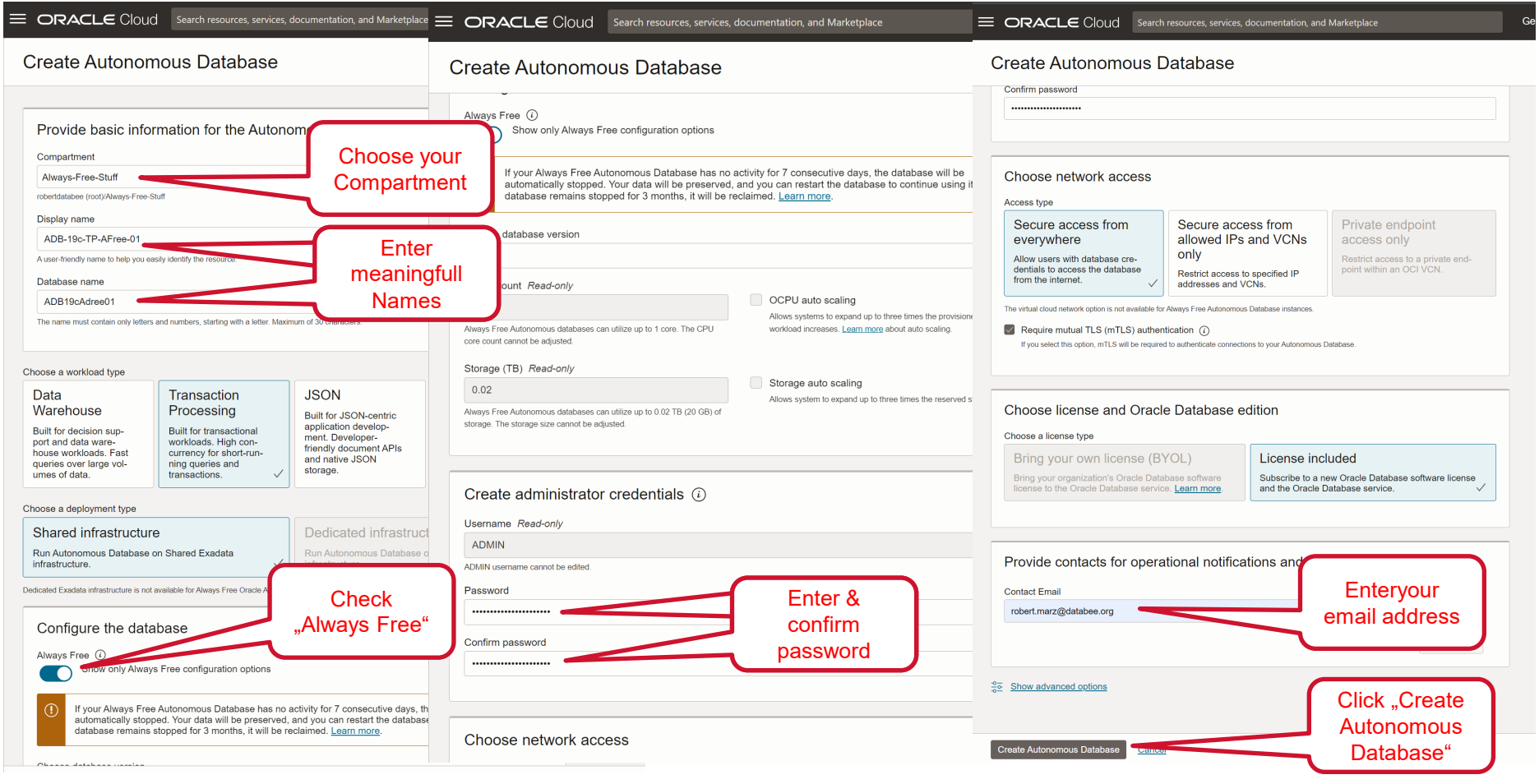
Click „Autonomous Database“

OCI Demo 07: Create Autonomous Database

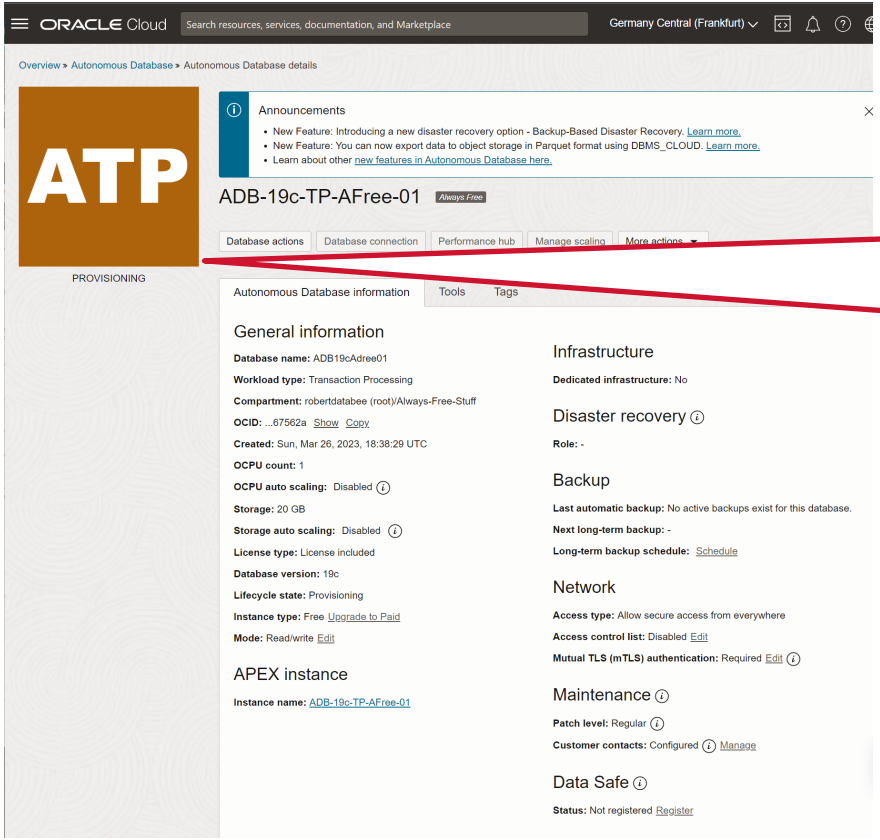


Click „Create Compartment“

OCI Demo 08: Create Autonomous Database Wizard

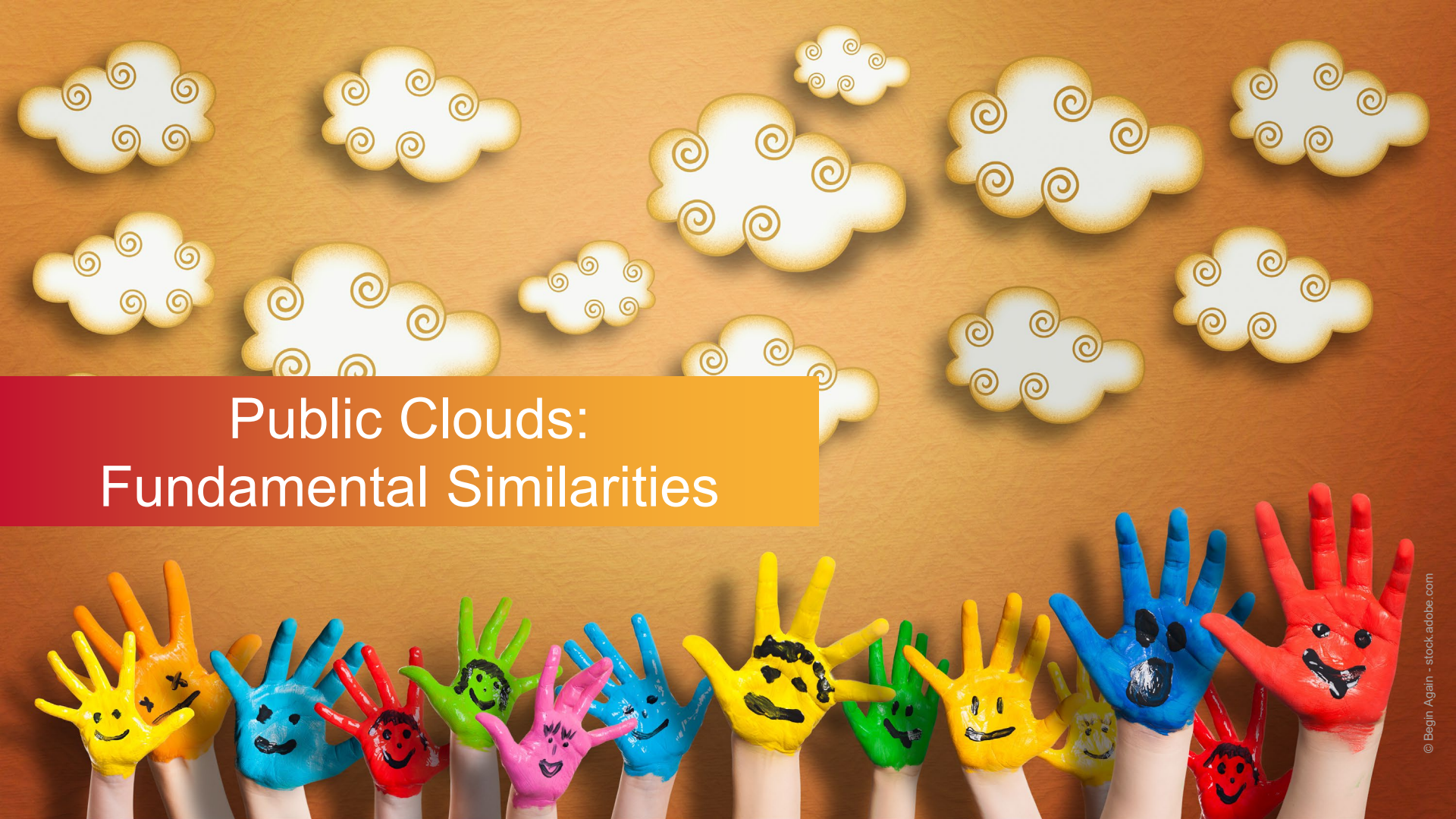


OCI Demo 09: Autonomous Database is provisioning

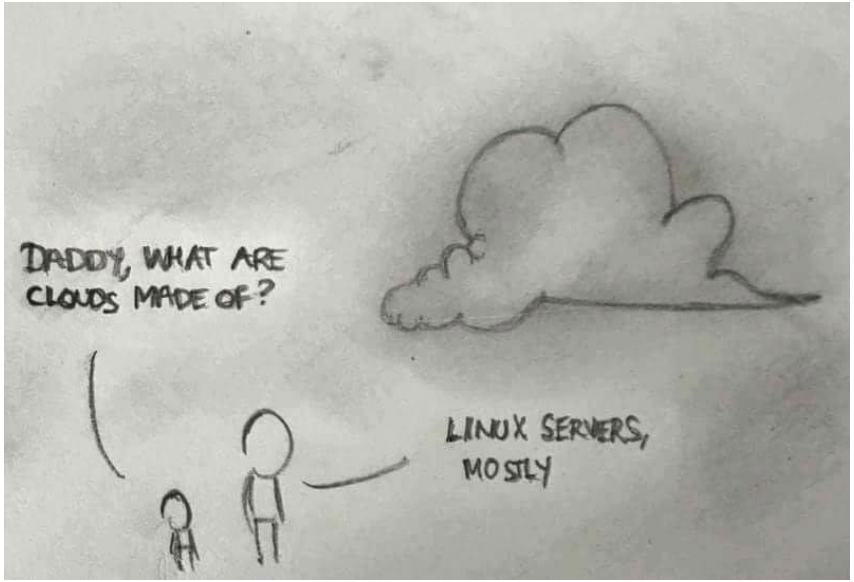


After a couple of minutes Icon color will change to green and status to „AVAILABLE“

Public Clouds: Fundamental Similarities



Public Clouds - Fundmentals



What are Clouds made of?

Linux Servers	Mostly
	MS Azure: also Windows Server
Network Components	Other supporting stuff
Software Defined (SDx)	Everything is Virtual
	For Cloud-Users

Infrastructure as a Service (IaaS)

Compute

VMs / Containers

- x86 & ARM Cores
- RAM
- Predefined or Custom Images

Storage

- Multiple Performance Tiers
- Files / Blobs / Block Devices

Network

- Gateways
- Filters
- Route Tables

Web Interface

Web Interface

- Every Cloud Provider has one

All follow their own

- UX
- Layout / Design
- Naming Conventions

ORACLE
Cloud Infrastructure

Google Cloud

aws

Azure

Automation: REST Interfaces & SDKs

REST API

"The Master"

All SDKs, CLI & The WebUI use it

Encapsulate

the complexity of REST API

Provides Access

to ALL Resources and Options

Mutliple Languages

Java, Python, Ruby, Go

REST API and SDKs are incompatible among Cloud providers

Automation: CLIs

Virtual Every Cloud Provider provides a CLI

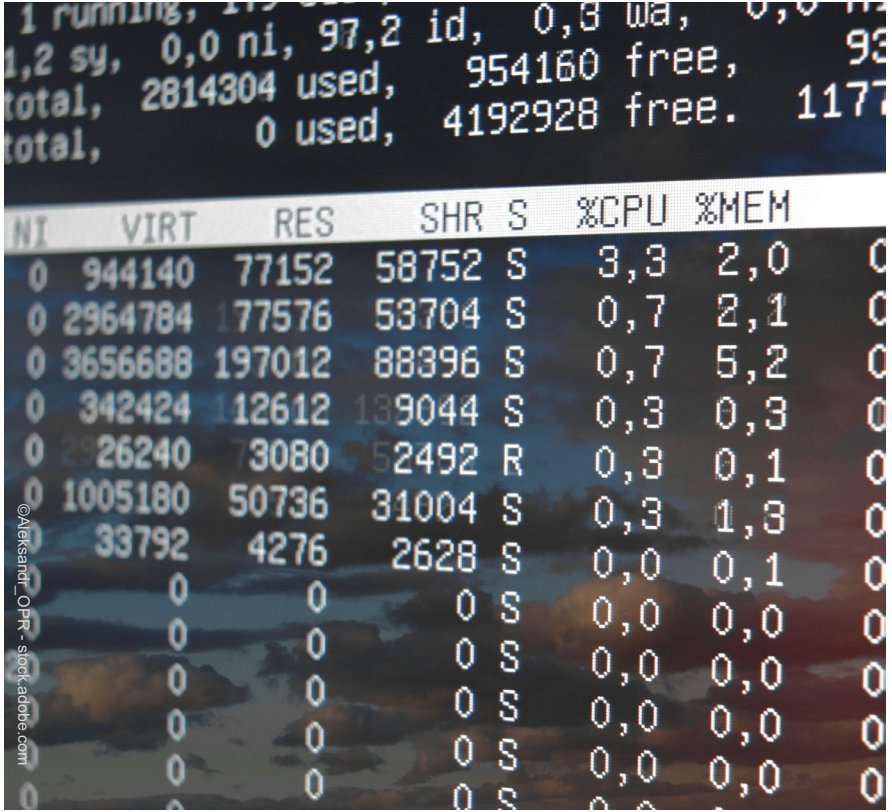
AWS Shell
`aws`
Azure CLI
`az`
Google Cloud SDK
`gcloud, gsutil, kubectl, bq`
Oracle Cloud Infrastructure CLI
`Oci`

CLIs purposes

ad hoc Changes
Batch Scripts

Syntax / Naming Conventions

Incompatible among Cloud Providers



OCI Command line Interface

Use to

make small changes
utility batch scripts
set up small environments (demos, etc)

OCI CLI

Python Based CLI

Platforms

MacOS, Unix, Linux
Windows

OpenSource

Hosted on GitHub
Developed & Maintained by Oracle

Scripting means Automation: Infrastructure as Code

Building up and tearing down of virtual environments happens frequently in the Cloud

Some changes can only be made by **recreating** the resource

Provisioning Cloud Resources by Clicking the UI is tedious and error prone

Use the Web-UI for Orientation only

Scripting is automation and documentation at the same time: **Software Defined Infrastructure**

Automation: CLI Best Practices

The CLI is the key to your datacenter

- do not put it on a laptop
- do not deploy it to the Cloud
- Limit access

Script everything

- Scripts are automation and documentation
- Learn how to deal with json
  - JMESPath
  - Tools like jq
- Use Variables for common parameters and IDs

Store your scripts without credentials

- Especially, when you version control them
- Use a key vault

Building complex Infrastructures: Hashicorp Terraform

Used to

plan, define and provision a datacenter infrastructure

Scripting

across all Major IaaS Providers

OCI Provider

developed by Oracle

De facto Standard

for Scripting Cloud Resources

HashiCorp Terraform

Configuration Management Tools

Used to

change multiple Machines
to a desired state at once

e.g. Ansible

Agentless Orchestration and Automation

OCI Module

provided by Oracle

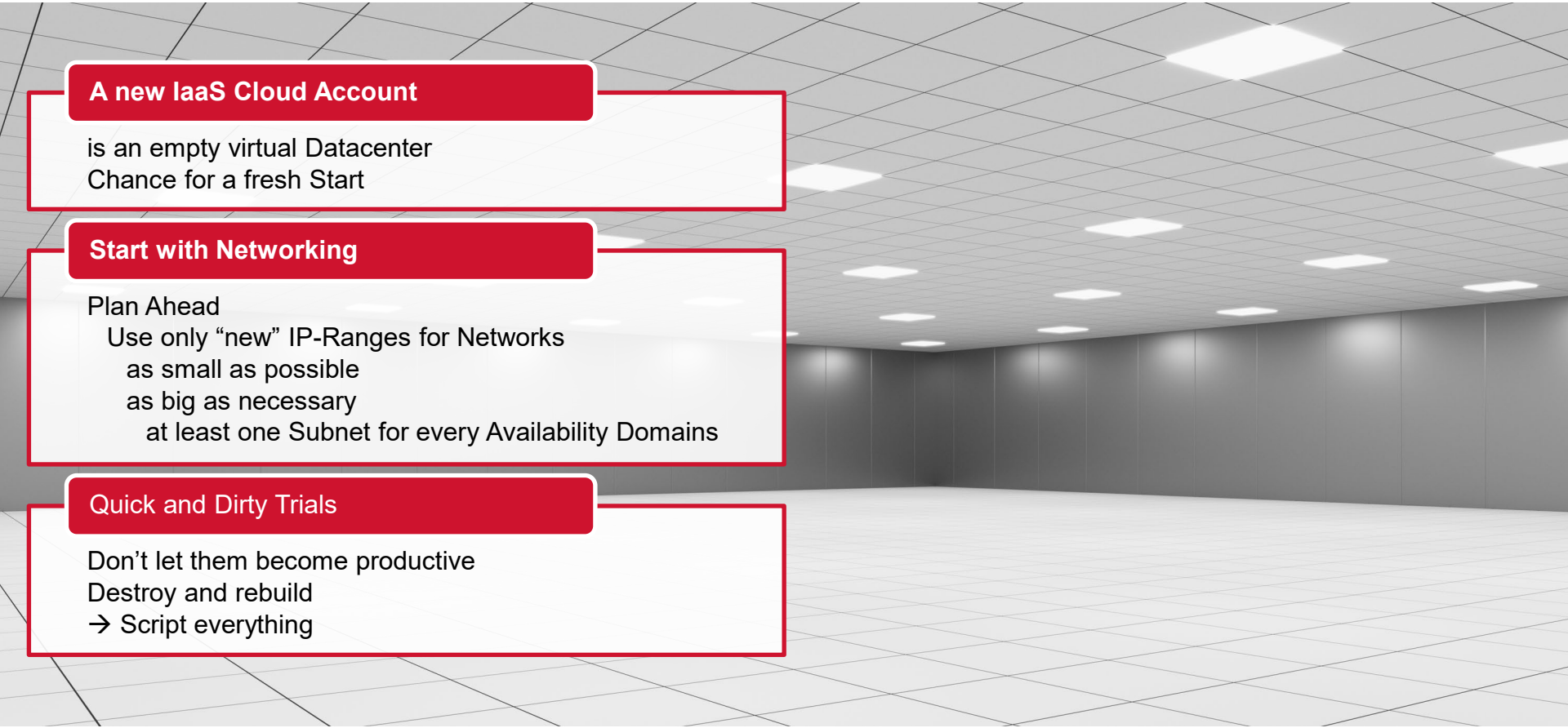
Other CM Tools

- Chef
- Puppet
- SaltStack
- …

Red Hat
Ansible

Moving into the Cloud:
Same Same, but different

Cloud Account is a new Datacenter



A new IaaS Cloud Account

is an empty virtual Datacenter
Chance for a fresh Start

Start with Networking

Plan Ahead
- Use only “new” IP-Ranges for Networks
  - as small as possible
  - as big as necessary
    - at least one Subnet for every Availability Domains

Quick and Dirty Trials

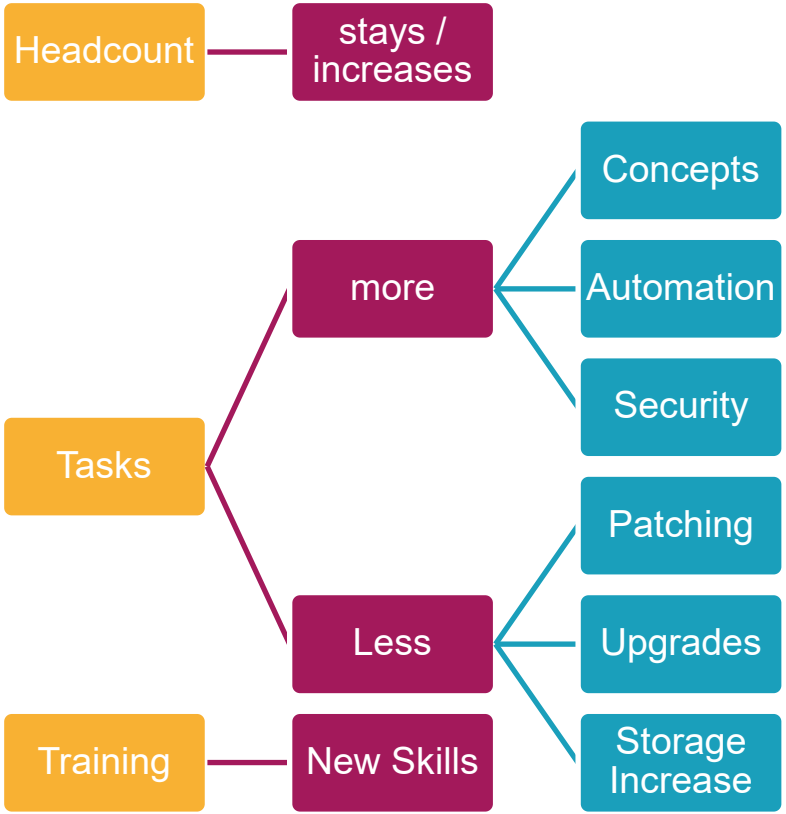
Don’t let them become productive
Destroy and rebuild
→ Script everything

Cloud: Lift & Shift Savings

Instant Savings

- Rooms
  - Energy
  - Cooling
  - physical Access Control
- Spare Hardware Parts
- Scale Up Hardware

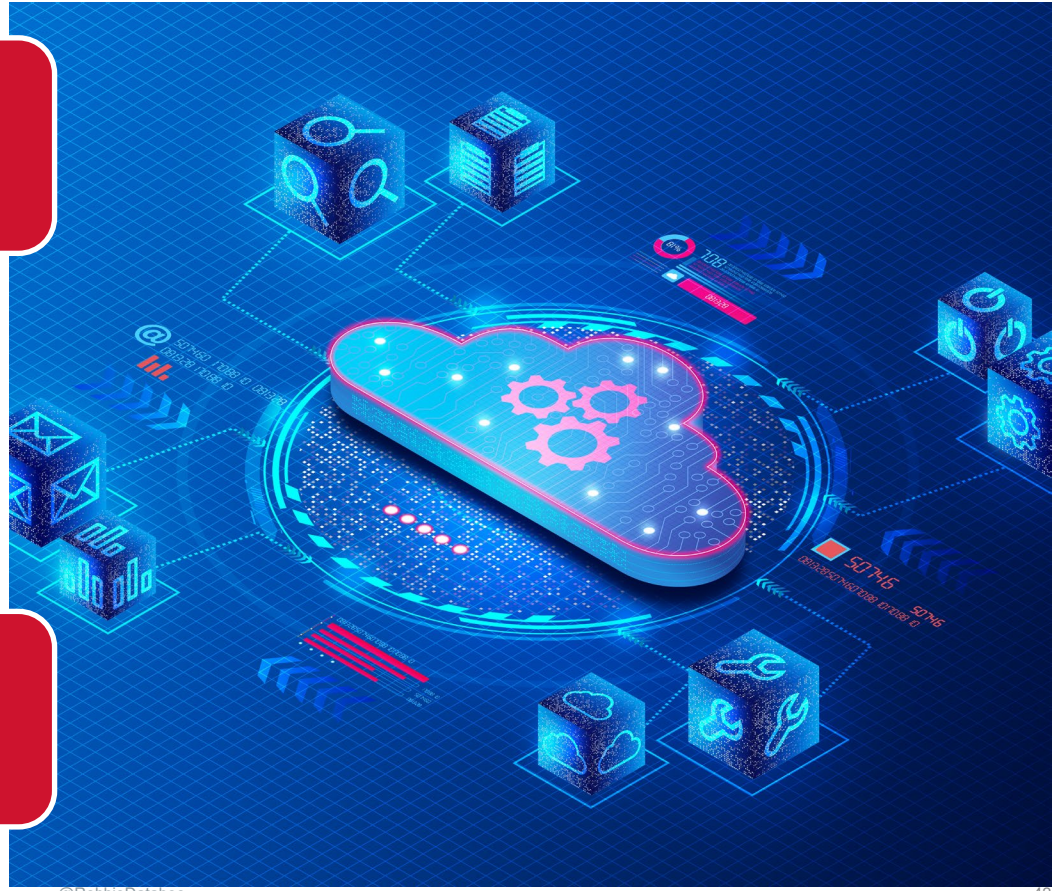
Cloud: Changes to IT Staff



Cloud native Apps

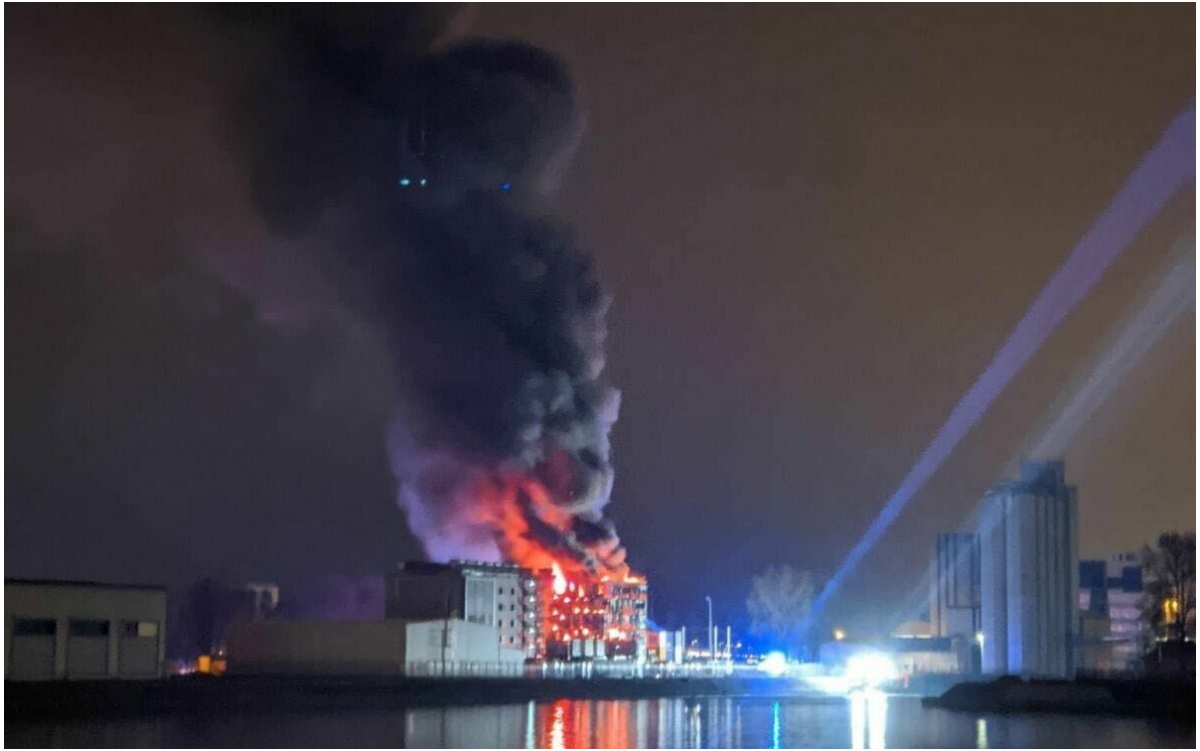
- New Developments only
- Different
  - Architecture
  - Deployment
- New Skillsets required

→ This is where the savings starts



Cloud: Backup / Disaster Recovery

There is no need for Backups in the Cloud – it‘s done by the Provider



„The OVH Cloud escaping it‘s Datacenter“

OHV Strasbourg Fire, March 2021

Cloud: High Availibility

HA / Backup in the Cloud

Same as on Premises

HA is not a product

it‘s a goal

Replicate / Backup

Across Regions
Across Cloud Providers
→ Multi Cloud

Drill your staff

Test Restore

Backup Complete?
Do you know your restore times?

Cloud Gotchas

Internet Connectivity

becomes crucial

Latency

increases
Gotcha for real time and legacy apps

Endless Capacity / Elasticity

can produce endless costs

Dead Data

generates costs

Conclusion

Public Clouds