

Überblick über die Oracle Cloud Infrastructure

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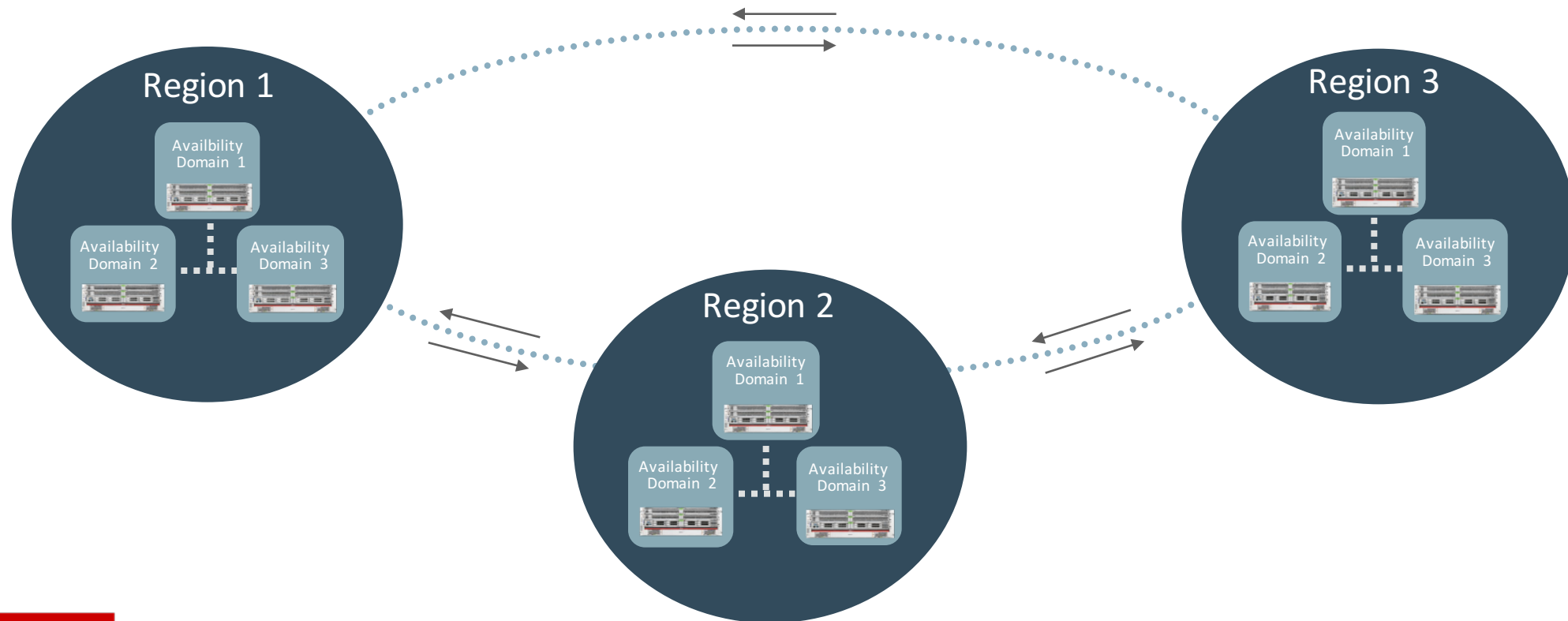
Frankfurt, 19. Juni 2018

Latest Technologies Enable a Modern Cloud Infrastructure

Technology	Benefit
Availability domains	Enables enterprise-level high availability
Flat, non-blocking network	Enables predictable low latency; eliminates “noisy neighbors”
Off-box IO virtualization & automated hardware wiping	Enables secure deployments of bare metal servers without Oracle management software overhead
Direct-attached NVMe storage	Enables highest IO workloads

Region / Availability Domain Topology

- Regions serve different geographies, provide Disaster Recovery
- Availability Domains provide a High Availability foundation in a Region



Inside a Region – High Availability Building Blocks

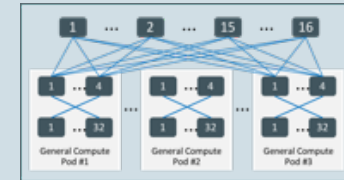
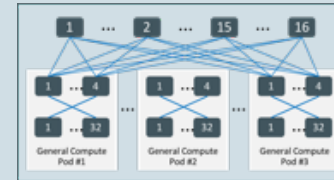
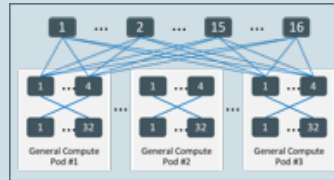
- Multiple fault-decorrelated, completely independent datacenters – Availability Domains (ADs), about 10km mutual distance
- Predictable low latency & high speed, encrypted interconnect between ADs
 - < 500μs latency



Inside an AD – High Scale, High Performance Network

- Non-oversubscribed network – flat, fast, predictable
- Very high scale – ~1 million network ports in an AD
- Predictable low latency & high speed interconnect between hosts in an AD
 - < 100μs RTT latency, 25Gb/s bandwidth, two hops max

Physical Network



Datacenters

Region

Availability Domain 1



Availability Domain 2

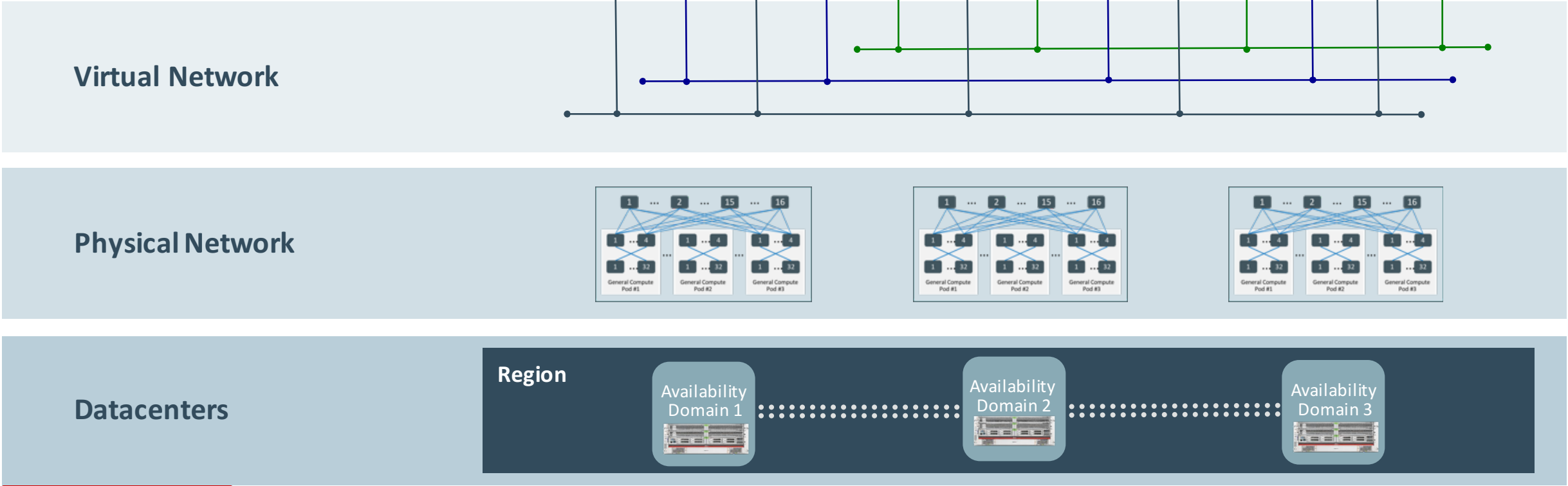


Availability Domain 3



Comprehensive Virtual Network with Off-box Virtualization

- Highly configurable private overlay networks – moves management and IO out of the hypervisor and enables lower overhead and bare metal instances
- No Layer 2 Overlay network between virtual hosts, all networking done through smart NICs



Cutting-edge, High IO Hardware Technology



High Performance Compute Systems

36 Cores per Server (52 Cores with X7)

Standard: Non-NVMe SSD, 256 GB RAM

High I/O: 12.8 TB NVMe SSD, 512 GB RAM

Dense I/O: 28.8 TB NVMe SSD, 512 GB RAM



High Performance Storage Systems

Local NVMe: up to 28.8 TB/Server, ~4 Million 4K Read IOPs

Block Storage: 256GB-2TB, 1.5K-6K IOPs per Volume

Object Storage – High Throughput, Strong Consistency

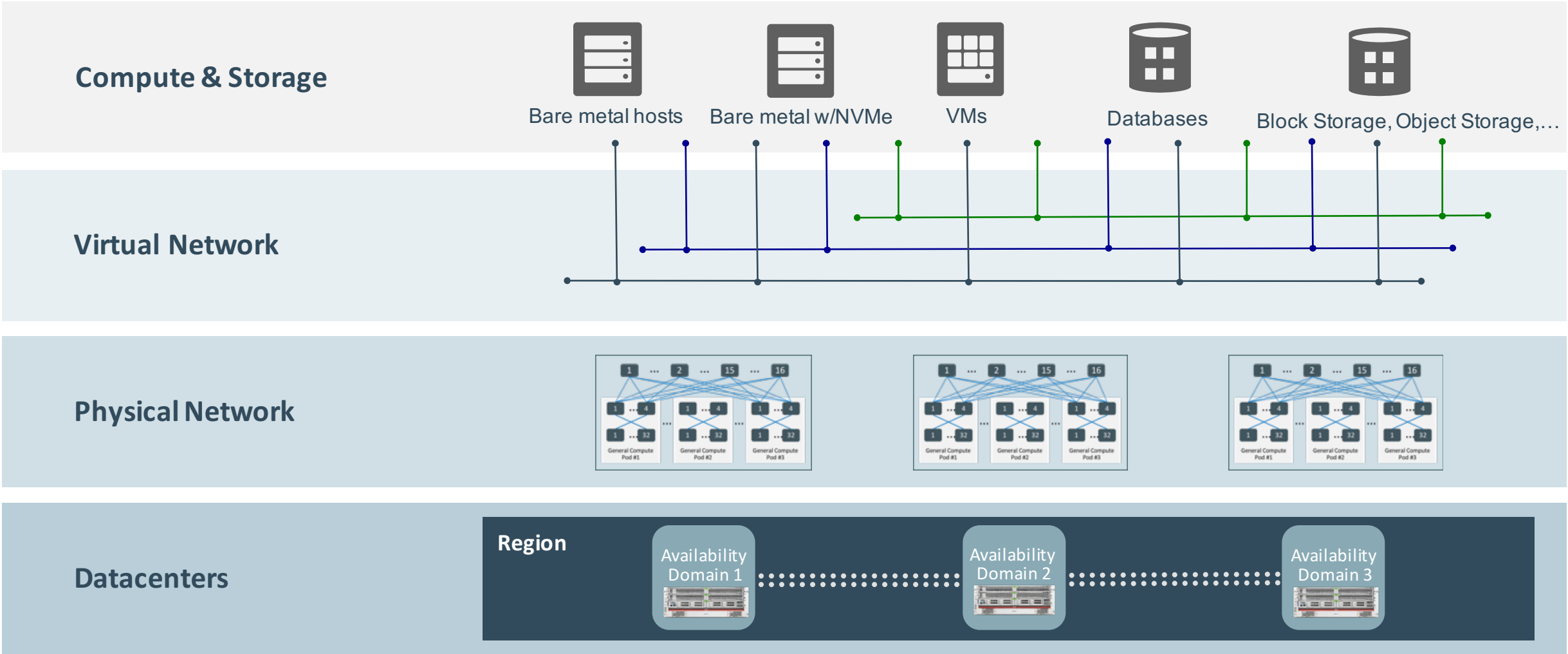
More cores

More RAM

2X Storage

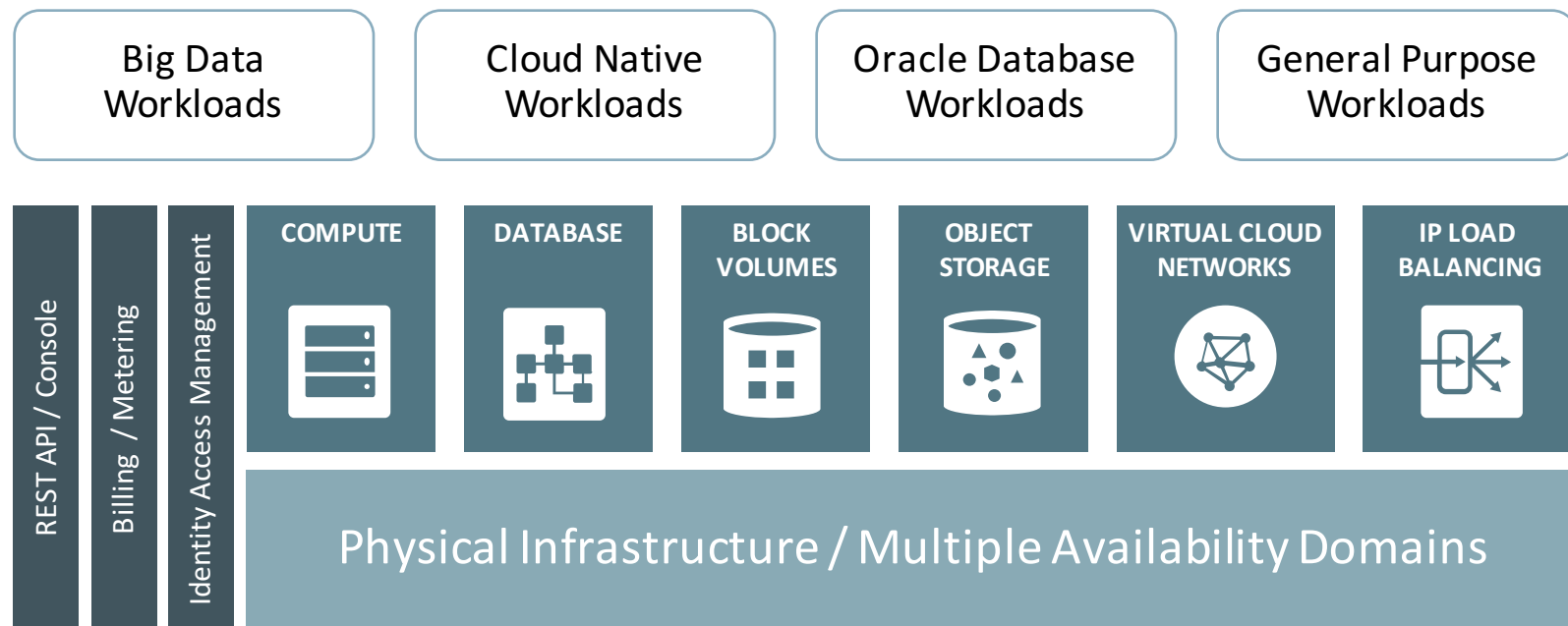
6X Write IOPS

Putting it All Together – Reliable, Predictable, Flexible, Fast



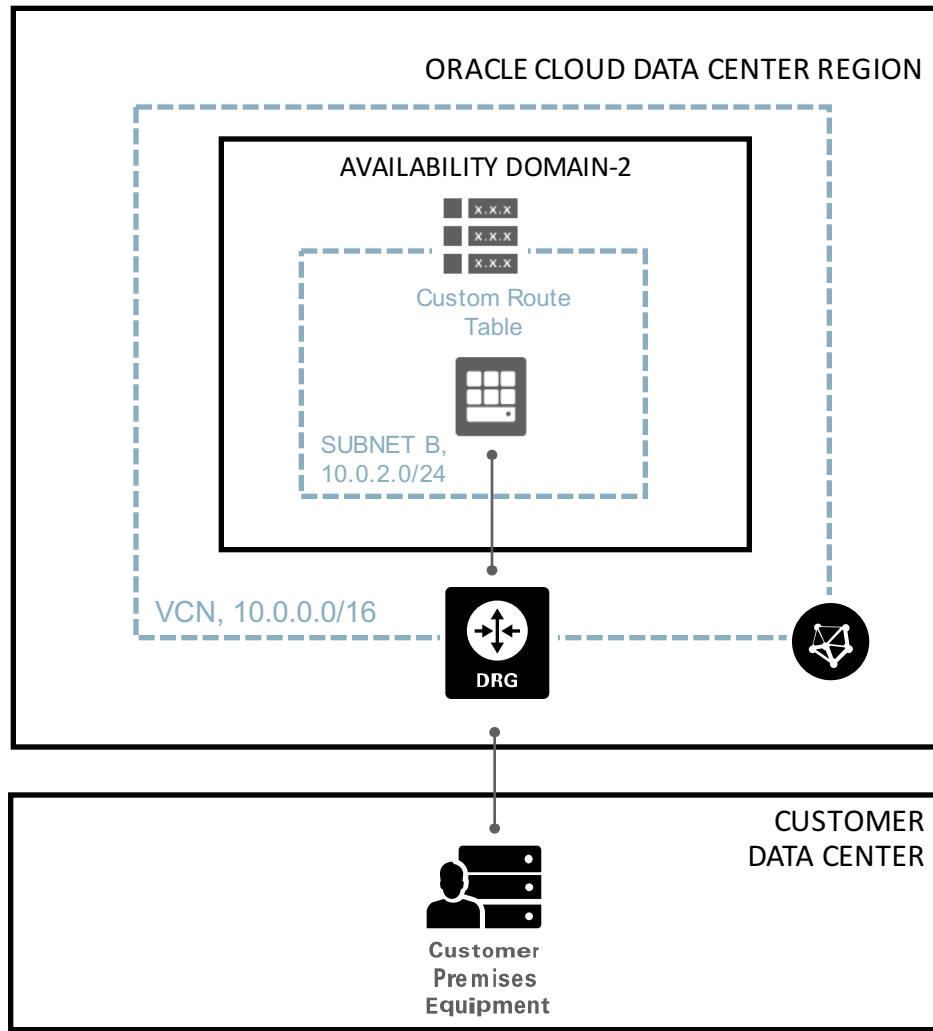
Oracle Cloud Infrastructure Services Overview

Bare metal compute, VM compute, high performance storage, database, on the same virtual network



- Broad Range of Elastic Compute
 - Bare Metal servers; Bare Metal with NVMe; VMs
 - Provision in mins; Pay by the hour
- High Performance Storage
 - Local NVMe servers
 - Dynamically attachable remote Block Storage with consistent general purpose IOPS
 - High performance, high durability Object Storage
- Virtual Private Networking
 - Manage your own high scale private IP networks
 - IPSec VPN; FastConnect
 - Stateful firewalls; optional Internet gateway; load balancing

Private Subnet with a VPN

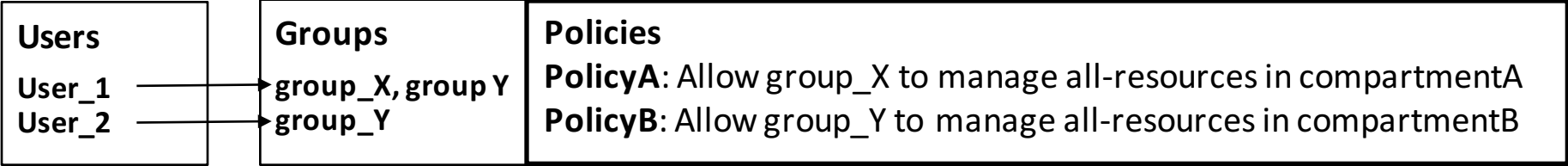


- Create an IPSec connection for VPN
- Data center admin needs to configure the on-premises router before network traffic can flow between your on-premises network and VCN
- At your end of the IPSec VPN is the actual router in your on-premises network (hardware or software). A virtual representation of the router in Oracle Cloud Infrastructure Services is referred to as Customer-Premises Equipment (CPE)
- If you need a throughput-reliable connection (i.e. not using the public internet), you can connect to the Oracle Cloud Infrastructure through dedicated lines through partner (FastConnect) or co-location.

IAM Service

Service Limits

Tenancy



CompartmentA



Object Storage



VCloud Network



PolicyA

CompartmentB



BM



Block Storage



Load Balance

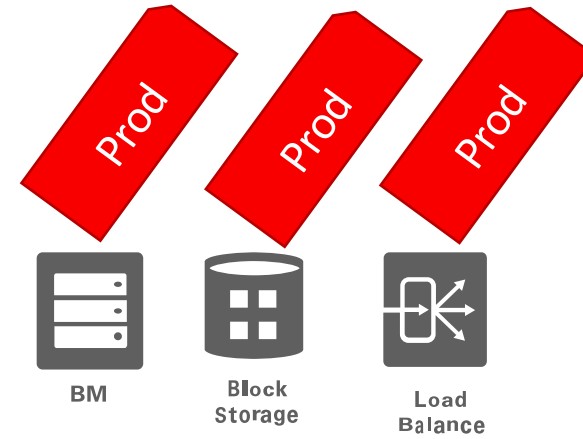
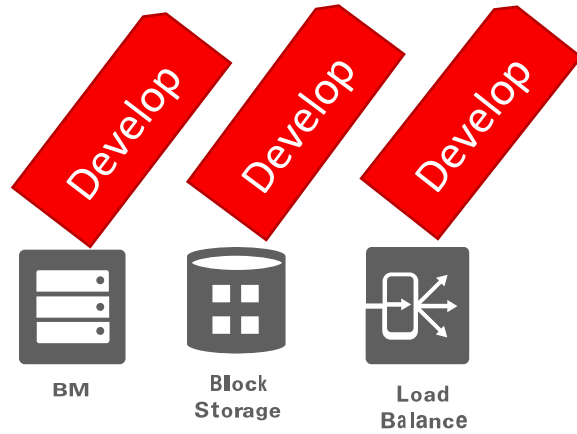


PolicyB

Tagging

Tenancy

CompartmentB



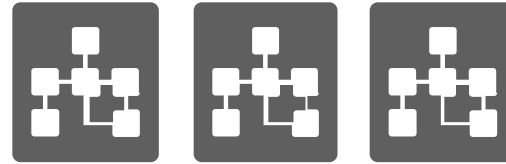
Oracle Database Cloud Service Offers Infrastructure Choice

Virtual Machines



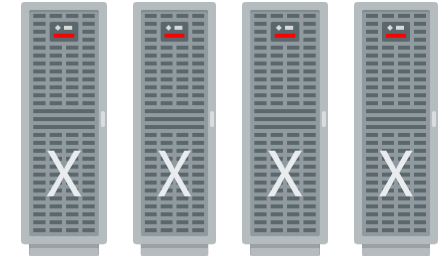
- Test, Development, Departmental Applications
- Oracle AppsUnlimited, PaaS
- Compute Shapes – by OCPU, Standard or High RAM
- Block Storage – by the GB
- Up to 40TB database

Bare Metal



- Intensive Test, Development, Departmental Applications
- Custom Applications
- Bare Metal Compute Shapes – by core, HighIO or DenseIO
- Fixed NVMe Storage by Shape
- Up to 9TB database

Engineered Systems



- Mission Critical, Intensive OLTP and Decision Support
- Oracle and Custom Apps
- ¼, ½ and Full Rack Shapes
- Fixed Storage and Memory by Shape
- Up to 168TB database

How to interact with Oracle Cloud Infrastructure

- Web Console

The screenshot displays the Oracle Cloud Infrastructure (OCI) Web Console interface. At the top, the Oracle logo and 'Oracle Cloud Infrastructure' text are on the left. The 'TENANCY' is 'intilaue' and the 'REGION' is 'eu-frankfurt-1'. The user 'ingo.laue@oracle.com' is logged in. Navigation links for 'Home', 'Identity', 'Compute', 'Database', 'Networking', 'Storage', and 'Audit' are present. The breadcrumb trail shows 'Compute » Instances » Instance Details'.

The main content area is titled 'MyDemolInstance'. It features a large green square with a white 'I' representing the instance, with the status 'RUNNING' below it. Action buttons include 'Create Custom Image', 'Start', 'Stop', 'Reboot', and 'Terminate'.

Instance Information

- Availability Domain:** maUU:EU-FRANKFURT-1-AD-3
- OCID:** ...bzv3lq (with 'Show' and 'Copy' links)
- Launched:** Mon, 13 Nov 2017 11:52:48 GMT
- Compartment:** c01
- Image:** [OracleLinuxWithApacheRunningInstance](#)
- Region:** eu-frankfurt-1
- Shape:** VM.Standard1.1
- Virtual Cloud Network:** [MyFirstNetwork](#)

Primary VNIC Information

- Private IP Address:** 10.0.2.4
- Public IP Address:** 130.61.53.221
- Fully Qualified Domain Name:** mydemoinstance... (with 'Show' and 'Copy' links)
- Subnet:** [Public Subnet maUU:EU-FRANKFURT-1-AD-3](#)

This Instance's traffic is controlled by its firewall rules in addition to the associated [Subnet's](#) Security Lists.

Resources

- [Attached Block Volumes \(0\)](#)
- [Attached VNICs \(1\)](#)
- [Serial Console Connections \(0\)](#)

Attached Block Volumes

No Attached Block Volumes

There are no Block Volumes attached to this Instance.

Buttons for 'Attach Block Volume' are located at the top and bottom of the 'Attached Block Volumes' section.

How to interact with Oracle Cloud Infrastructure

- Java SDK with REST API underneath

```
public static Instance createInstance(
    ComputeClient computeClient,
    String compartmentId,
    AvailabilityDomain availabilityDomain,
    String instanceName,
    Image image,
    Shape shape,
    Subnet subnet,
    String sshPublicKey) {

    Map<String, String> metadata = new HashMap<>();
    metadata.put("ssh_authorized_keys", sshPublicKey);

    LaunchInstanceResponse response =
        computeClient.launchInstance(
            LaunchInstanceRequest.builder()
                .launchInstanceDetails(
                    LaunchInstanceDetails.builder()
                        .availabilityDomain(availabilityDomain.getName())
                        .compartmentId(compartmentId)
                        .displayName(instanceName)
                        .imageId(image.getId())
                        .metadata(metadata)
                        .shape(shape.getShape())
                        .subnetId(subnet.getId())
                        .build()
                    )
                .build());

    return response.getInstance();
}
```

How to interact with Oracle Cloud Infrastructure

- Command Line Interface (Unix-Shell) with REST API underneath

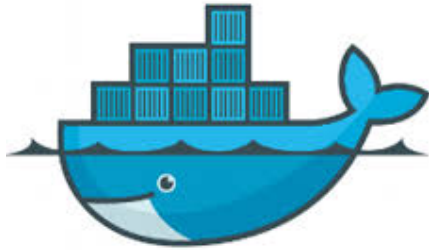
```
oci compute instance launch
  --availability-domain "maUU:EU-FRANKFURT-1-AD-2"
  -c ocid1.compartment.oc1..aaaaaaaaau4qyploevXXX
  --shape "VM.Standard1.1"
  --display-name "Instance created from Custom Image"
  --image-id ocid1.image.oc1.eu-frankfurt-1.aaaaaaaaaqa4pyXXXX
  --subnet-id ocid1.subnet.oc1.eu-frankfurt-1.aaaaaaaayjcjppqXXXX
```


How to interact with Oracle Cloud Infrastructure

- Cloud Orchestration Tools (Terraform). Non-procedural, designs the required target architecture

```
resource "oci_core_instance" "MyDemoInstance" {
  availability_domain = "${lookup(data.oci_identity_availability_domains.ADs.availability_domains[var.AD - 1], "name")}"
  compartment_id     = "${var.compartment_ocid}"
  display_name       = "MyDemoInstance"
  hostname_label     = "instance1"
  image              = "${lookup(data.oci_core_images.OLImageOCID.images[0], "id")}"
  shape              = "${var.InstanceShape}"
  subnet_id         = "${var.SubnetOCID}"
  metadata {
    ssh_authorized_keys = "${var.ssh_public_key}"
    user_data           = "${base64encode(file(var.BootstrapFile))}"
  }
}
```

Docker and Kubernetes



- Popular, easy to use tooling targeting developer productivity
- De Facto standard container runtime and image format
- Developer on-boarding and Gen1 application management (Compose, Swarm)



- Production grade container management targeting DevOps and Ops, widespread adoption
- Complex but powerful toolset supporting Gen2 applications
- Rich operations feature set, autoscaling, rolling upgrades, stateful apps and more.

Container Orchestration And Containers as a Service (CaaS)

- Multi-container apps
- Scheduling
- Service Discovery
- Maintaining Desired State

- Orchestration as a service
- Hosted Container Runtime
- Minimize operational overhead

Container Native Application Development Capabilities

Build, Deploy, Operate Container Based Applications



OCI Container Engine for Kubernetes (OKE)



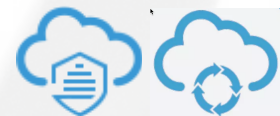
Fully Managed Standard Kubernetes Service



Oracle Cloud Infrastructure Registry (OCIR)



Docker Compliant Container Image Registry



**Oracle Container Pipelines
Oracle Developer Cloud**



Continuous Integration and Delivery Pipeline



Fn Project



Open Source Serverless Functions Framework

Open Source Extensibility




OKE supports HELM for easy deployments


<https://github.com/kubernetes/charts/tree/master/stable>



Oracle Cloud Infrastructure and Kubernetes

Roll Your Own, Pre-Built Installer, Managed Service

OCI

 Terraform

 **kubernetes**

 MESOS

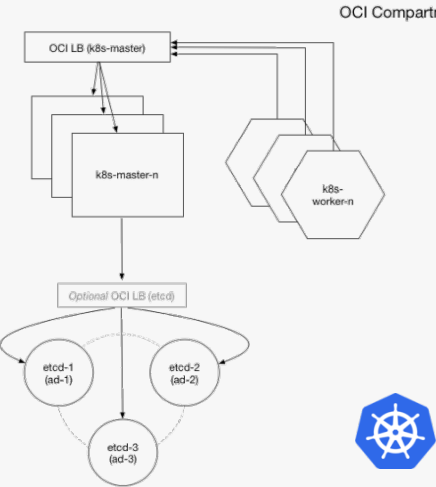
DIY Container Management

IaaS

Quickstart Experience

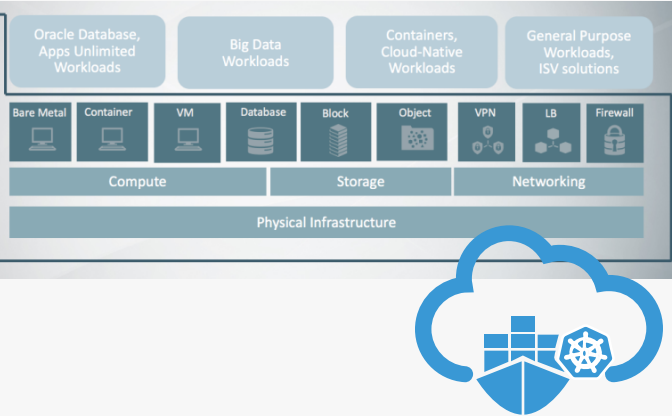
OSS Terraform Installer on GitHub

OCI Compartment



Self Managed Kubernetes Service

OCI Container Engine for Kubernetes



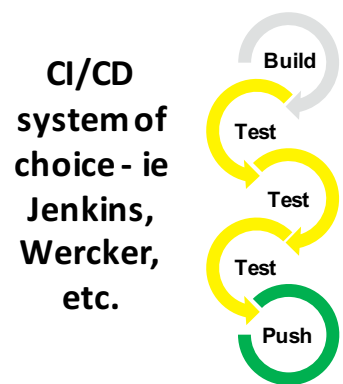
Enterprise Class Managed Kubernetes Service

CaaS

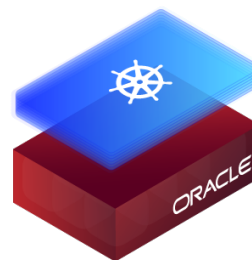


Detail: OCI Container Engine for Kubernetes and Registry

An Open, Fully-Managed Kubernetes Platform & Private Registry



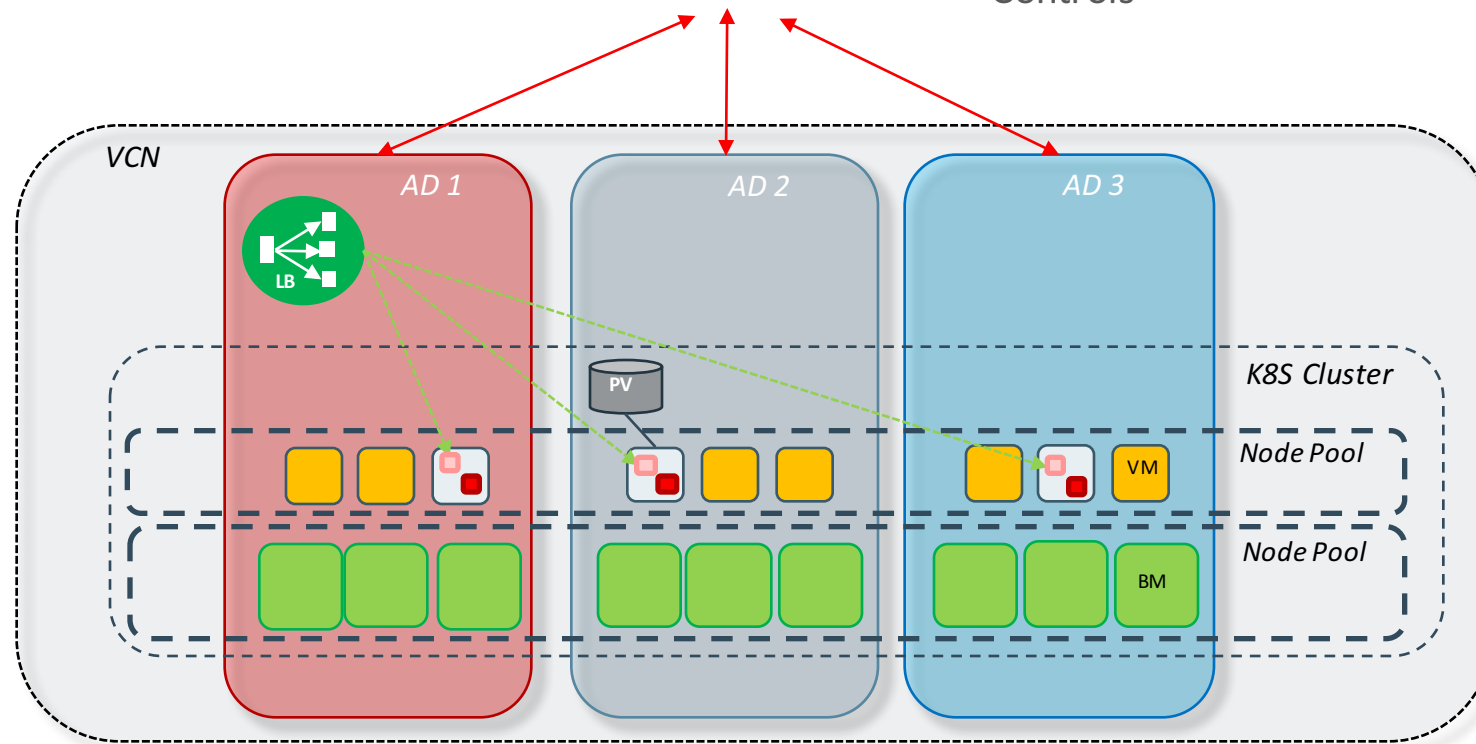
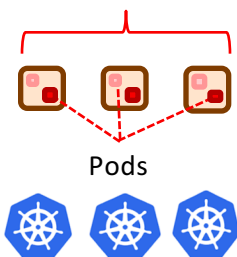
OCI Registry



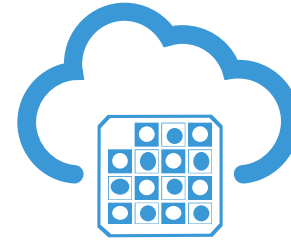
OCI Container Engine for Kubernetes

- **Container Native:** Standard Upstream Kubernetes; Fully Managed Lifecycle; Integrated Registry
- **Developer Friendly:** Simple, Streamlined User Interface; REST API; Helm, and DNS Built-in
- **Enterprise Ready:** Oracle Cloud Infrastructure Performance; Highly Available; Secure with OCI Access Controls

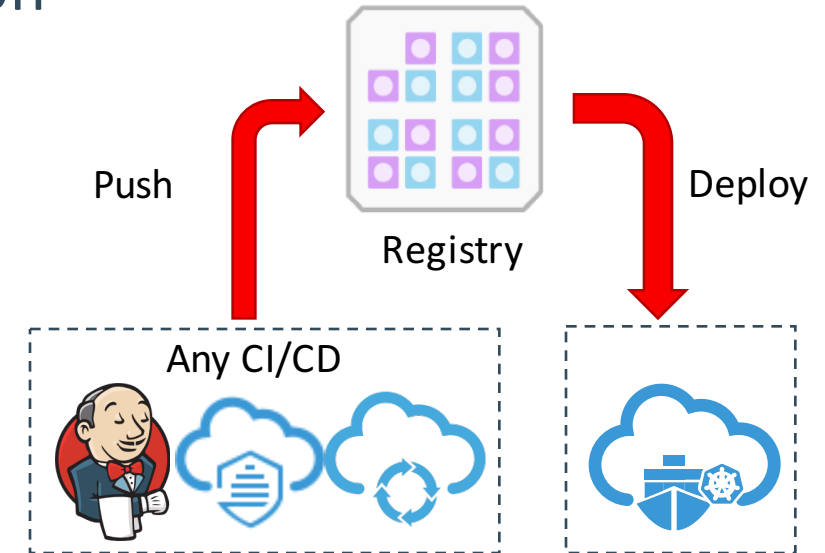
Exposed Kubernetes Service



Introducing OCI Registry - OCIR

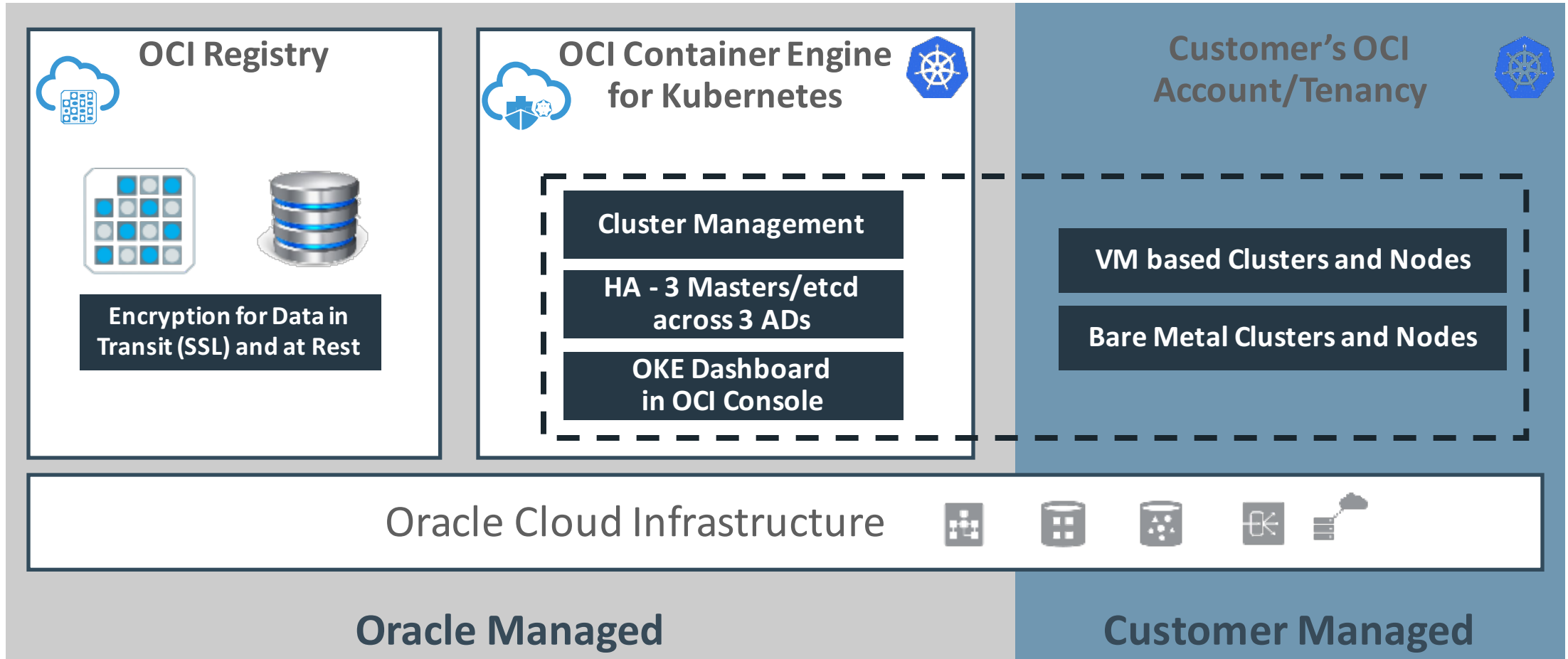


- High availability Docker v2 container registry service on Oracle Cloud Infrastructure
- Full integration with OKE
- Stores Docker Images in Private Repositories
- Automatic Org Image Layer De-duplication
- Co-located regionally with Container Engine for low latency Docker image deploys



OKE and OCIR

Oracle and Customer Managed Aspects



Oracle Cloud Infrastructure (Summary)

- Network virtualization is processed by the software-driven network. No network overhead for customer instances. Subnets, connectivity to your DC, FastConnect, secure through route tables and firewall rules
- Fast, non-blocking, not oversubscribed flat networks.
- Concept of Availability Domains: Min. 3 geographically separated, independently operated data centers offer better DR than just separated Availability Zones (cages within the same DC)
- Wide Spectrum of Compute Shapes: From single-core VMs to full 52 core Bare Metal Servers, databases up to full Exadata racks
- Choice of storage: Attached NVMe SSDs, block volumes, object and archive storage
- Fine-grained Identity and Access Management through users, groups, compartments, policies and tagging.
- Embraces Open Source Technologies (Docker, Kubernetes, Fn, ...)



Demo



Questions?

Thank you.

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