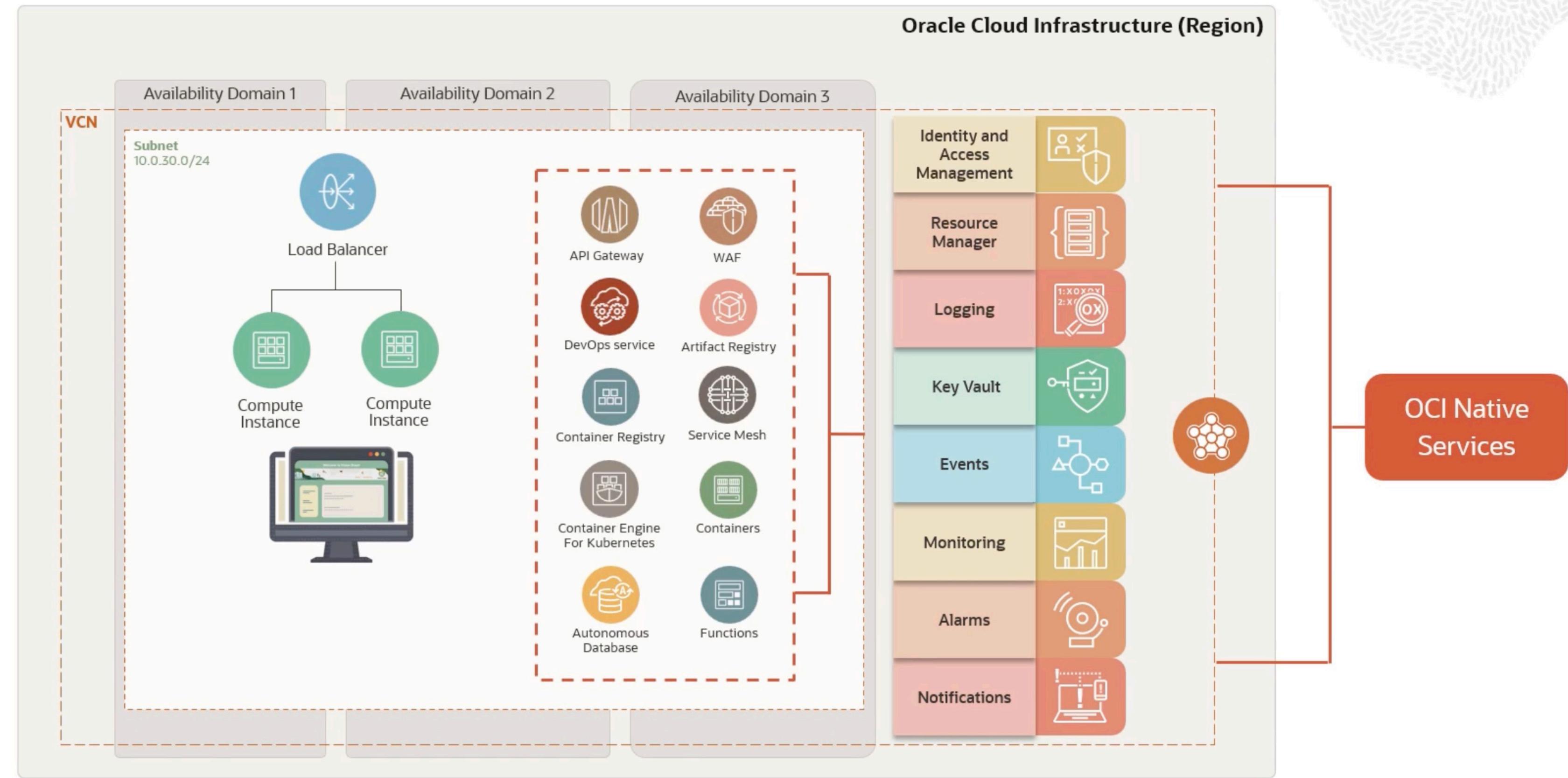
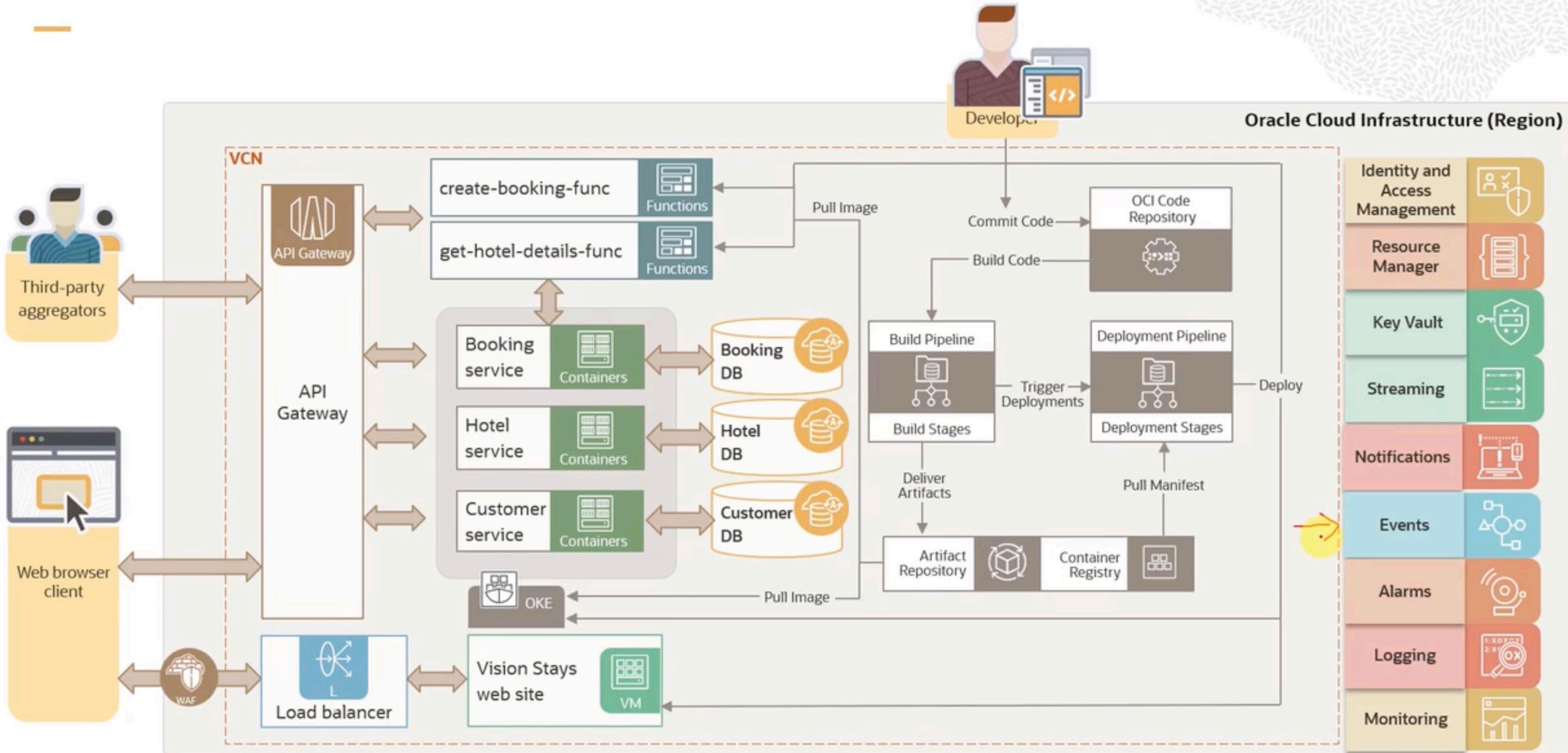


Step 2: Enhancing Static Website using OCI Services





Step 4: Set Up Monitoring, Alerting, and Logging Systems to Keep Track of the Application's Performance



Use Cases

Security Services

- > Security posture management
- > Secure Enclave
- > Threat Intelligence
- > Vulnerability and exposure scanning

Detection and Remediation



Cloud
Guard



Security
Zones



Threat
Intelligence



Vulnerability
Scanning

- > Encryption for data at rest and in transit
- > Centralized key storage and management
- > Security of Data at rest and in transit
- > Discover, classify, and protect data

Data Protection



Vault Key
Management



Dedicated
/External KMS



Data Safe



Certificates

- > Secure Boot, Measured Boot, TPM
- > Workload isolation
- > Managed Bastion
- > OS patch and package management

OS and Workload Protection



Shielded
Instances



Autonomous
Linux



Bastion



OS Management

- > DDoS protection
- > Network security controls
- > Network firewalls
- > Filter malicious web traffic

Infrastructure Protection



DDoS
Protection



Web Application
Firewall



Security
Lists/ NSG



Network
Firewall

- > Manage user access and policies
- > Manage multi-factor authentication
- > Access governance
- > Audit and Reporting

Identity and Access Management



IAM



MFA



Access
Governance



Audit

Deploying a Highly Available SDDC



Compute

Determine the total number of Compute nodes required

OCVS provides a 3-to-64 node ESXi cluster (using only Dense IO shapes)

High availability of the Compute nodes is provided on OCI Fault Domain Architecture

vSphere Cluster High Availability (HA) is enabled to protect VMs running in the cluster



Network

A VCN resembles a traditional network with firewall and GWs.

NSX-T is an overlay network with:

- NSX Manager and Controller
- NSX Edges

Factor vSphere Cluster HA function for NSX component's high availability.

NSX networking depends on the VCN, which provides greater extension for SDDC to scale out.

SDDC Bare Metal is backed by high bandwidth network (example: 2x25-Gbps network and supports 52 VNICS)



Storage

VMware vSAN provides in-built enterprise-class performance, reliability, and availability.

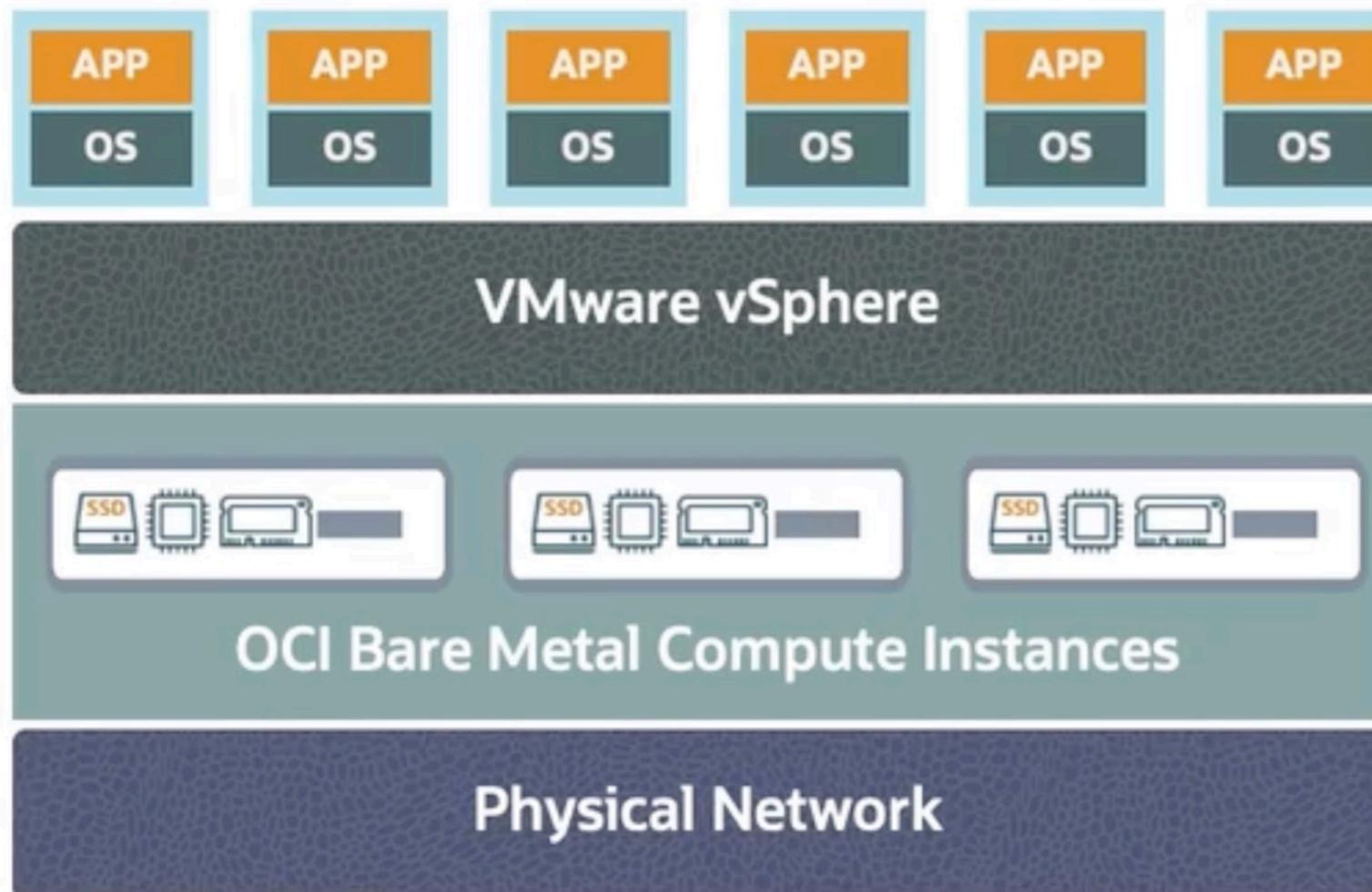
It uses an “all flash” solution built on a NVMe-backed bare metal instance.

vSAN implements storage fault domains and storage policies.

Block storage with persistent and durable remote NVM-e drives

NFS based File Storage with ZFS-HA and Oracle Linux Storage Appliance

vSphere: The Hypervisor



Hypervisor: vSphere (combination of ESXi and vCenter)

vSphere Cluster – a collection of ESXi Hosts

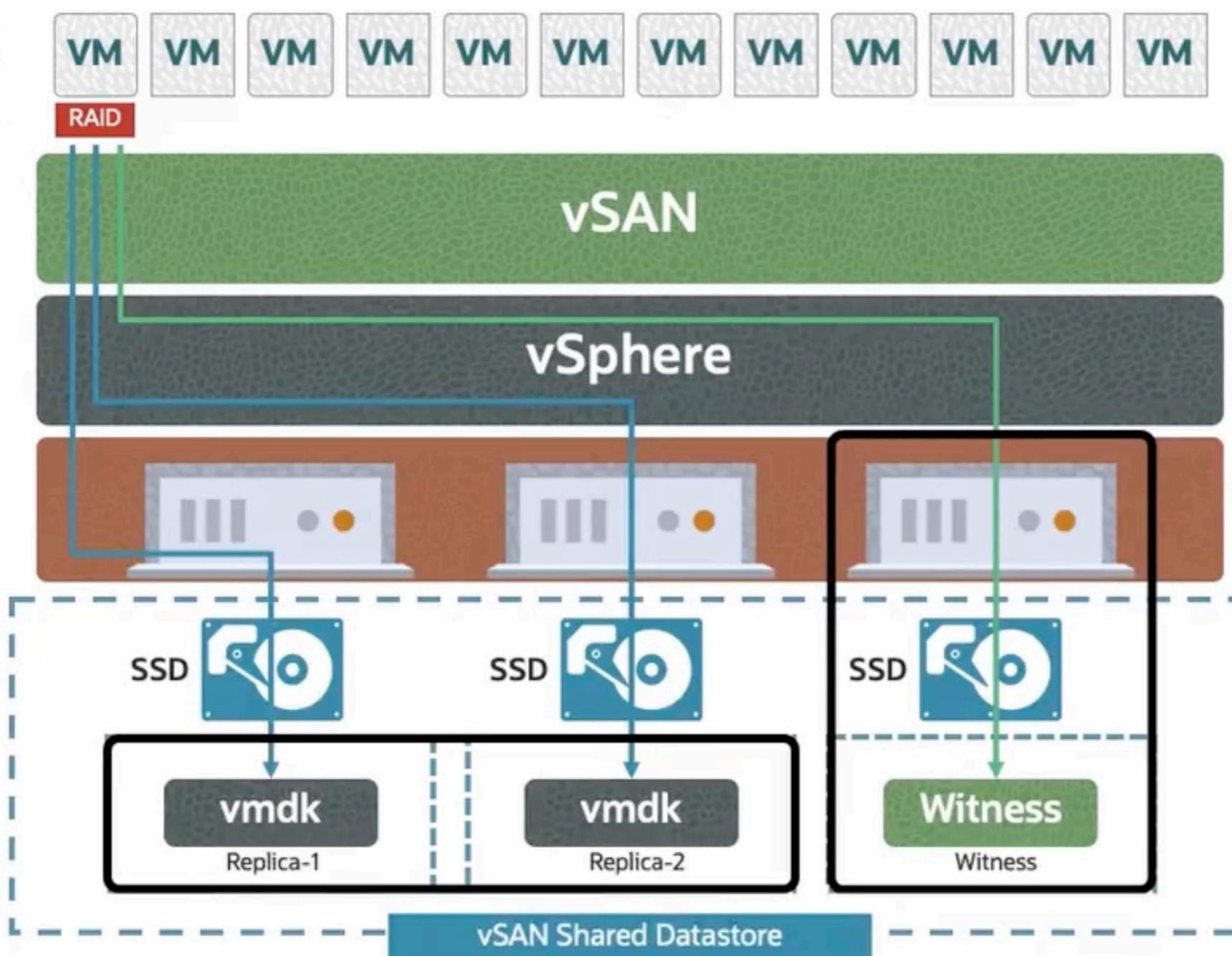
VMs share CPU, Memory, Datastore and Network resources with intelligent Resource Management.

High Availability (HA) & Distributed Resource Scheduler (DRS)

VMotion | Storage VMotion

Minimum 3 to 64 Hosts (Dense) for Production

vSAN: Software Defined Storage



Hyper-converged, Local attached NVMe
“all flash” drives

Pools Direct-Attached storage devices to a
Distributed/Shared Datastore

Disk Groups: Capacity Tier and Cache Tier

vSAN Fault-Domain Architecture

Storage Policies: FTT (Failures to Tolerate),
FTM (Failure Tolerance Method)

vSAN Witness Node

NSX-T: Software-Defined Networking and Security

It is software-defined networking, much like VCN!

Heterogenous

Multi-cloud
Multi-hypervisor
VMs, Bare Metal,
Containers,
Cloud Native Apps

Services

Security – Firewalls
Load Balancing
Routing & Switching
NAT
VPN

Automation

REST/JSON
Terraform
OpenStack
Inventory Support

NSX-T Integrated Planes: Management, Control and Data

Nodes: NSX Manager, NSX Controller, Transport

Transport Zones and Transport Nodes

Gateway Services: Tier 0 | Tier 1

Supports BGP and OSPF

Segments – VLAN backed and Overlay

Geneve encapsulation

Storage Options

iSCSI Block

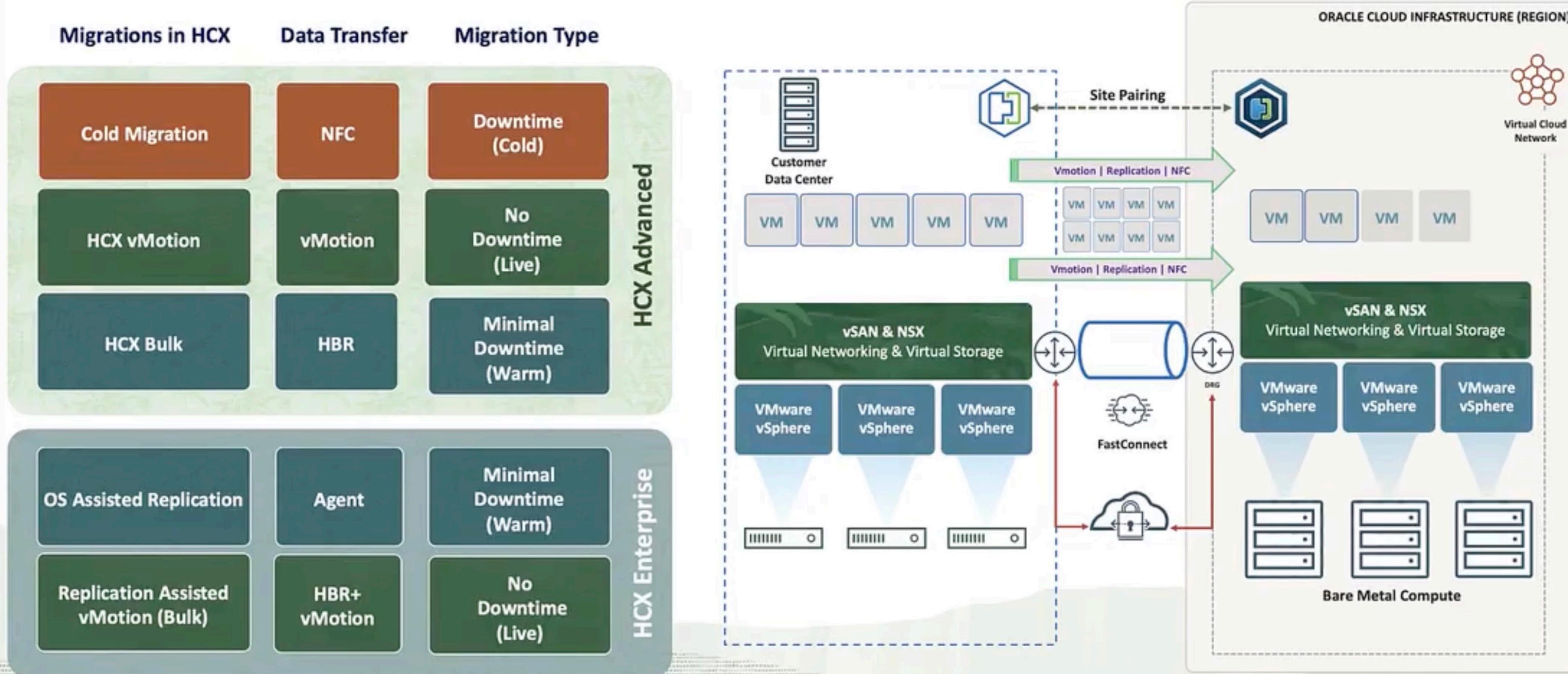
- Persistent and durable remote NVMe
- Three data copies per availability domain
- Encrypted by default
- 32 x 32 TB (1 PB) volumes per cluster
- Dynamically adjust IOPS

NFS

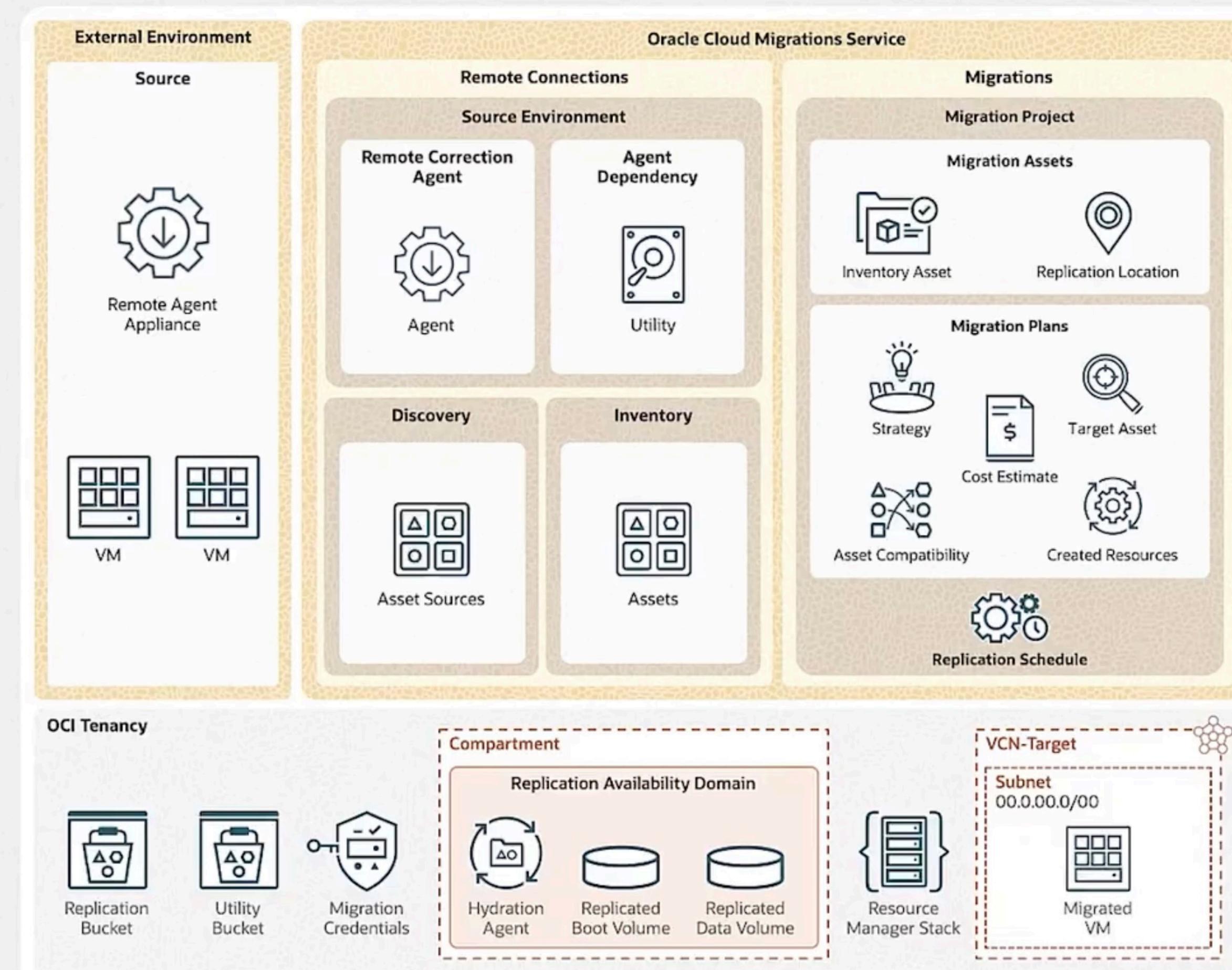
- File Storage Service (up to 8 Exabytes)
- Multiple Marketplace options
 - ZFS-HA Appliances
 - Oracle Linux Storage Appliance



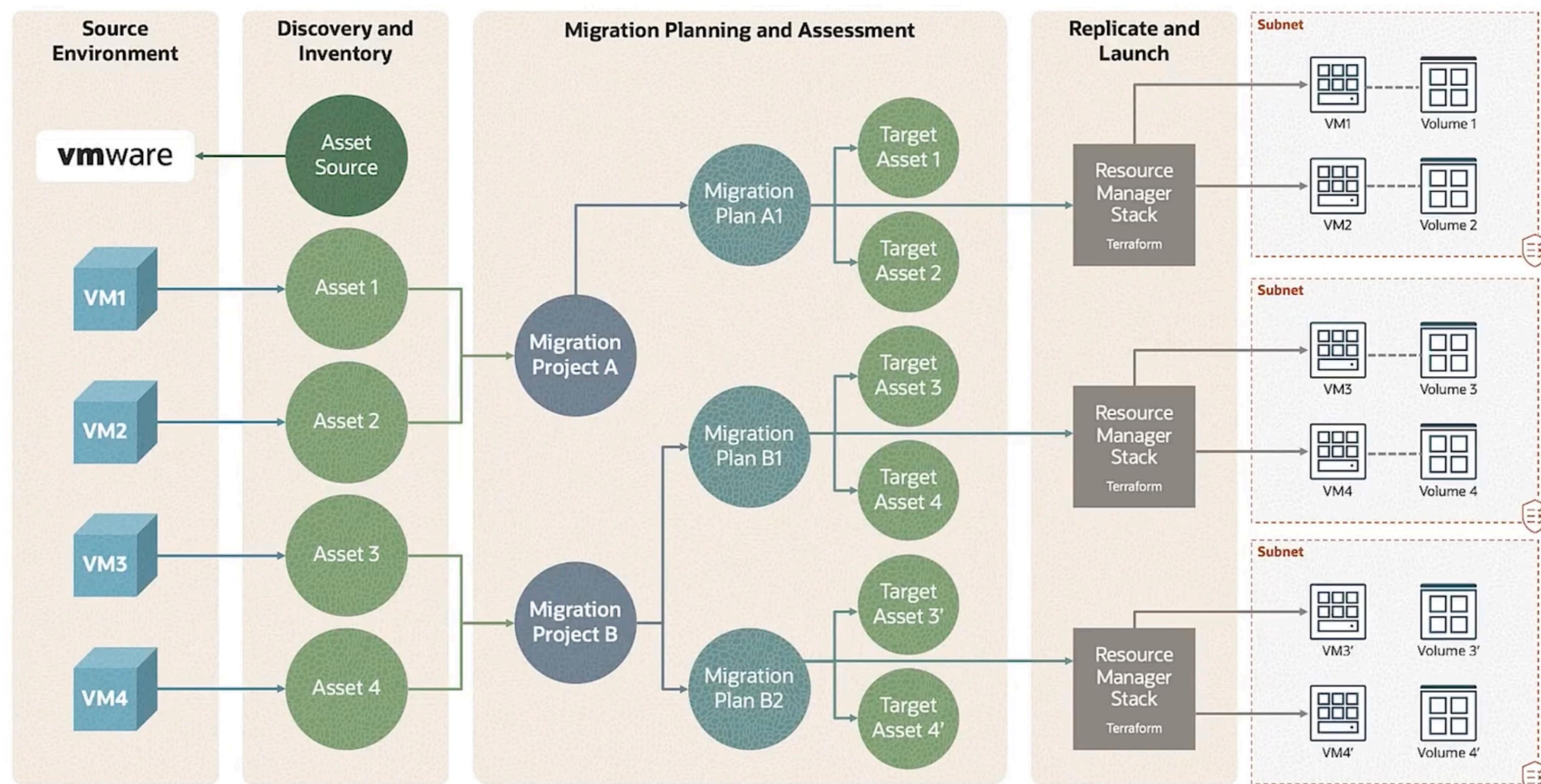
Migrations with HCX



Service Architecture & Components



Migration End-to-End Process



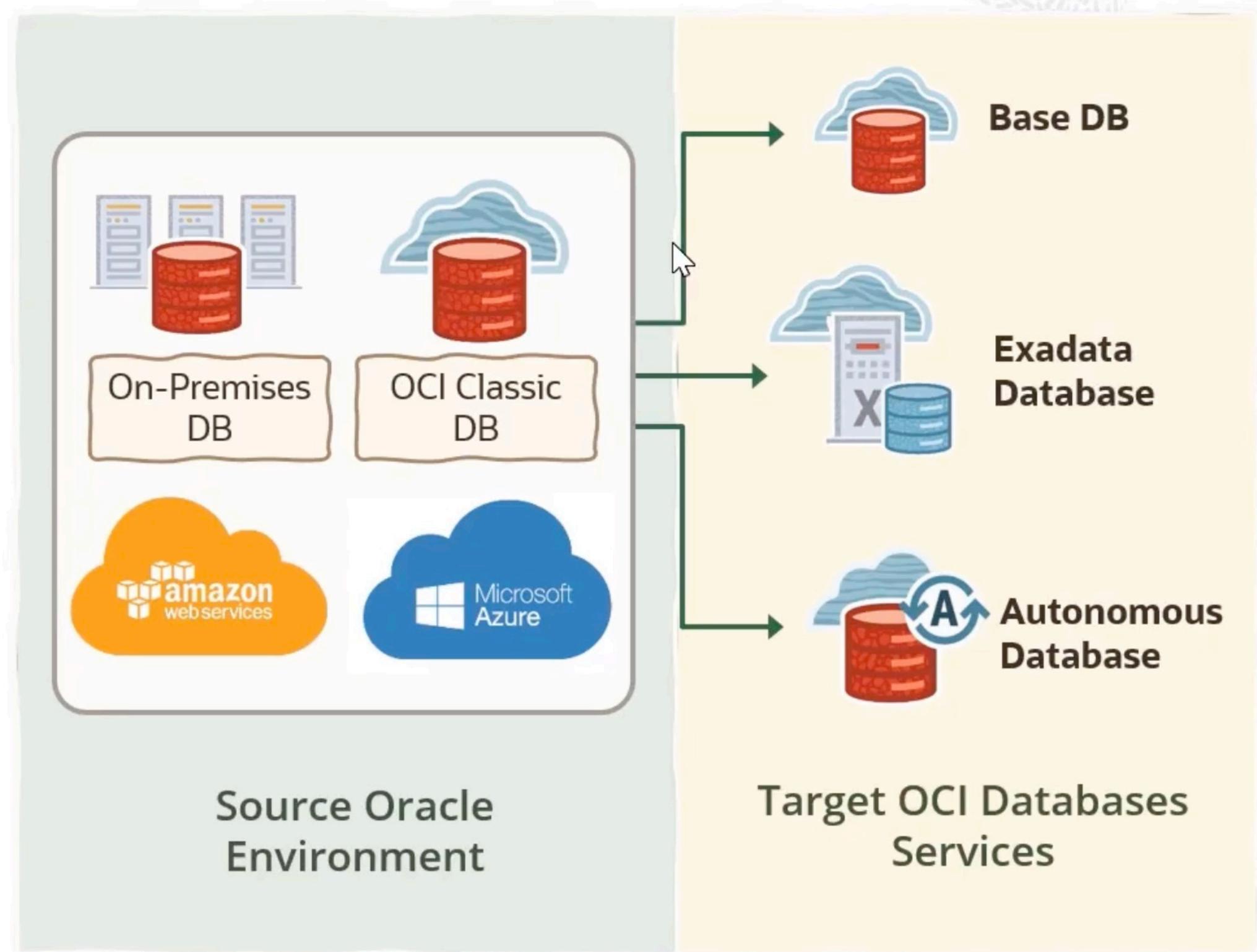
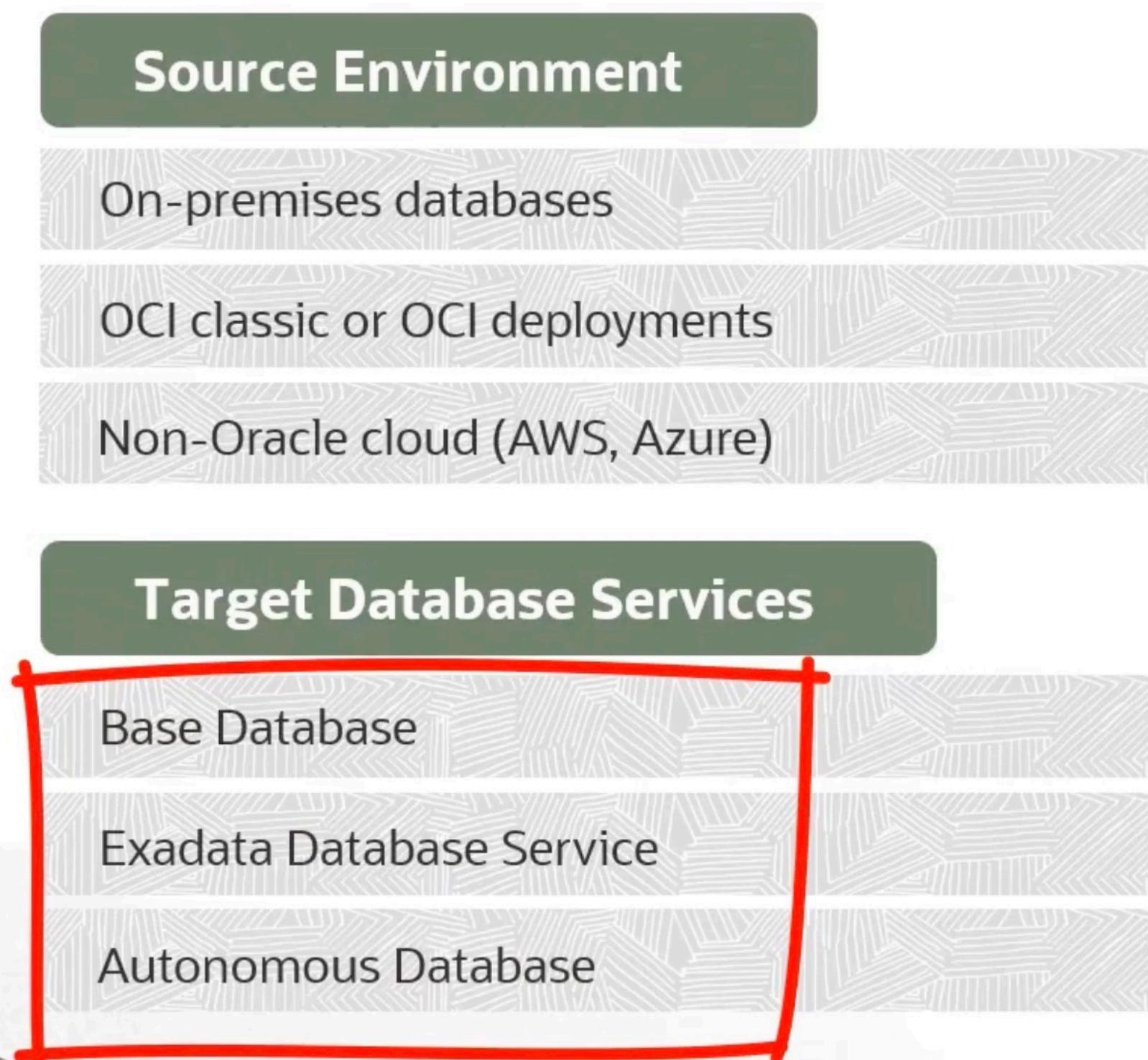
Migration Methods for Oracle Database

Quick Glance into Supported Types by Different Methods

Method \ Type	Logical Online	Logical Offline	Physical Online	Physical Offline	Cross-Platform	** Cross-Database
Data Pump		✓			✓	
RMAN				✓	✓	
SQL Developer		✓				✓
Oracle GoldenGate	✓				✓	✓
Data Guard			✓			
Enterprise Manager		✓		✓	✓	
Zero-Downtime Migration (ZDM)	✓	✓	✓	✓	✓	
Database Migration	✓	✓	✓	✓	✓	→
Remote Clone (PDB)		✓				
Unplug/Plug(PDB)				✓		

** You can migrate only supported non-Oracle databases to OCI Oracle DB Service as targets using Oracle GoldenGate or SQL Developer.

Migrating Oracle Data Sources to OCI DB Services



Migrating Non-Oracle Data Sources to OCI DB Services

Source Environment

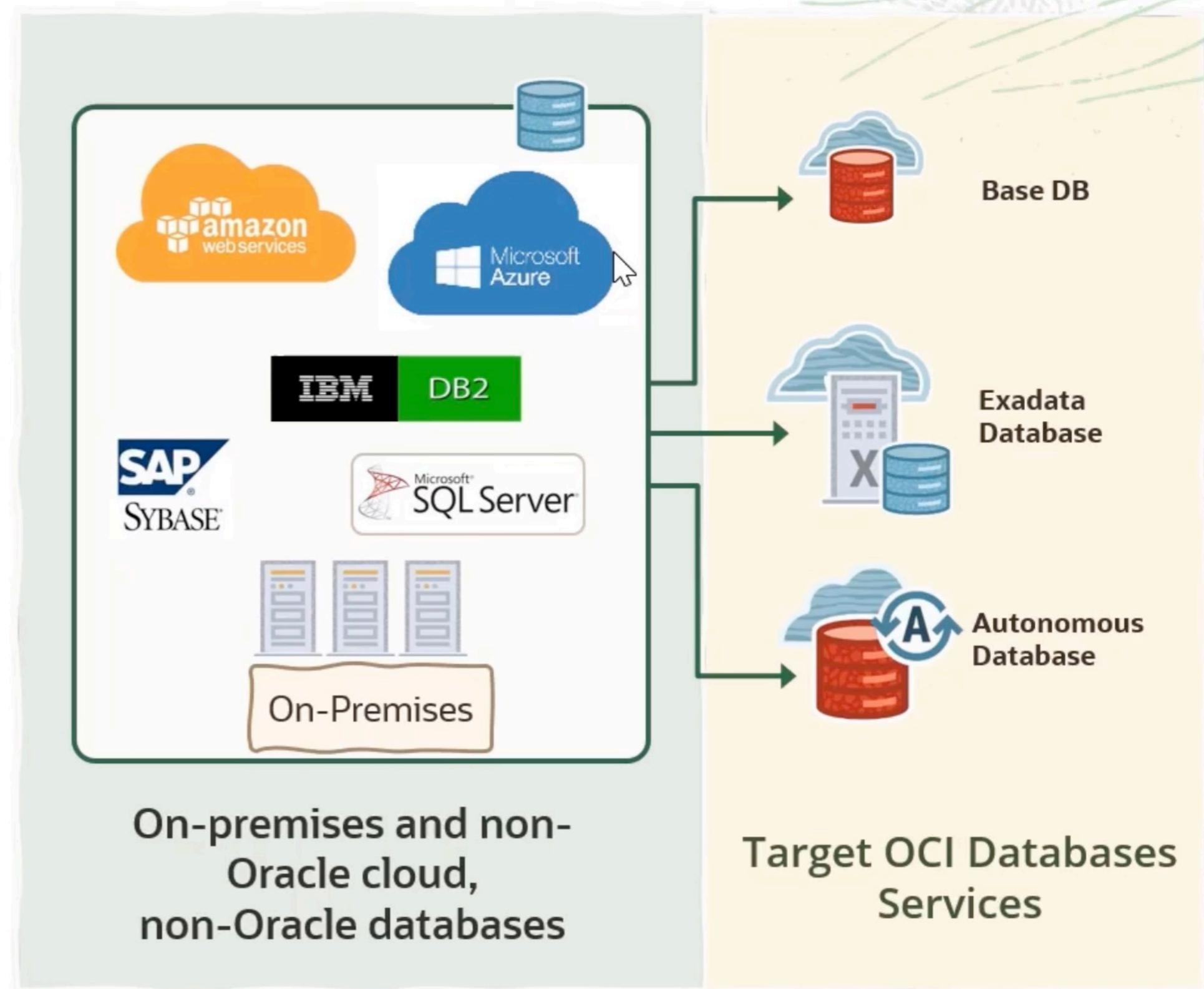
- On-premises non-Oracle databases
- Non-Oracle cloud (AWS, Azure) databases
- SQL Server, Sybase, Teradata databases, IBM DB2

Target Database Services

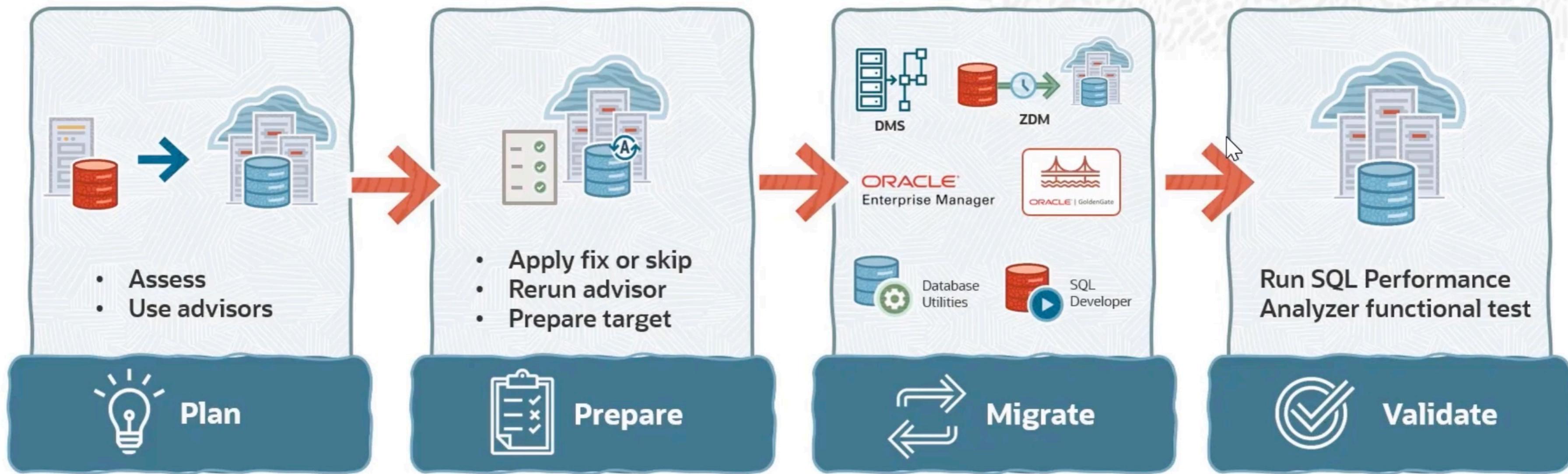
- Base Database
- Exadata Database Service
- Autonomous Database

Migration Type

Logical (supported source and target version) –
offline/online

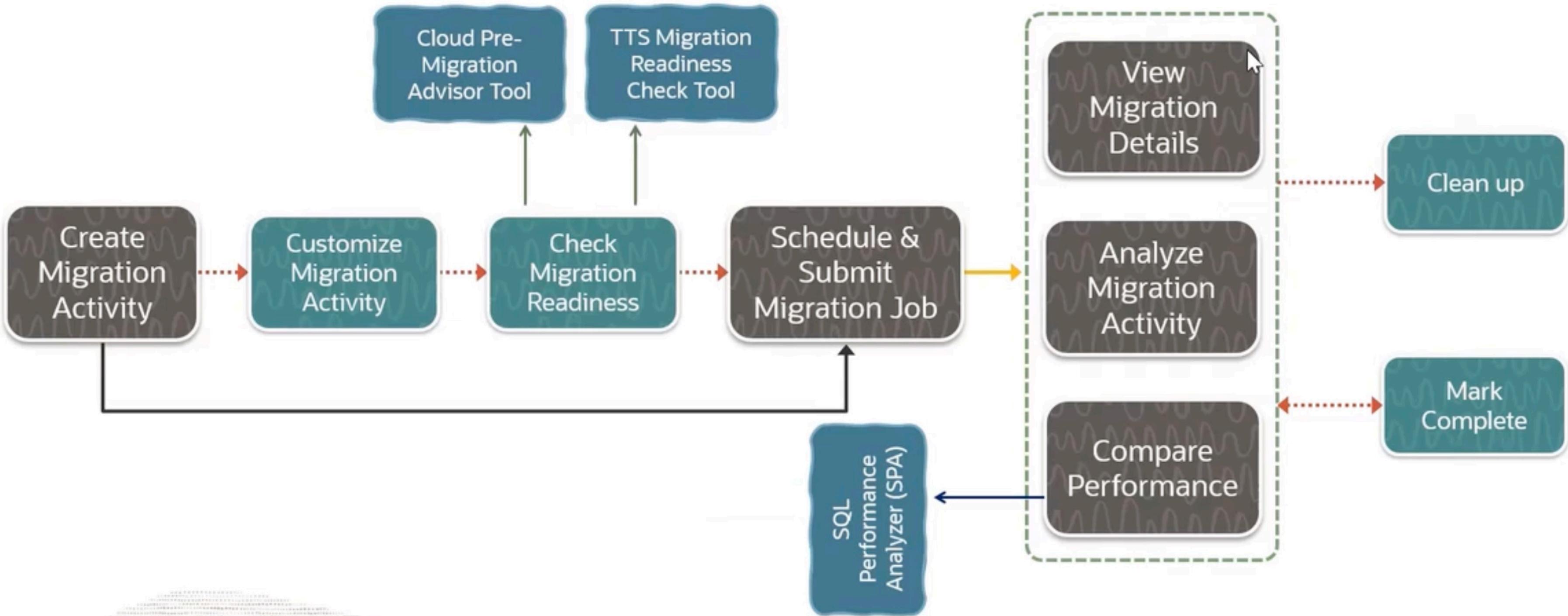


Migration Process to OCI DB Services



EM Migration Workbench

Process Workflow



Source

Oracle Zero Downtime Migration

Targets

On-Premises



Oracle Standard |
Enterprise Edition

OCI



Oracle Base
Database Services



Exadata Cloud Service,
Cloud@Customer

3rd Party Clouds



Readiness



Source and
Target Discovery



Pre-Migration
Checks

Initial Data Transfer

Physical



RMAN Backup
or Restore from
Service

Locations:
NFS, Object
Storage, ZDLRA

Logical



Data Pump
Export

Locations:
NFS, Object
Storage, AWS S3

Ongoing Synchronization

Physical



Data Guard

Logical



GoldenGate

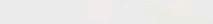
Switchover

Physical



Switchover to
Target
Role Swap Source
to Standby

Logical



Switchover to
Target

Evaluation and Completion



Post-Migration
DB Checks &
Cleanup



Successful DB
Migration

On-Premises



Exadata On-Premises

OCI



Oracle Base
Database Service



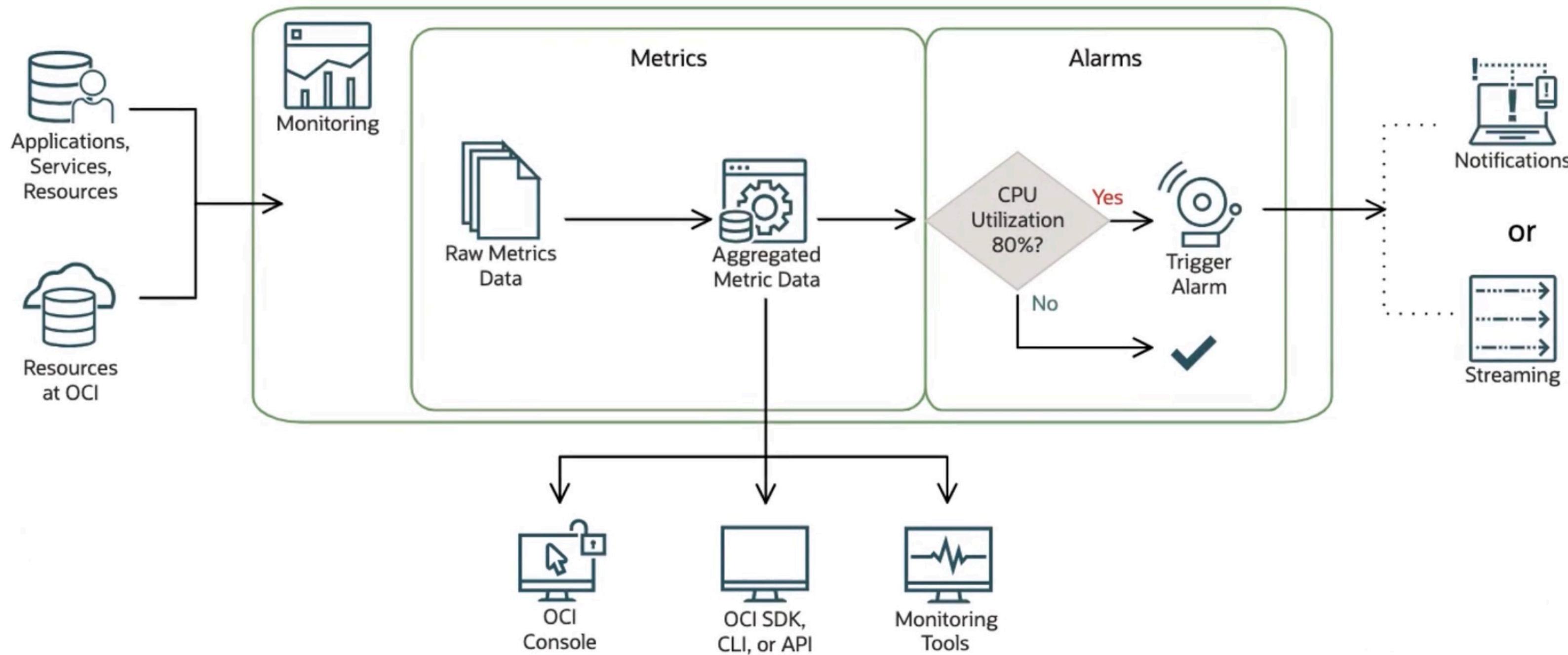
Exadata DB -D and
Cloud@Customer



Autonomous
Database



Monitoring Service Workflow



Metric Query Components



Query Component	Examples
Metric	oci_computeagent: CpuUtilization, MemoryUtilization, DiskBytesWritten, LoadAverage oci_vcn: VnicIngressDropsSecurityList, VnicEgressDropsSecurityList, VnicFromNetworkBytes, VnicToNetworkBytes oci_blockstore: VolumeReadOps, VolumeWriteOps, VolumeReadThroughput, VolumeWriteThroughput oci_objectstorage: ObjectCount, StoredBytes
Interval	1m, 5m, 1h (Basic mode) 1m-60m, 1h-24h, 1d (Advanced mode)
Dimensions	availabilityDomain, faultDomain, imageId, region, resourceDisplayName, resourceId, shape, projectId
Grouping Function	groupBy() grouping()
Statistic	absent(), avg(), count(), max(), min(), sum()
Comparison operation (Trigger Rule)	>, >=, ==, !=