Base Database Service Storage Architecture

LVM

ASM

- There is a choice of LVM or Grid Infrastructure (ASM) storage management.

Eddie Ambler
SENIOR TECHNICAL PRODUCT MANAGER
ORACLE

Base Database Service Storage Architecture

LVM

Block Storage

- There is a choice of LVM or Grid Infrastructure (ASM) storage management.

- ASM uses DATA and RECO disk groups.

- Block Storage provides triple mirroring of data.

- ASM for the storage management layer is required for 2-node RAC DB System deployments.

- DB System clones are also supported.

ASM
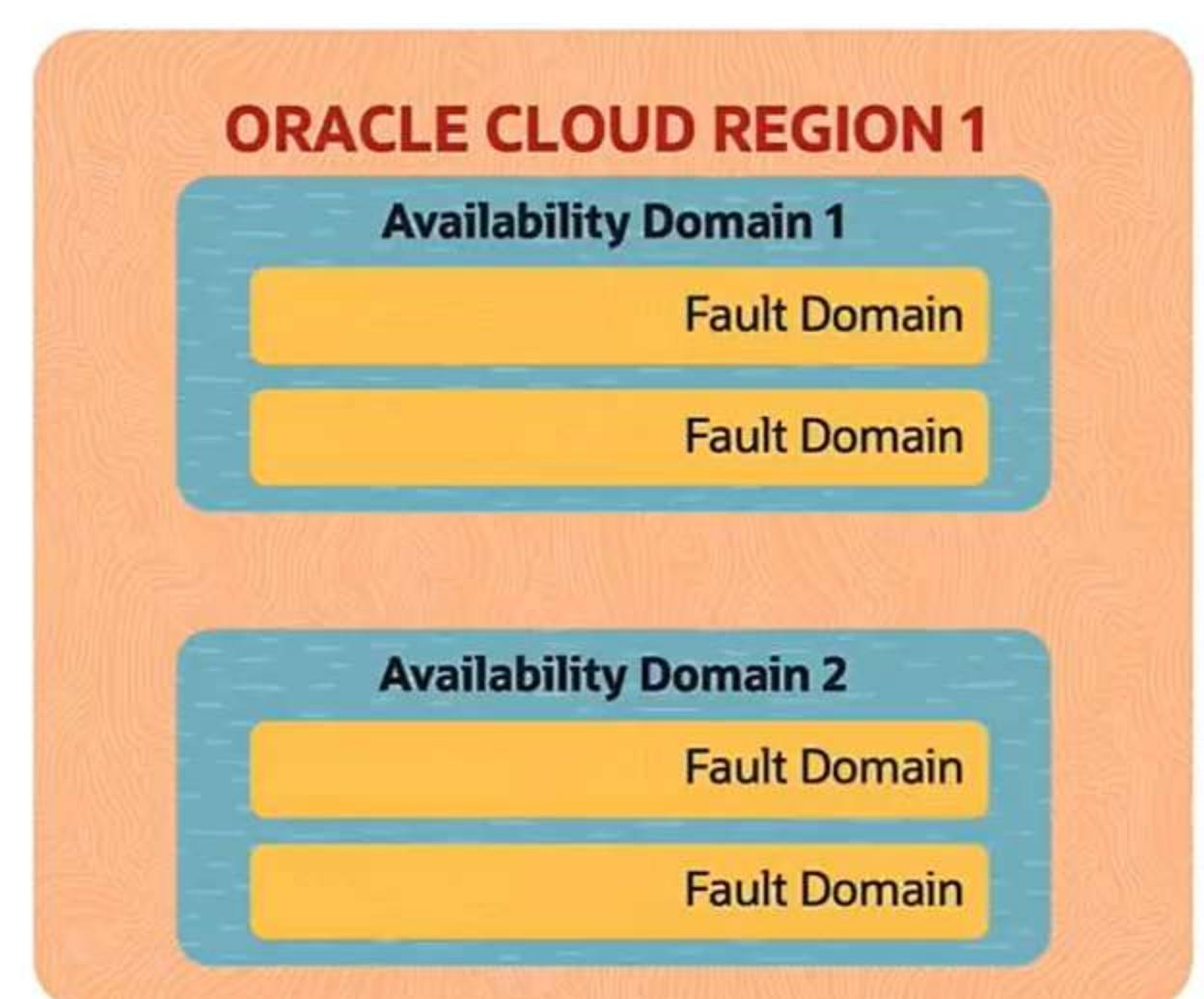
DATA | **RECO**

**ASM Disk Groups +DATA, +RECO**

Block Storage
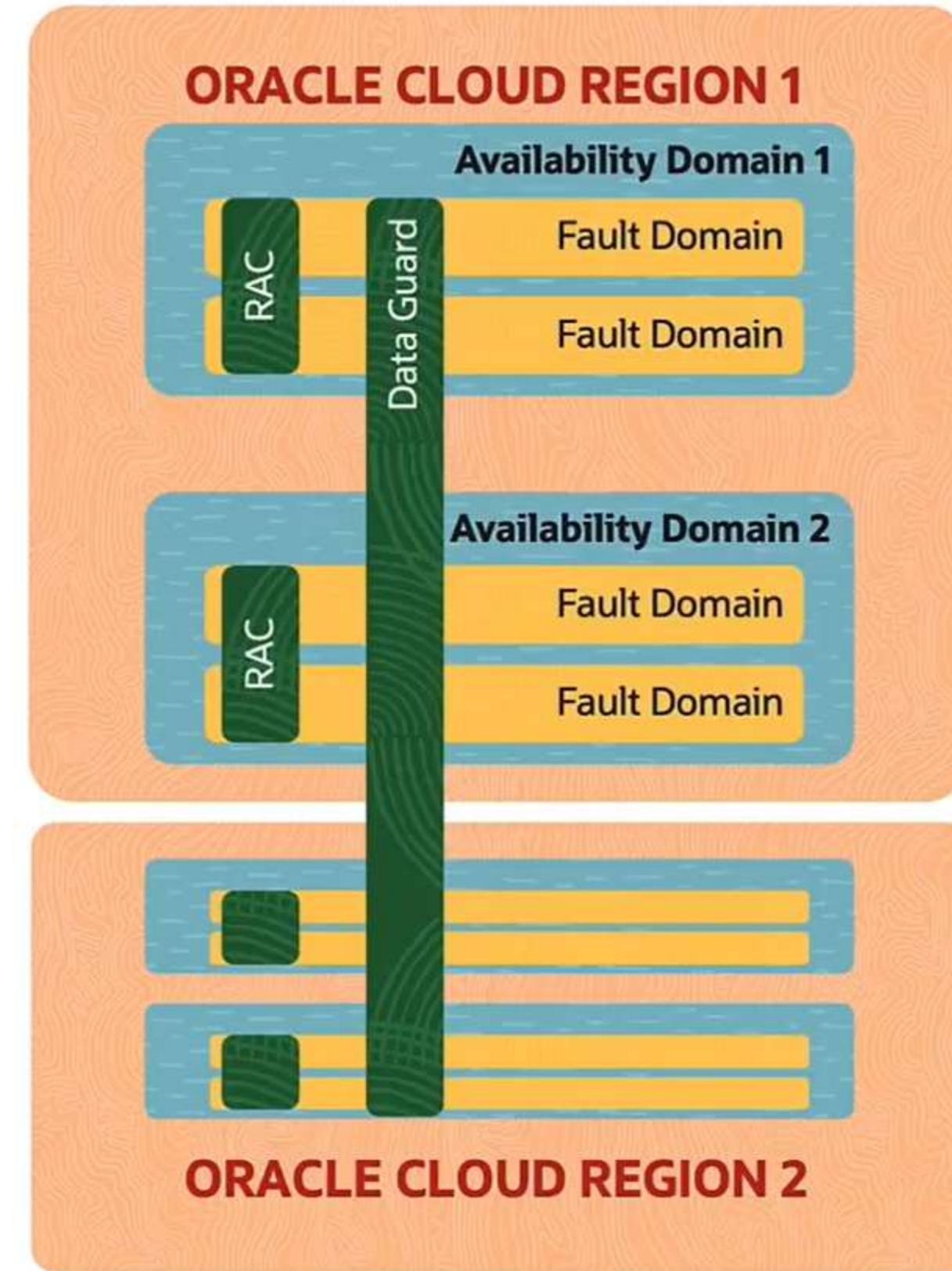
Fault Domains, Availability Domains, and Regions

- *A Region* is **a single localized geographical area where Oracle has deployed Oracle Cloud Infrastructure**.

  - Each region is wholly independent of other regions and can be thousands of miles apart from other regions.

- *An Availability Domain* consists of **a set of data centers within an Oracle Cloud Infrastructure region**.

  - The availability domains within a region are interconnected via a low-latency network.

  - A region can have multiple isolated availability domains with separate power and cooling.

- *A Fault Domain* is **a grouping of hardware and infrastructure within an availability domain**.

  - Each availability domain contains three fault domains.

  - Fault Domains are used to reduce the impact of hardware failures.

ORACLE CLOUD REGION 1

Availability Domain 1

Fault Domain

Fault Domain

Availability Domain 2

Fault Domain
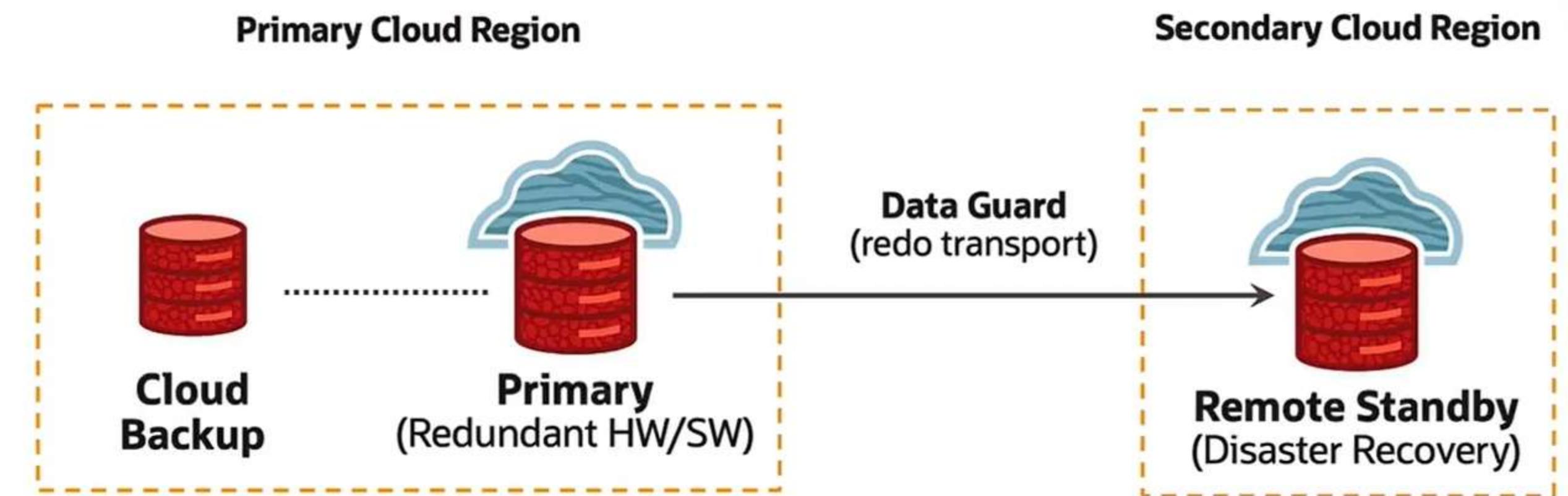
Fault Domain

Fault Domains, Availability Domains, and Regions

- Real Application Clusters (RAC) across Fault Domains provides database instance fault isolation.

- Data Guard deployed across availability domains within a region provides high availability.

- Data Guard deployed across regions provides geographic isolation for disaster recovery.

Oracle Maximum Availability Architecture (MAA)

High-Availability Blueprint in the Cloud

Primary Cloud Region   **Secondary Cloud Region**

Cloud Backup · · · · · · · · · · · **Primary** (Redundant HW/SW) → **Data Guard** (redo transport) → **Remote Standby** (Disaster Recovery)

Key Cloud MAA Technologies

Continuous availability
Application Continuity   Global Data Services
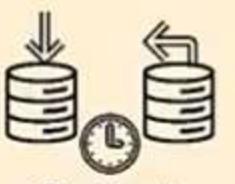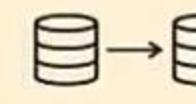
Data protection
Flashback   RMAN

Active replication
Active Data Guard   ORACLE GoldenGate
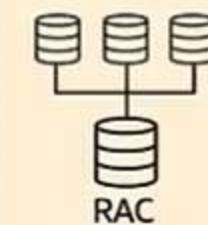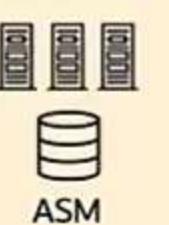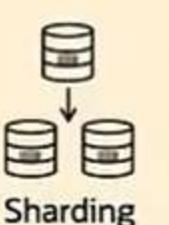
Scale out
RAC   ASM   Sharding

MAA Components for License-Included Editions

		Standard Edition	Enterprise Edition	High Performance	Extreme Performance - SI	Extreme Performance - RAC
	Flashback	Only Flashback Query	✔	✔	✔	✔
	Backup & Recovery	Non-parallel only	✔	✔	✔	✔
	Multitenant	Single CDB per VM DB System, Max 3 PDBs starting with 19c	Single CDB per VM DB System, Max 3 PDBs starting with 19c	Single CDB per VM DB System, Max 4098 PDB	Single CDB per VM DB System, Max 4098 PDB	Single CDB per VM DB System, Max 4098 PDB
	Data Guard	✖	Standard Data Guard	Standard Data Guard	Active Data Guard	Active Data Guard
	RAC	✖	✖	✖	✖	✔
	Application Continuity	✖	✖	✖	✔	✔

Integrated Security from Data to Identity

Defense in Depth

Data
- Transparent Data Encryption (TDE)
- Data Redaction
- Data Masking
- Data Subsetting
- OCI Vault
- Oracle Database Vault
- Oracle Database Firewall
- Data Safe
- NIST SP-800-88r1 erase

Compute
- STIG Hardened
- Minimal packages
- Token-based SSH access

Networking
- Network Isolation
- Oracle Native Network Encryption
- FastConnect/ VPN

Infrastructure
- Vulnerability Scanning
- ISO 27001
- SOC 1/2/3
- PCII-DSS
- HIPAA
- Etc.

OCI Tenancy
- Identity and Access Management (IAM)
- Federated Identity providers
- Multifactor authentication
- Policy-based access control
- Users, groups
- Compartments
- Instance Principals
- Resource Principals