



# High Availability & Disaster Recovery on Oracle Cloud Infrastructure

May 2020





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Passionate about Database  
& Cloud Technologies

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## Safe harbor statement

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## Agenda

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- High Availability Building Blocks
- Block Volume Backups and Cloning
- Application Architecture
- Database Architecture
- 1-AD regions and Cross-region scenarios

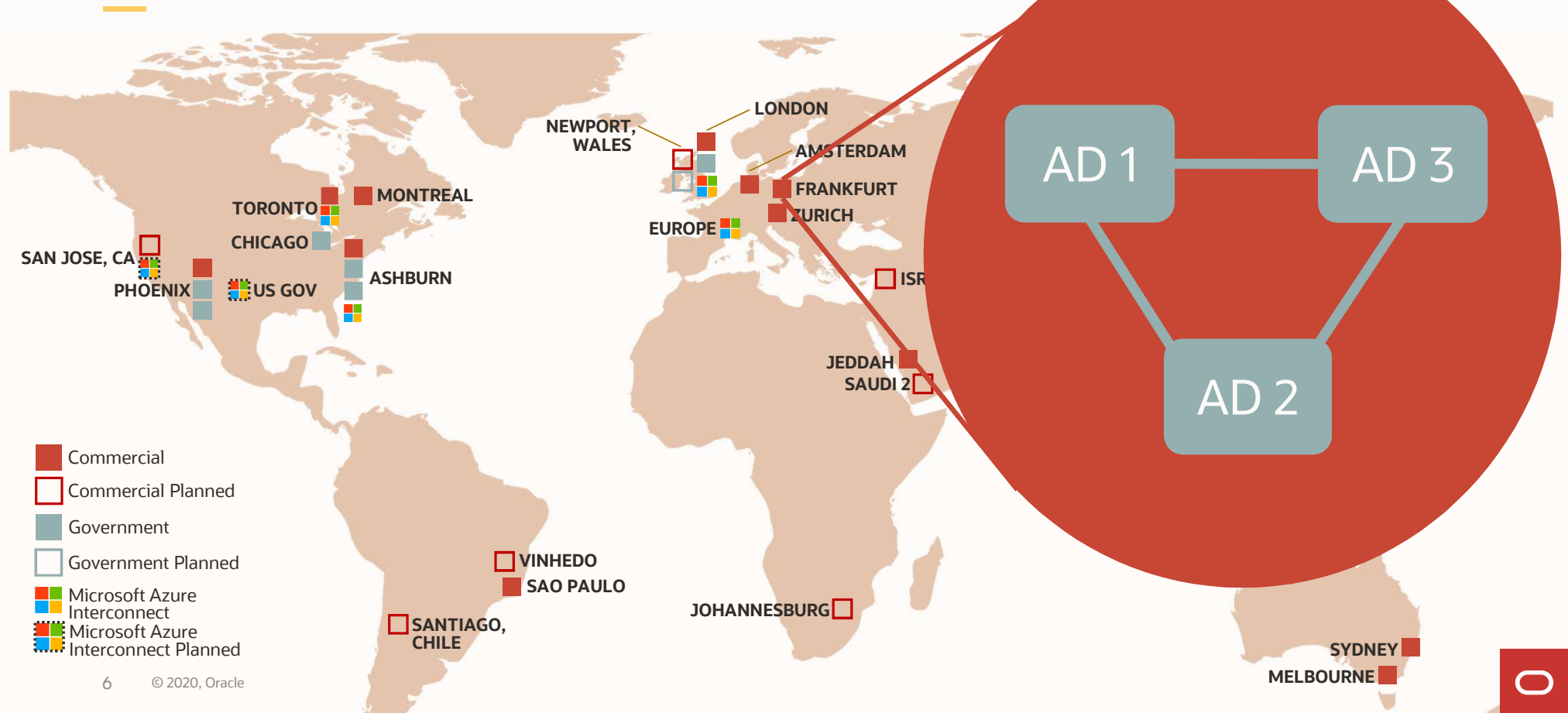
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# Oracle Cloud Infrastructure Global Footprint

May 2020: 23 Regions Live, 13 Planned



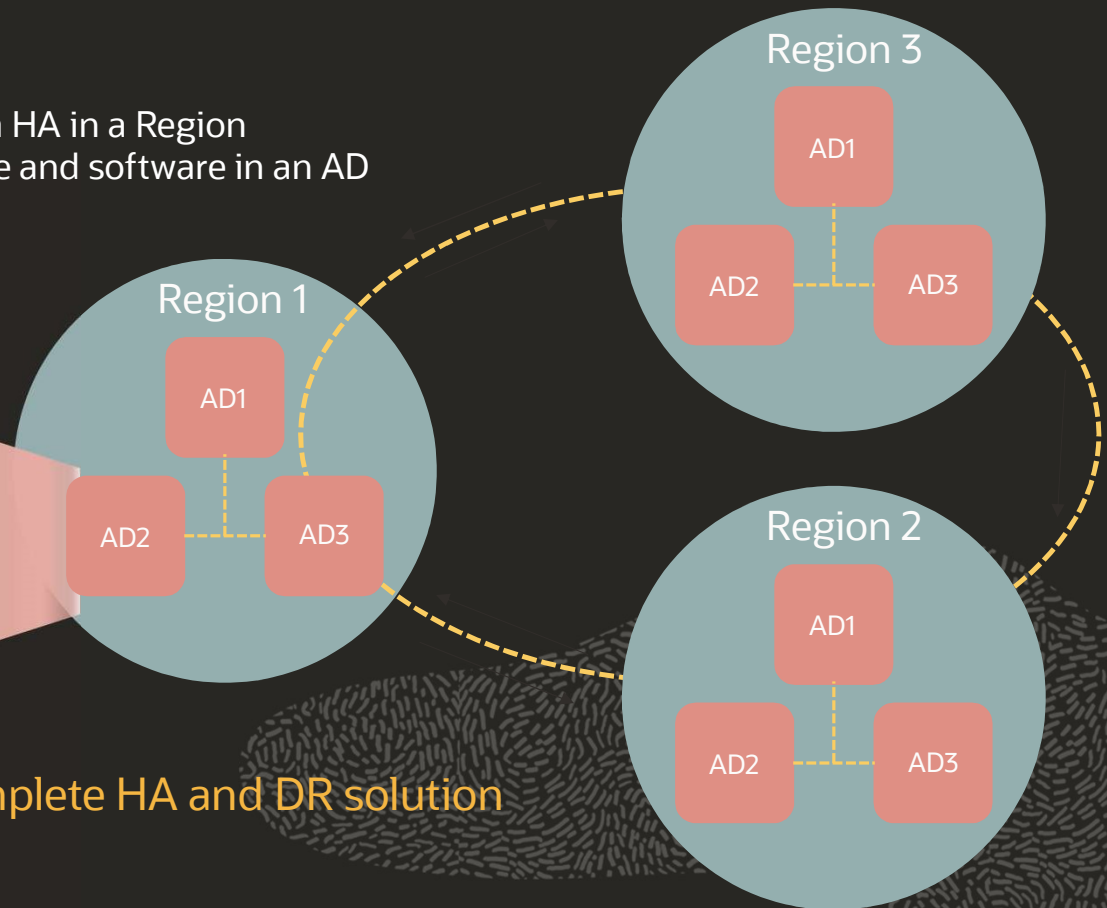


# OCI Topology

- Regions serve different geographies
- Availability Domains (ADs) provide a HA in a Region
- Fault Domains (FDs) group hardware and software in an AD
  - Each AD has 3 FDs



Complete HA and DR solution

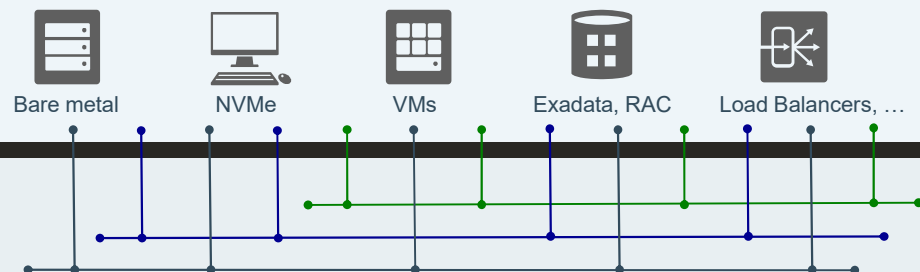


# OCI Architecture

Customer's  
DATACENTER

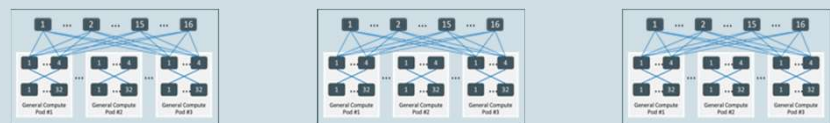
.....  
Internet  
VPN  
FastConnect

COMPUTE, STORAGE,  
DATABASE, LBs, ...



VIRTUAL NETWORK

PHYSICAL NETWORK



REGION

DATACENTERS





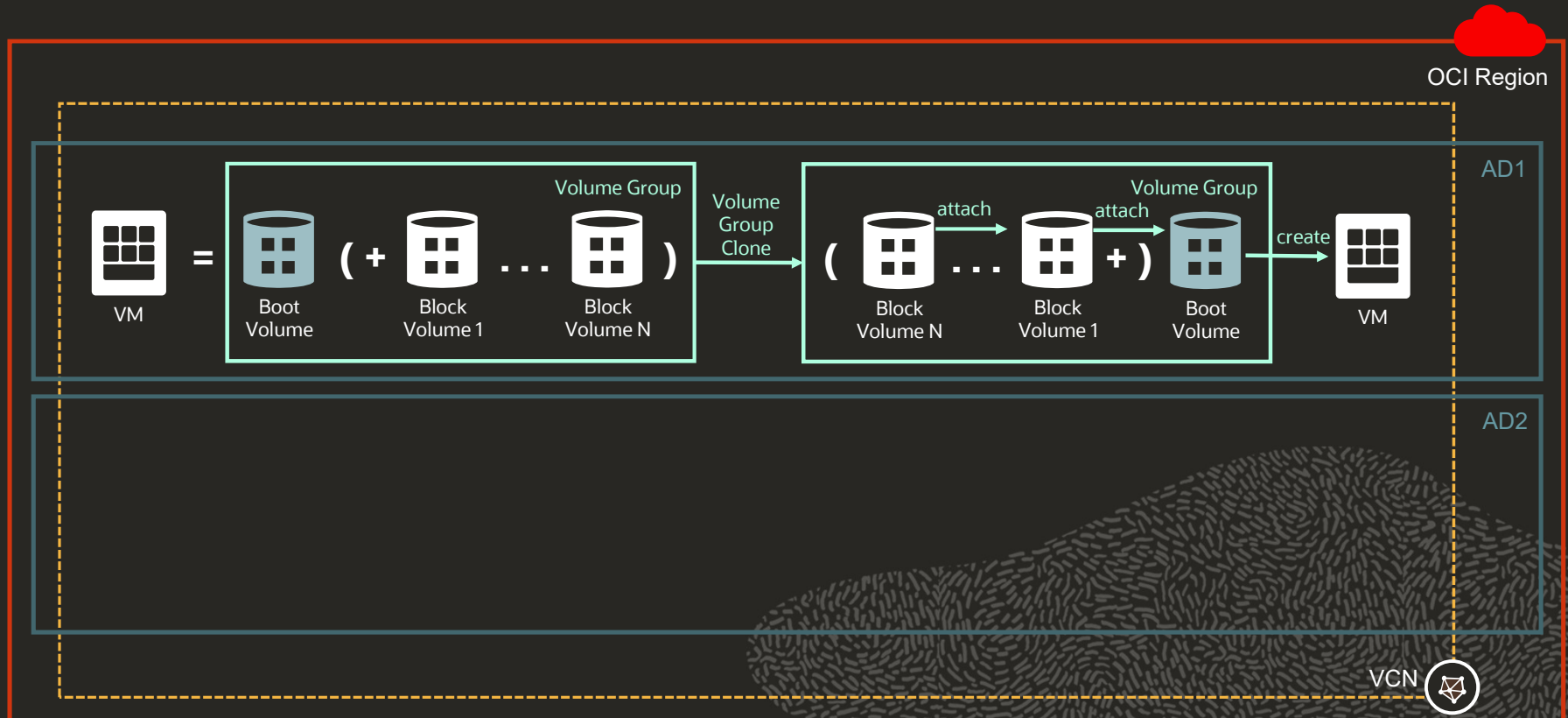
## Agenda

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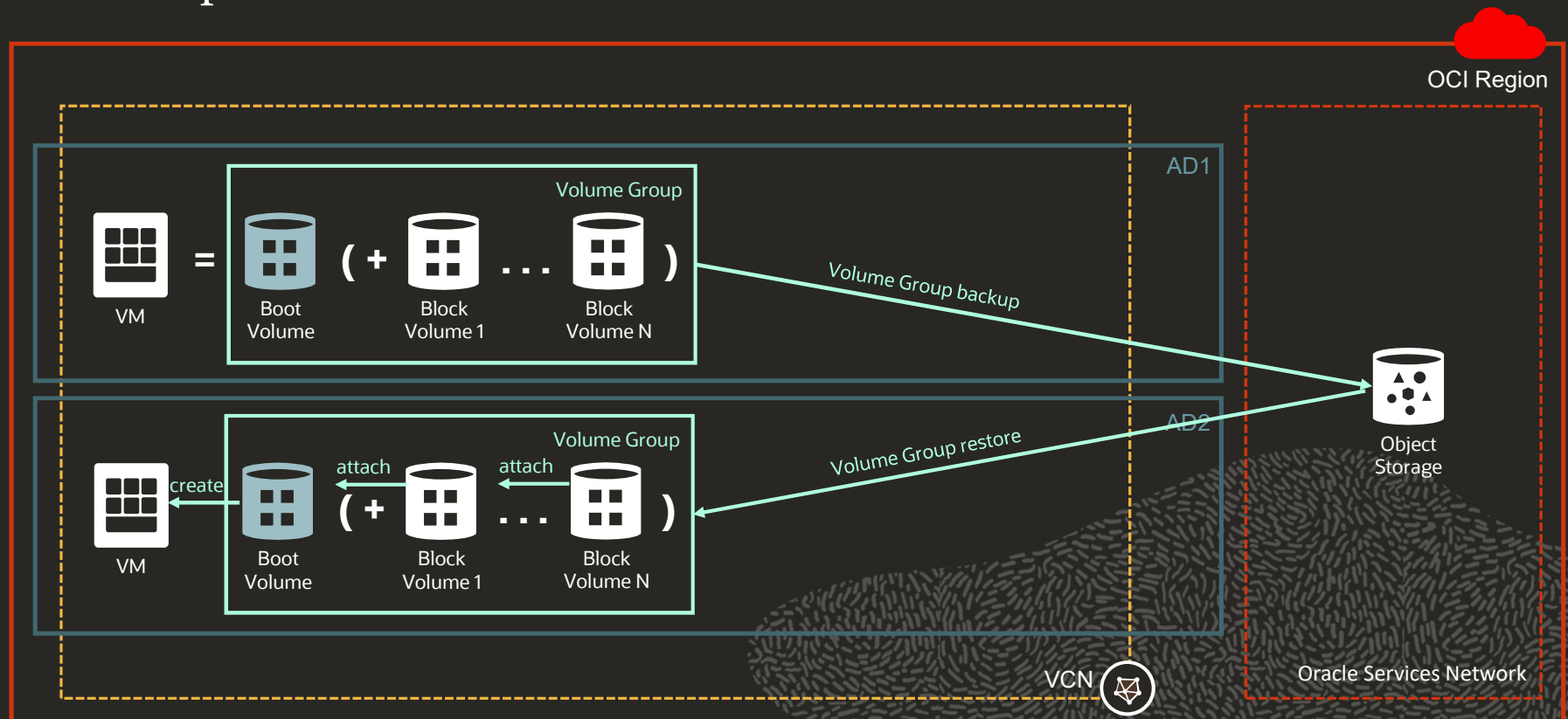
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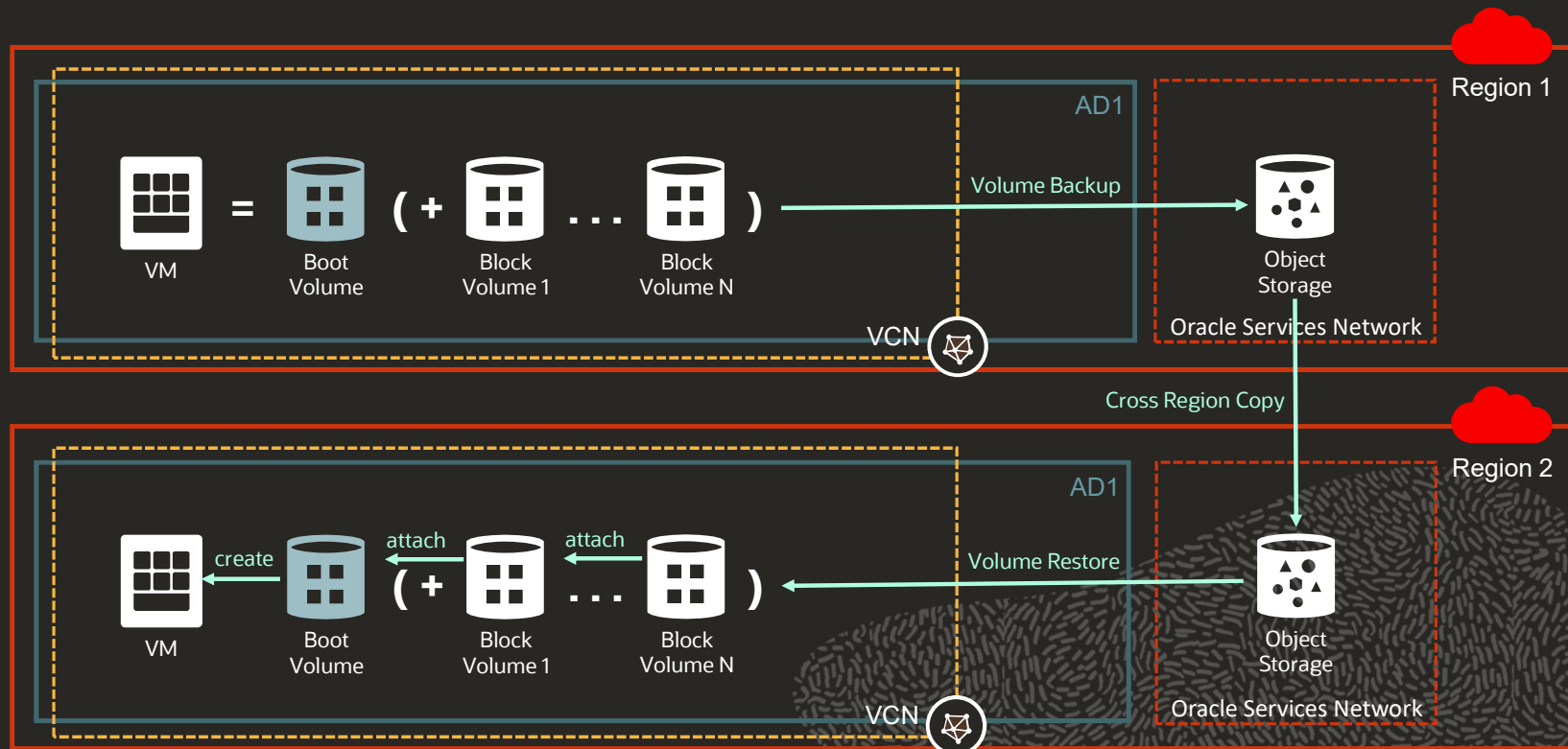
# Volume Clone



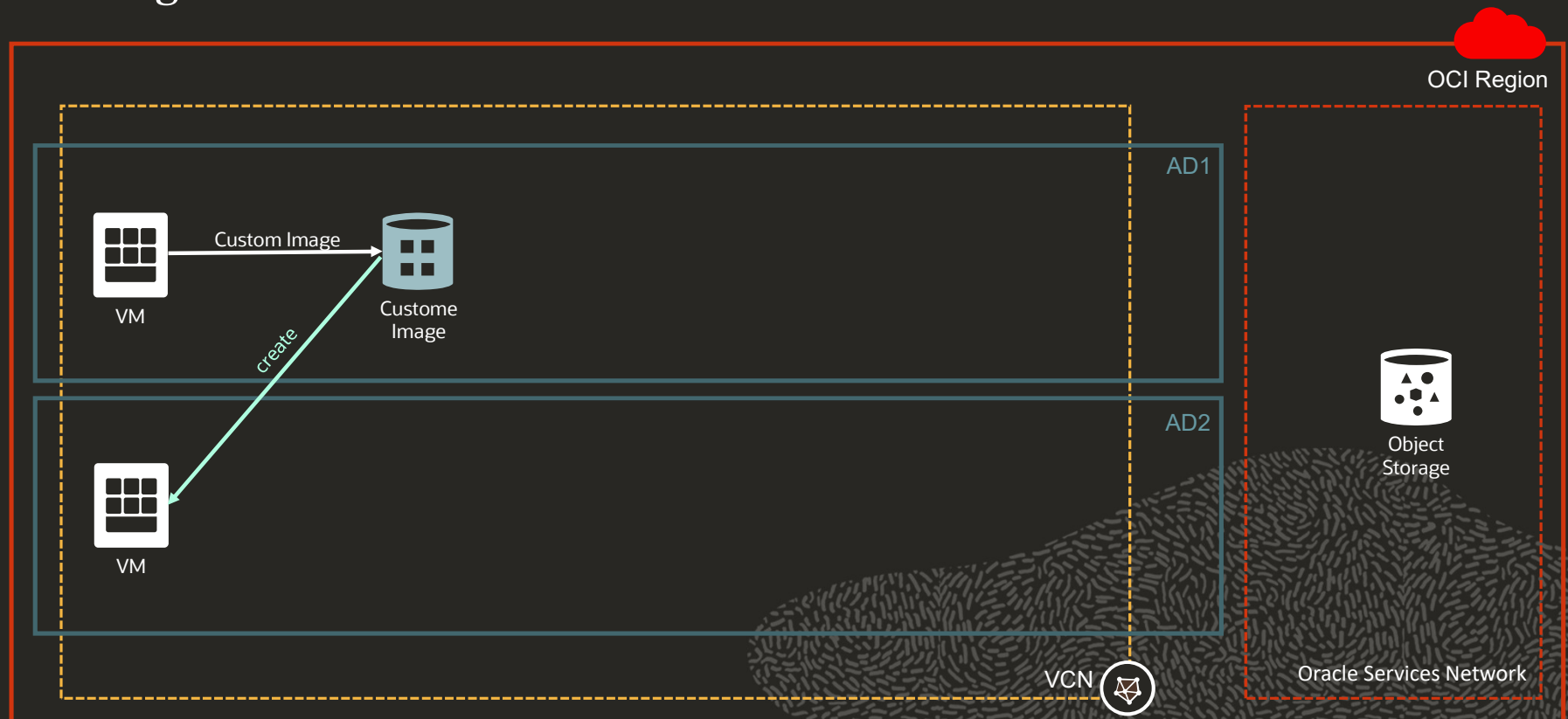
# Volume Backup



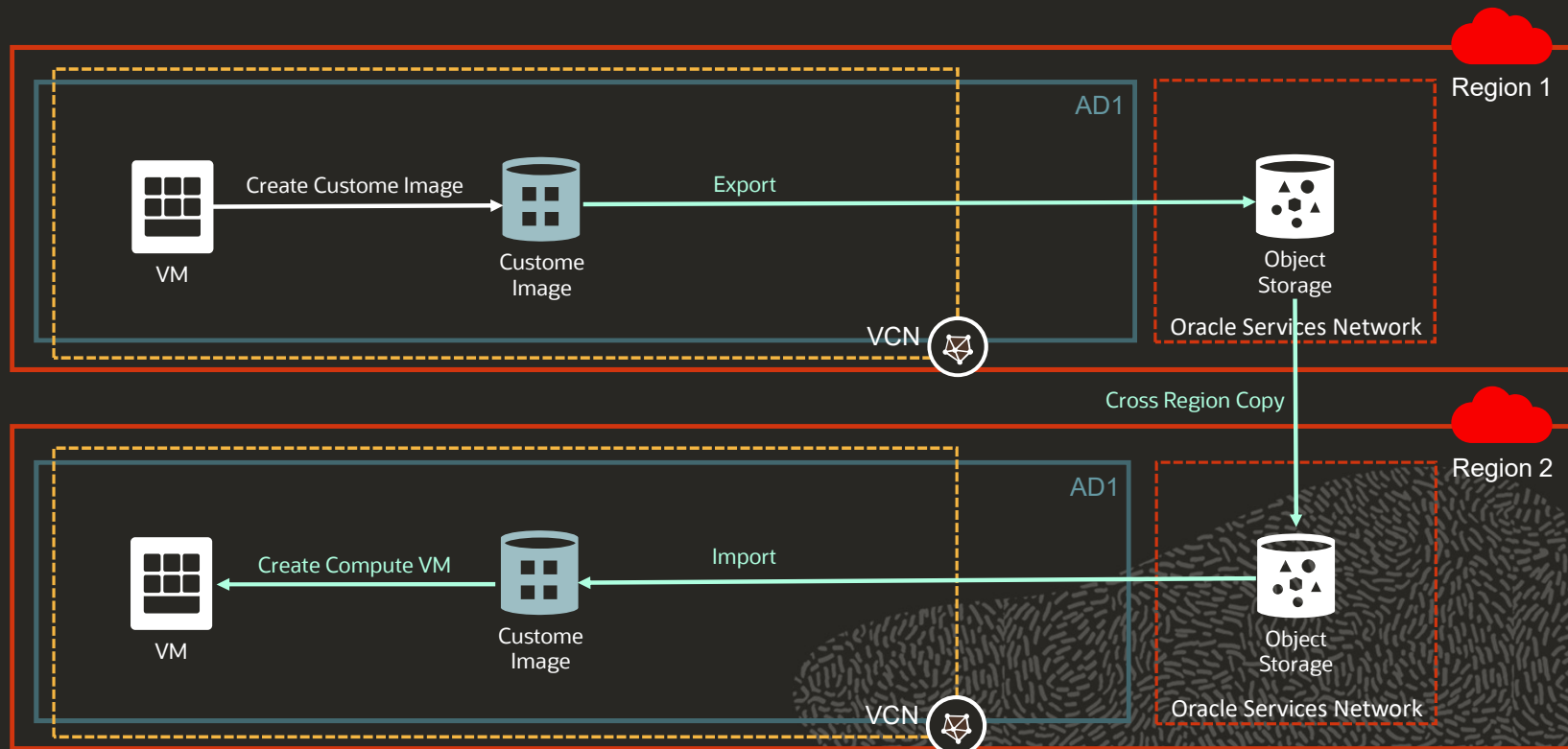
## Volume Backup | Cross-region Copy



## Custom Image



## Custom Image | Cross-region Copy





## Volume Backups vs. Clones vs. Custom Images

	Volume Clone	Volume Backup	Custom Image
Restore to diff. AD	No	Yes	Yes
Cross-region copy	No	Yes	Yes
Volume Groups	Yes	Yes	No
Backup Policies	No	Yes	No
Online	Yes	Yes	No
Cost	Higher cost (Block Storage)	Lower cost (Object Storage)	No cost

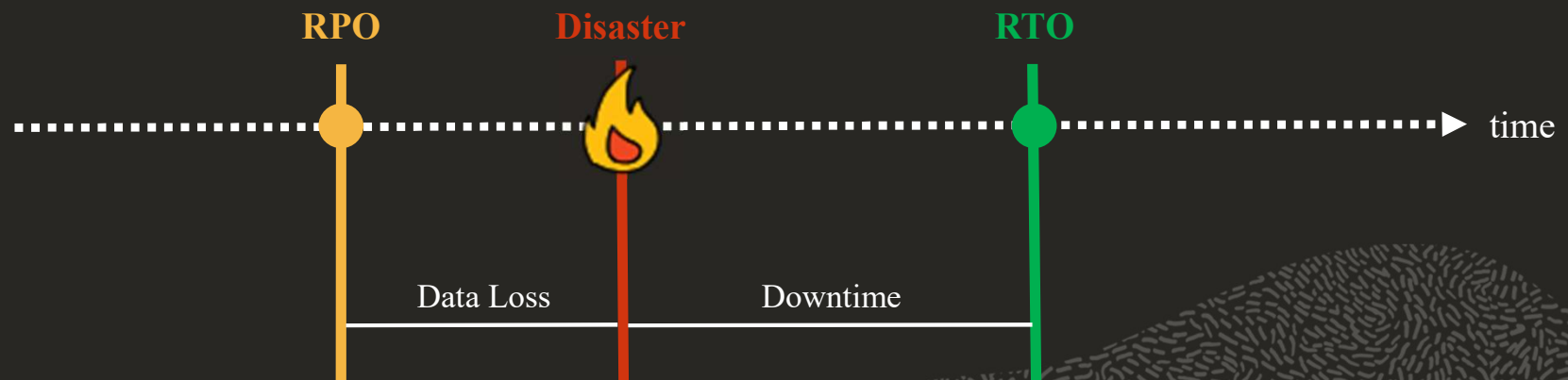
<https://docs.cloud.oracle.com/en-us/iaas/Content/Block/Concepts/blockvolumebackups.htm#backupsvsclones>

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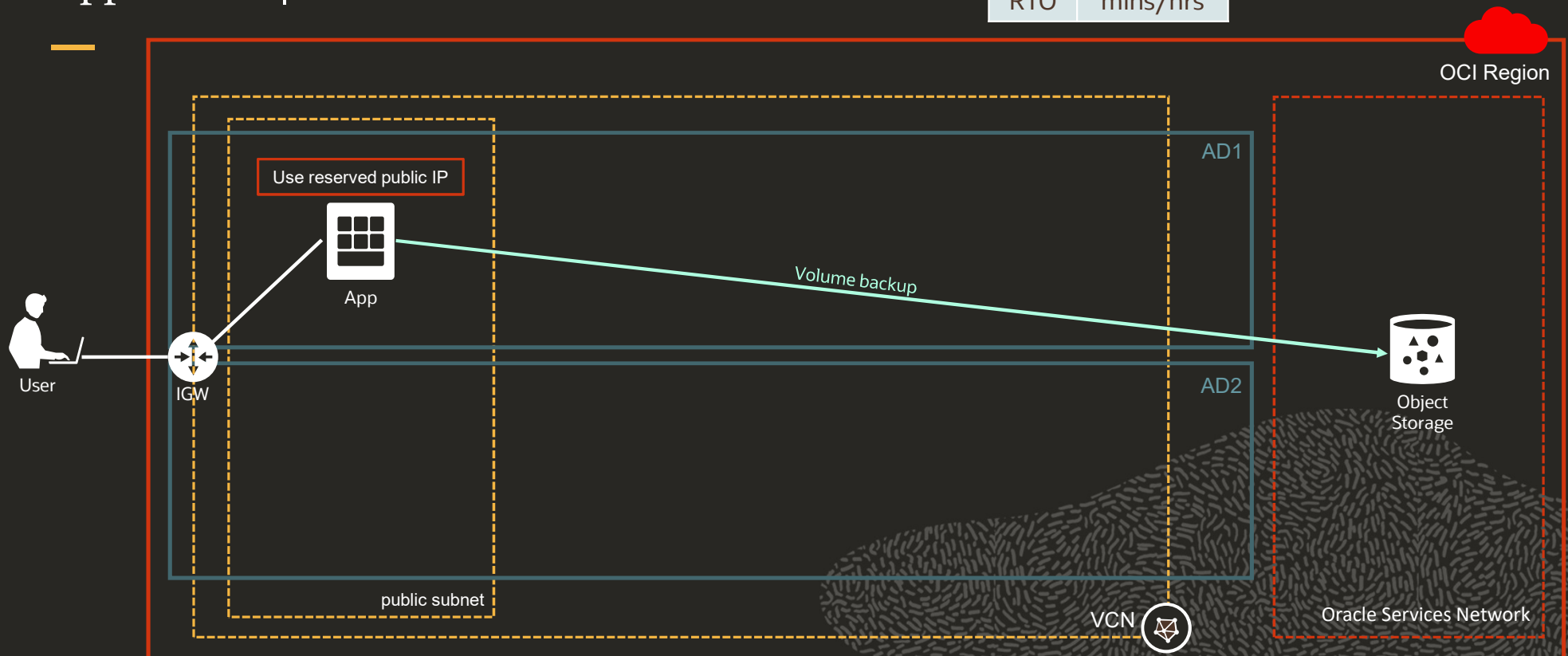
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## Recovery Point Objective (RPO) & Recovery Time Objective (RTO)



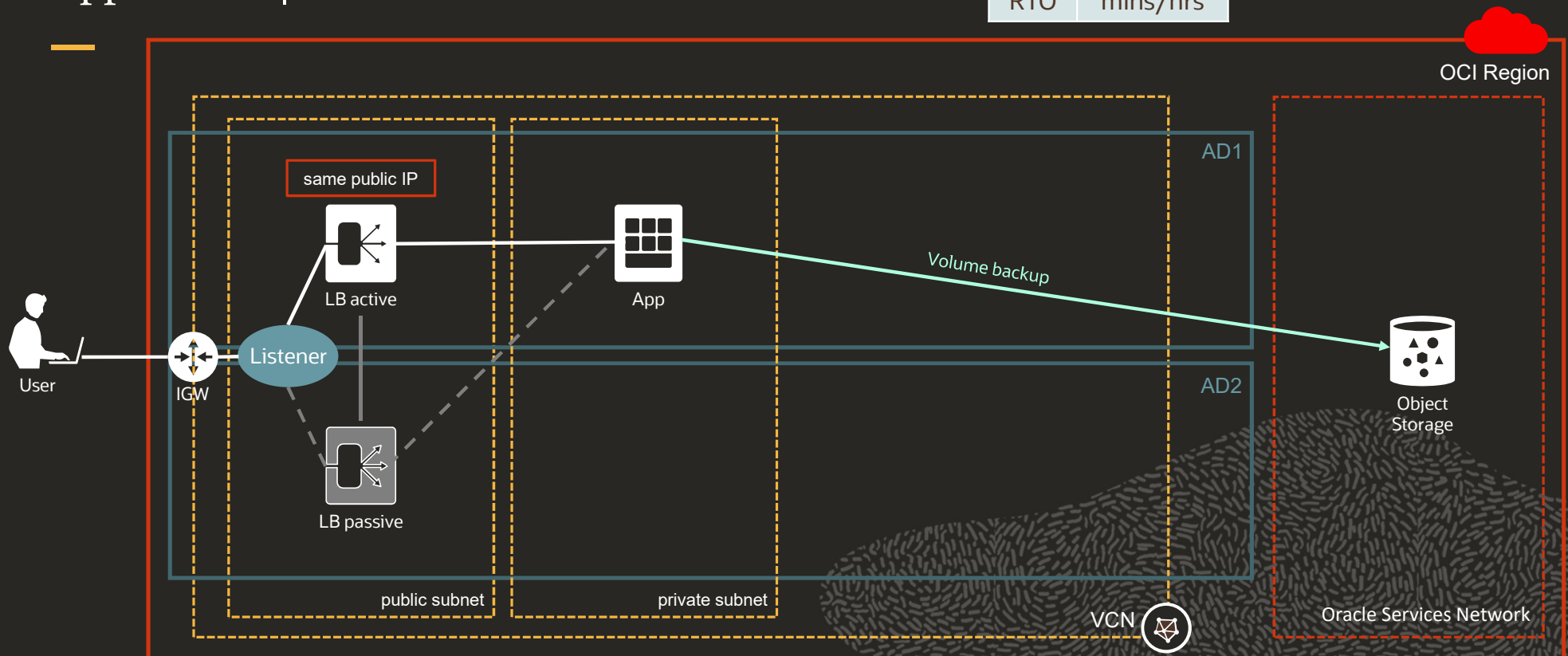
# Application | Basic Architecture

	App
HA	no
RPO	mins/hrs
RTO	mins/hrs



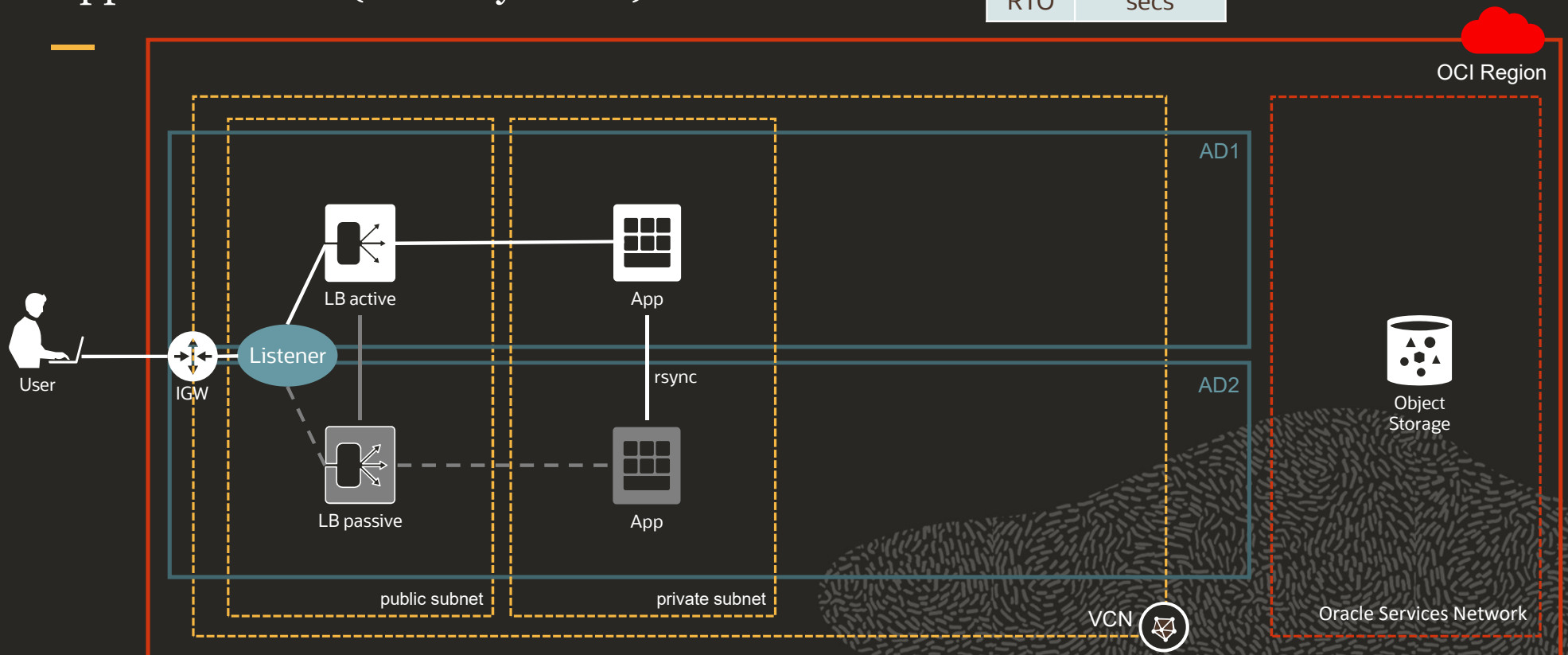
# Application | Basic Architecture + LB

	App
HA	no
RPO	mins/hrs
RTO	mins/hrs



# Application HA (Standby mode)

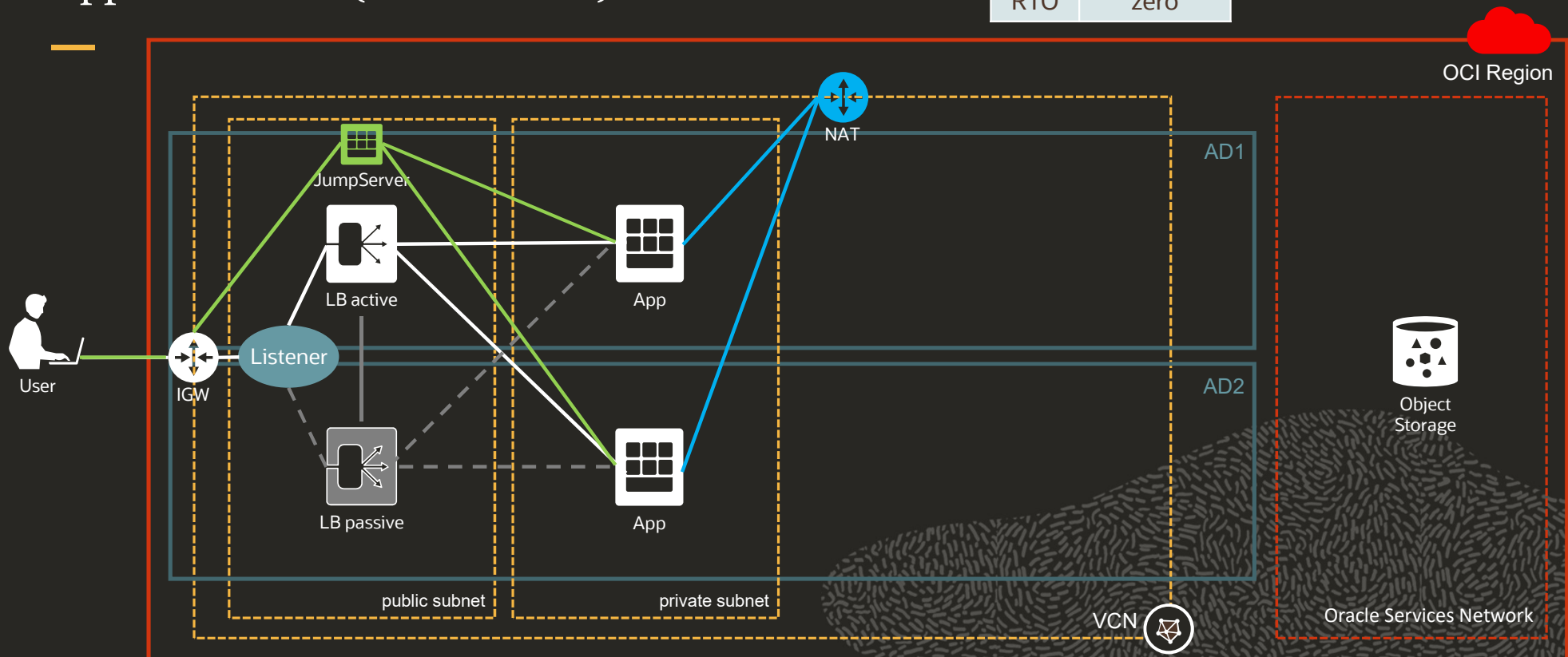
	App
HA	yes
RPO	zero
RTO	secs





# Application HA (Active mode)

	App
HA	yes
RPO	zero
RTO	zero



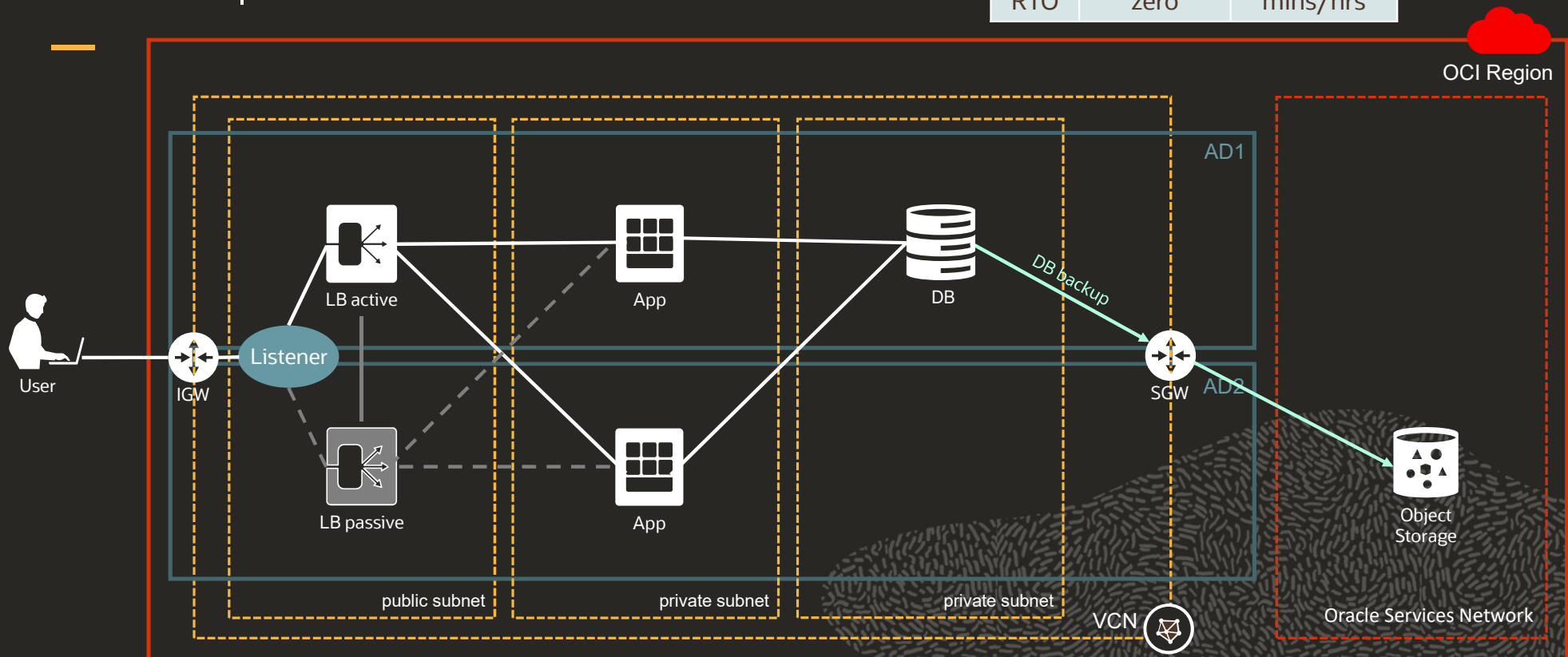
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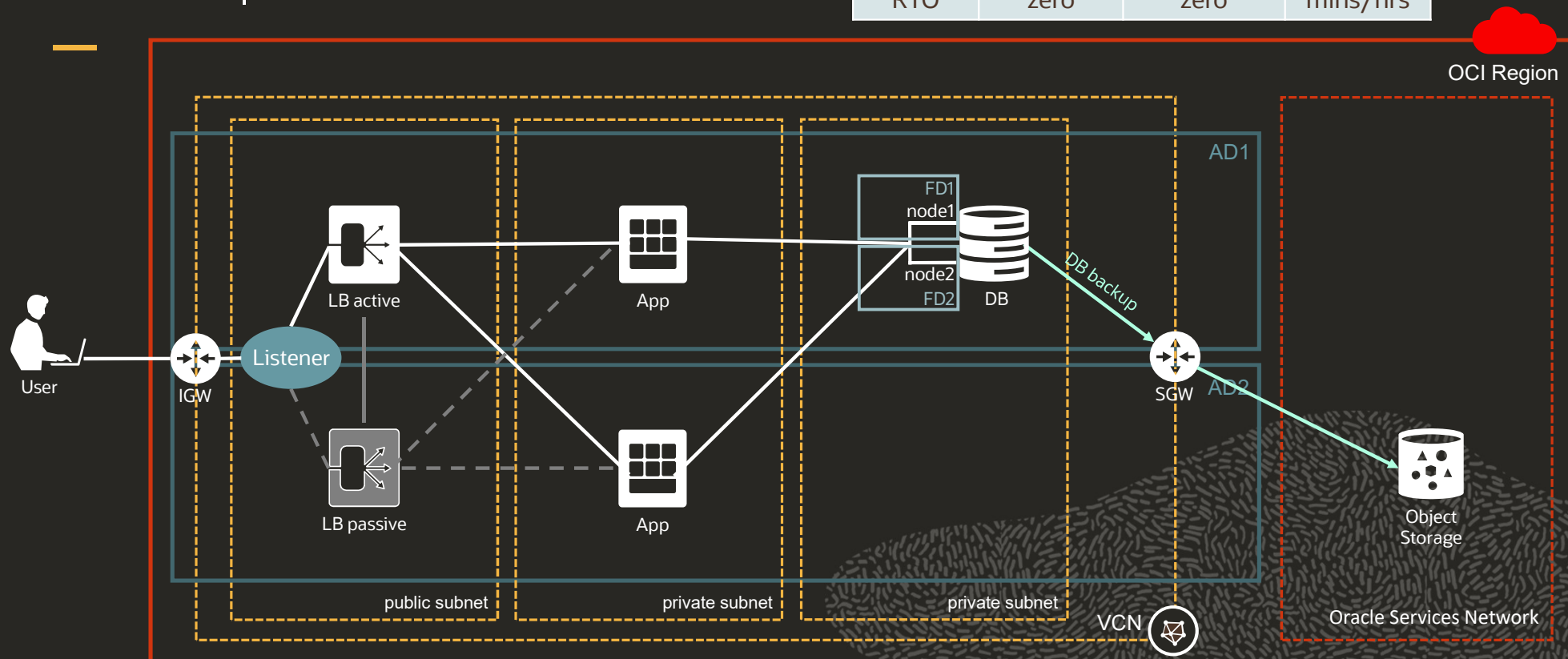
## Database | Basic Architecture

	App	DB
HA	yes	no
RPO	zero	mins
RTO	zero	mins/hrs



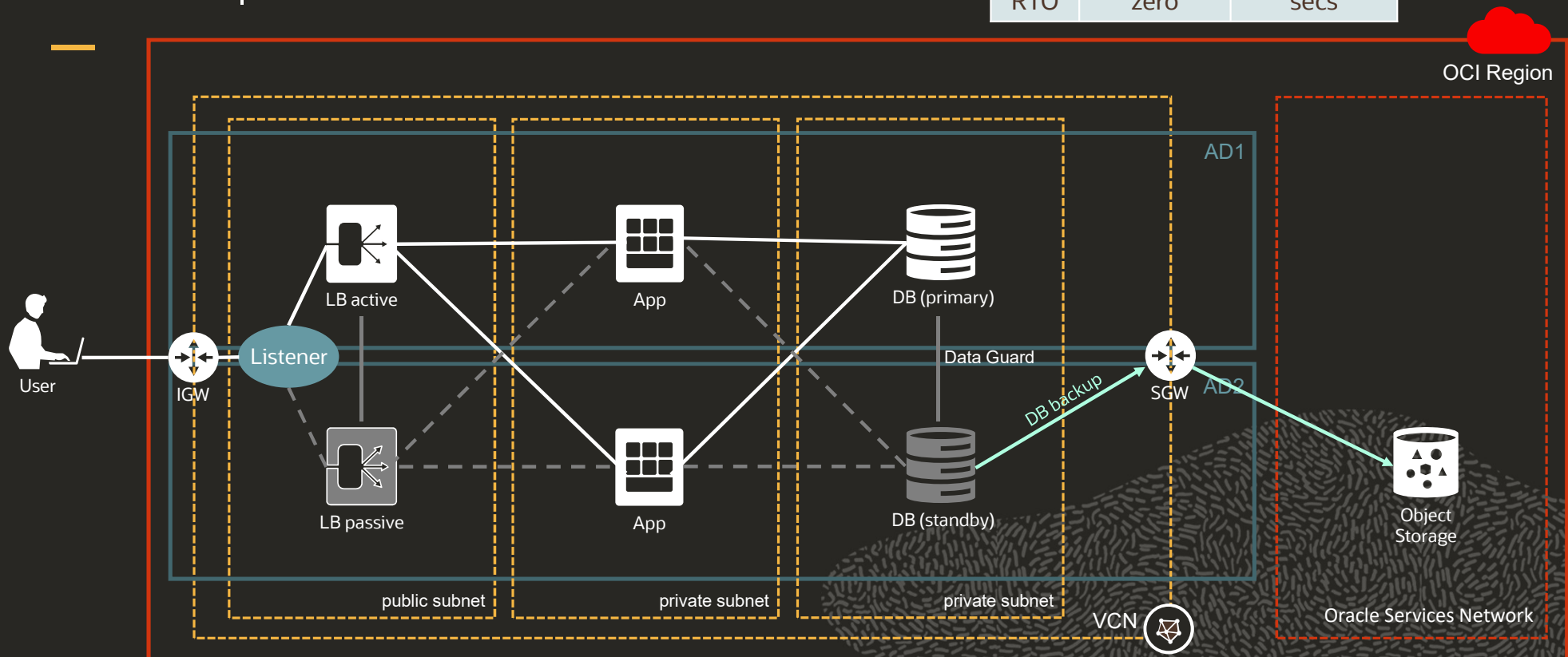
## Database | RAC

	App	DB (server)	DB (AD)
HA	yes	yes	no
RPO	zero	zero	mins
RTO	zero	zero	mins/hrs



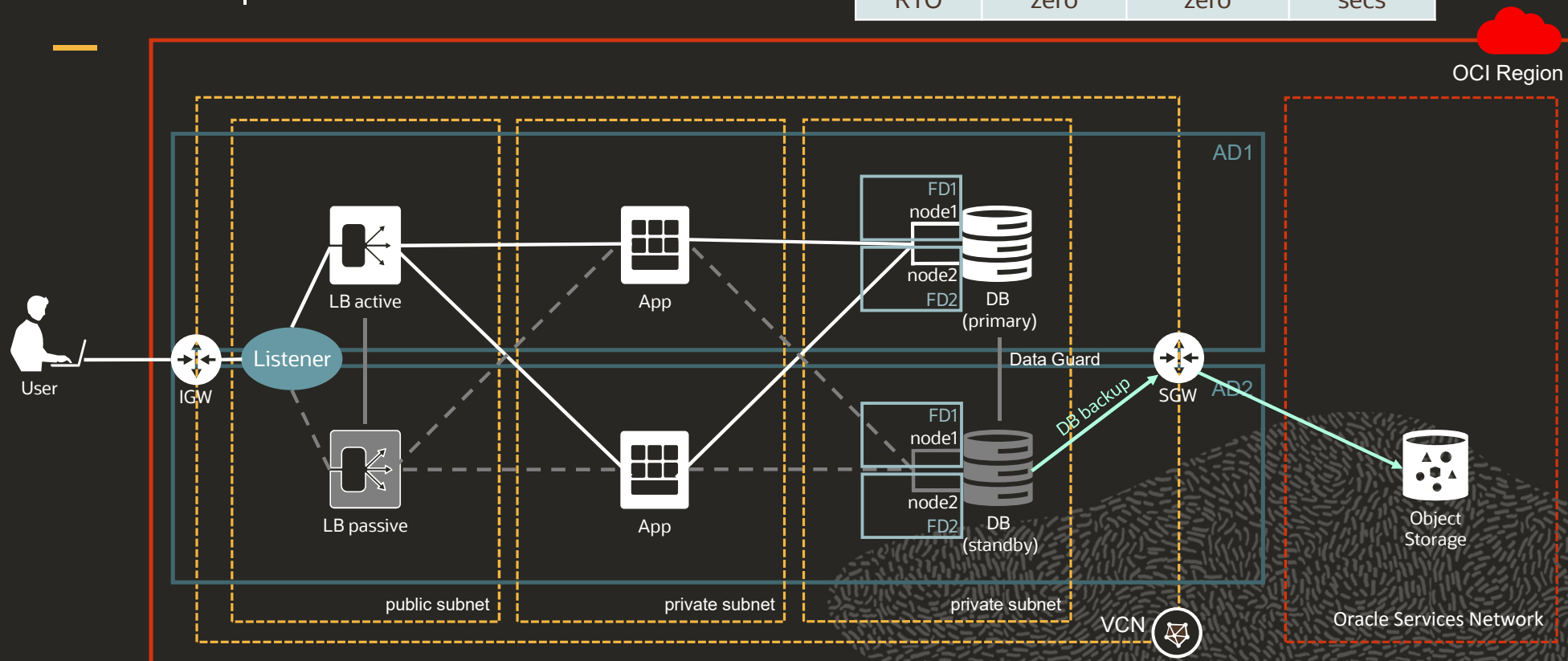
## Database | Data Guard

	App	DB
HA	yes	yes
RPO	zero	zero
RTO	zero	secs



# Database | RAC & Data Guard

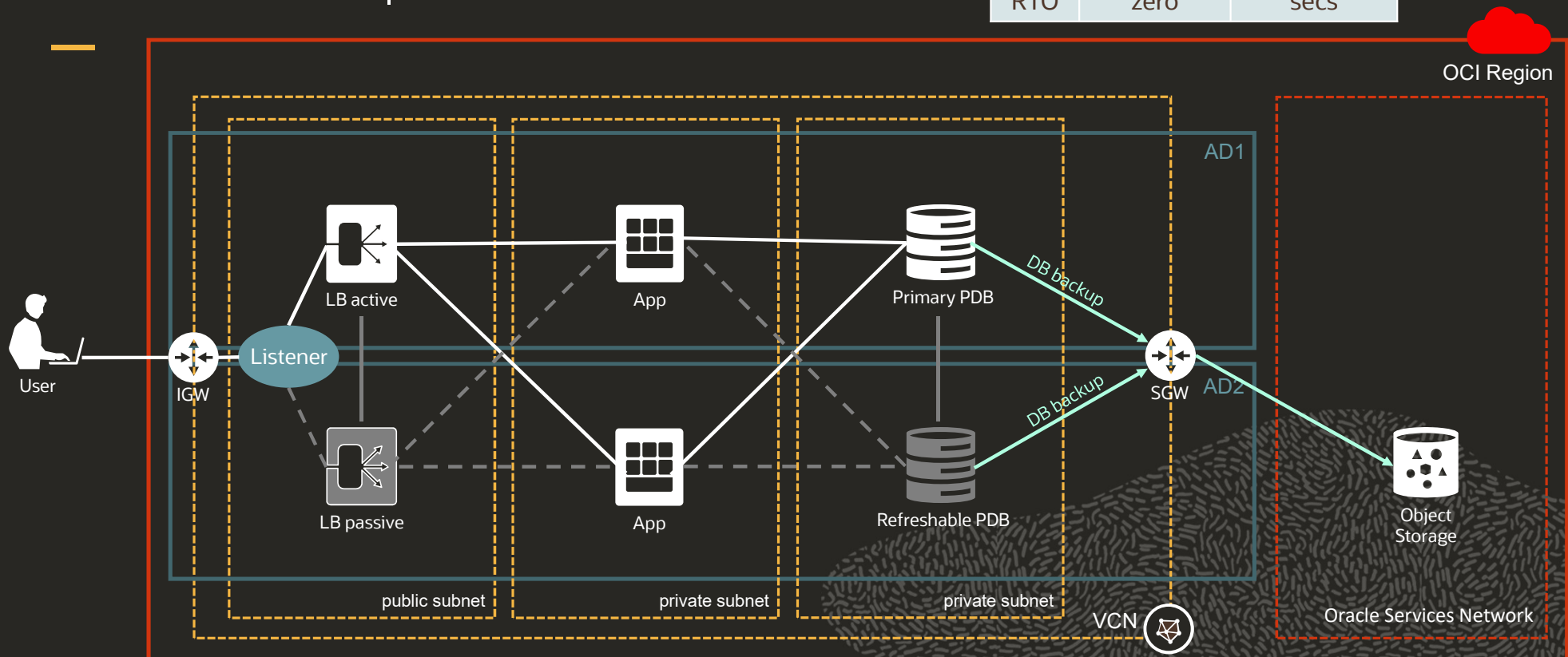
	App	DB (server)	DB (AD)
HA	yes	yes	yes
RPO	zero	zero	zero
RTO	zero	zero	secs





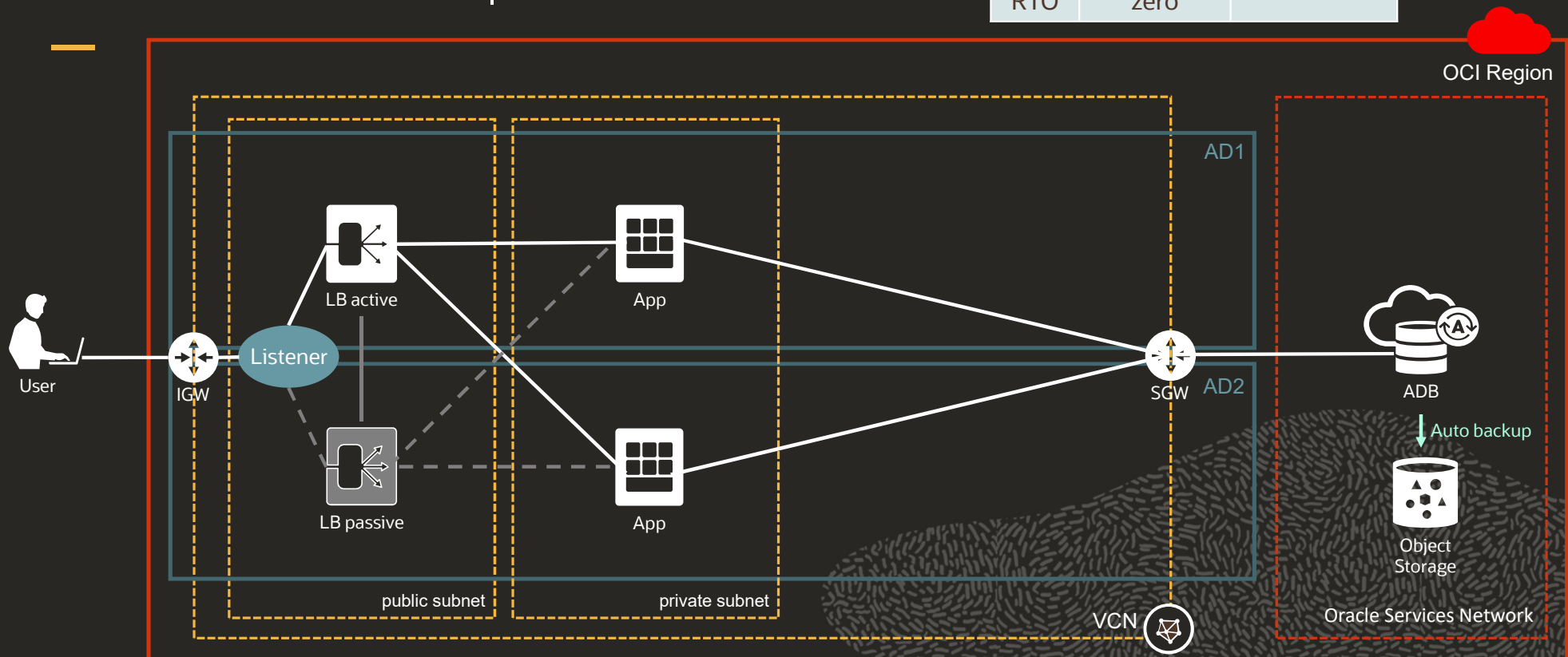
## Standard Edition | Refreshable PDB Switchover

	App	DB
HA	yes	yes
RPO	zero	1 min
RTO	zero	secs



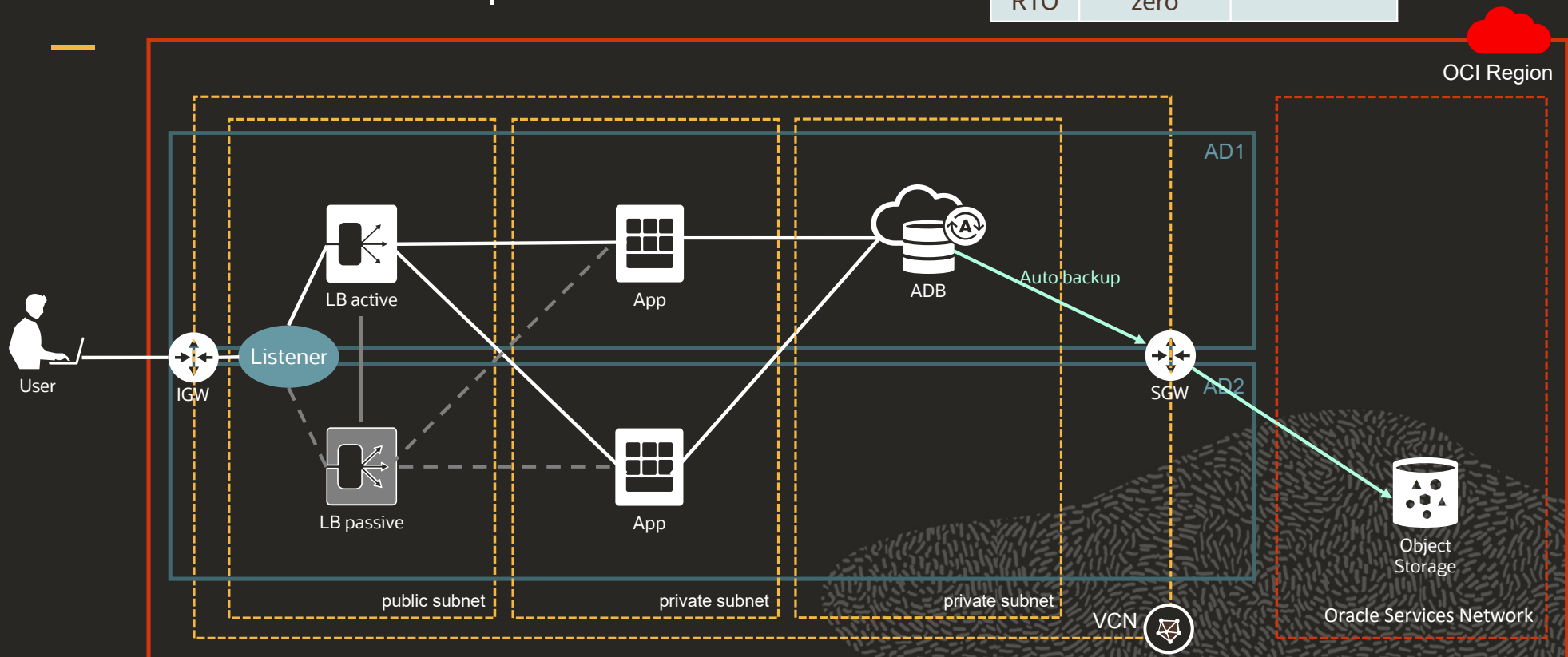
# Autonomous Database | Shared Infrastructure

	App	DB
HA	yes	<b>99.95% SLA</b>
RPO	zero	
RTO	zero	



# Autonomous Database | **Dedicated** Infrastructure

	App	DB
HA	yes	<b>99.95% SLA</b>
RPO	zero	
RTO	zero	



## Agenda

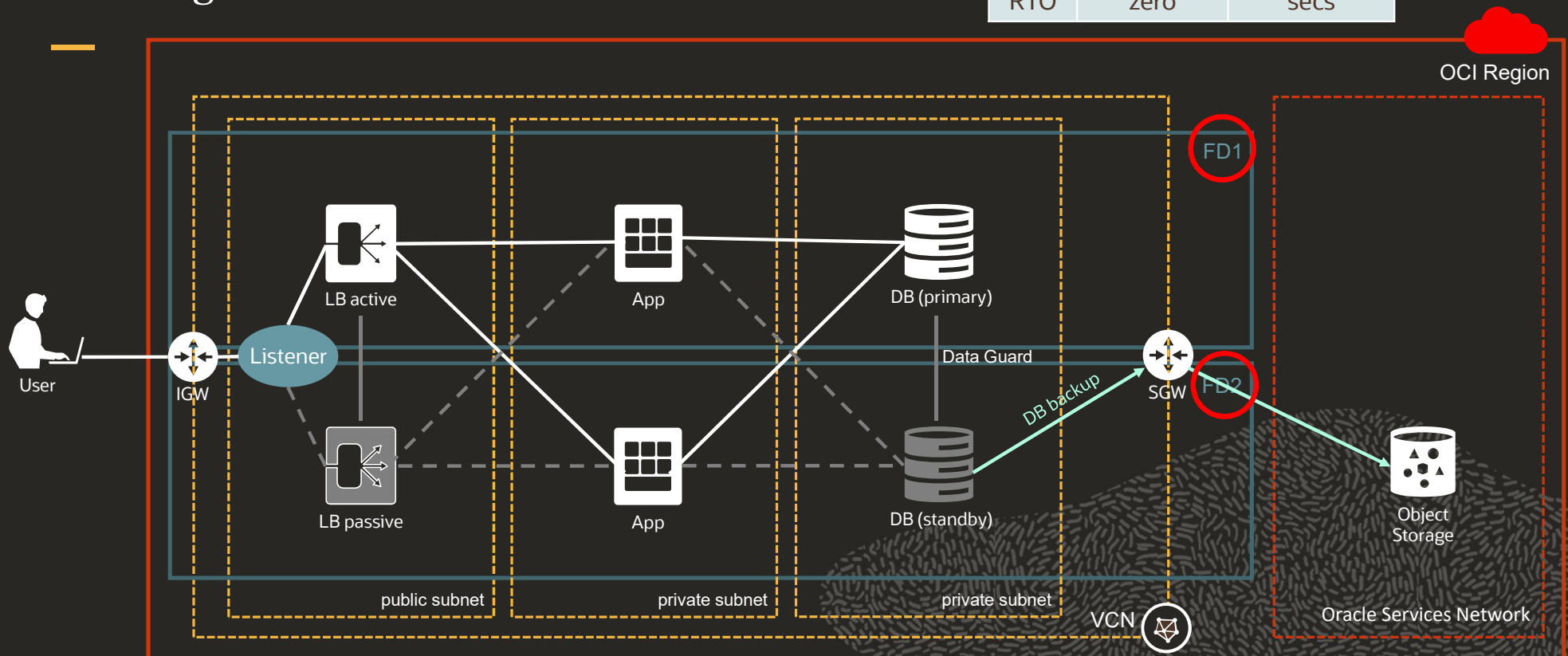
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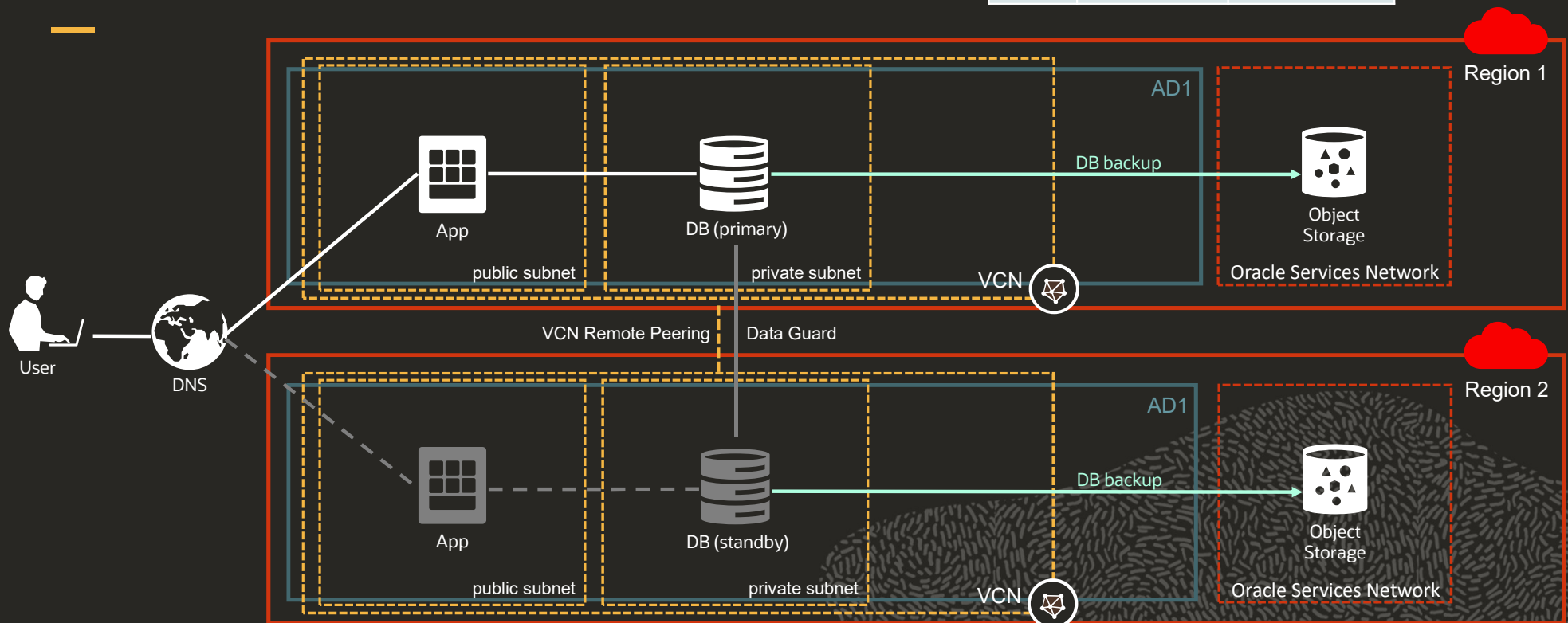
## 1-AD region

	App	DB
HA	yes	yes
RPO	zero	zero
RTO	zero	secs



# Cross-region Disaster Recovery

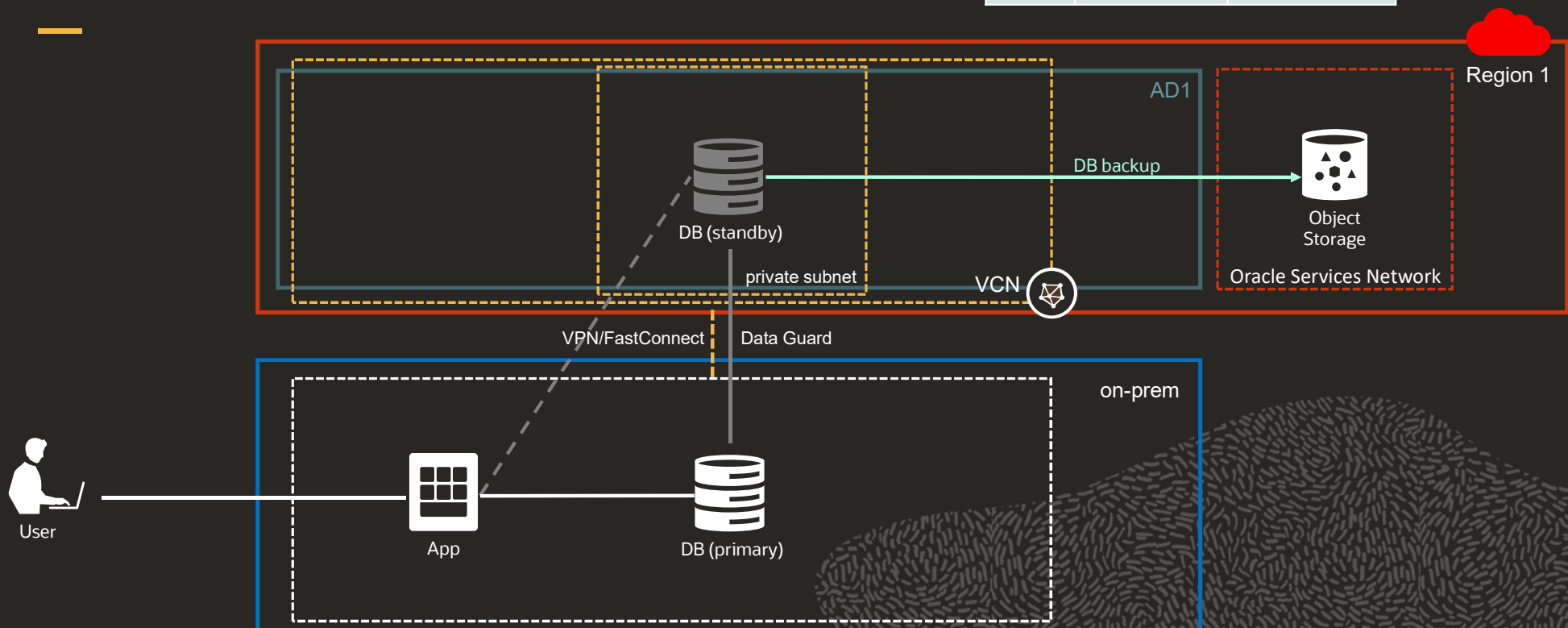
	App	DB
HA	yes	yes
RPO	zero	zero/secs
RTO	secs	secs





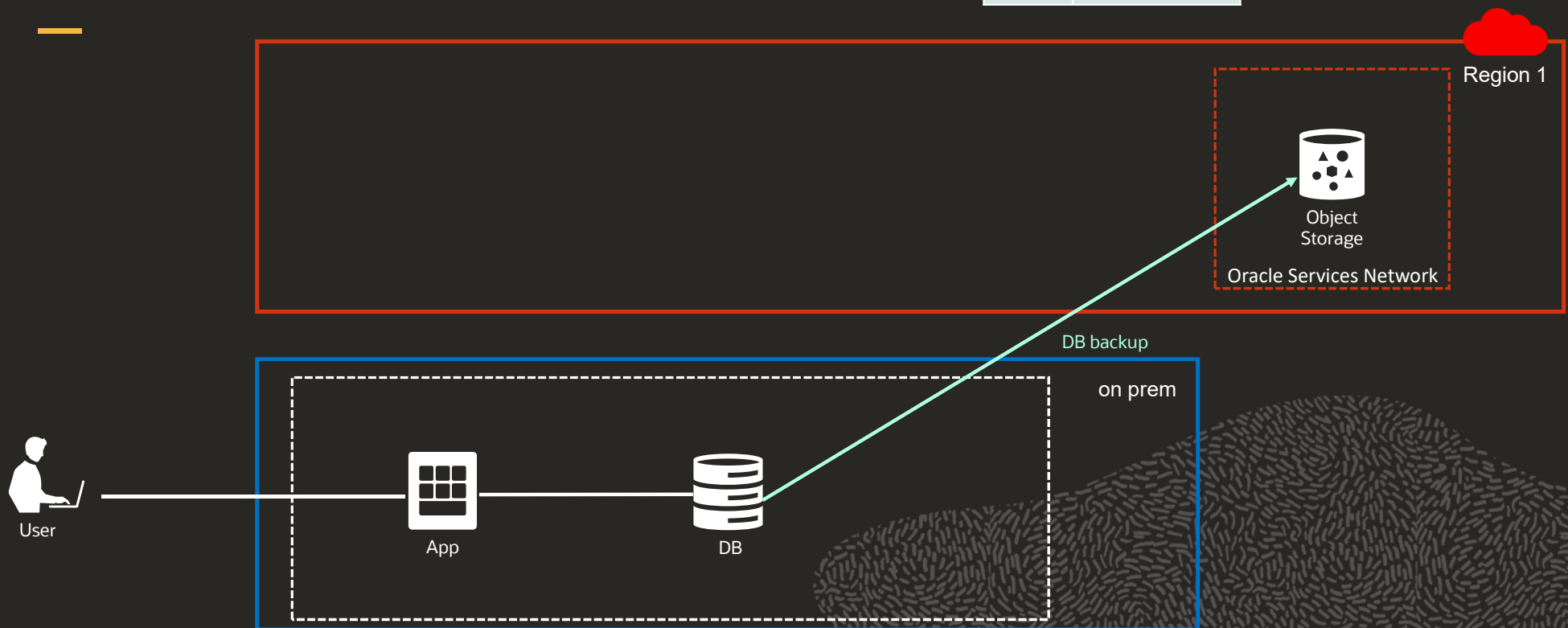
# Hybrid Cloud | Data Guard

	App	DB
HA	yes	yes
RPO	zero	zero/secs
RTO	secs	secs



# Hybrid Cloud | Backup

	DB
HA	no
RPO	mins
RTO	mins/hrs



## Further Reading

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Best Practices for Deploying High Availability Architecture on OCI

<https://docs.cloud.oracle.com/en-us/iaas/Content/Resources/Assets/whitepapers/best-practices-deploying-ha-architecture-oci.pdf>

Building Highly Available Applications in a Region with One Availability Domain

<https://docs.cloud.oracle.com/en-us/iaas/Content/Resources/Assets/whitepapers/building-ha-apps-in-one-availability-domain.pdf>

Oracle MAA Blueprints for OCI Deployments

<https://www.oracle.com/technetwork/database/availability/oci-maa-reference-architectures-5228897.pdf>

Learn About High Availability in Oracle Cloud

<https://docs.oracle.com/en/solutions/design-ha>

Learn About Disaster Recovery in Oracle Cloud

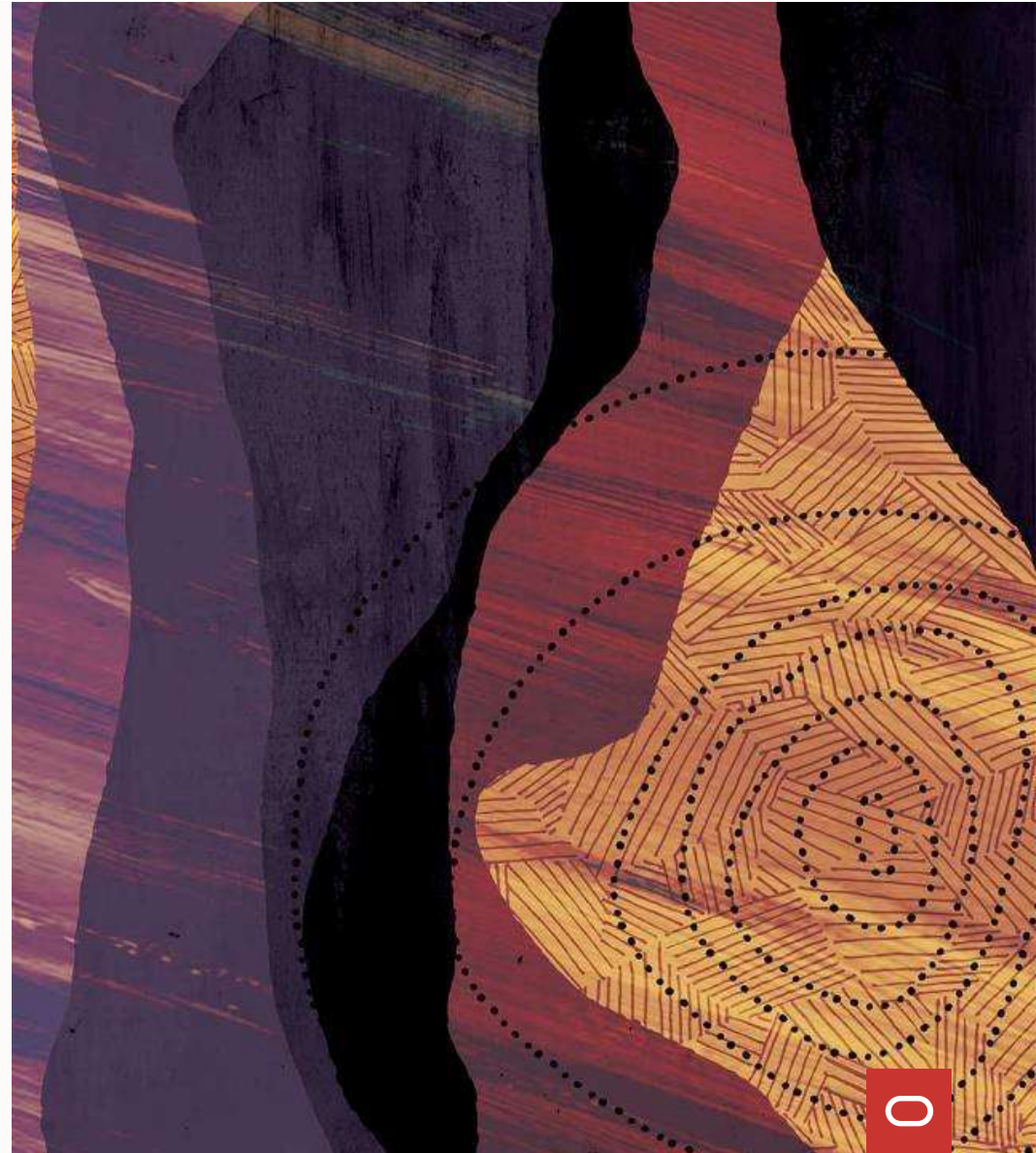
<https://docs.oracle.com/en/solutions/design-dr/learn-dr-building-blocks-oracle-cloud.html>

Refreshable PDB Switchover in Standard Edition Cloud Service

<https://www.linkedin.com/pulse/refreshable-pdb-switchover-standard-edition-cloud-sinan-petrus-toma/>

# Thank you

**Sinan Petrus Toma**



ORACLE





Our mission is to help people see  
data in new ways, discover insights,  
unlock endless possibilities.

