

OCI Database with PostgreSQL

Latest addition to OCI portfolio



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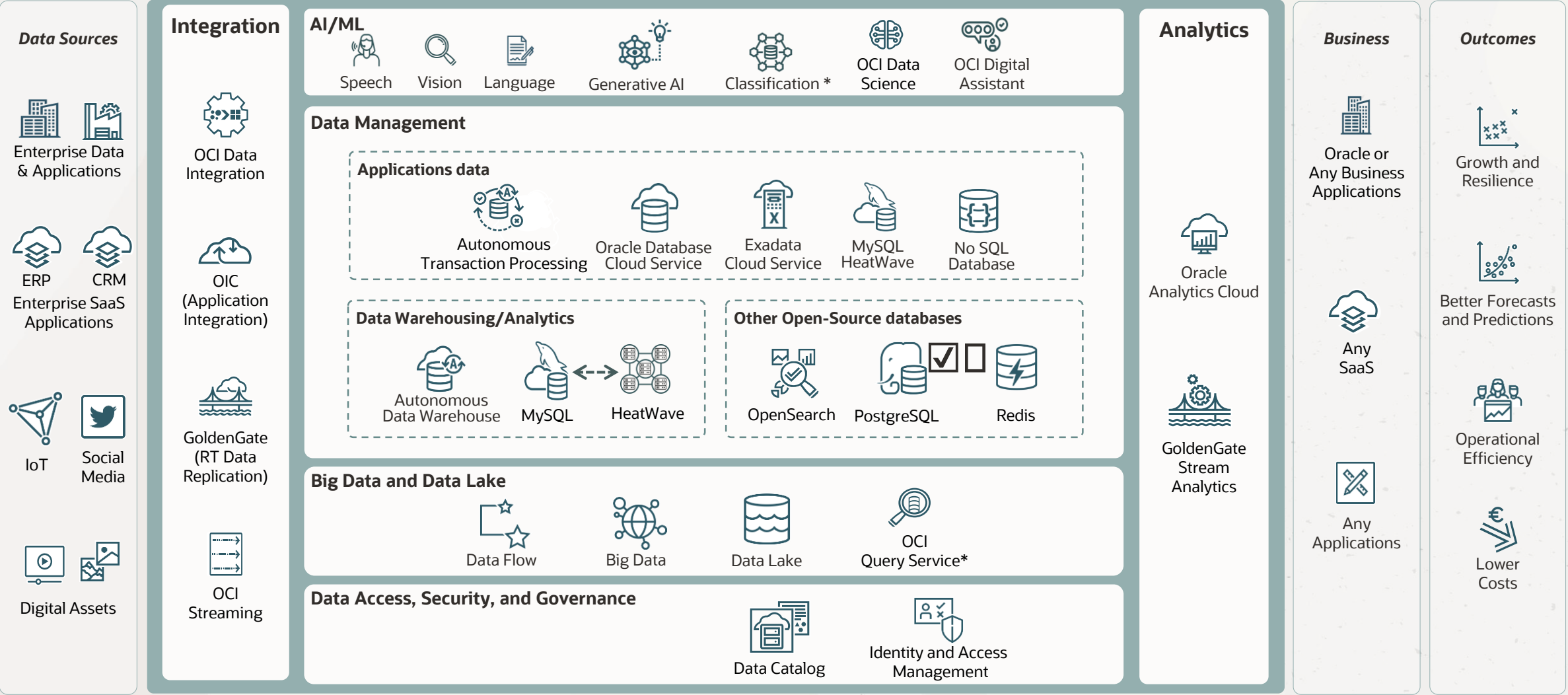
Cloud Architect, Oracle Latin America

Why is Oracle investing in PostgreSQL



Oracle Data Platform: A complete suite of services


Oracle Data Platform





OCI is committed to offer the widest choice to our customers


PostgreSQL is the latest addition to existing open source compatible and/or managed services on OCI


Native integrations with the dev tools you're used to



kubernetes
MANAGED CONTAINERS



docker
CONTAINERS



Terraform
INFRASTRUCTURE AS CODE



AUTONOMOUS LINUX



jupyter
DATA SCIENCE



GitHub
DEV-OPS



AUTOMATION



Terraform
INFRASTRUCTURE AS CODE



MySQL
DATABASE



hadoop
BIG DATA



Spark
ANALYTICS ENGINE



redis
CACHING



PyTorch
MACHINE LEARNING FRAMEWORK



ANSIBLE
DEV-SEC-OPS



ANSIBLE
AUTOMATION



ATLASSIAN
TEAM COLLABORATION



fluentd
DATA COLLECTION



cloudevents
EVENT DELIVERY



kafka
STREAMING



**OpenJDK
GraalVM**
PROGRAMMING LANGUAGE



kubernetes
CONTAINER MANAGEMENT



HELM
PACKAGE MANAGEMENT


RISK MANAGEMENT


fn
FUNCTIONS


OpenSearch
SEARCH


**OPEN API
INITIATIVE**
API GATEWAY


HYPERLEDGER
BLOCKCHAIN



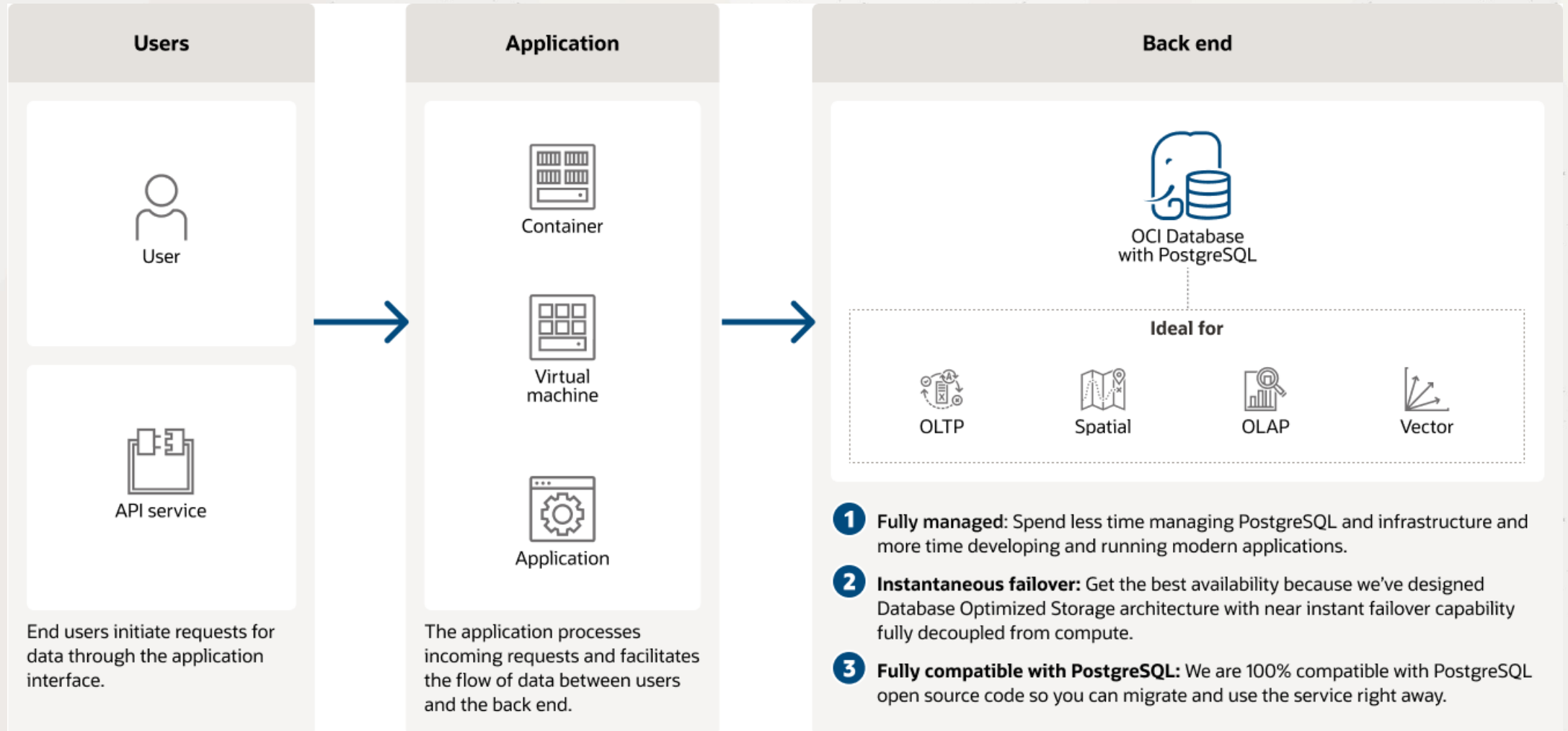
PostgreSQL - one of the most advanced open source databases

DB Engines ranking:

Rank			DBMS	Database Model	Score		
Nov 2023	Oct 2023	Nov 2022			Nov 2023	Oct 2023	Nov 2022
1.	1.	1.	Oracle +	Relational, Multi-model ⓘ	1277.03	+15.61	+35.34
2.	2.	2.	MySQL +	Relational, Multi-model ⓘ	1115.24	-18.07	-90.30
3.	3.	3.	Microsoft SQL Server +	Relational, Multi-model ⓘ	911.42	+14.54	-1.09
4.	4.	4.	PostgreSQL +	Relational, Multi-model ⓘ	636.86	-1.96	+13.70
5.	5.	5.	MongoDB +	Document, Multi-model ⓘ	428.55	-2.87	-49.35
6.	6.	6.	Redis +	Key-value, Multi-model ⓘ	160.02	-2.95	-22.03
7.	7.	7.	Elasticsearch	Search engine, Multi-model ⓘ	139.62	+2.48	-10.70
8.	8.	8.	IBM Db2	Relational, Multi-model ⓘ	136.00	+1.13	-13.56
9.	9.	↑ 10.	SQLite +	Relational	124.58	-0.56	-10.05
10.	10.	↓ 9.	Microsoft Access	Relational	124.49	+0.18	-10.53

OCI Database with PostgreSQL

A fully managed service



OCI Database with PostgreSQL

A fully managed service

60%

Less costly than Amazon Aurora with PostgreSQL¹

3X

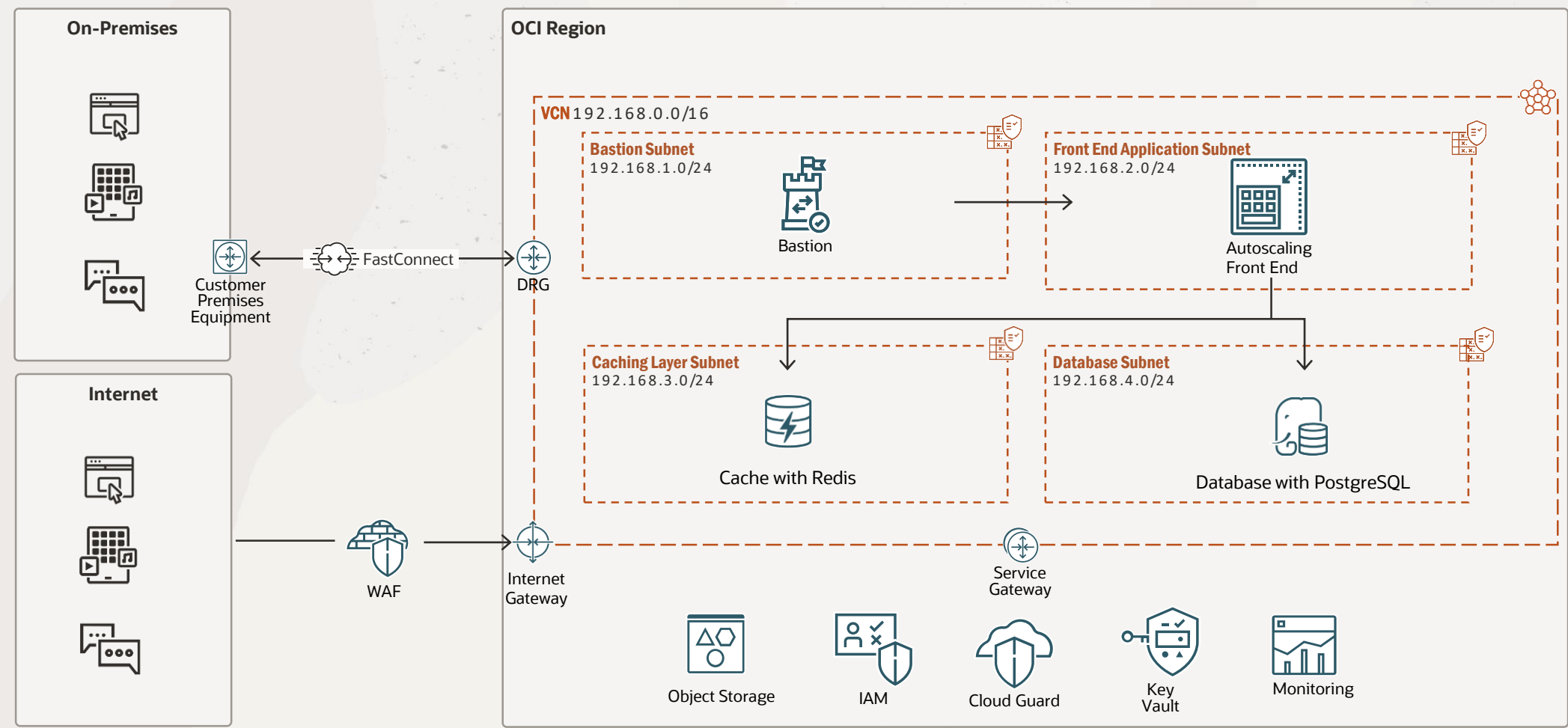
Faster than a self-managed cluster²

99.99%

Availability SLA

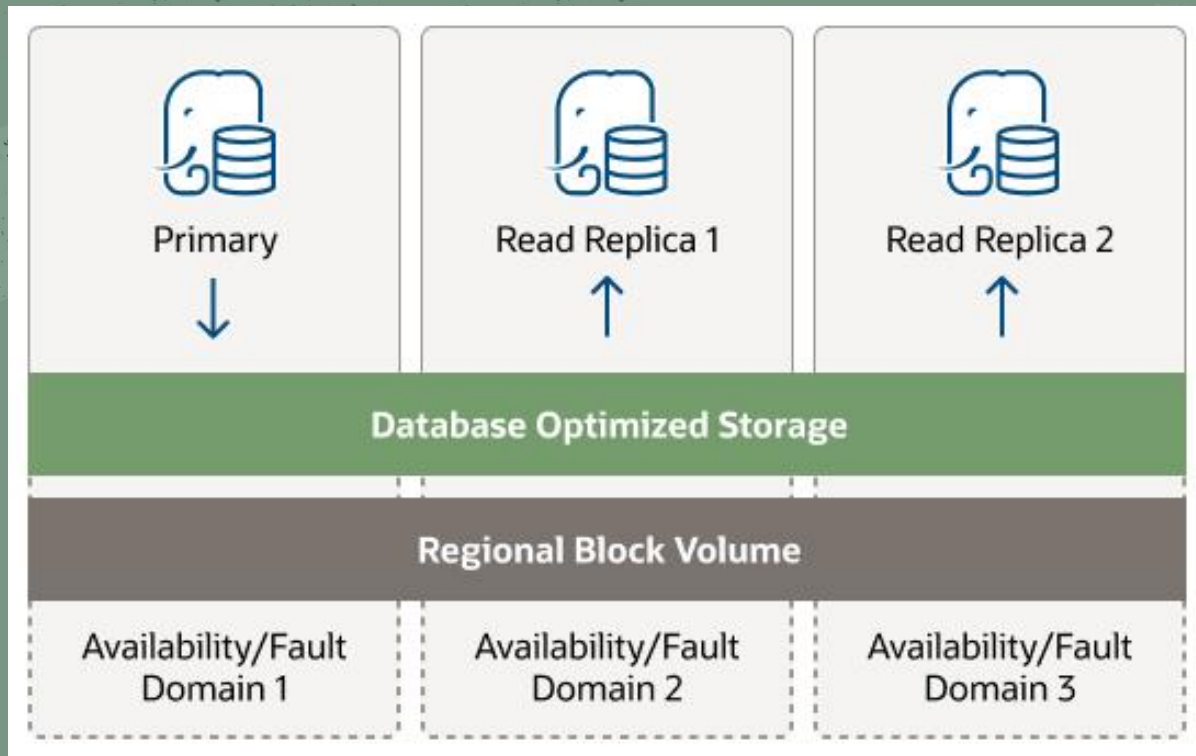
OCI Database with PostgreSQL

Reference Architecture



OCI Database Optimized Storage

An Oracle Innovation



- Dynamic scaling with usage
- Pay only for what you use (scaling is zero downtime)
- Distributed across multiple Availability Domains for 0 RPO and fast recovery

Features available now

Features	Availability
Operations	
Fully managed	✓
Storage Dynamic scaling	✓
Backups - manual and automatic	✓
Managed maintenance and patching	✓
Monitoring and metrics	✓
Notifications and alarms	✓
Terraform support	✓
Automatic minor upgrades	✓
HA / DR	
Multi availability-domain data replication	✓
RTO	< 2 min (multi node) < 20 min (single node)
RPO	0
Automatic/Manual failover	✓
Security	
End-to-end encryption	✓
Automatic security patching	✓
Development	
Version Support - Postgres 14	✓
Stored procedure languages	✓
Extensions – btree_gin; btree_gist; citext; cube; dict_int; fuzzystmatch; hstore; intarray; isn; lo; ltree; pg_trgm; pgcrypto; plpgsql; pg_stat_statements; seg; tablefunc; tcn; tsm_system_rows; tsm_system_time; unaccent	✓
Limits: 32 TB storage, 1024 cores, 16 TiB RAM	✓

Over 20 Extension Supported and more on their way

See: docs.oracle.com/iaas/Content/postgresql/

- btree_gin
- btree_gist
- citext
- cube
- dict_int
- fuzzystmatch
- hstore
- intarray
- isn
- lo
- ltree
- pg_trgm
- pgcrypto
- plpgsql
- pg_stat_statements
- seg
- tablefunc
- tcn
- tsm_system_rows
- tsm_system_time
- unaccent



Among the best price/performance ratio on the market

See: oracle.com/cloud/postgresql/pricing/

Database with PostgreSQL

USD - US Dollar

Estimated Monthly Cost **\$219.97**

Database with PostgreSQL

UTILIZATION [Edit](#)

ESTIMATED MONTHLY COST

744 hrs/month

\$146.54

Nodes Per Cluster

Database Optimized Storage Across All...

1

10

Oracle Cloud Infrastructure Database with PostgreSQL is a fully managed service that uses the PostgreSQL database with a database-optimized storage layer. The service automates the complex and routine tasks associated with deploying and managing a distributed environment so you can focus on building great applications. We offer easy cluster creation, automated HA, patching, security updates, and automatic storage scaling.

Compute - PostgreSQL

UTILIZATION

ESTIMATED MONTHLY COST

1 instance

\$72.91

SHAPE

Processor

Shape

OCPU

CPU Memory [GB]

AMD

PostgreSQL.VM.Standard

2

32

Storage - PostgreSQL

ESTIMATED MONTHLY COST

\$0.51

Storage Performance Tier

VPU

75,000 IOPS

30

[Open in Cost Estimator](#)



Features in the roadmap

Category	Features
Versions	v13, v15, v12, v16
Operation	Autonomous configuration Custom IP endpoints
HA / DR	Point-in-time recovery Cross-region replication
Extensions	PotgresGIS TimescaleDB Other extensions: uuid-osp, dblink, file_fdw_program, pg_buffercache, pg_partman, pg_trgm, pgcrypto, pglogical, Plpgsql, pg_catalog, plpython2u, postgres_fdw, pgvector
Security	BYOK
Migration	Manual/Migration service
Dev	Connection Pooling



Demo

OCI Database with PostgreSQL



Fully
managed



Unique
price/perf ratio



Versatile and
Extensible
database



Easy-to-Use
service

Meets you where you are

Thank You!



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Cloud Architect, Oracle Latin America

Appendix



Walk through the improved design

Confidence in the technology

ORACLE CLOUD
Infrastructure

FIRST PRINCIPLES

Optimizing PostgreSQL for the cloud



First Principles Architectural Breakdown

- **Gain Peace of Mind:**
Walk through Oracle Database with PostgreSQL's design piece-by-piece with the First Principles Series
- **Straight from the Architects:**
In-depth specs from the designers about the Optimized Database Storage that offloads replication functions for zero RPO and minimal cluster management

[Read the Blog](#)



User Experience - PostgreSQL clusters list view

ORACLE Cloud

Search resources, services, documentation, and Marketplace

US West (Phoenix) ▾

PostgreSQL

Overview

Databases

Backups

Configurations

Additional resources ⓘ

Work requests

List scope

Compartment

George-test-compartment ▾

opmdemo (root)/Demo-compartment/JimB_Lab/George-test-compartment

Databases in George-test-compartment *Compartment*

Create PostgreSQL database

Search by name

Name	State	Database system	OCPUs	RAM (GB)	Software version	Created ▾
postgresql20230901100050	● ACTIVE	Multi node	4	64	14.5	Fri, Sep 1, 2023, 17:06:53 UTC ⋮
postgresql20230818173824-test	● ACTIVE	Multi node	4	64	14.5	Sat, Aug 19, 2023, 00:42:38 UTC ⋮

Showing 2 items < 1 of 1 >

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User Experience - Create multi-node PostgreSQL cluster

ORACLE Cloud

Search resources, services, documentation, and Marketplace

US West (Phoenix)

Create PostgreSQL database

1 Select creation type

2 Configure database

3 Review and create

Configure database

Database configuration

Database name in george-test-compartment [\(Change compartment\)](#)

postgresq20231105080048

Description: Optional

User-provided data about the DB system

PostgreSQL version

14.x

Database system

Node count ⓘ

5

One primary node is required. Additional nodes will be reserved as standby/replica nodes.

Performance tier

300K IOPS

Data placement

Regional

Data stored durably in multiple availability domains

Availability Domain-specific

Data stored durably within the selected availability domain

Availability Domain

AD-1

dUcB:PHX-AD-1

AD-2

dUcB:PHX-AD-2

AD-3

dUcB:PHX-AD-3

Previous

Next

Cancel

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User Experience - Create multi-node PostgreSQL cluster cont.

ORACLE Cloud

Search resources, services, documentation, and Marketplace

US West (Phoenix)

Create PostgreSQL database

1 Select creation type

2 Configure database

3 Review and create

Hardware configuration

Memory scales with number of OCPU selected. Storage scales depending on usage. [Learn more](#)

OCPU count

32

Available Shapes

Name	OCPUs	RAM (GB)
<input checked="" type="checkbox"/> PostgreSQL.VM.Standard.E4.Flex.32.512GB	32	512 GB

1 selected

Showing 1 item

Network configuration

The VCN and subnet where the DB system endpoint will be attached. The DB system endpoint uses a private IP address and is not directly accessible from the internet. [How do I connect to a DB system?](#) If you do not have a VCN, [create a VCN](#).

The current region has a single availability domain, creating a highly available DB system will spread all PostgreSQL instances across all fault domains in the region, irrespective of whether an AD-specific or regional subnet are selected.

Virtual Cloud Network in **george-test-compartment** [\(Change compartment\)](#)

G-Test-VCN

Subnet in **george-test-compartment** [\(Change compartment\)](#)

private subnet-G-Test-VCN (Regional)

Private IP address *Optional*

Database administrator credentials

Username ⓘ

Admin

Once set, this username cannot be changed.

Password options

☒ Input password ☐ Use OCI Vault

Previous

Next

Cancel

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


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User Experience - Detailed view with Read replica

ORACLE Cloud

Search resources, services, documentation, and Marketplace

US West (Phoenix)     

PostgreSQL > Databases > Database details



ACTIVE

postgresql20230901100050

Edit name

Create backup

Move resource

Restore

More actions

DB system information

Management policy

Tags

General information

Compartment: [George-test-compartment](#)

OCID: [...godmm5d7oa](#) [Show](#) [Copy](#)

PostgreSQL version: 14.5

Performance tier:

DB system type: Multi node

Status: ● ACTIVE

Availability Domain: dUcB:PHX-AD-1

Shape: VM.Standard.E4.Flex

OCPU count: 4

RAM(GB): 64

Configuration: [PostgreSQL_VM.Standard.E4.Flex.4.64GB-14.5-0_10](#) [Edit](#)

Created: Fri, Sep 1, 2023, 17:06:53 UTC

Last updated: Fri, Sep 1, 2023, 17:14:52 UTC

Network configuration

Virtual Cloud Network: [G-Test-VCN](#)

Subnet: [private-subnet-G-Test-VCN](#)

Connection details

Endpoint: 10.0.1.171

FQDN: [7mp4fjcin7ac8x52xvvgodmm5d7oa-primary.postgresql.us-phoenix-1.oc1.oraclecloud.com](#)

CA certificate: [Copy](#) [Download](#)

Resources

Database nodes

Add node

Name	State	Type	Availability Domain	Updated	Created
dbinstance-e5e8614922a0	● ACTIVE	Primary	dUcB:PHX-AD-1	Fri, Sep 1, 2023, 17:14:52 UTC	Fri, Sep 1, 2023, 17:06:53 UTC
dbinstance-0a355b8b7d89	● ACTIVE	Replica	dUcB:PHX-AD-1	Fri, Sep 1, 2023, 17:14:52 UTC	Fri, Sep 1, 2023, 17:06:53 UTC

Showing 2 items < 1 of 1 >

Database nodes

Backups

Metrics

Work requests

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