SAOUG 2026 · CAPE TOWN

ORACLE TECHNOLOGY & APPLICATIONS USER GROUP

Oracle AI Database Operator for Kubernetes



What's new in v2.1 and v2.2, and how it brings DBAs, developers and platform teams together

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Ubuntu: moving forward together

Ubuntu, in Kubernetes terms

Umuntu ngumuntu ngabantu

“A person is a person through other people.”

Databases on Kubernetes work the same way: DBAs, developers and platform teams succeed when they share one way of describing and running the database.



DBAs

HA, backup and patching know-how



Developers

Ask for a database in a YAML file



Platform / DevOps

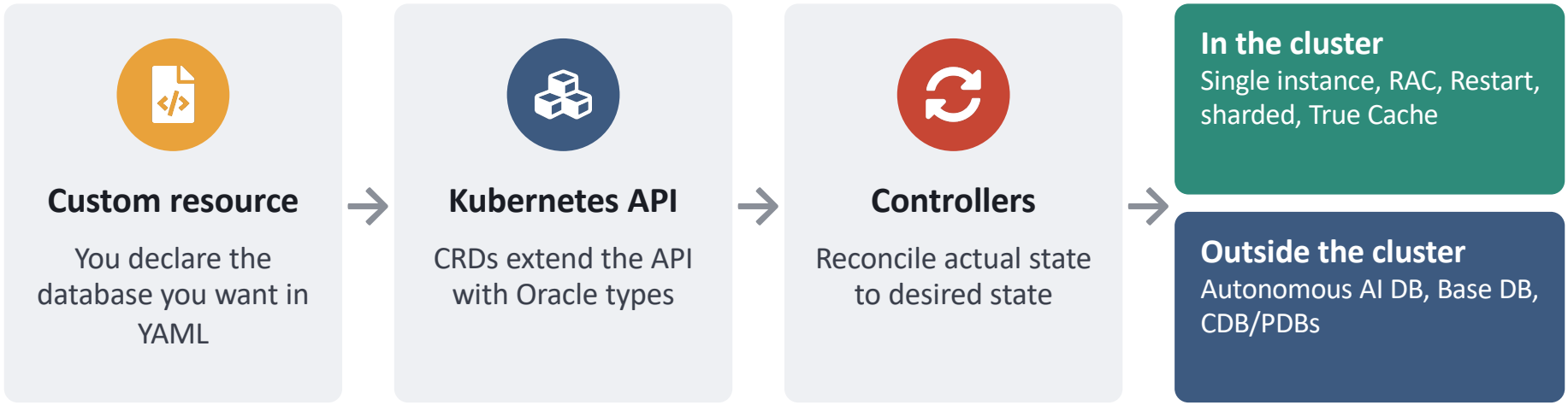
Run it all with GitOps and kubectl

→ **One declarative operating model**

Today’s journey

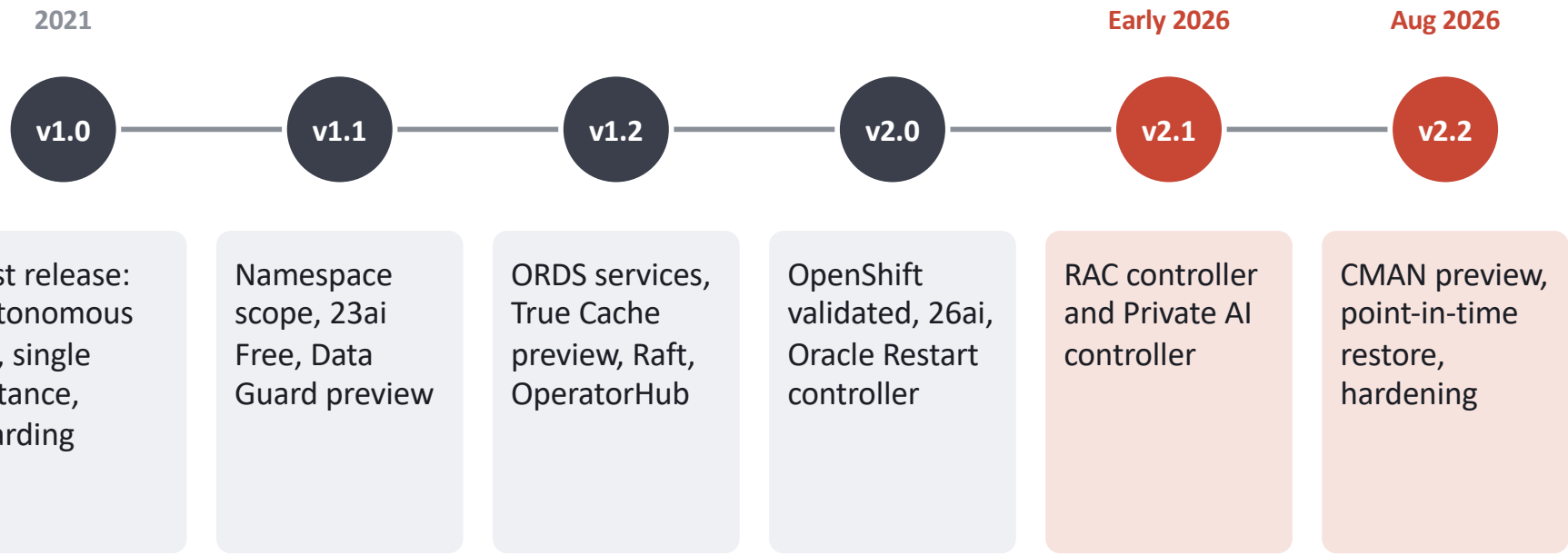
1. What OraOperator is and how it works
2. Where it came from: v1.0 to v2.2
3. What’s new in v2.1: RAC and Private AI
4. What’s new in v2.2: lifecycle, networking, security
5. 30 mins hands-on lab: Single instance DB - SIDB on Minikube

How OraOperator works



The reconcile loop: observe → compare with the spec → act → report status. Change the YAML and the operator does the work, no tickets or manual runbooks.

From v1.0 to v2.2



One operator, many database shapes

Autonomous AI DB
Serverless and dedicated

Single instance
Incl. 26ai Free

RAC
Containers, on-prem

Oracle Restart
GI + ASM storage

Distributed DB
Sharding and Raft

Multitenant
CDB / PDB lifecycle

Data Guard
Broker and FSFO

True Cache
In-memory read cache

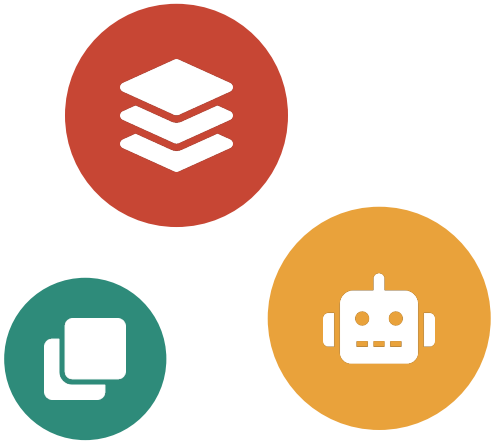
ORDS services
REST and APEX

Observability
Metrics and logs

Private AI
AI Services containers

Conn. Manager
CMAN · preview

RAC and Private AI join the family



v2.1 highlights

RAC database controller

Provision RAC, scale instances up or down, add ASM disks, run maintenance

Private AI controller

Full lifecycle of Oracle Private AI Services containers, with dynamic scaling

LREST: PDB lifecycle

Wallet-backed secrets, finer tracing, better auto-discovery, online password reset

ORDS Services

Native K8s Secrets, TNS admin secret, central config, shared mTLS zip wallets



v2.2

Production release · August 2026

v2.2 at a glance

Lifecycle and reconciliation	Autonomous AI DB, dedicated infra, backup, restore, multitenant
Broader topology automation	Single instance, RAC, Restart, Distributed DB, Data Guard Broker
Connection Manager (preview)	CMAN endpoints and generated routing rules
Security and observability	HTTPS metrics, hardened context, RBAC, network policies
Runs where you run	OKE, OpenShift, OLCNE, GKE, AKS, EKS, Minikube

Autonomous AI Database, end to end





Keep Kubernetes and OCI in step

New reconciliation and validation keep the cluster’s view and the cloud’s view aligned.



Point-in-time restore

With OCI work-request integration



Validated backup targets

Owner references on backup and restore



Wallet validation, rotation

Plus backup-resource sync and cleanup



Finalizer-based cleanup

Controlled, predictable deletion

More automation across topologies

Single instance	Endpoints, TCPS, True Cache, Data Guard prep, clone and restore, external PVCs
RAC and Restart	RAC and ASM storage lifecycle; phased reconciliation, static or dynamic PVs
Distributed DB	Lifecycle and scaling for sharded topologies: catalog, shards, status
True Cache	New mode for same-cluster, cross-cluster or external databases
Data Guard Broker	Wallets, FSFO observer management, tracking, idempotent switchover

Multitenant and ORDS get easier



Multitenant (LREST / LRPDB)

- Simpler internal comms, no HTTPS password needed
- Create app users in PDBs from K8s Secrets
- Reconcile PDB init parameters
- Load tnsnames.ora topology



ORDS Services

- HTTP-only edge deployments
- Access-log forwarding and persistence
- Instance API bootstrap
- Resource limits, metadata, JVM options

Private AI and Connection Manager

Private AI controller

- Phased dependency and workload reconciliation
- Rollout tracking and update-lock status
- TLS-secret lifecycle
- vLLM and GPU-based deployments

Connection Manager

PREVIEW

- New CMAN controller CRD
- CMAN endpoints and generated rules
- cman.ora file mode, endpoint status
- New network.oracle.com/v4 API

Hardened for production



Secure HTTPS metrics

Operator metrics served over TLS



Hardened security context

Tighter defaults for the manager



More RBAC and webhooks

Incl. compatibility webhooks



Network policies

Shipped with samples



DatabaseObserver

Server-Side Apply, safer ownership



Broader test coverage

Better readiness and status

Runs where you run

v2.2 has been installed and tested on:

- **OCI Kubernetes Engine (OKE)**
- **Red Hat OpenShift**
- **Oracle Linux Cloud Native Env.**
- **Google Kubernetes Engine**
- **Azure Kubernetes Service**
- **Amazon EKS**
- **Minikube**



OCI, on-premises and multi-cloud: one consistent operating model for South African hybrid estates.

Declarative in practice

```
apiVersion: database.oracle.com/v4
kind: SingleInstanceDatabase
metadata:
  name: saoug-demo
spec:
  sid: FREE
  edition: free
  adminPassword:
    secretName: db-admin-secret
  image:
    pullFrom: container-registry.oracle.com/
              database/free:latest
  persistence:
    size: 50Gi
  replicas: 1
```

1. **Install cert-manager**
   Prerequisite for the operator's webhooks
2. **Deploy the operator**
   kubectl, OperatorHub or the OKE add-on
3. **Apply your resource**
   kubectl apply -f saoug-demo.yaml
4. **Watch it reconcile**
   kubectl get singleinstancedatabase

Lab: a single instance in 30 minutes

0–5 min	**Prepare**	`kubectl get nodes` · `install cert-manager`
5–10 min	**Deploy the operator**	`kubectl apply -f oracle-database-operator.yaml`
10–15 min	**Create admin secret**	`kubectl create secret generic db-admin-secret …`
15–25 min	**Provision the database**	`kubectl apply -f saoug-demo.yaml`
25–30 min	**Connect and clean up**	`sqlplus via connect string` · `kubectl delete -f …`

UBUNTU · MOVING FORWARD TOGETHER

DBAs, devs and platform teams describe databases the same way

v2.2 hardens lifecycle, security and observability

OCI, on-premises and multi-cloud Kubernetes

Get started: github.com/oracle/oracle-database-operator · operatorhub.io · container-registry.oracle.com

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