



# DevOps & Cloud Native Services

## Your digital transformation journey on OCI

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Thiago Lemos  
Alexandre Fagundes



**SQL> select \* from person where name = 'Alexandre Fagundes'**



**MULTI\_TASK = YES** Father, Son, Husband, DBA

Graduated in Information Systems (UniSociesc - SC)  
Applications & Database Administrator  
Certified OCI Architect Professional  
Certified Microsoft Azure Administrator

**MULTI\_THREAD = YES**

“MySQL Cookbook: Solutions for Database Developers and Administrators” Paul DuBois

**PARALLEL\_READ = YES**

**SESSION\_PERSISTENCE = YES**

Oracle EBS & Database Consultancy Services since 2002

**KEEP\_ALIVE = YES**

Next-Challenge: Learn & Deploy MySQL Replication to Clickhouse

## Safe harbor statement

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# Stay Connected with the Latin America Partner Community!

Information, collaboration and training all in a single spot.

The **LAD Partner Community** is a space dedicated to our partners in Latin America, where you can find information and stay up to date on what OPN has to offer.

In the Community, you will find all the information that we communicate to our ecosystem by email.

- Explore **Categories**: organized by grouping publications on a same topic;
- Access the **Recent Discussions** tab to check the latest posts published;
- Take part in **Groups** and interact with Oracle Experts and other partners.

**Important:** An Oracle SSO account is required to access the Community and other OPN resources. If you don't have this account yet, access [\*\*this link\*\*](#) or the QR code below.

Access the Community:



Create your SSO account:



# Overview

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- 1 Introduction to Cloud Native and DevOps**
- 2 The Oracle Cloud Products and solutions**
- 3 Use Cases and Demo**
- 4 Conclusions and Next Steps**

## Cloud Native: the next wave of digital disruption

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“It’s not uncommon for companies starting out in the cloud to simply “lift and shift” existing applications ... but it won’t often unlock the full suite of benefits the cloud can provide.

**Cloud native** software is specifically designed to take full advantage of both the platform and the infrastructure capabilities of the cloud.

THE WALL STREET JOURNAL.  
CIO JOURNAL.

<https://bit.ly/wsj-cn>

# Cloud Native Journey

## A new style of architecture



### Distributed Computing

- Multi-master
- Many Data Centers
- Many Fault Domains
- Many Regions
- Global Server Load Balancing
- Replication

### Microservices

- Minimal Function
- Service Discovery
- API-first
- Polyglot
- Choreography
- Loose Coupling

### \* as a Service

- Consume Infrastructure and Software as a Service
- Fault Tolerant by Definition
- Auto-scaling
- Infinite Elasticity

### DevOps

- Automated Provisioning
- Automated Setup
- Continuous Integration
- Continuous Delivery
- Automated Testing
- Agile
- Culture Change

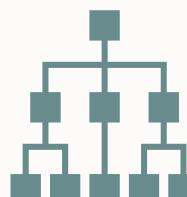
# Top Challenges For Business Leaders

## Organizational



1. Organizational push back
2. Legacy business models
3. Defining ideal business outcomes
4. Time-to-market

## Legacy



1. Monolithic architecture
2. Large existing on-premise footprint
3. Inflexible tech stack and development processes



## Expertise

1. In-house development resourcing lacks expertise
2. 3<sup>rd</sup> parties hard to work with
3. Cloud experience is lacking outside silicon valley



## Distributed services

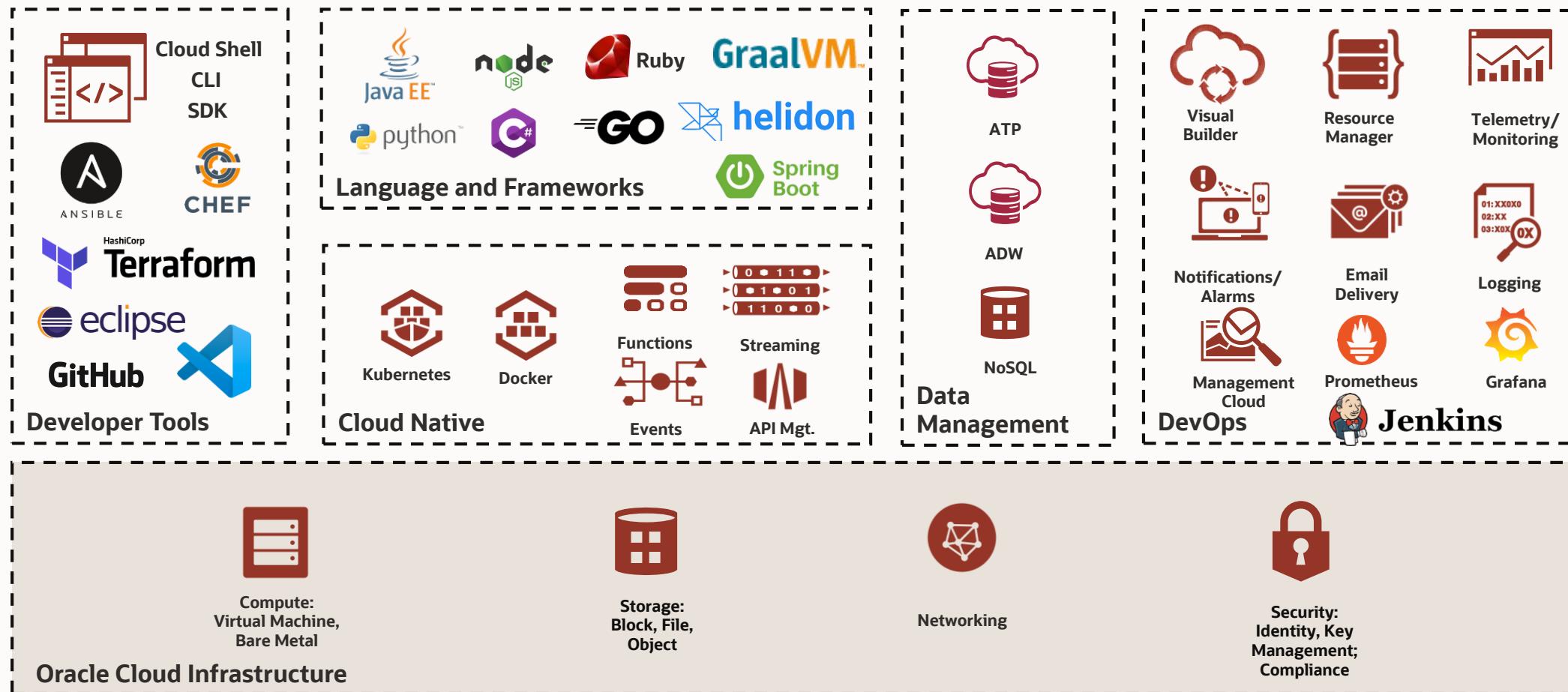
1. Solutions span many platforms and services
2. Integration is a nightmare
3. Performance is poor

# Overview

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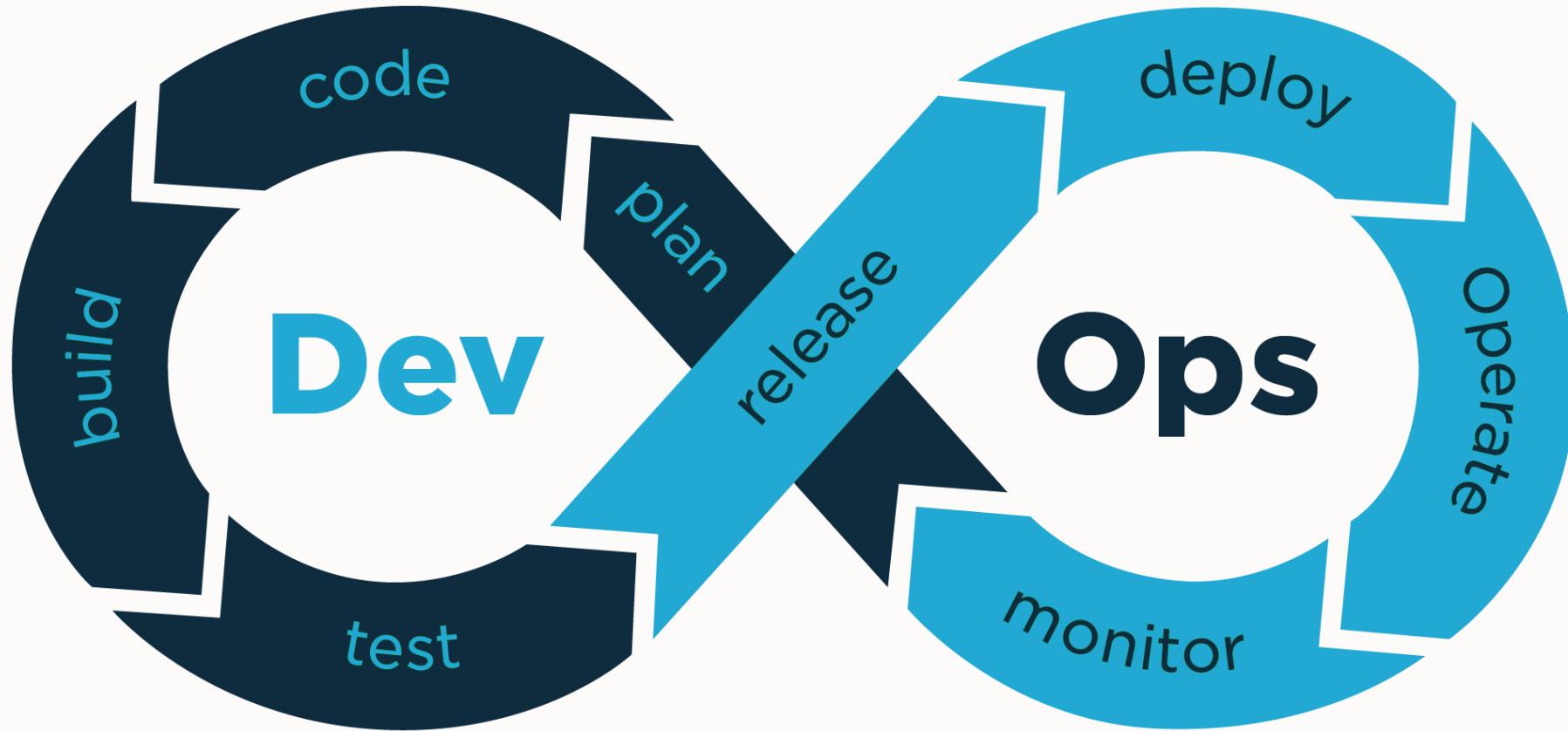
- 1 Introduction to Cloud Native and DevOps
- 2 **The Oracle Cloud Products and solutions**
- 3 Use Cases and Demo
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# Oracle for Cloud Native and DevOps



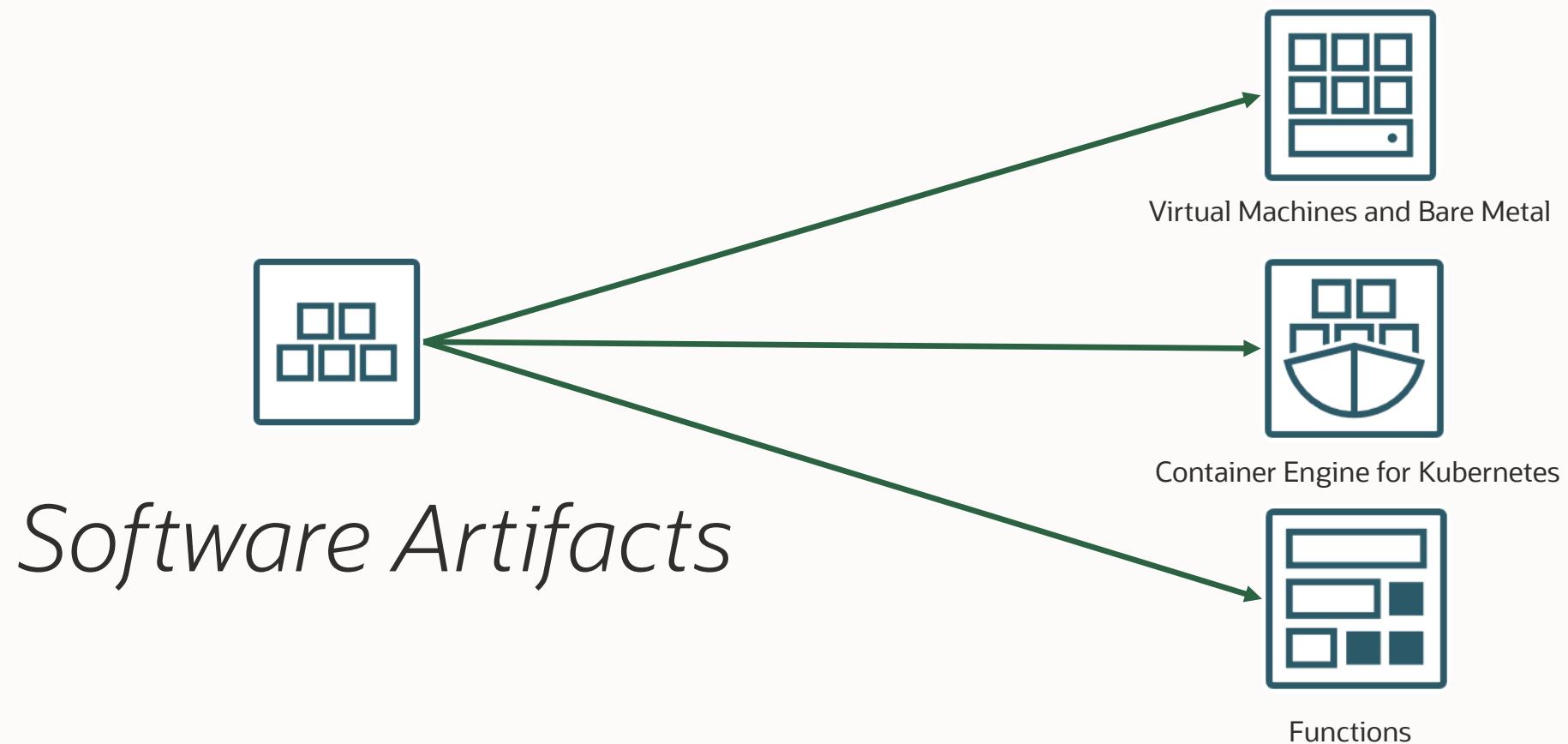
## Let's start with Dev and Ops

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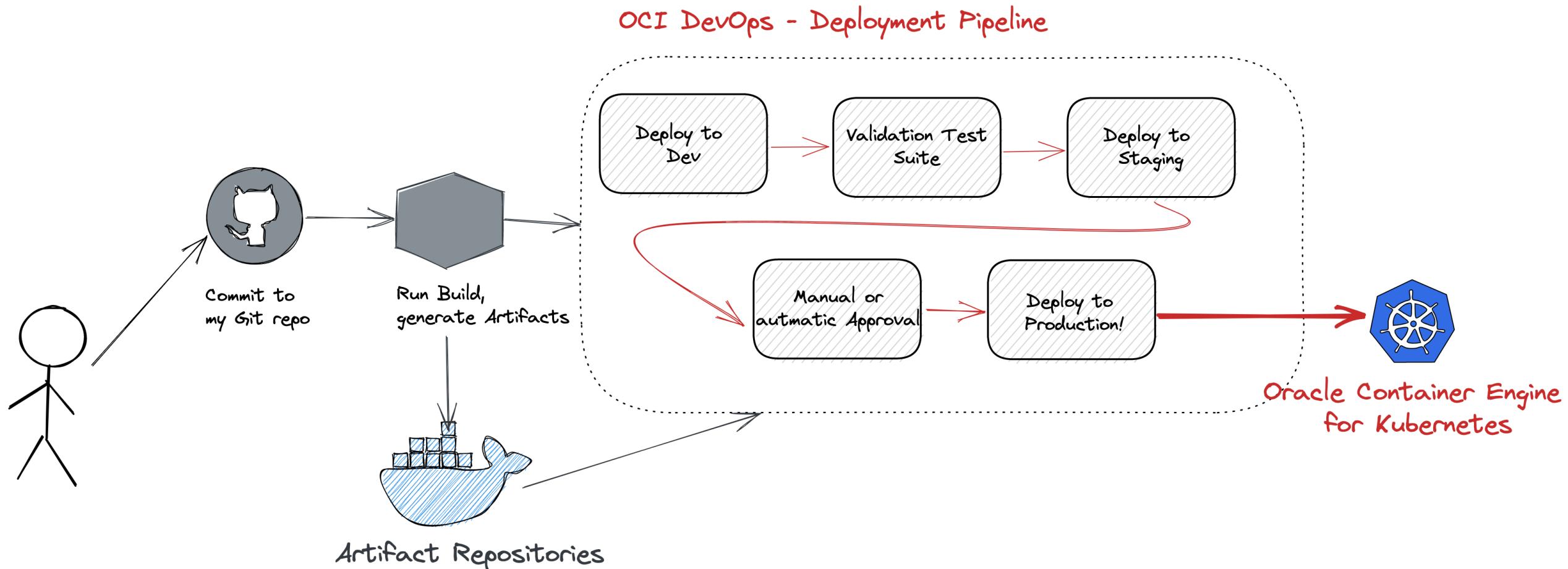


# Automate Delivery to OCI Platforms

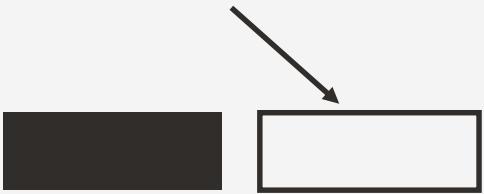
*OCI Platforms*



# Automate Delivery to OCI Platforms



# Deployment Pipelines – Capabilities



## Release Strategies

Reduce downtime, faster recovery

**Blue/Green deployments, Canary stage\*** – minimize downtime and increase confidence in your deployment

\* on our roadmap



## Integrated

Connect your CI platform

**Jenkins plugin** to run a deployment from your Jenkins job. Integrate with Gitlab, GitHub.



## Rollback

Recover from errors

**Automatic or manual** rollback of a deployment stage

# Deployment Pipelines – Benefits



**Fully managed**  
No CI/CD servers to operate

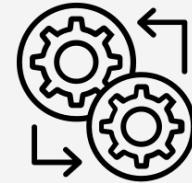
**Free to use for deployments**, pay for your application consumed memory and compute. Resources start, complete jobs and terminate.



**Secure**  
Prevent Deployment Vulnerabilities

**Prevent deployments** of unsecure container artifacts. Only allow deployment of **trusted artifacts\***.

\* FY22 on our roadmap



**Native**  
OCI CD Workflow

Perform **global deployments** across regions. Intuitively connect deployments from a build pipeline.

Integrated OCI identity and permissions.

ORACLE Cloud Search for resources, services, and documentation US East (Ashburn) ⚙️ 🔔 🎉 💬 🌐 🌐

Developer Services » DevOps Projects » JS\_HelloWorld » Pipelines » Release HelloWorld to Production

Pipeline Deployments Parameters Work Requests Tags Metrics

Release HelloWorld to Production-20210629-1222

Status: Succeeded Started at: Tue, Jun 29, 2021, 19:22:27 UTC Total duration: 12min 11s Stages running: 0 Stages complete: 3 of 3 Re-Run :

Deployment Progress

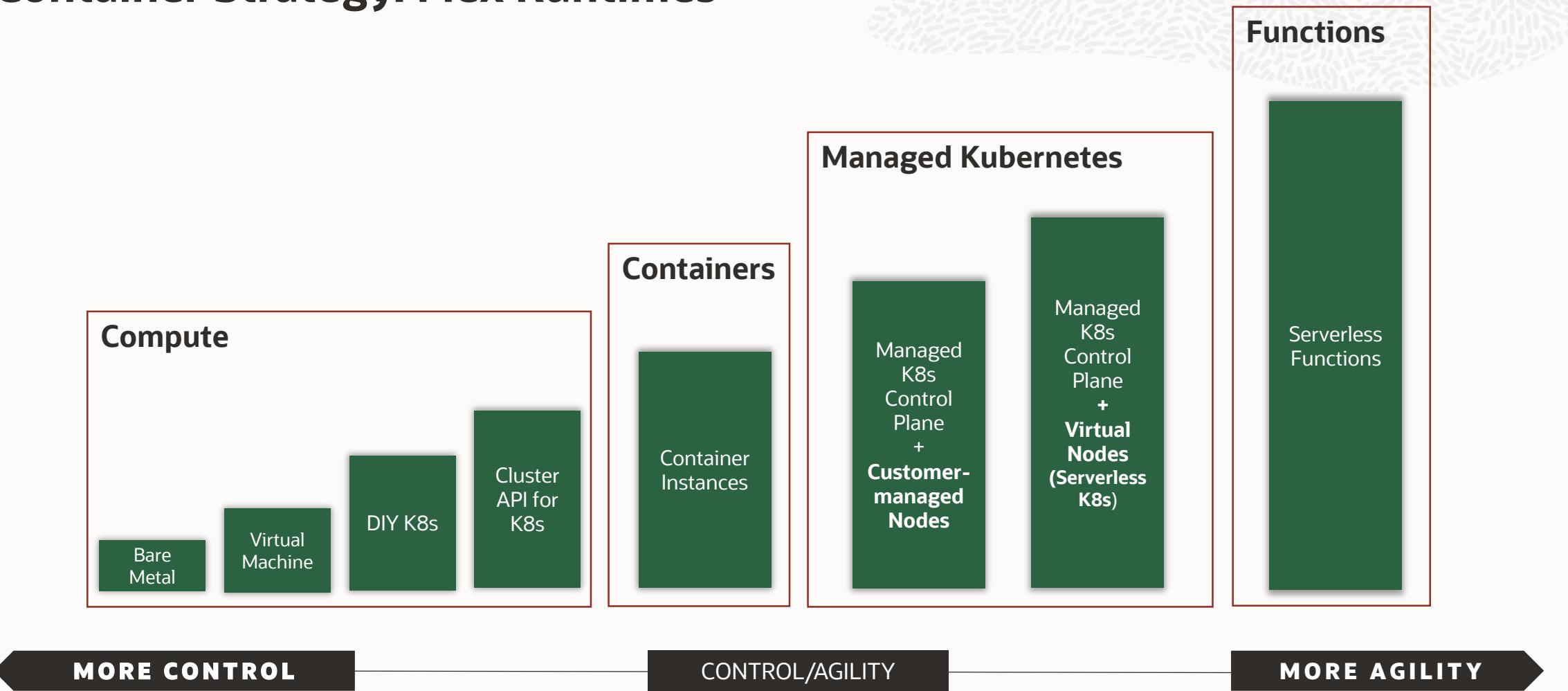
- OKE DEV DEPLOY
  - Apply kubernetes manifest 0min 18s ✓
  - Check deployment status 0min 4s ✓
  - 0min 12s ✓
- Release Manager Approval 11min 33s ✓
- PROMOTE TO PROD
  - Apply kubernetes manifest 0min 8s ✓
  - Check deployment status 0min 5s ✓
  - 0min 2s ✓

Find... Timestamp Message

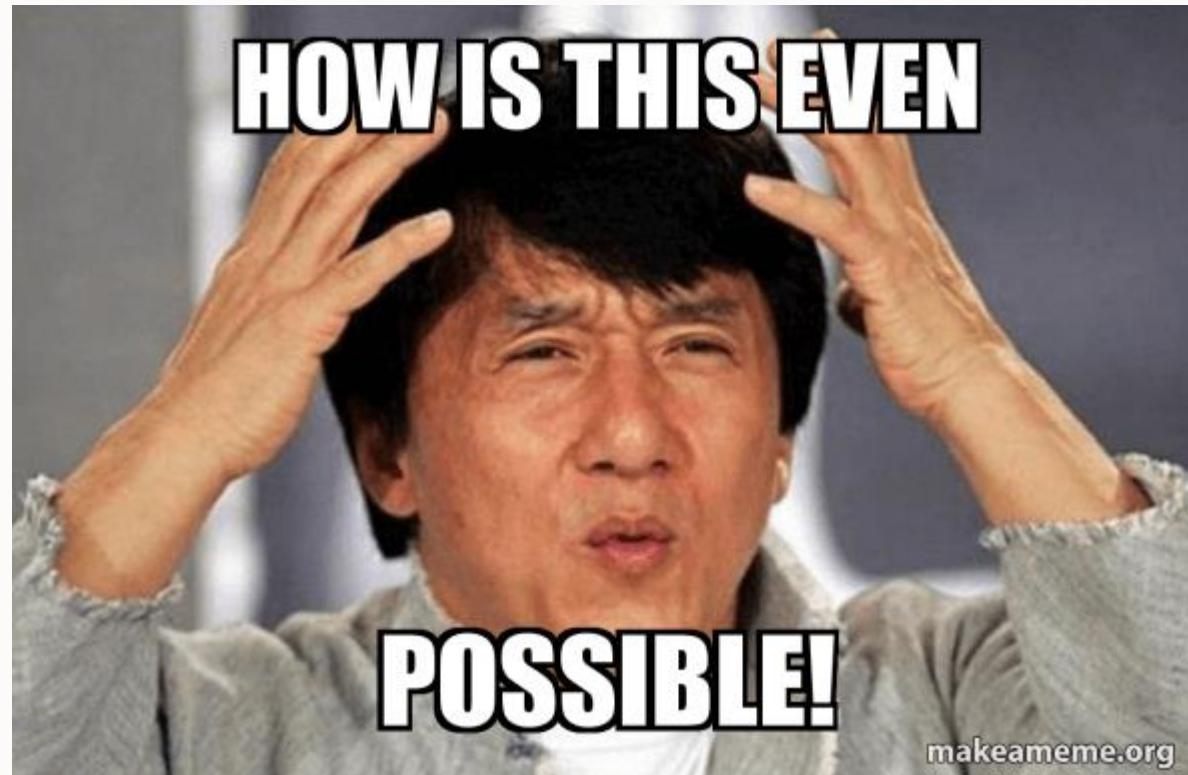
Timestamp	Message
2021-06-29T19:22:27.420Z	Deployment started. Deployment na
2021-06-29T19:22:28.770Z	Starting executing stage. StageId
2021-06-29T19:22:33.178Z	Starting to execute OKE deploymen
2021-06-29T19:22:35.220Z	Invoked apply command for resourc
2021-06-29T19:22:35.245Z	Invoked apply command for resourc
2021-06-29T19:22:35.264Z	Invoked apply command for resourc
2021-06-29T19:22:35.264Z	Apply manifest succeeded. Artificia
2021-06-29T19:22:35.462Z	Checking OKE deployment status
2021-06-29T19:22:45.038Z	Checking OKE deployment status
2021-06-29T19:22:47.298Z	Current state of resource: demo-o class V1Namespace { apiVersion: v1 kind: Namespace metadata: class V1ObjectMeta annotations: null clusterName: null creationTimestamp: 2021-0 deletionGracePeriodSecond deletionTimestamp: null finalizers: null generateName: null generation: null labels: null managedFields: [class V1M apiVersion: v1 fieldsType: FieldsV1 fieldsV1: {f: manager: before-first operation: Update time: 2021-06-23T00:4 }] name: demo-oke-dev namespace: null ownerReferences: null resourceVersion: 13387482

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# Container Strategy: Flex Runtimes



What is it?



# Oracle Container Engine for Kubernetes (OKE)



# Introducing OKE

## Oracle Container Engine for Kubernetes (OKE)

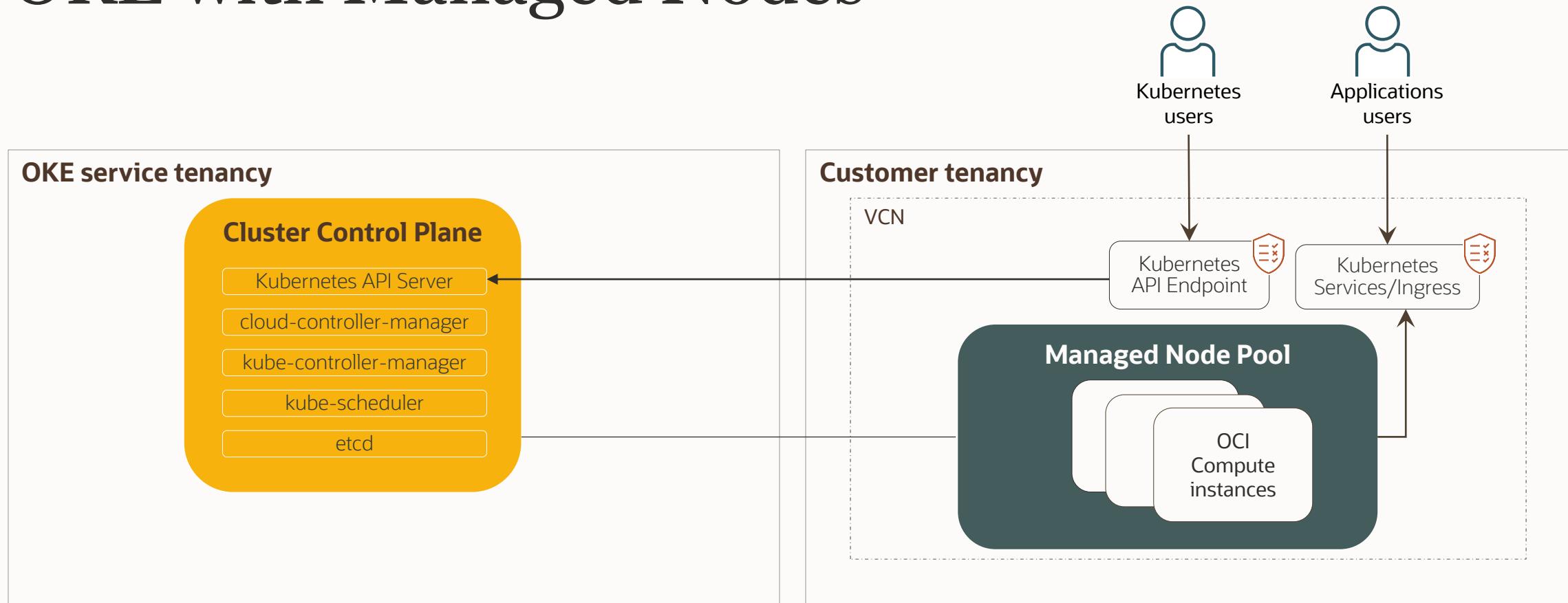
### What is it?

- Enterprise grade & developer friendly container orchestration service based on Kubernetes
- Fully managed
- Cloud Native Compute Foundation (CNCF) conformant
- Provides cloud portability due to non-proprietary, unmodified upstream Kubernetes implementation
- Integrated private registry
- Available in all OCI commercial regions

### What benefits does it provide?

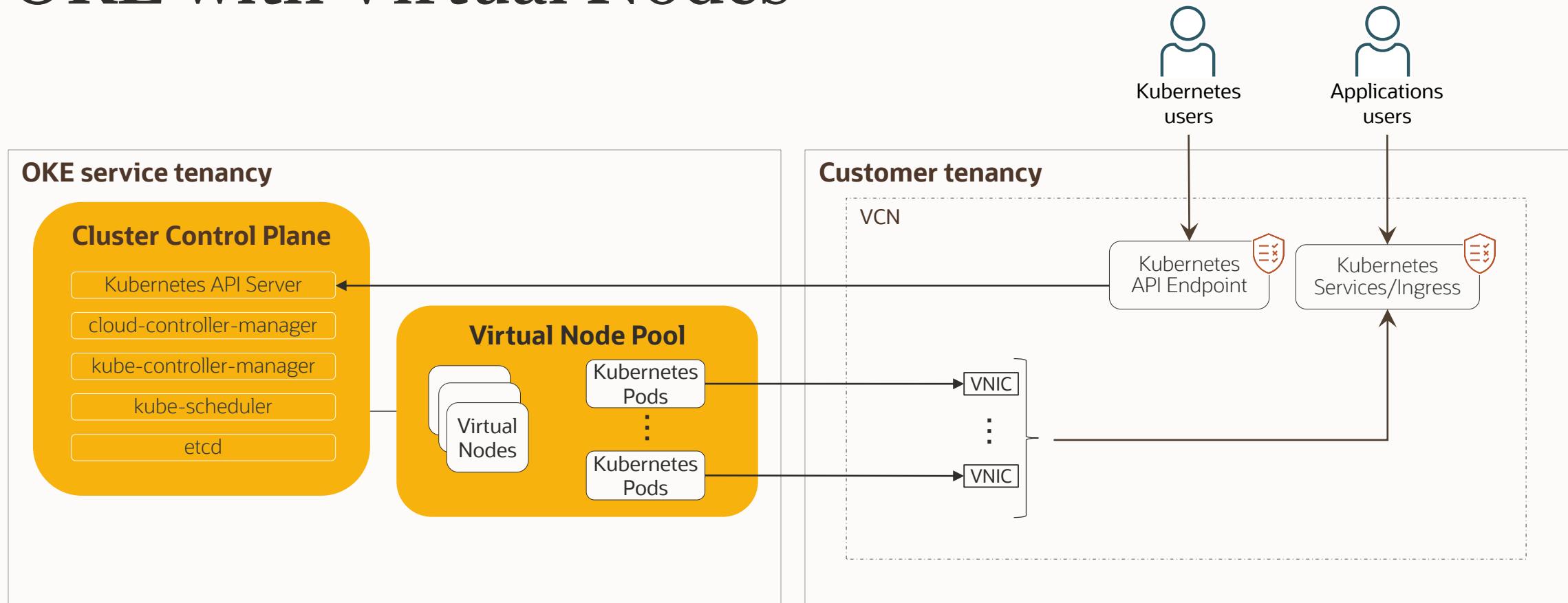
- High predictable performance: Uses Oracle Cloud Instances that are reliable and high performant
- Faster Time to Market: Developers can deploy applications quicker in the environment
- Lower Costs: Oracle Compute costs are lower compared to other cloud providers

# OKE with Managed Nodes



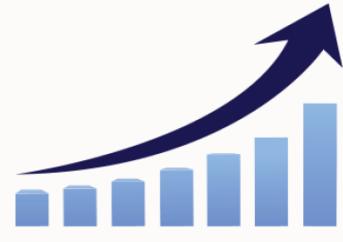
The Kubernetes Cluster Control Plane is managed by OKE. The Cluster Data Plane runs in the customer's tenancy.

# OKE with Virtual Nodes



The Kubernetes Cluster Control Plane and Data Plane are managed by OKE.

# Use cases



## Workload use cases

- Highly scalable stateless application  
Example: Web application with state in Autonomous Database
- Highly scalable stateful applications  
Example: Spark
- Jobs, Cron jobs, batch, etc.
- Workflows  
Example: Argo Workflow
- Scale to 0 applications  
Example: Knative

## Operation use cases

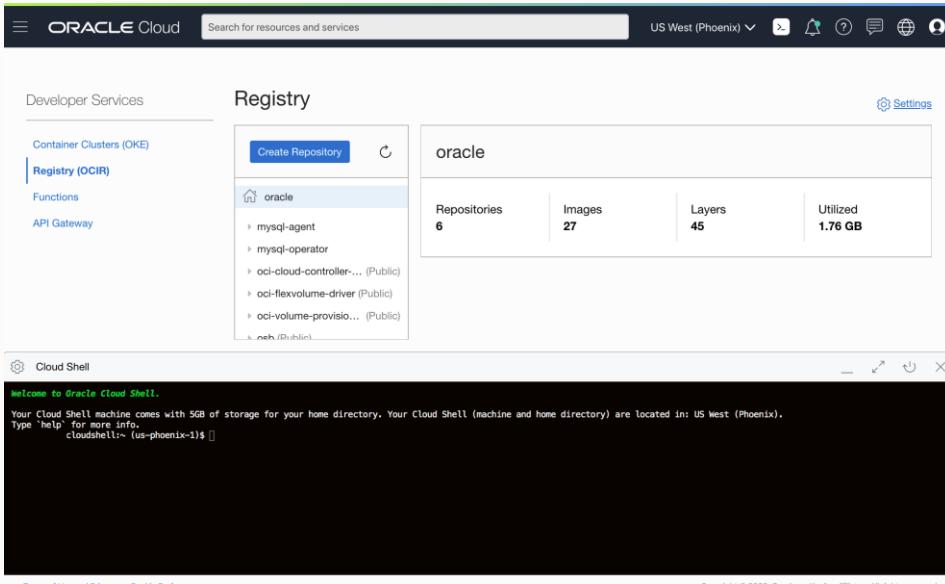
- Handle spikes of usage with built-in elasticity
- Kubernetes without infrastructure operations
- Burst workloads onto a Virtual node pool
- Multi-tenant clusters
- Application-level chargeback

# Introducing OCIR

## Oracle Cloud Infrastructure Registry (OCIR)

### What is it?

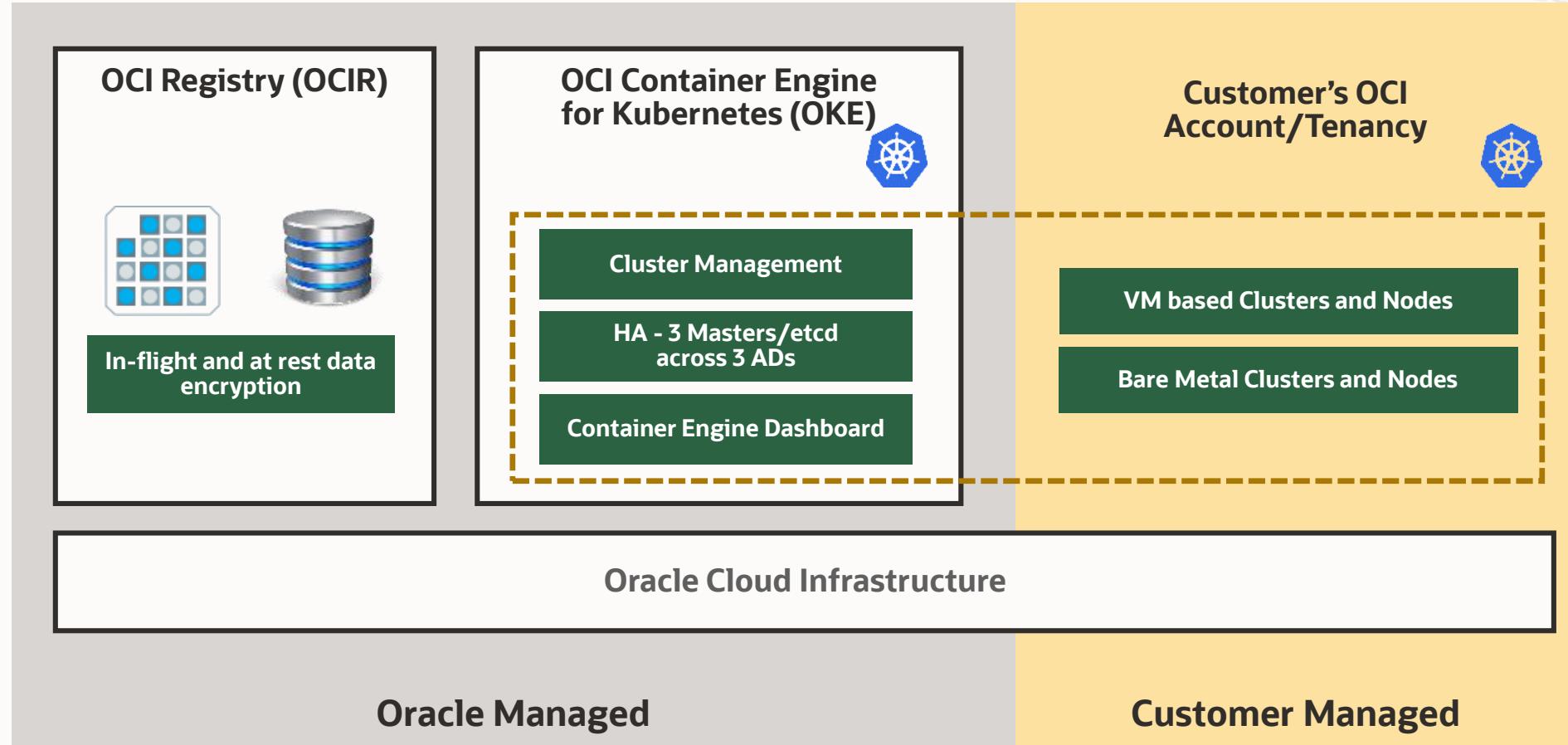
- Enterprise grade & highly available registry service
- Stores Docker images in private repositories
- Runs as a fully managed service on OCI



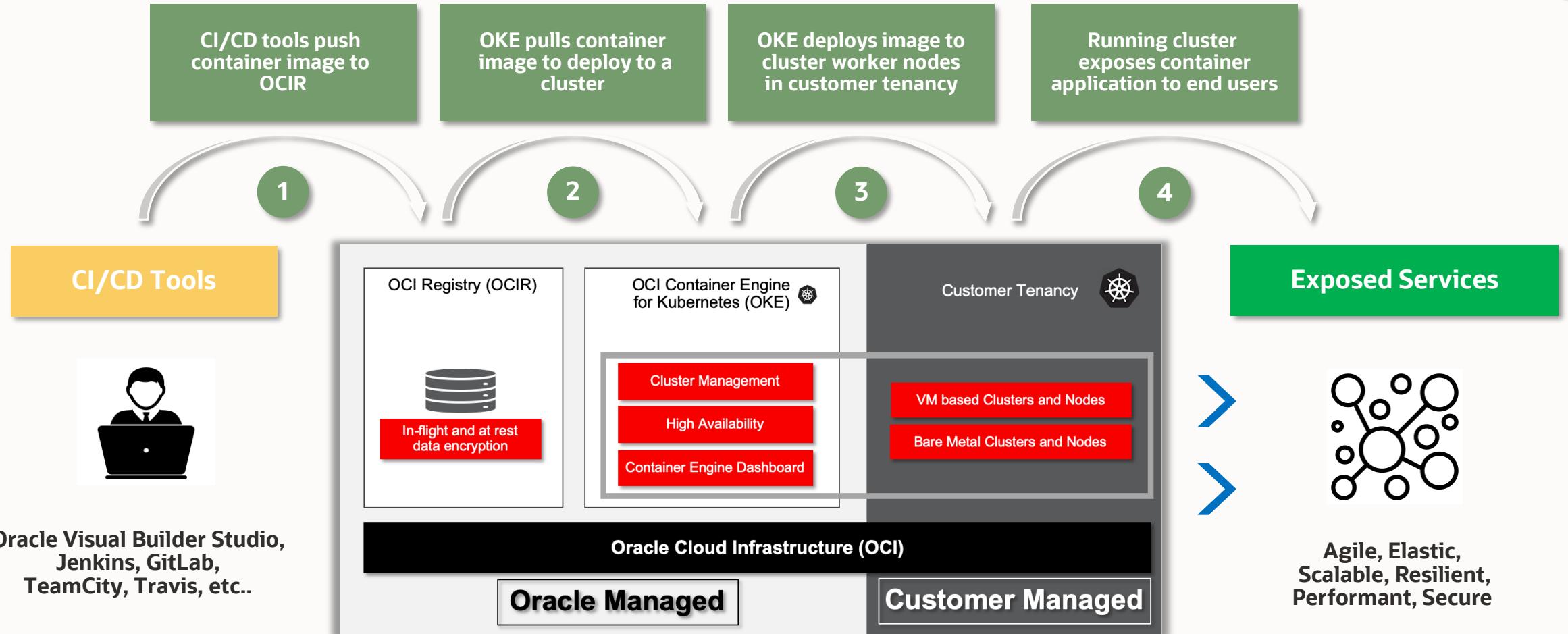
### What benefits does it provide?

- Full integration with OCI Container Engine for Kubernetes (OKE)
- Registries are private by default, but can be made public by an admin
- Co-located regionally with Container Engine for low latency image pulls
- Leverages OCI for high performance, low latency, and high availability

# Working with OKE and OCIR on OCI



# OKE & OCIR: Container Application Life Cycle



# OCI Container Instances



Simple, quick, and secure way to run containers in OCI



Serverless compute  
for containers



Launch applications  
quickly

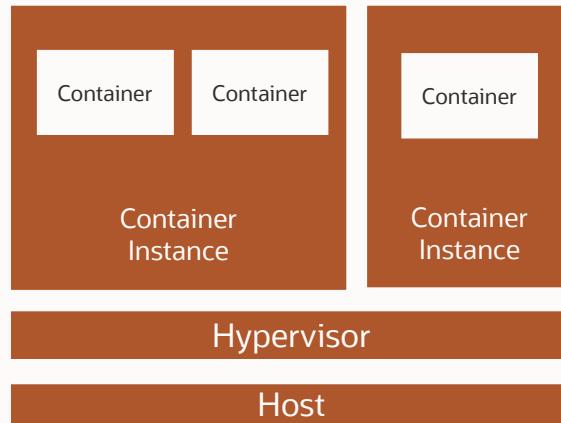


Up to 128 vCPU and  
1024 GB memory\*



Same price as  
'regular' Compute

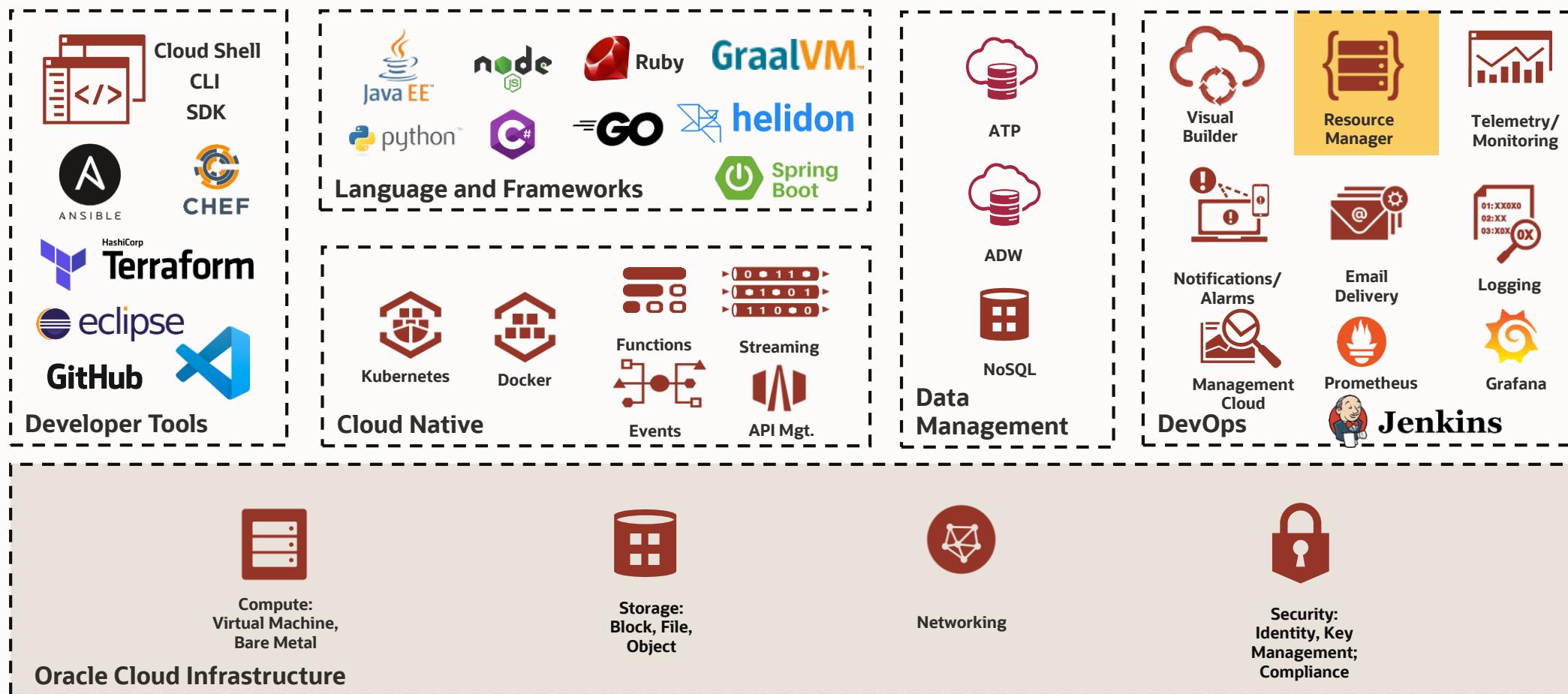
# Key Features



- Oracle managed
- Customer managed

- Serverless Compute – no servers to manage
  - Select preferred compute shape; E4/E3 Flex at GA with plans to add more
  - Specify CPU/memory resources
  - Can allocate all the resources provided by the shape to support demanding apps
  - 15 GB ephemeral storage included
- Simple, fast, and flexible
  - Easy launch using Console, CLI, API, Terraform
  - One or more containers per instance
  - Pull images from OCIR or external registry
  - Optional configuration – graceful shutdown, restart policy, environment variables, startup options, resource throttling etc.
- Security, networking and observability
  - Strong isolation – no sharing of kernel, resources across instances
  - Secure communication through VCN with option to assign public IP
  - IAM access control using resource principal
  - Built-in metrics
  - View logs on console or pull using API

# Oracle for Cloud Native and DevOps



# Introducing Resource Manager

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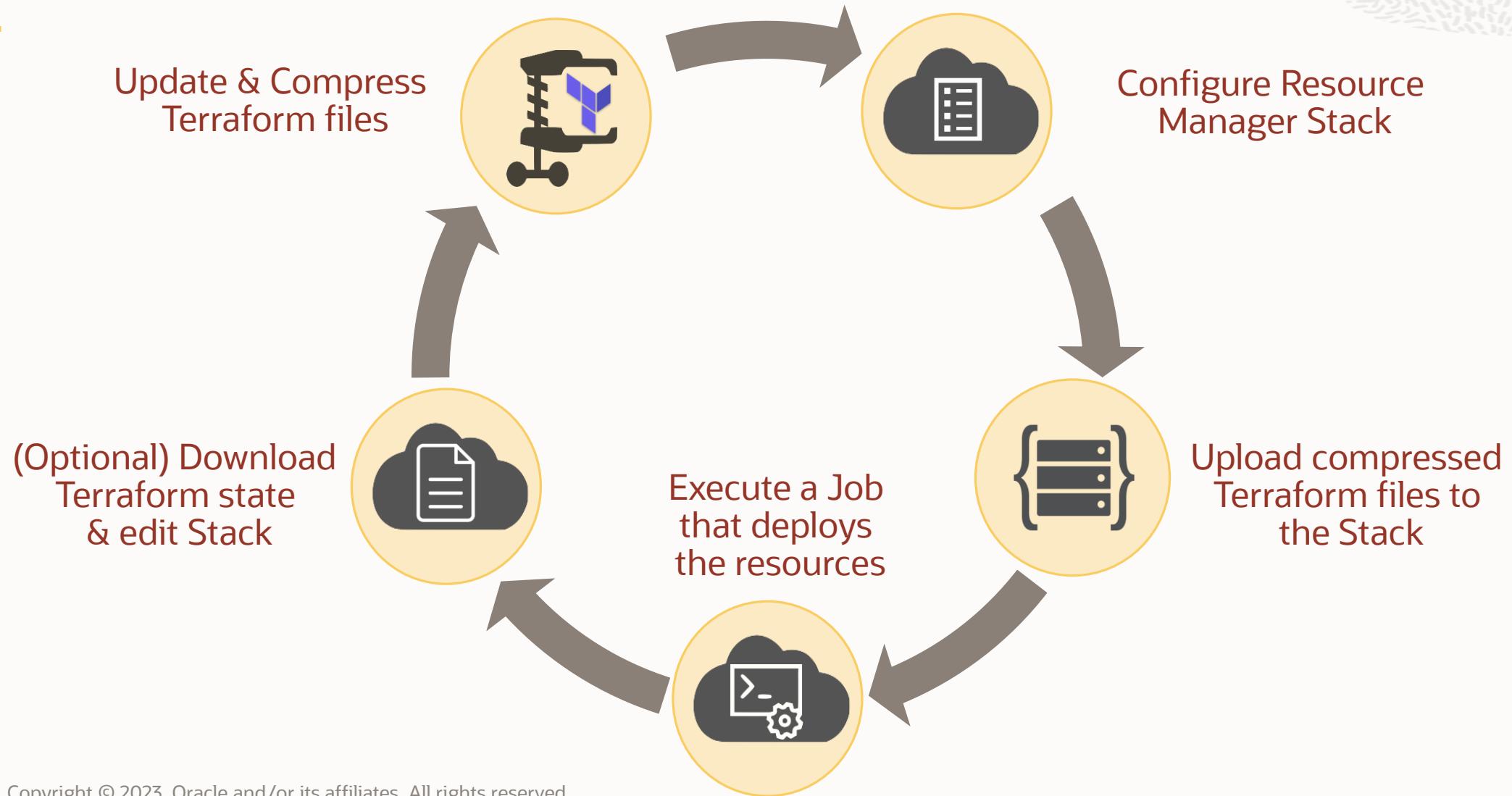
## What is it?

- Allows for Infrastructure as Code (IaC)
- Resource Manager manages infrastructure using HashiCorp Terraform
- Use templates to define configurations, reuse those templates as needed
- Pay only for infrastructure, not for service
- Deeply integrated with Oracle Cloud Infrastructure: identity, security, metering, monitoring, tagging, etc..

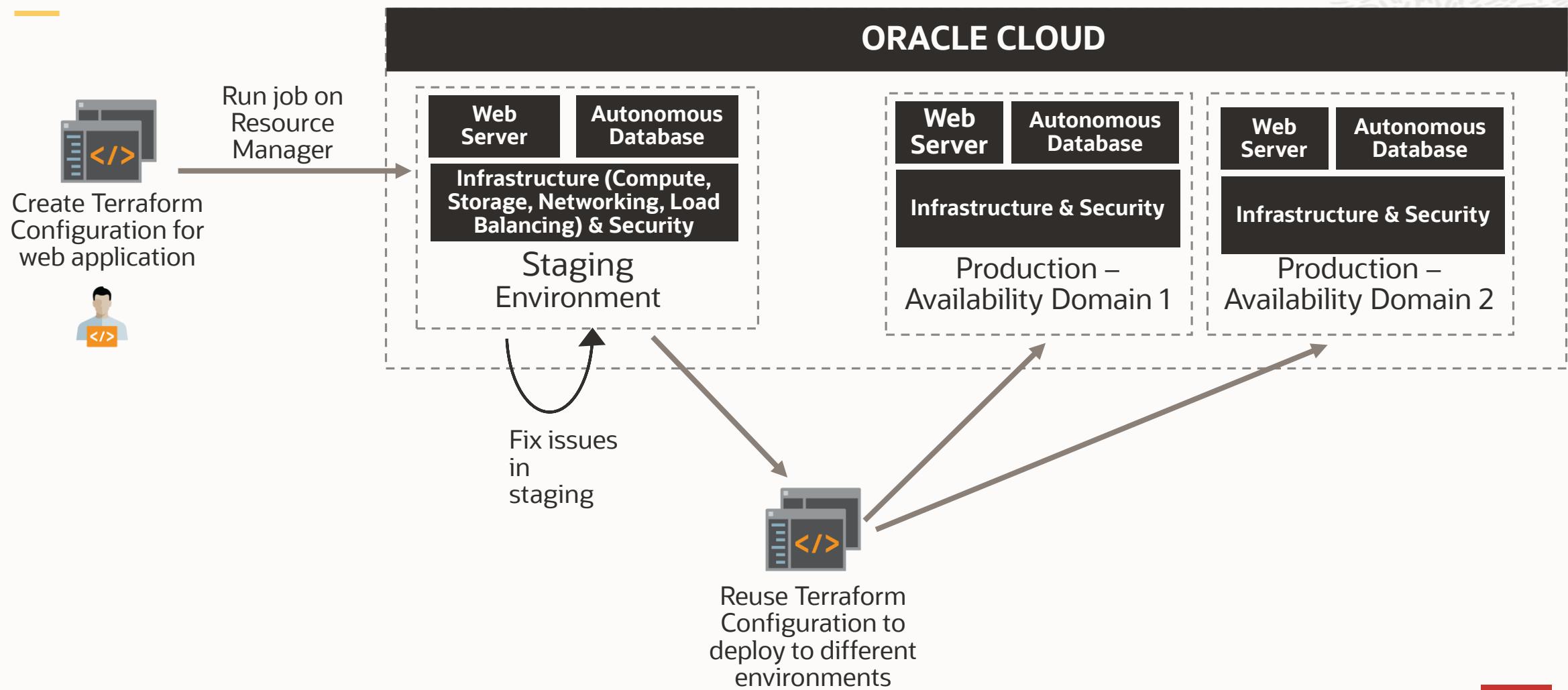
## What benefits does it provide?

- Automate and standardize your infrastructure & easily replicate environments
- Deep integration with OCI Platform (i.e. Identity, Tagging, KMS, etc..)
- Seamlessly manages state files and improves team collaboration

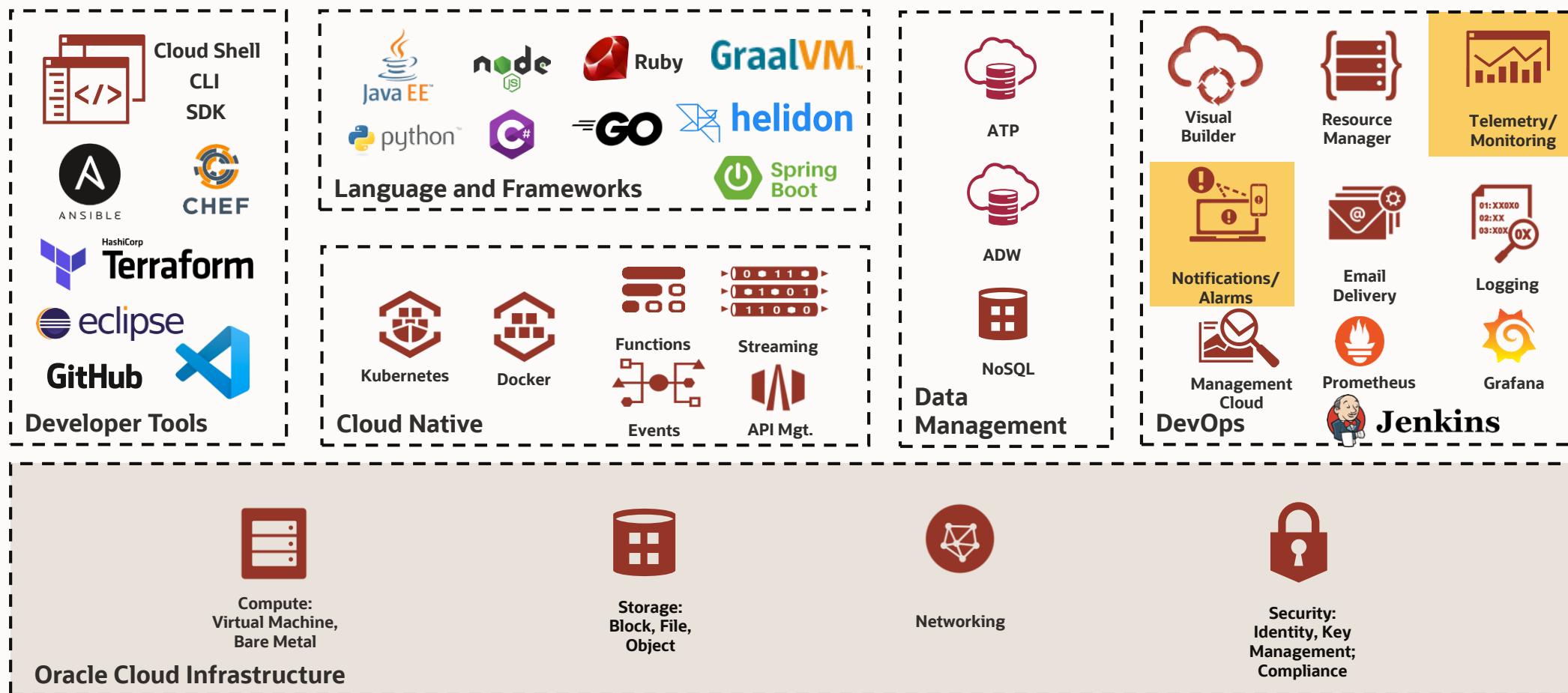
# How Does it Work?



# Infrastructure as Code : Use Cases



# Oracle for Cloud Native and DevOps



# Introducing Monitoring and Notifications Services

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## What is it?

### **Oracle Monitoring Service**

- Out of the box performance and health metrics for OCI compute, block storage, etc..
- Custom metrics capability, e.g. web analytics or application performance measures
- Agentless monitoring for OCI resources, e.g. virtual cloud networks, load balancers

### **Oracle Notifications Service**

- Pub-sub based service, leverages Oracle Streaming
- Alarms for real-time alerts via email and PagerDuty

## What benefits does it provide?

### **Oracle Monitoring Service**

- Optimize resource utilization by “slicing and dicing” workloads across infrastructure optimally
- Anomaly alerting in real-time

### **Oracle Notifications Service**

- Centralizes a service to manage subscribers and multiple protocols
- Push notifications at scale
- Stitch together distributed systems, microservices, serverless applications

# Monitoring & Notifications: Metrics Dashboard

## Metrics Explorer

Write and edit queries in Monitoring Query Language (MQL), using metrics from either your application or an Oracle Cloud Infrastructure service.



Resources:  
5 compute  
instances

Metric: 90<sup>th</sup> percentile  
throughput. Others  
available: min, max, etc..

# Notifications Dashboard screenshot

The screenshot shows the Oracle Cloud Notifications Dashboard. On the left, there's a sidebar with a large green circle containing a white 'T'. The main area has a header with the Oracle Cloud logo, a search bar, and navigation icons. The main content area is titled 'Notifications-Topic'.

**Topic Information:**

- Description: (empty)
- OCID: ...bffpo4xbaa [Show](#) [Copy](#)
- Compartment: bmc\_ons (root)
- Created: Wed, May 20, 2020, 24:03:54 UTC

**Resources:**

This list shows only resources that you have access to.

Protocol	Endpoint	Subscription OCID	State	Created	⋮
Email	gebore8008@v...com	<a href="#">ocid.....pp6hgu4q</a>	Active	Wed, May 20, 2020, 24:04:49 UTC	⋮
Function	Function: <a href="#">testfunc</a> Application: <a href="#">FunctionToSlack</a>	<a href="#">ocid.....cfygznbg</a>	Active	Wed, May 20, 2020, 24:06:10 UTC	⋮
PagerDuty	<a href="#">https://events.pagerduty.com/integration/sdax821sal192121/enqueue</a>	<a href="#">ocid.....h7ghpn6a</a>	Pending	Wed, May 20, 2020, 24:06:26 UTC	⋮
Slack	<a href="#">https://hooks.slack.com/services/T57AZVDD4/B0115UP</a>	<a href="#">ocid.....fp23sr4a</a>	Pending	Wed, May 20, 2020, 24:05:50 UTC	⋮

Notifications Topic:  
Collection of  
Subscriptions

**Supported Protocols:**

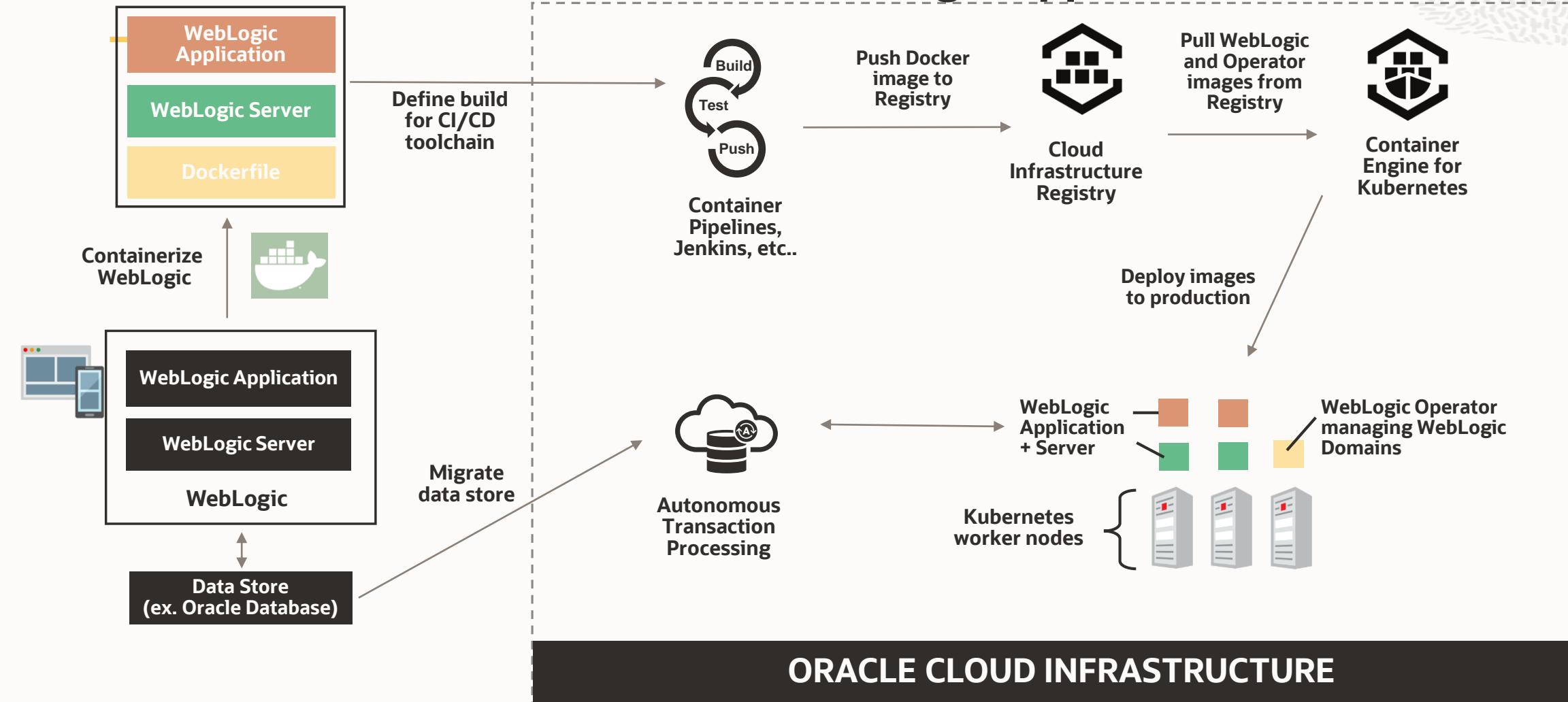
- Email
- Oracle Functions
- PagerDuty
- Slack

# Overview

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# Containers Use Case: Lift & Shift WebLogic Application





# VERRAZZANO

## Enterprise Container Platform

Intelligent  
Workload  
Management  
Across  
Environments



Application  
Lifecycle  
Management/  
DevOps  
Enablement



Automated  
Built-in  
Observability



Multi-Cluster  
Infrastructure  
Management



Multi-level  
Security

Cross-cloud Consistency

[Oracle Verrazzano](#)

[DOCs](#)

[Git Hub](#)

# Oracle Functions: Use Cases

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*Trigger Code in Response to Events*



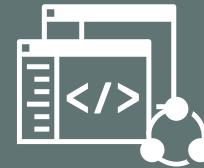
Event-driven  
Governance



Web, Mobile  
Middle Tier



Real-time File  
Processing



Machine Learning,  
DevOps

# Extend Customer Fusion SaaS Applications

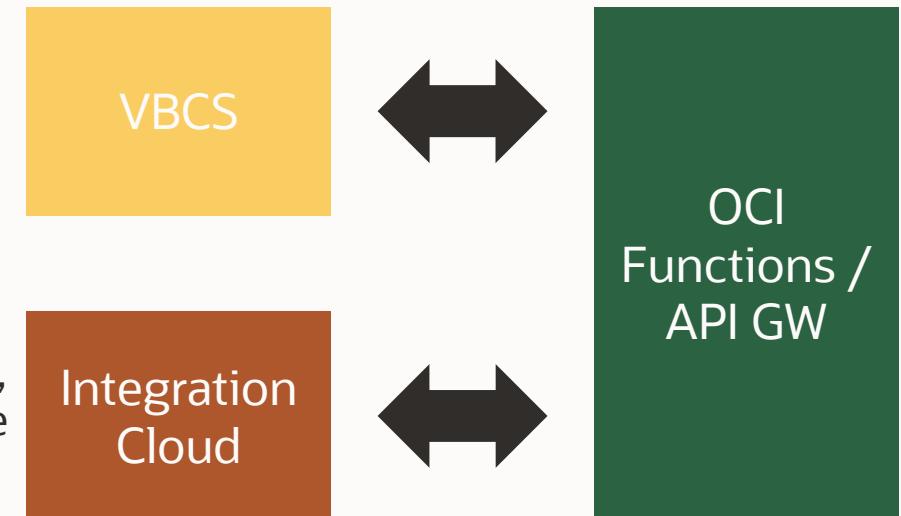
## Oracle Functions Use Case

Display data in Fusion SaaS that is not directly related to Fusion SaaS

- **Example:** A bank with a requirement to view customer profile info such as average quarterly balance from within Sales Cloud

The need for a user interface that is not satisfied by Fusion SaaS tools

- **Example:** Display accounts and related contacts in a graphical view, often dictated by the UI standards of another application (corporate portal)



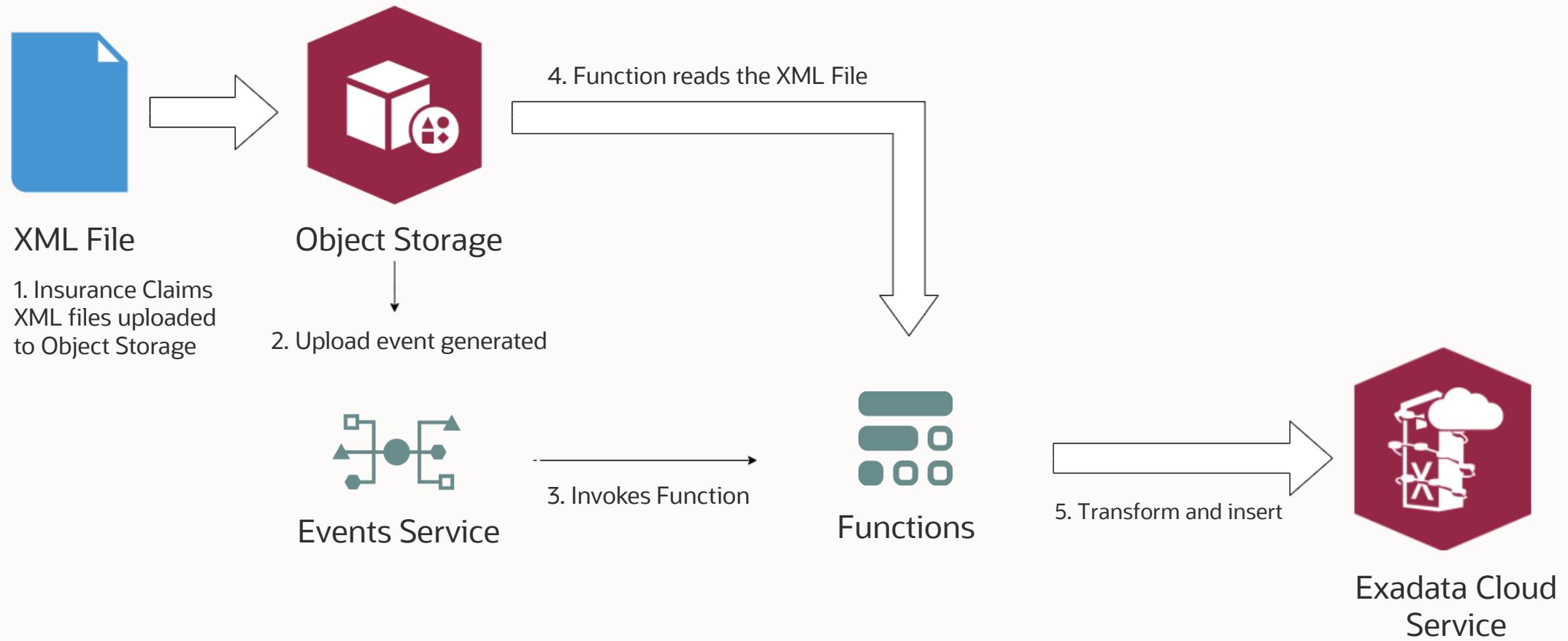
The need for a common user interface or web service to be reused across different applications

- **Example:** A credit scoring calculation system that can be leveraged by multiple apps

# High Volume ETL Solution

## Oracle Functions Use Case

Processes ~1-1.5 million files per day



# Mocks

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Creating Deployment Pipeline in the Console

## Takeaways

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-  End-to-end vision for Cloud Native and DevOps
-  Cost-effective managed services
-  Open source compatible, and strong partner ecosystem
-  World class services on 36 regions by the end of 2020
-  Services leveraged internally to drive the multi-billion dollar Oracle business

Thank you.

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