Accelerating Your Cloud Native DevOps with Oracle Linux and VirtualBox

使用**Oracle Linux**和**VirtualBox**加速您的云原生**DevOps**

Honglin Su – 苏虹林
Sr. Director of Product Management
Oracle Linux and Virtualization

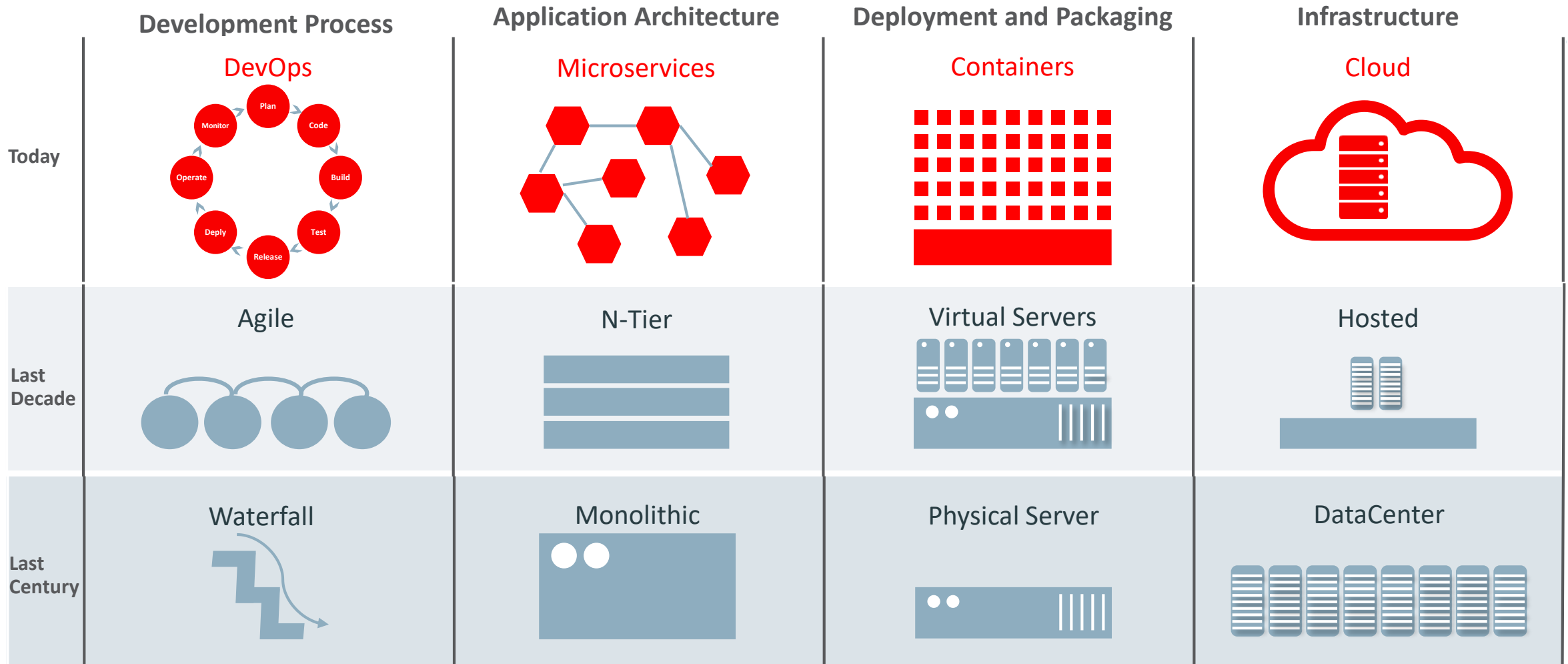June 25, 2019

KubeCon | **CloudNativeCon**

OPEN SOURCE SUMMIT

China 2019

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How Are Customers Building Modern Cloud Applications?

|	Development Process	Application Architecture	Deployment and Packaging	Infrastructure
Today	DevOps	Microservices	Containers	Cloud
Last Decade	Agile	N-Tier	Virtual Servers	Hosted
Last Century	Waterfall	Monolithic	Physical Server	DataCenter

Challenges in Application Development and Deployment

Developers

- Innovate at the pace of business
- Develop apps with modern capabilities such as chatbots, mobile, and analytics.
- Rapidly build or prototype new apps
- Scale apps quickly without rewriting
- Design solutions with security in mind
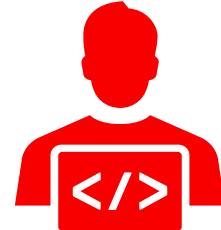
Operations

- Better manage and predict IT costs
- Keep pace with business demands
- Rapidly provision Dev/Test environments at scale
- Maintain always up & resilient apps
- Provide the tools for customers to achieve their security goals

How to Navigate Cloud Native Landscape?

- Developers and IT Need a DevOps Infrastructure Blueprint

  – A complete, integrated infrastructure from a technology leader, not just fragmented tools and technologies

  – An infrastructure that meets both Dev and Ops needs for performance, reliability and security

  – A blueprint for open technologies that can evolve and avoid cloud lock-in

Source: https://landscape.cncf.io/
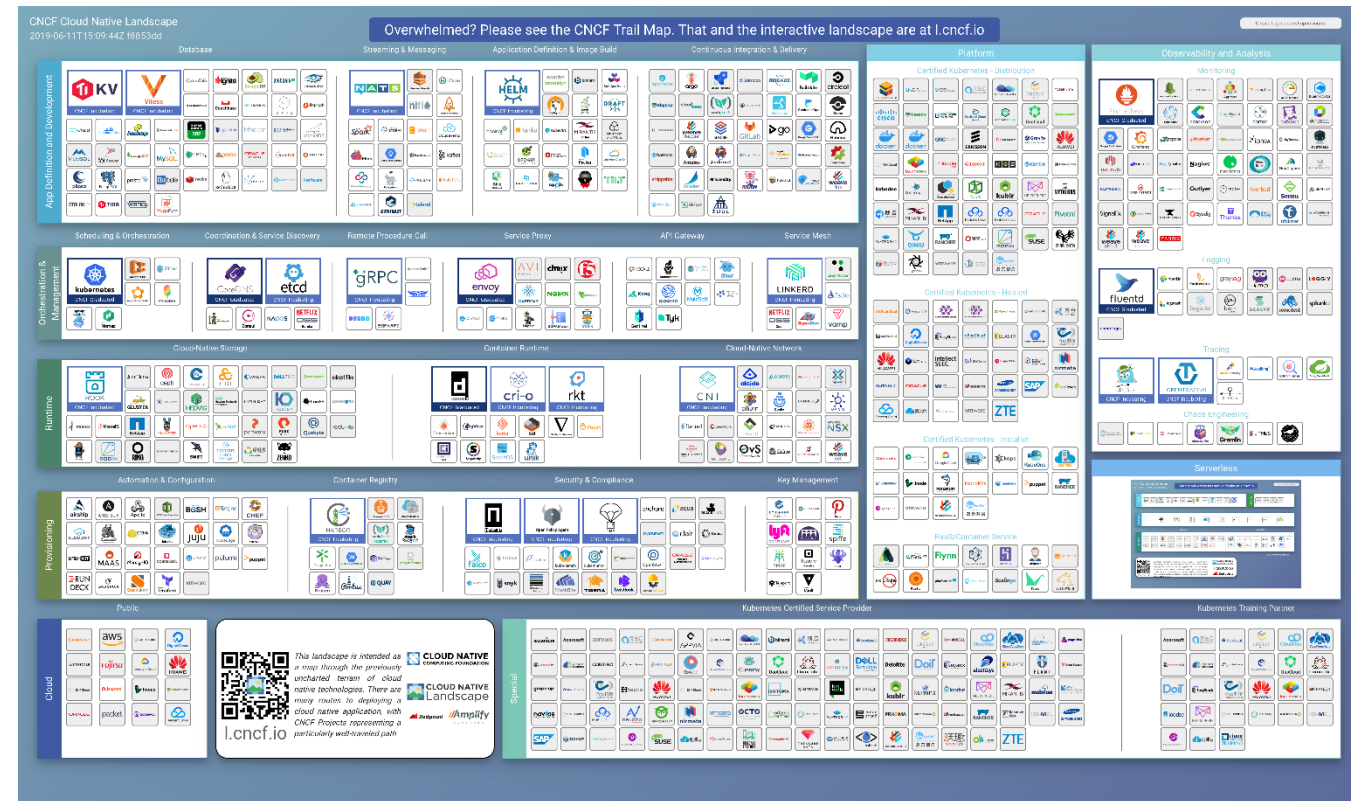
A Complete Open DevOps Environment for Digital Transformation

Shipping for more than 12 years

Powers Oracle Cloud & Engineered Systems

Tens of thousands of enterprises supported

Over 5 million Docker hub downloads

The Linux Foundation® Platinum board member

Cloud Native Computing Foundation® Platinum member

Oracle Linux & Virtualization

Oracle Linux Cloud Native Environment

CLOUD NATIVE ENVIRONMENT

App Definition & Development

Container Provisioning

Orchestration Management

Container Runtime

Observability & Analysis

- Latest cloud technologies – Containers, Kubernetes, and much more
- Both for cloud and on-premises developers
- Included with Oracle Linux

Running Containers with Oracle Linux

- Oracle Container Runtime for Docker 18.09
  - Available now
  - Includes a Docker Engine binary built and maintained by Oracle
  - Support for `btrfs` and `overlay2` as Docker filesystem
  - Implements multi-registry support
  - Requires Oracle Linux 7 with UEK Release 4 or 5

- Oracle Container Runtime for Kata
  - Available as a Developer Preview
  - Provides enhanced security while not sacrificing speed
  - Kata combines Intel Clear Linux OS Containers and Hyper runV technologies
  - Managed by Kubernetes

Oracle Products Available Inside Docker Containers

- Oracle Linux
  - 6 and 7 with slim variants
- MySQL Community Server
- MySQL Server Enterprise Edition
- OpenJDK
- Oracle Java SE
- Oracle NoSQL Database
- Oracle Database
- Oracle GoldenGate

- Oracle Business Intelligence
- Oracle Coherence
- Oracle Fusion Middleware Infrastructure
- Oracle Data Integrator
- Oracle SOA Suite
- Oracle Tuxedo
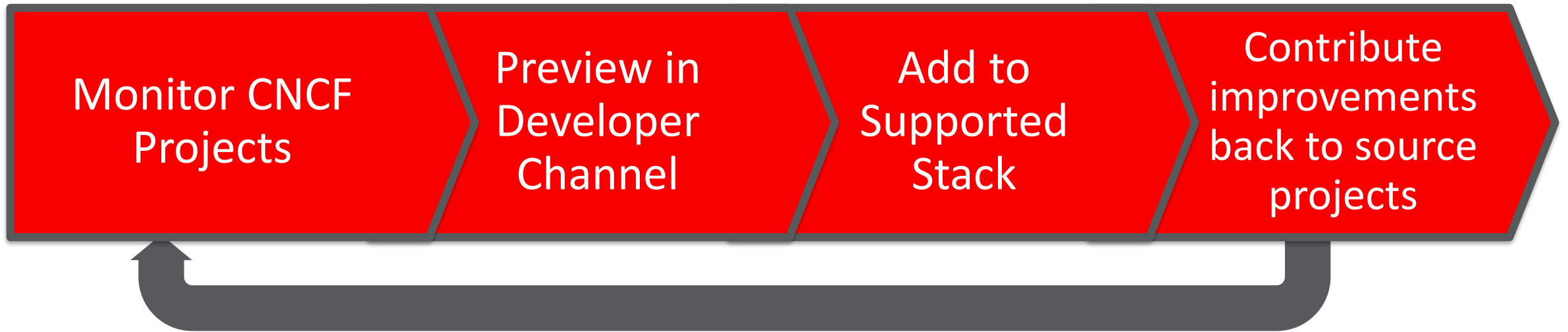- Oracle WebLogic Server
- Oracle HTTP Server

Download Docker container images from https://container-registry.oracle.com
Or download Dockerfiles and samples from https://github.com/oracle/docker-images

Orchestrating Containers with Oracle Linux

- Oracle Container Services for use with Kubernetes
  - The current release is based on the upstream 1.12 and certified by Cloud Native Computing Foundation (CNCF®)
  - Delivered as RPM packages and Docker containers
  - Includes Oracle provided setup script to ease install/config on Oracle Linux 7
  - Provides instructions to create multi-master HA clusters

Oracle Linux Cloud Native Environment

Monitor CNCF Projects → **Preview in Developer Channel** → **Add to Supported Stack** → **Contribute improvements back to source projects**

Development:
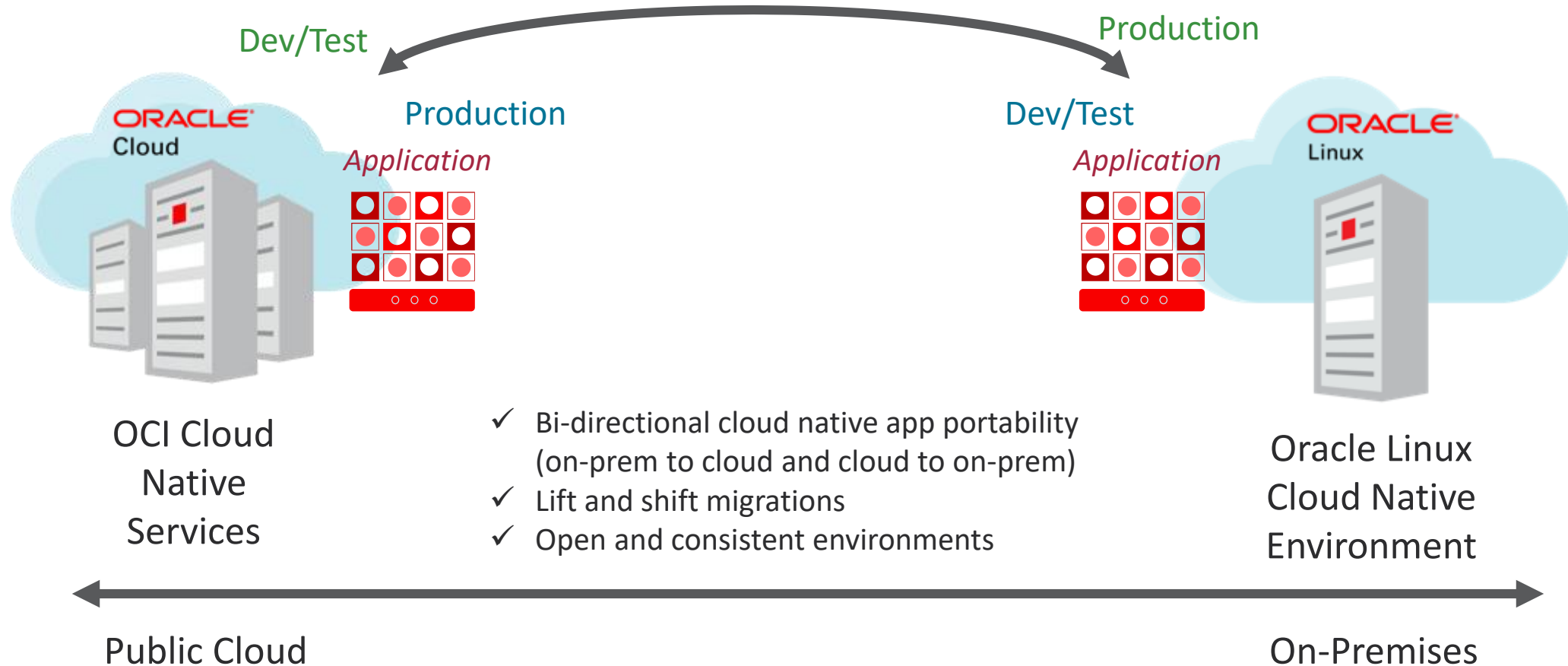- Calico
- Istio / Envoy
- Jenkins X
- Prometheus
- fluentd

Developer Preview:
- Kata Containers
- CRI-O
- Helm

Available Now:
- Docker
- Kubernetes
- Oracle Container Registry
- Flannel

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Oracle Cloud Native Framework:
Application Portability & Migration for Hybrid Clouds

Dev/Test

Production

Production

Dev/Test

Application

Application

ORACLE Cloud

ORACLE Linux

OCI Cloud
Native
Services

Oracle Linux
Cloud Native
Environment

✓ Bi-directional cloud native app portability
(on-prem to cloud and cloud to on-prem)
✓ Lift and shift migrations
✓ Open and consistent environments

Public Cloud

On-Premises

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Oracle VM VirtualBox

Free and open source, Cross-Platform Virtualization Software

Private Cloud   Public Cloud

- Available for Windows, Mac OS X, Linux and Oracle Solaris

- Supports a wide range of guest platforms

Hybrid Cloud

- Easy-to-use graphical user interface

Vibrant Community Participation | **Oracle Development & Support**

- Powerful, scriptable command line interface

Download & Test   Dev & Deploy

- Import and export virtual machines using OVF/OVA standards

- Shared folders between guest and host

- Create a multi-platform test and development environment

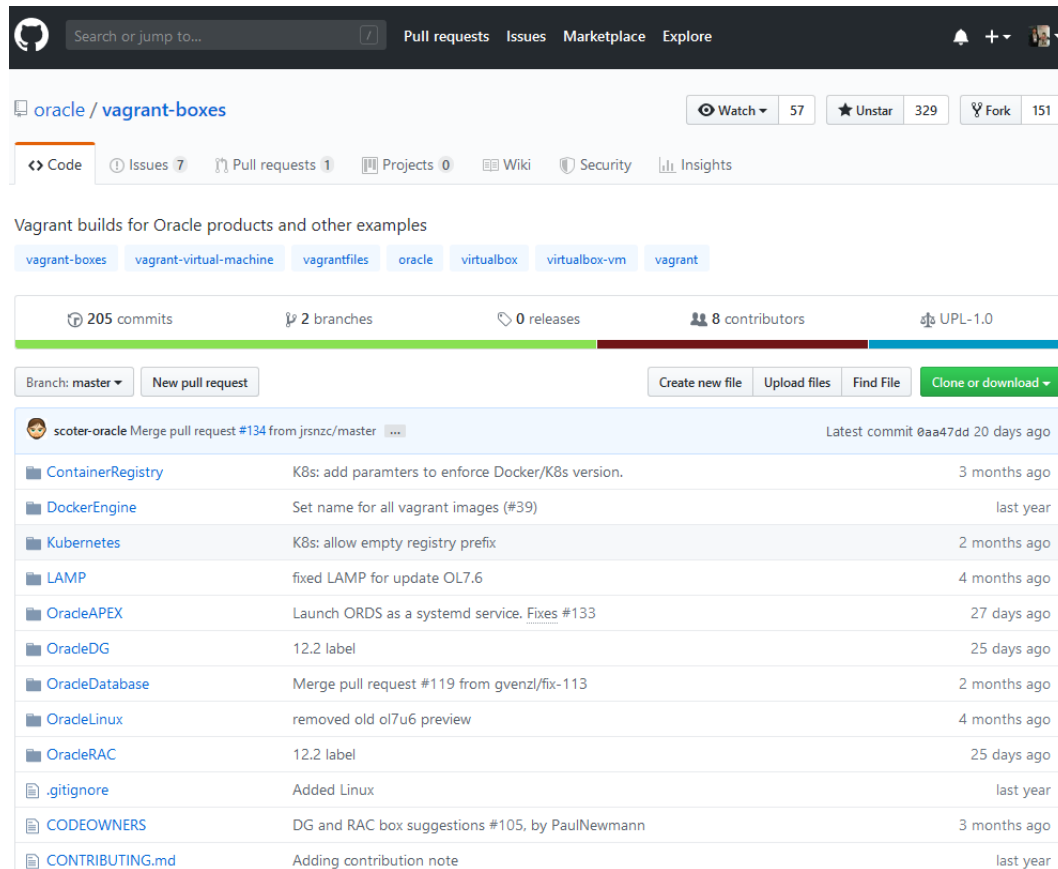- Extend the lifetime and usefulness of existing computers
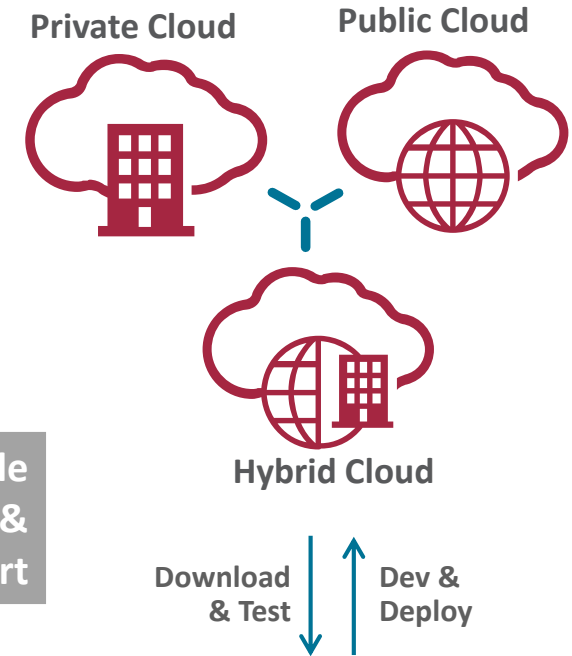
VirtualBox + Vagrant

- Command line interface
- Vagrant box
  - Base image
- Vagrantfile
  - Defines one or more VM instances
- `vagrant up`
  1. Starts headless VM
  2. Sets up port forwarding for NAT network
  3. Mounts your project directory as a shared folder on `/vagrant`
  4. Creates and inserts ssh keys for password-less authentication

VirtualBox on GitHub: Vagrant Oracle Images

https://github.com/oracle/vagrant-boxes

Search or jump to…   Pull requests   Issues   Marketplace   Explore

oracle / **vagrant-boxes**

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<> Code   ⊙ Issues 7   ⎇ Pull requests 1   ▥ Projects 0   ▦ Wiki   ⊙ Security   ⊪ Insights

Vagrant builds for Oracle products and other examples

vagrant-boxes   vagrant-virtual-machine   vagrantfiles   oracle   virtualbox   virtualbox-vm   vagrant

⊙ 205 commits   ⎇ 2 branches   ⬡ 0 releases   ⚏ 8 contributors   ⚖ UPL-1.0

Branch: master ▾   New pull request   Create new file   Upload files   Find File   Clone or download ▾

scoter-oracle Merge pull request #134 from jrsnzc/master …   Latest commit 0aa47dd 20 days ago

ContainerRegistry	K8s: add paramters to enforce Docker/K8s version.	3 months ago
DockerEngine	Set name for all vagrant images (#39)	last year
Kubernetes	K8s: allow empty registry prefix	2 months ago
LAMP	fixed LAMP for update OL7.6	4 months ago
OracleAPEX	Launch ORDS as a systemd service. Fixes #133	27 days ago
OracleDG	12.2 label	25 days ago
OracleDatabase	Merge pull request #119 from gvenzl/fix-113	2 months ago
OracleLinux	removed old ol7u6 preview	4 months ago
OracleRAC	12.2 label	25 days ago
.gitignore	Added Linux	last year
CODEOWNERS	DG and RAC box suggestions #105, by PaulNewmann	3 months ago
CONTRIBUTING.md	Adding contribution note	last year

- Vagrant images for Oracle
  - Oracle Linux 7 (latest)
  - Oracle Linux 6 (latest)
  - Oracle Linux 7 with Docker Engine
  - Oracle Linux LAMP
  - Kubernetes Cluster with Oracle Linux 7
  - Oracle Database (19c, 18c, 12c, and 11g)
  - Oracle RAC (19c, 18c, and 12c)
  - Oracle Data Guard (DG) with Oracle Database (19c, 18c, and 12c)
  - Oracle Database XE 18.4 with Oracle Application Express (APEX)
  - etc.

Demo – Set up Kubernetes Cluster in Minutes

- Prerequisites
  - Install Oracle VM VirtualBox
  - Install Vagrant
  - Sign into Oracle Container Registry and accept the proper license terms

- Quick start
  - Clone this repository git clone https://github.com/oracle/vagrant-boxes
  - Change into the vagrant-boxes/Kubernetes folder
  - Run vagrant up master; vagrant ssh master
  - Within the master guest, run as root:
    /vagrant/scripts/kubeadm-setup-master.sh
    You will be asked to log in to the Oracle Container Registry
  - Run vagrant up worker1; vagrant ssh worker1
  - Within the worker1 guest, run as root:
    /vagrant/scripts/kubeadm-setup-worker.sh
    You will be asked to log in to the Oracle Container Registry
  - Repeat the last 2 steps for worker2

Demo – Validate Kubernetes Cluster

- Your cluster can be ready in minutes!

- Within the master guest you can check the status of the cluster (as the vagrant user). e.g.:
  - kubectl cluster-info
  - kubectl get nodes
  - kubectl get pods --namespace=kube-system

```
[vagrant@master ~]$ kubectl get nodes
NAME                 STATUS     ROLES     AGE     VERSION
master.vagrant.vm    Ready      master    28m     v1.12.7+1.1.2.el7
worker1.vagrant.vm   Ready      <none>    16m     v1.12.7+1.1.2.el7
worker2.vagrant.vm   Ready      <none>    109s    v1.12.7+1.1.2.el7
```

Follow the complete hands on lab:
https://community.oracle.com/docs/DOC-1027008

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Oracle Linux for Development

- EPEL (Extra Packages for Enterprise Linux)
  - built and signed by Oracle
  - Over 12,000 extra RPMs published as of June 2019

- Web & API programming languages
  - Python, Node.js, Go, PHP

- Oracle Database development
  - Oracle Instant Client
  - Database connectors for Python, Node.js, PHP

- Oracle Linux yum server in each Oracle Cloud region

- Software Collection Library 3.2
  - Current versions of GNU compiler collection, debugger, git, maven

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Applications & Platform Services

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