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

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How Are Customers Building Modern Cloud Applications?

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Today vs. Last Decade vs. Last Century:

- **Today**: Agile development processes, microservices architecture, containers, cloud infrastructure.
- **Last Decade**: Waterfall development, monolithic architecture, traditional server-based computing.
- **Last Century**: Waterfall development, monolithic architecture, physical servers in data centers.
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

- 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

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

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

- **Available Now:**
  - Docker
  - Kubernetes
  - Oracle Container Registry
  - Flannel
Oracle Cloud Native Framework: Application Portability & Migration for Hybrid Clouds

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

Free and open source, Cross-Platform Virtualization Software

- Available for Windows, Mac OS X, Linux and Oracle Solaris
- Supports a wide range of guest platforms
- Easy-to-use graphical user interface
- Powerful, scriptable command line interface
- 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

- 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
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
Integrated Cloud
Applications & Platform Services