



VirtualBox for Development

VENKATT GUHESAN

FRI, SEP. 27, 2024

Agenda / What will we cover today?

PURPOSE: How to setup a locally running VirtualBox Linux instance?

- ▶ Why? What does it solve?
- ▶ The Stack / Host vs Virtual Machine
- ▶ Virtual Machines (VMs) vs. Containers – Key Differences
- ▶ Big Questions – you should consider
- ▶ Demo Time
- ▶ How to use this for your work?
- ▶ Q&A
- ▶ Thank you

Step By Step Instructions

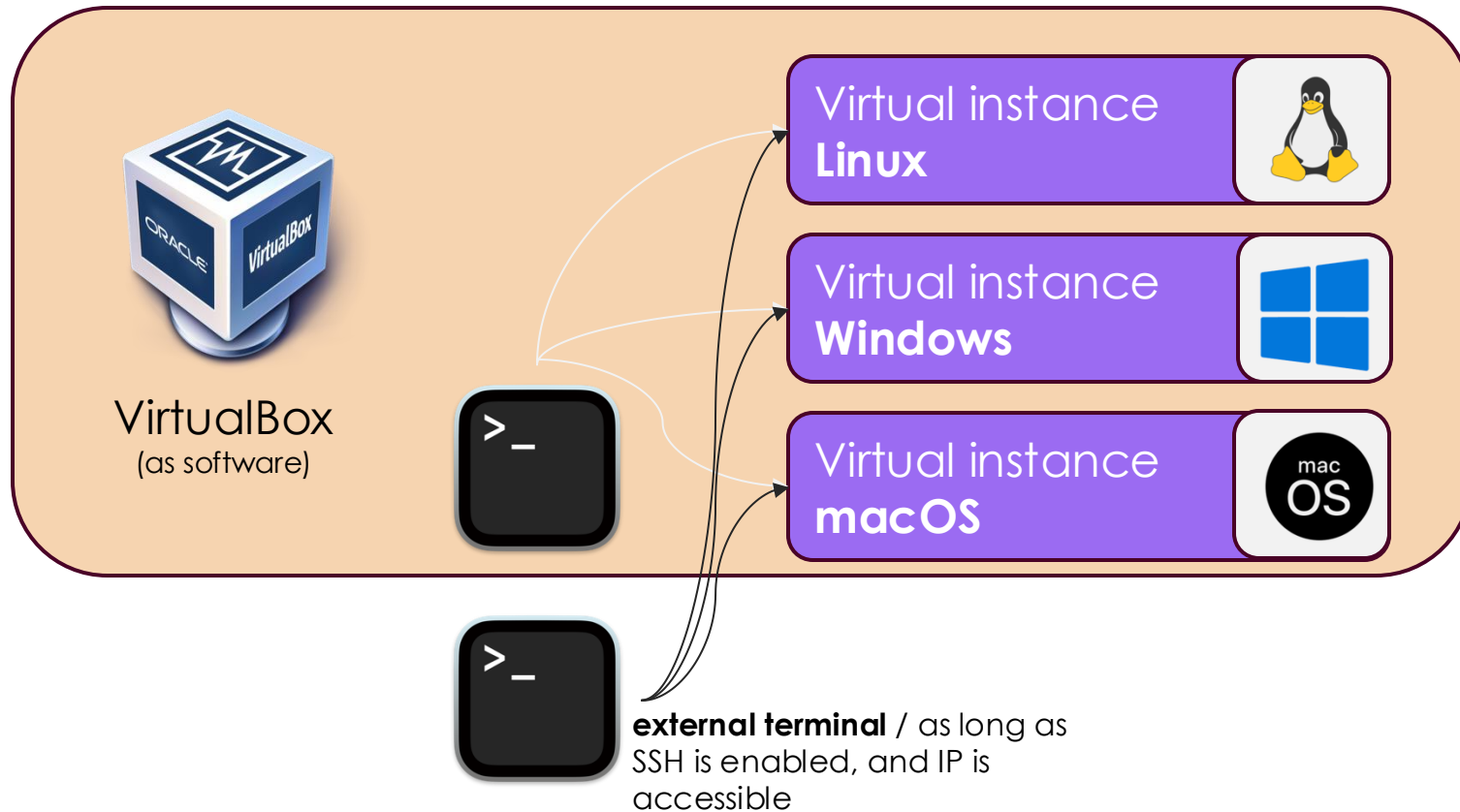
Step-By-Step Instructions:
<https://github.com/vguhesan/devnotes-virtualbox>

Why? What does it solve?

- ▶ **Isolation:** Leverage your local development laptop but isolate the setup to its own virtual environment.
- ▶ **Learning:** Learning a new tool set – Kubernetes, Open Shift, Podman, Kustomize, etc.
- ▶ **Local development** of new home-grown software
- ▶ **\$\$\$:** Save/avoid hidden hourly costs with hosting it on AWS, Google Cloud or Azure. (Free option – Open Stack – RHEL option)
- ▶ **Disposable Stack** – worry free / not contaminate the host system.

The Stack / The Host vs The VM

The Host



Host

- Windows
- Linux
- macOS

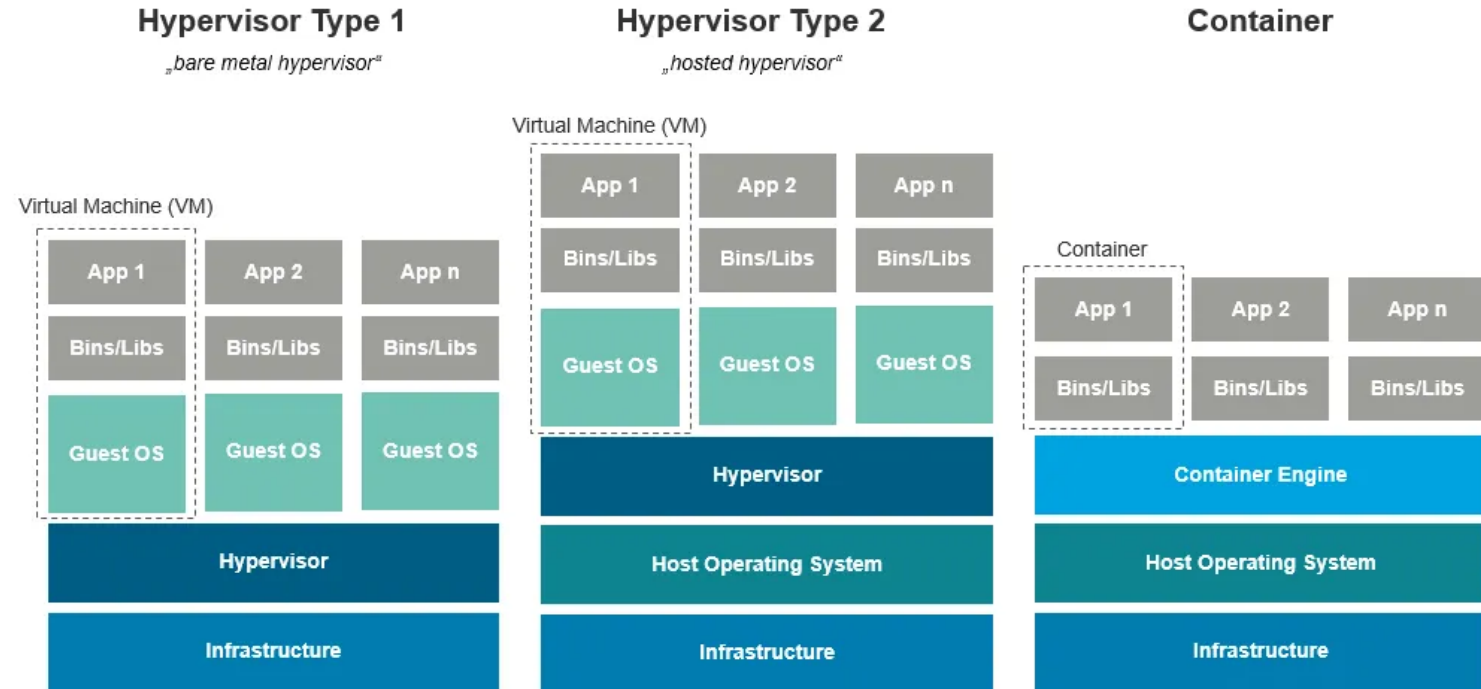
* Enable virtualization in BIOS for older laptops

Virtual Instances

- Windows
- Linux
- macOS

Virtual Machines vs Containers Key Differences

- ▶ Isolation
- ▶ Size
- ▶ Speed
- ▶ Use Cases
- ▶ Suitability
- ▶ Compatibility
- ▶ Storage



Big Questions That You Should Consider

Can you install a x80_86 based OS in VirtualBox on a mac with arm64 processor?

- ❑ No, you cannot directly install an x86 based operating system in VirtualBox on a Mac with an ARM64 processor because the architecture is incompatible; VirtualBox running on an ARM Mac cannot natively virtualize x86 systems without using an emulation layer, which can significantly impact performance.
- ❑ The processor must match.
- ❑ The good news is that Windows creates a version of Windows OS that is formulated to run on a Mac Silicon.

Big Questions That You Should Consider

Can you install a x80_86 based OS as Docker container images on a mac with arm64 processor? Can you install a x80_86 based OS in VirtualBox on a mac with arm64 processor?

- ❑ No, you cannot directly install an x86_64 based OS as a Docker container image on a Mac with an ARM64 processor because the architecture mismatch prevents the container from running natively; however, you can use Docker's emulation features (like Docker Buildx) to build and run such images on your Mac M1 by specifying the target platform as "Linux/amd64" when building the image, which will leverage QEMU emulation to run the x86_64 container on your ARM64 machine.

Big Questions That You Should Consider

Can you install x86_64 based container images on a Mac with an arm64 processor using Kubernetes?

- ❑ Learn to use “uname -a”
- ❑ Short Answer: Prefer AARCH64 over ARM64
- ❑ Yes, you can install an x86_64 based container image on a Mac with an ARM64 processor using Kubernetes, but you will need to use a tool like Docker Buildx or a virtual machine to enable emulation, as the native architecture of the Mac is incompatible with the x86_64 container image directly; essentially, you'll need to run the container in emulation mode using a technology like Rosetta 2 on macOS.

Big Questions That You Should Consider

For MacBook Air m2 should I use arm64 or aarch64?

- ❑ For a MacBook Air M2, you should use aarch64 when choosing between the two options, as it is the specific designation for the ARM architecture used by Apple Silicon chips like the M2, essentially synonymous with “arm64” but considered the more precise term for Apple devices.
- ❑ The M2 chip in a MacBook Air M2 is based on Apple’s ARM architecture, which is referred to as “aarch64”.
- ❑ While “arm64” is widely understood to mean the same thing, “aarch64” is technically the correct term for Apple’s implementation of ARM architecture.

Rocky Linux vs RHEL vs Ubuntu / Notable Differences

- ❑ **Rocky Linux:** community-supported, open-source enterprise operating system that uses the Red Hat Enterprise Linux (RHEL) source code.
- ❑ **RHEL** (Red Hat Enterprise Linux): RHEL is a commercial product developed by Red Hat intended for enterprises that need strong support and stability.
- ❑ Both Rocky Linux and RHEL are derivatives of Fedora Linux.
- ❑ **Ubuntu:** is a user-friendly, popular Debian based Linux Distribution with a good clean user interface.
- ❑ RHEL/Rocky Linux uses - yum/dnf and rpm for the package manager.
- ❑ Ubuntu uses - apt, dpkg and snap as the package manager.



DEMO TIME



**How to apply this
to your work?
(discussion)**



Useful Resources

Step-By-Step Instructions:
<https://github.com/vguhesan/devnotes-virtualbox>

- ▶ Rocky Linux: <https://rockylinux.org/>
- ▶ <https://cdimage.ubuntu.com/jammy/daily-live/current/>
- ▶ RHEL Download:
<https://developers.redhat.com/products/rhel/download>
- ▶ VirtualBox Downloads:
https://www.virtualbox.org/wiki/Linux_Downloads
- ▶ VirtualBox User Guide:
<https://www.virtualbox.org/manual/>
- ▶ Linux variants for macOS (apple silicon)
 - ▶ <https://asahilinux.org/about/>
 - ▶ <https://cdimage.ubuntu.com/jammy/daily-live/current/>
 - ▶ <https://rockylinux.org/download>
- ▶ How-to PostgreSQL?
 - ▶ <https://www.cherrysevers.com/blog/how-to-install-and-setup-postgresql-server-on-ubuntu-20-04>
 - ▶ <https://www.directedignorance.com/blog/upgrading-postgresql-14-to-16-on-ubuntu>



THANK YOU