

[Daniel Francis](#)

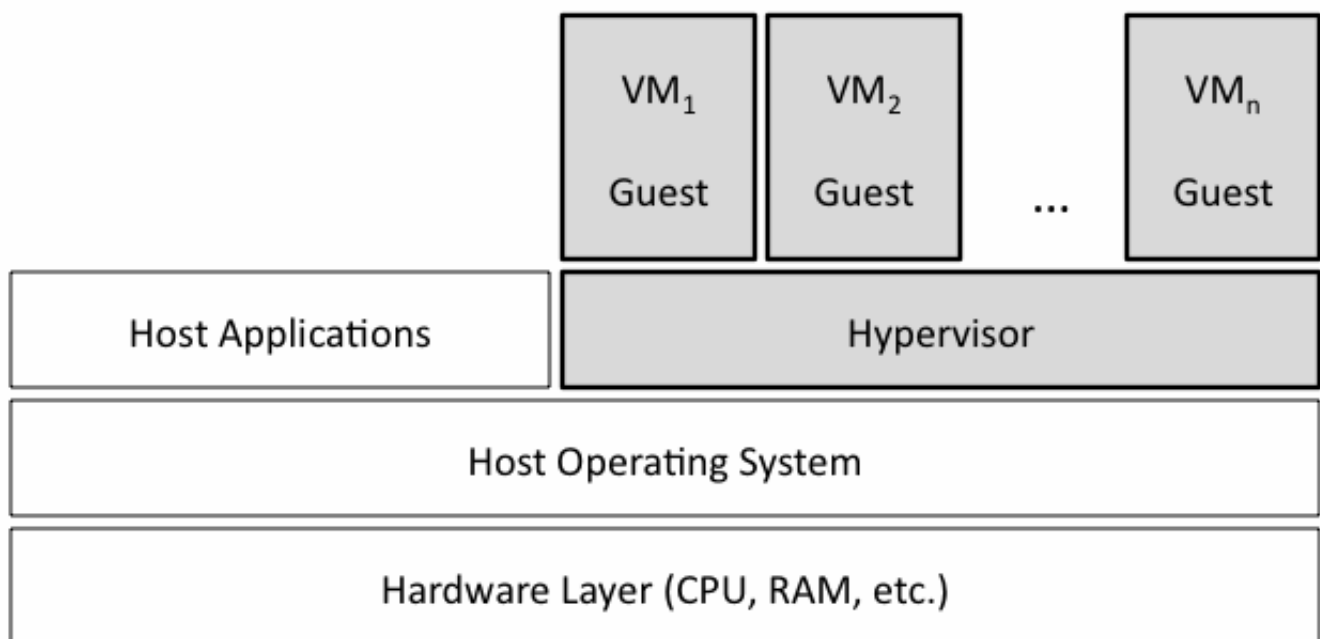
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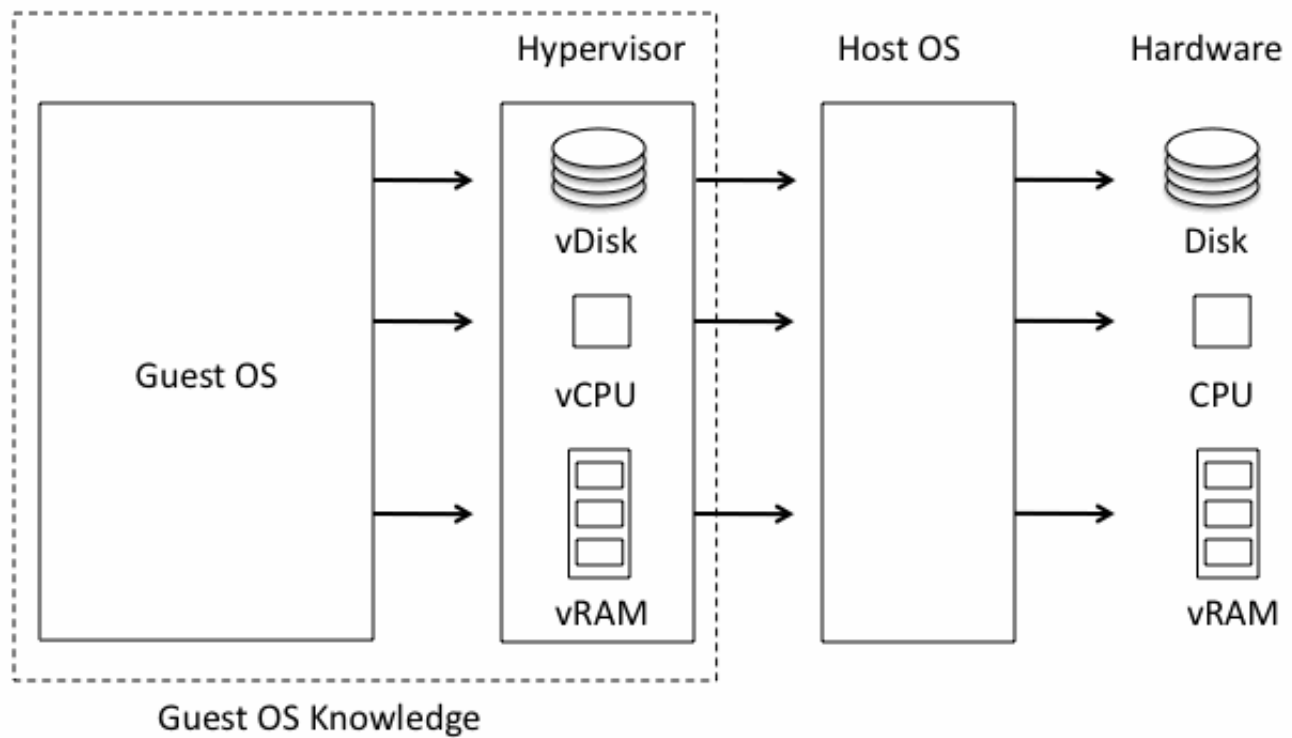
Linux Containers: A Lightweight Replacement for Virtual Machines

Jan 28th, 2014 | [Comments](#)

In the architecture of traditional virtual machines, there's a host operating system and virtual machines are loaded on it. Those virtual machines run a guest OS on emulated hardware.

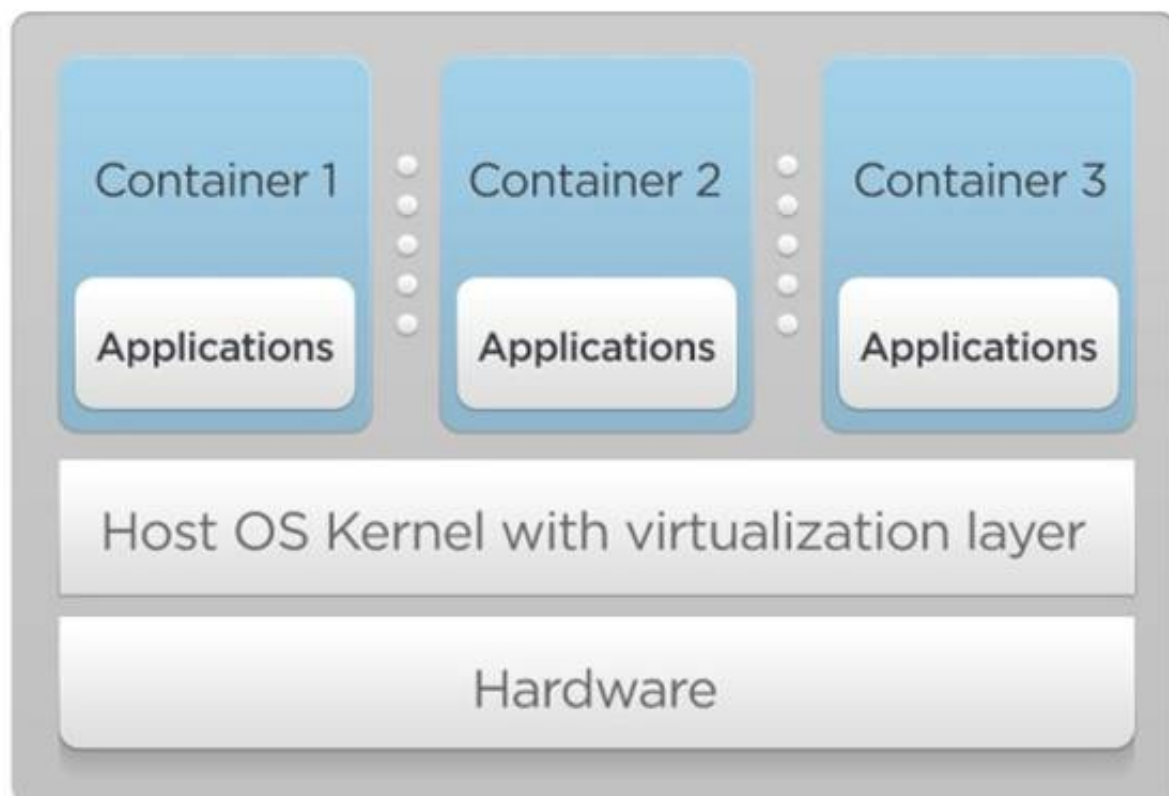


Architecture of a host system



Architecture of a guest system

In a container, there's no emulated hardware and there's no guest kernel.



One of the main advantages of containers is that you can have many containers running in the same computer without spending memory or making the machine slow.

Creating your first Linux Container

The installation of linux containers is very easy since Linux 2.6 because you don't need to patch the kernel.

The most common name for the package on distros is **lxc**. Anyway, if you are not using Debian or Ubuntu, I recommend to read instructions for your distro.

Now, lets create a container with Ubuntu!

This needs **debootstrap**, so if it wasn't installed as a dependency of lxc, do it manually.

```
1 $ sudo lxc-create -t ubuntu -n ubuntu-example
2 $ sudo lxc-start -n ubuntu-example
```

lxc-start turns on the container and it starts the command line for the guest system, asking for user "ubuntu" and password "ubuntu". You can use the argument *-d* to start it as a daemon and connect to it later.

The way to open a new console for a container is the command *lxc-console*.

You can list all containers with *lxc-ls* and see if it is running with *lxc-info -n ubuntu-example*.

Networked containers

By default the container will not be connected to the internet. The difficult part of containers is that users need to be familiar with Linux bridges.

If you are an advanced Linux user, you can do lot of things emulating network on a container. If you are just looking to get your container connected to the internet, there's a short way to configure it.

[The Debian Wiki](#) suggests the **libvirt** default network.

Once it is configured you can know the IP for a container using *ifconfig* inside it and emulate the connection to a real computer.

Shared directories

Containers are simple chrooted environments. Each container has a directory inside **/var/lib/lxc**. If well you can add files manually or mount the shared folder, there's an *fstab* file inside each container directory.

The line for a shared directory looks like:

```
1 /home/user/directory    home/ubuntu/directory    none    bind    0    0
```

Integration with Vagrant

In my job people use Vagrant with a VirtualBox provider in their development environments. There's a provider for linux containers which is called [vagrant-lxc](#). For forwarding ports it requires the package *redirect*.

Instead of Vagrant, you can use the [Docker](#) container engine.

Resources

- [Linux Containers](#)
- [Debian Wiki](#)
- [Vagrant LXC](#)
- [Blog post about Vagrant and LXC](#)
- [Docker](#)

Posted by Daniel Francis Jan 28th, 2014 [Linux](#), [chroot](#), [lxc](#)



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