Using QEMU & Kernel Virtual Machine (KVM) on CentOS 7

x86_64 Virtualization

- Lots of virtualization software products out there.
- VMware - desktop (Workstation) and server (ESXi)
- VirtualBox - desktop product and semi server support
- QEMU-KVM - great all around virtualization package
- Docker Containers (Solaris & FreeBSD did it first)
- All have positives and negatives. Best fit depends on problem you're trying to solve.

CentOS 7 & Systemd

- A build of RHEL without the trademarked red hats all over everything.
- RHEL stability without RHEL “support” cost.
- Fully moved to systemd. Frankly, I like systemd, I use it everyday.
- (If you don’t like systemd, be sure to let this man know: http://0pointer.de/lennart/)
- Not that great as a desktop system, you’re better served by Fedora, Ubuntu, Debian, Mint, etc…
- Great server OS due to limited changes and back ported security fixes.
- (yum install bash-completion)

QEMU + KVM

- What is **QEMU**? - Queasy Egrets Manhandling Ubuntu?
- No, **Q**uick **Emu**lator
- What is **KVM**? - Keyboards, Videos, and Mouses?
- No, **K**ernel **V**irtual **M**achine
- How are they related?

Installing QEMU-KVM

- CentOS
  - **yum** install kvm virt-manager libvirt virt-install qemu-kvm xauth dejavu-lgc-sans-fonts
- Ubuntu / Debian
  - **apt-get** install cpu-checker qemu-kvm libvirt-bin virt-manager

Virtual Networking

- A **bridge** is a like a virtual switch
- Virtual machine network interfaces are connected to bridges
- Bridges are connected to physical interface ports on the hypervisor
- In this configuration, all traffic is routed through the bridge interface before leaving the hypervisor

Networking Shenanigans

- CentOS 7 is a systemd based system, as such network interfaces **may** not be named with standard Linux nomenclature (eth0, eth1, etc…)

- http://www.freedesktop.org/wiki/Software/systemd/PredictableNetworkInterfaceNames/

- If **qemu-kvm** is installed, virbr0 is created by default but is setup for NATing

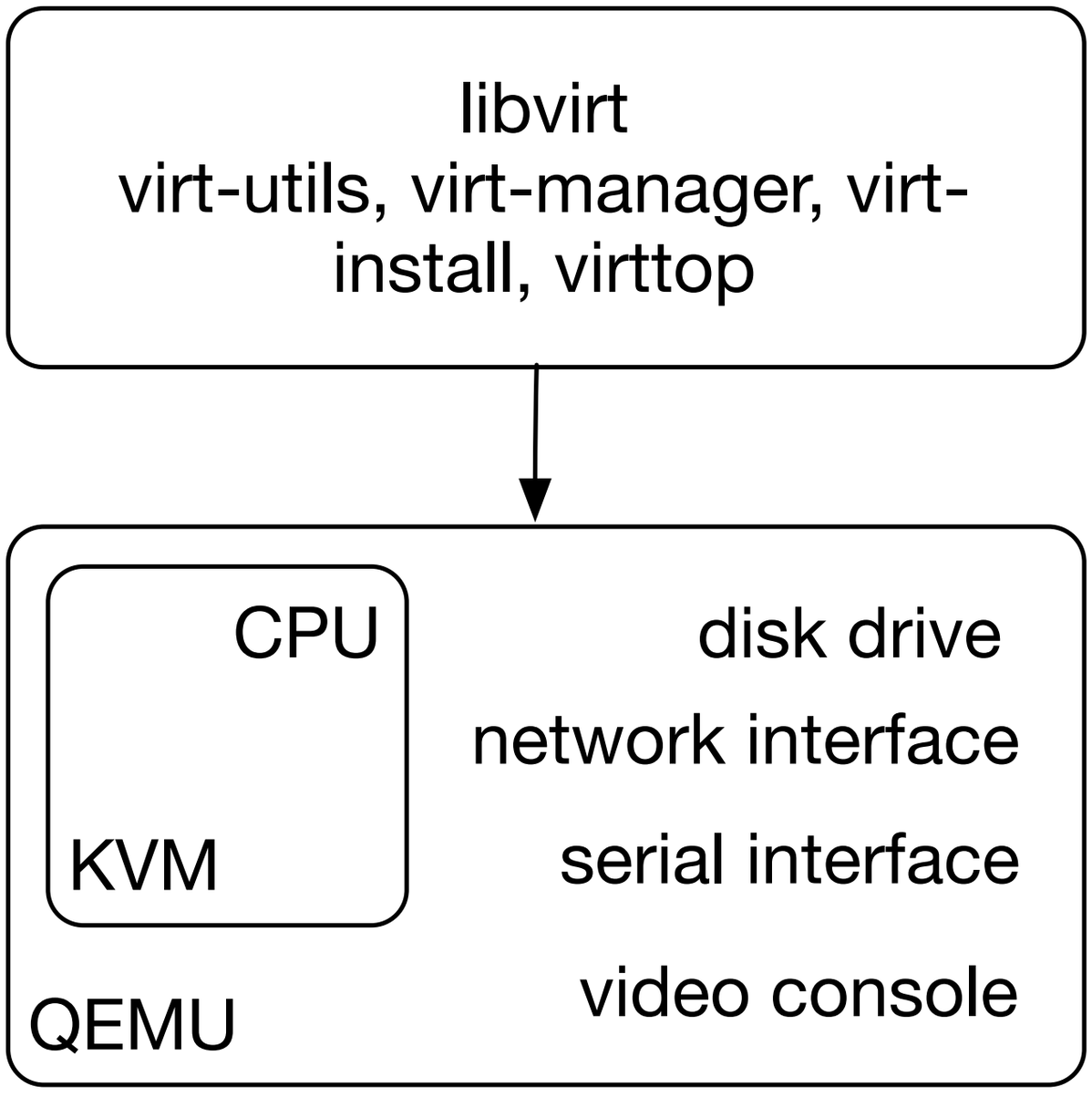
- You can create virbr1 to access the host network but requires removing IP from primary interface and IP-ing the bridge interface

Installing Virtual Machine with QEM-KVM

- Setup networking (if necessary)
- You can use virt-install or virt-manager to begin installation
- Connect ISO
- Boot and follow prompts

(Mostly) Useful Commands

- **virsh** - CLI based, very useful but unwieldy (XML) for folks new to linux
- **virt-manager** - GUI based, very useful but can be rage inducing for pros
- **virt-install** - install a VM! yay!
- **virttop** - top for VMs
- **virt-sysprep** - useful to pros for deploying many like virtual machines
- **virt-*** - many utilities that range in usefulness



Grossly Inaccurate Diagram of QEMU / KVM / libvirt Interaction

- libvirt
  - provides API for virtual machine management
  - virt-manager
  - virttop
  - virt-*
- QEMU
  - hardware emulation like disk drives, network interfaces, etc
- KVM
  - fast CPU emulation for x86_64 systems

Confused
and/or
Annoyed?

Demonstration

The End

https://github.com/jgrafton/svlug_kvm