



Virtualization with KVM(and Libvirt)

Red Hat

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Agenda

- 1 KVM Virtualization overview and architecture
- 2 libvirt, libguestfs and virt-tools
- 3 Demonstration
- 4 In the works/Upcoming



Section 1

KVM Virtualization overview and architecture

KVM overview

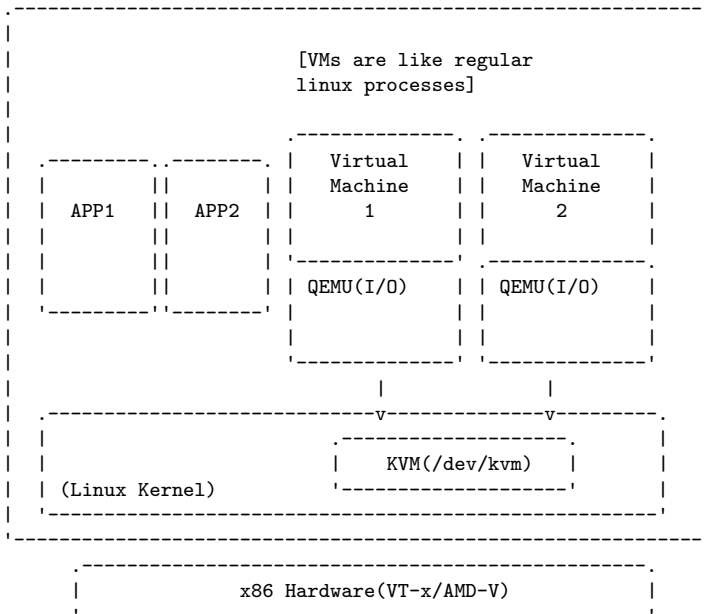
- Hardware-assisted
 - Uses CPU virtualization extensions(Intel-**vmx** /AMD-**svm**)
 - Enables a 'guest operating mode'

- A loadable kernel module

```
root@~$ modprobe -l | grep kvm
kernel/arch/x86/kvm/kvm.ko
kernel/arch/x86/kvm/kvm-intel.ko
kernel/arch/x86/kvm/kvm-amd.ko
root@~$
```

- Turns Kernel into hypervisor
 - **/dev/kvm** character device is used by user-space to create guests
 - Re-uses Linux kernel features — CPU scheduling, Memory mgmt, Power mgmt, Drivers...
 - Design & development driven by hardware specs

KVM Architecture

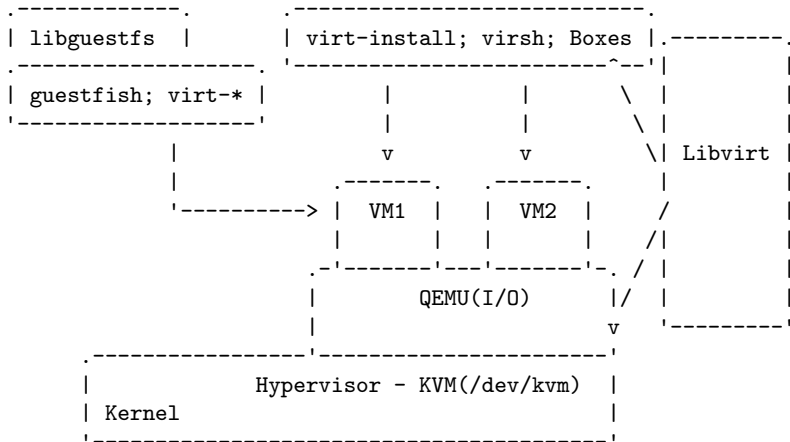




Section 2

libvirt, libguestfs and virt-tools

Libvirt and Virt tools overview



Libvirt

- A library, daemon, tool to manage virtual{machines, infrastructure}:
 - General VM life-cycle management
 - XML format to store/define VM configuration
 - Management shell interface – **virsh**
 - CPU Pinning
 - Manage: Devices, Networks, Snapshots, Storage pools. . .
 - Security: POSIX user/groups; sVirt(SELinux based)
 - **Plenty others. . .**

Libguestfs and virt-tools

- A library/API and a set of tools
 - Inspect, edit, resize, rescue VM disk images
 - **GUEST** Filesystem Interactive **SHell** – **guestfish**
 - Scriptable using guestfish or lang. bindings{python, perl, ruby...}
 - **libguestfs** based virt tools — virt-inspector, virt-cat, virt-edit, virt-rescue, virt-*



Section 3

Demonstration



Section 4

In the works/Upcoming

What's next

- Quite a few interesting things. A random list:
 - Live snapshots/ Live migration
 - Qcow2 (v3)
 - Security: Sandboxing
 - Storage : Virtio-scsi
 - PCI Device assignment enhancements
 - Nested Virt
 - Plenty others...

References



Fedora virt

https://fedoraproject.org/wiki/Getting_started_with_virtualization



KVM website

<http://www.linux-kvm.org/>



libvirt website

<http://www.libvirt.org/>



libguestfs

<http://libguestfs.org/>



virt-tools based on libvirt and libguestfs

<http://virt-tools.org/>



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The end.

Thanks for listening.