

Virtualization with **libvirt**

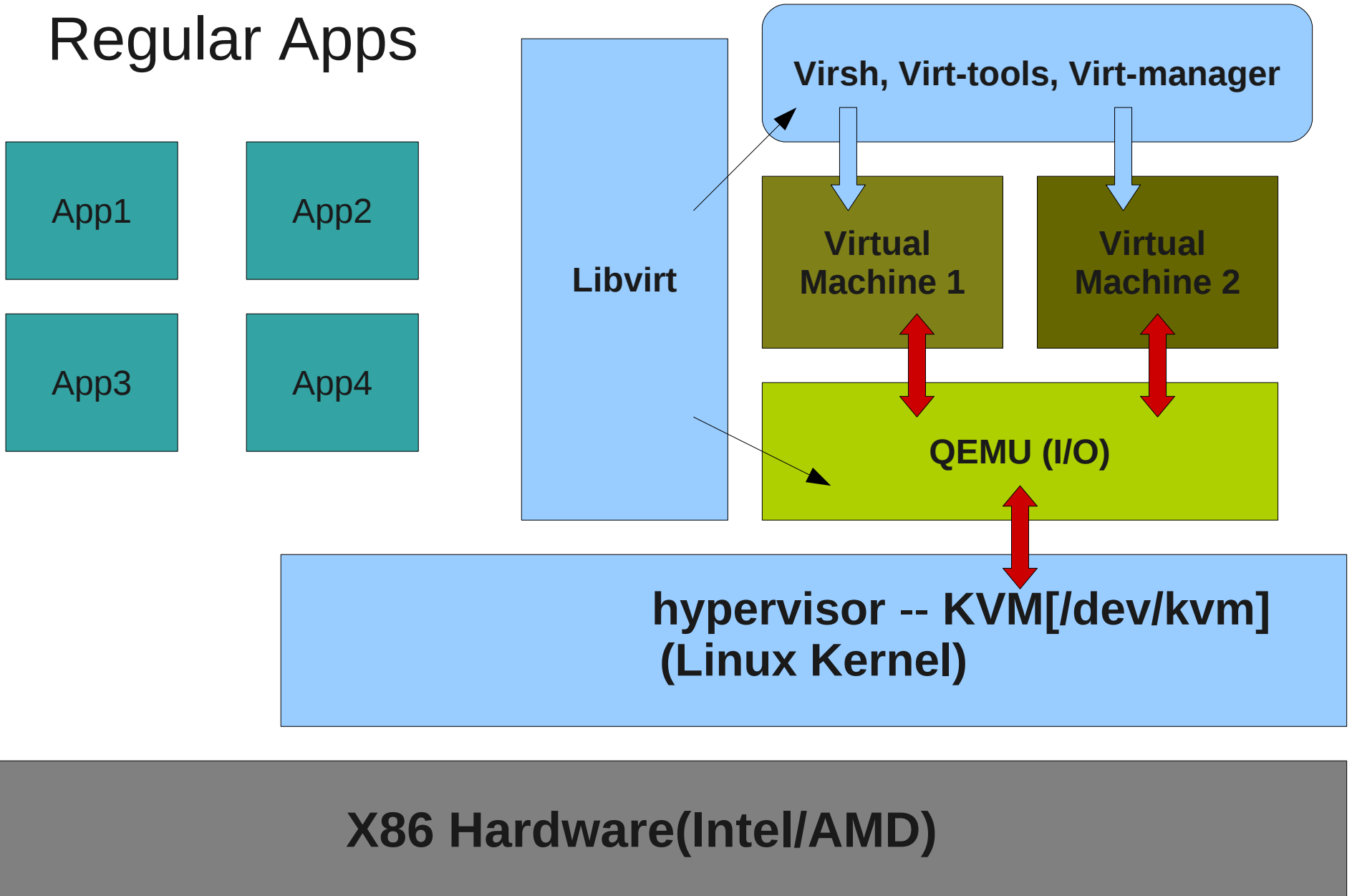
Kashyap Chamarthi

Outline

- 1/ Virt Architecture
- 2/ What Libvirt
- 3/ Terminology
- 4/ Virtualization Shell
- 5/ Common virsh operations
- 6/ Snapshots
- 7/ Security
- 8/ Libguestfs
- 9/ Conclusion

Virt Architecture

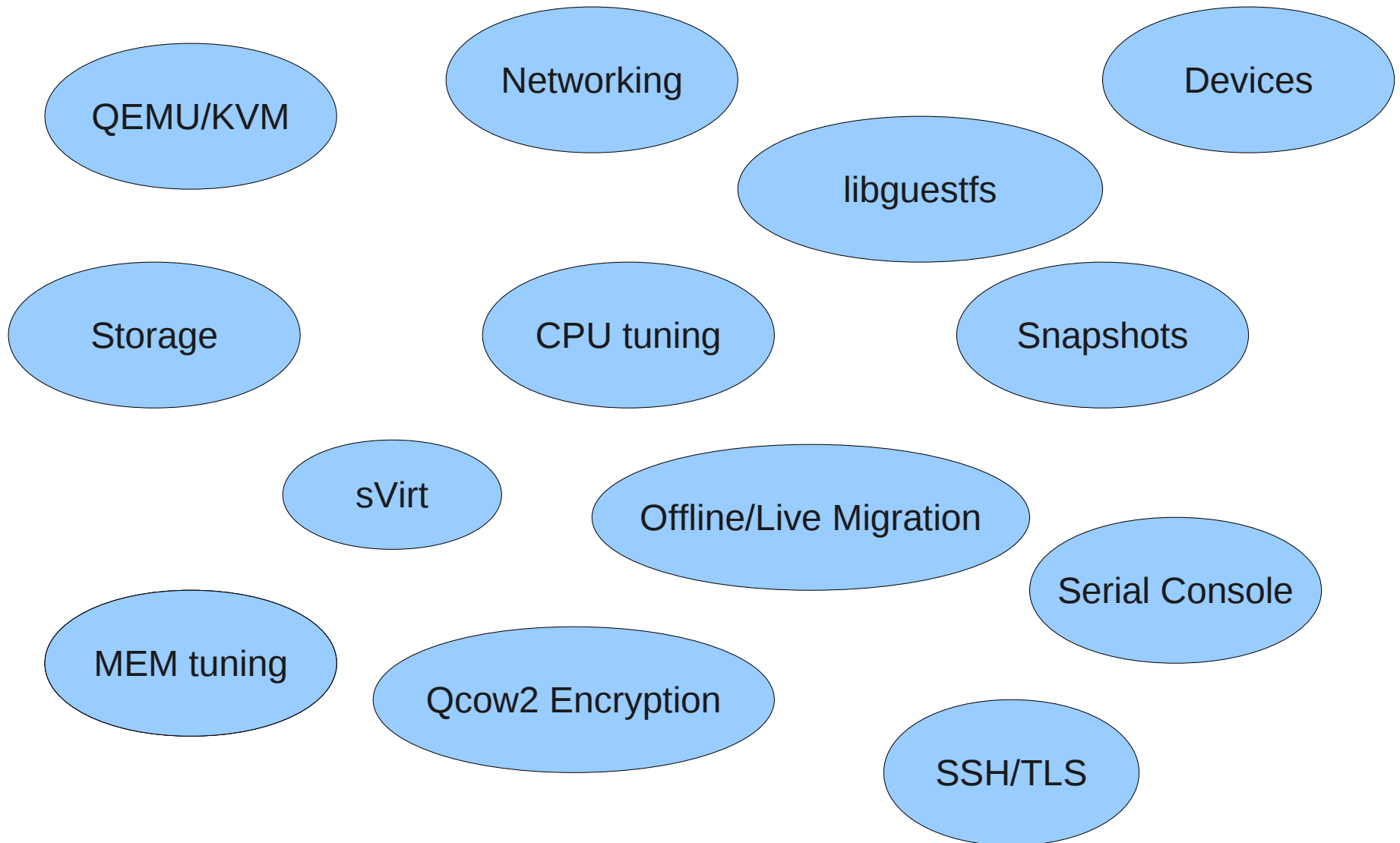
Regular Apps



OK, so, what the heck is libvirt?

- Library to securely manage Virtual Machines
 - Uses a client/server model
- Supports multiple hypervisors
 - **KVM**, QEMU, XEN, Virtualbox, LXC, and more
- XML format to define virtual machine
- Stable

More libvirt..



Terminology

- **node** – Physical machine/Bare Metal
- **domain** – Virtual machine/Guest machine
- **hypervisor** – A software layer which enables to run multiple operating systems

Virt-install Illustration1

- `virt-install --connect=qemu:///system \`
`--name fedora16 \`
`--disk /export/vmimgs/fedora16.img,size=5 \`
`--ram 1024 \`
`--vcpus=2 \`
`--check-cpu \`
`--hvm \`
`--cdrom /export/isos/Fedora-16-Beta-x86_64-`
`Live-Desktop.iso`

Virtualization shell

- A powerful shell interface to manage guests
 - **\$ virsh help host**
 - **\$ virsh capabilities**
 - **\$ virsh dominfo**

virsh examples

- **\$ virsh nodeinfo**
- **\$ virsh define lovelock1.xml**
- **\$ virsh start lovelock1**
- **\$ virsh shutdown lovelock1**
- **\$ virsh list --all**

More virsh operations

- Edit and define
 - **\$ virsh edit** lovelock1
- Save VM(or domain)
 - **\$ virsh save** lovelock1 savedlovelock1
 - **\$ virsh restore** savedlovelock1
- Connect to a remote virt-host
 - **\$ virsh --connect **
qemu+ssh://root@remotehostname/system

Libvirt Security

- Guests are run as unprivileged user – '**qemu**'
- **sVirt** - SELinux(Mandatory Access controls)
 - Integrated into libvirt qemu driver
- Example SELinux label for a VM
 - Syntax: USER:ROLE:TYPE:MCS label
 - **system_u:object_r:svirt_image_t:s0:c162,c597**
/export/vmimages/yellow.qcow2

Snapshots

- Currently supports Qcow2 disk image formats
 - **\$ virsh snapshot-create lovelock1**
- Types of snapshots
 - VM state
 - VM State is stored to a file ; Can restore instantly
 - Internal
 - Single file to move around ; Very handy
 - External
 - Uses backing files ; useful to creating templates

Libguestfs

- Read, Modify, Manage, Inspect disk images
- An interactive shell to access guest file-systems
- For a 'running' guest
 - **\$ guestfish -ro -i -a /path/to/disk-image**
- For an 'offline guest'
 - **\$ sudo guestfish -rw -i -a /path/to/disk-image**

Where else libvirt is used

- Virt-manager ; Boxes(gnome-shell integration)
- Virt-install (part of python-virtinst)
- Libguestfs and friends
- Oz – an automatic VM creator with minimal input
- Many cloud based projects – **aeolusproject**, **openStack**, **openNebula** etc

Try it out !

- <http://libvirt.org/>
- <http://virt-tools.org/>
- http://fedoraproject.org/wiki/Getting_started_with_v
- <http://aeolusproject.org/oz.html>
- <http://libguestfs.org/>
- <http://kashyapc.fedorapeople.org/virt/create-guest->

Thank You

<kashyapc@fedoraproject.org>

kashyap on irc.freenode.net

<http://kashyapc.fedorapeople.org/>

<http://kashyapc.wordpress.com/>