# KVM & LIBVIRT

by can.

# OVERVIEW

- KVM for "Kernel-based Virtual Machine"
- QEMU for "Quick EMUlator"
- kvm-qemu
- libvirt: a library to interact with virtualization hypervisors

# KVM

- XML based configuration
  - /etc/libvirt/qemu
- utilities include virsh, virt-manager
- libvirt:

```
import libvirt
connection = libvirt.open('qemu+ssh://root@210.25.137.233/system?socket=/var/run/libvirt/libvirt-sock')
```

# VM REMOTE ACCESS

- configure vm as responsive to all requests

```
<graphics type='vnc' port='-1' autoport='yes' listen='0.0.0.0'>
  <listen type='address' address='0.0.0.0'/>
</graphics>
```

- get runtime info using vm.XMLDesc()

```
<graphics type='vnc' port='5902' autoport='yes' listen='0.0.0.0'>
  <listen type='address' address='0.0.0.0'/>
</graphics>
```

- and of course ssh(needs public IP address)

# VM NETWORK

```
<interface type='network'>
  <source network='default'/>
  <model type='virtio'/>
  <address type='pci' domain='0x0000' bus='0x00' slot='0x03' function='0x0'/>
</interface>
```

- NAT forwarding(aka.“vitual network”)
  - default
  - /etc/libvirt/qemu/networks

```
<network>
  <name>default</name>
  <bridge name="virbr0" />
  <forward/>
  <ip address="192.168.122.1" netmask="255.255.255.0">
    <dhcp>
      <range start="192.168.122.2" end="192.168.122.254" />
    </dhcp>
  </ip>
</network>
```

- bridged(aka.“shared physical device”)
  - try replacing with Open vSwtich

# VM CLONE

- copy the image file
- copy the XML file and change some fields:
  - name
  - uuid
  - mac address

# TO BE SOLVED

- Open vSwitch & corresponding network configuration
- a minimum vm description/image
- anything else?

# USEFUL INFO

- Open vSwitch supports IPv6 since v1.4
- and better in 1.7

```
v1.7.0 - 30 Jul 2012
---------------------
    - kernel modules are renamed. openvswitch_mod.ko is now
      openvswitch.ko and brcompat_mod.ko is now brcompat.ko.
    - Increased the number of NXM registers to 8.
    - Added ability to configure DSCP setting for manager and controller
      connections.  By default, these connections have a DSCP value of
      Internetwork Control (0xc0).
    - Added the granular link health statistics, 'cfm_health', to an
      interface.
    - OpenFlow:
        - Added support to mask nd_target for ICMPv6 neighbor discovery flows.
          Added support for OpenFlow 1.3 port description (OFPMP_PORT_DESC)
          multipart messages.
```

```
v1.4.0 - 30 Jan 2012
---------------------
    - Compatible with Open vSwitch kernel mod
    - New "VLAN splinters" feature to work ar
      in old Linux versions.  (This feature is deprecated.  When
      broken device drivers are no longer in widespread use, we will
      delete this feature.)  See ovs-vswitchd.conf.db(5) for more
      information.
    - OpenFlow:
        - Added ability to match on IPv6 flow label through NXM.
        - Added ability to match on ECN bits in IPv4 and IPv6 through NXM.
        - Added ability to match on TTL in IPv4 and IPv6 through NXM.
          Added ability to modify ECN bits in IPv4.
        - Added ability to modify TTL in IPv4.
```

# ABOUT OUR THESIS

- testbed
- innovative points:
  - openflow?
  - distributed architecture? (“cloud”?)
  - experiments automation?
  - algorithm? (for what?)