Virtualization on Desktops

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What for?

- **security**  Guest is isolated from host
- **reliability** Guest is host independent
- **recovery** Guest can be saved at any point
- **testing** One can run many different environments
- **shareability** Guest can be shared among multiple users
Stable: protection from hypervisor API changes
Portable: Linux, Windows, OS-X, ...
Secure: TLS, SASL, (lib-)SSH, PolicyKit
Simple: rapid application development
Open: LGPLv2+
Supported HV: QEMU, KVM, ESX, Xen (XenD, XenStored, Xen Hypervisor), LXC, VirtualBox, UML, Hyper-V, OpenVZ, Phyp, VMWare, test
What else?

► Storage: LVM, disk, SCSI, iSCSI, NFS
► Network: bridge, bonding, vlan, VEPA, OpenVSwitch
► QoS, filtering (iptables + ebtables)
► CGroups: CPU, memory, disk I/O limits
► PCI/USB device passtrhough
► Guest agent
► Host management
libvirt

Language bindings:
- Core: C
- Perl, Python, Java, Ocaml, Ruby, C#, PHP

Mappings to different models:
- CIM/DMTF: libvirt-cim
- AMQP/QMF: libvirt-qmf
- SNMP: libvirt-snmp
- GObject: libvirt-glib
virsh

```
zippy@bart ~ $ virsh -c qemu:///system
Welcome to virsh, the virtualization interactive terminal.
Type: 'help' for help with commands
    'quit' to quit

virsh # list --all
  Id  Name    State
  ----  ------  -----
   1    f17    running
-    f16    shut off
-    f16_nfs shut off
-    win7    shut off

virsh # start f16
Domain f16 started
```

CLI for managing libvirt
virsh

- Nearly every API is exposed
- Ported to many platforms: Linux, OS-X, Windows, Solaris, ...
- Capable of talking to some HVs directly
- Remote access
- Stable output ⇒ easily usable in scripts
Desktop management UI
Other virt-* utilities

- virt-what
- virt-top
- virt-dmesg
- virt-addr
- virt-install
- virt-clone
- virt-image
libguestfs

- **virt-df**  guest filesystem usage
- **virt-cat** read file
- **virt-ls**  list directory
- **virt-resize** change virtual disk size
- **virt-win-reg** edit Windows registry
- **virt-v2v** covert guests between hypervisors
- **guestmount** mount guest disk via FUSE
Sandbox on the top of LXC/KVM with libvirt

- Host filesystem passthrough bind mounts or P9FS
- Small overheads: LXC 200ms, KVM 3000ms
- Boot kernel+initrd (KVM) “init” binary (LXC)

Usage scenarios: run apache per virtual host inside sandbox, mock RPM build
Where to go?

- Libvirt http://libvirt.org
- libguestfs http://libguestfs.org
- libvirt-sandbox http://berrange.com/tags/sandbox/

GNOME Shell - not standalone mgmt applications, but virtualization builtin desktop(gnome-boxes)
The End

Questions?