



# 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

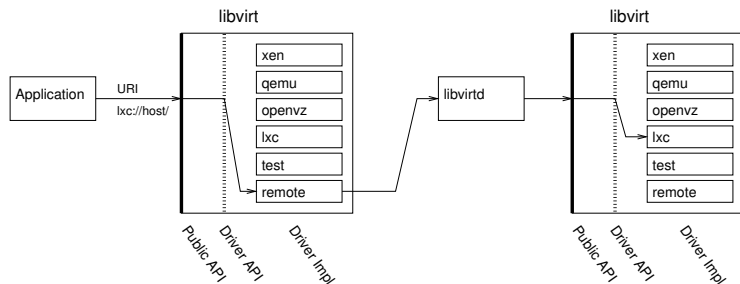




- ▶ Stable: protection from hypervisor API changes
- ▶ Portable: Linux, Windows, OS-X, . . .
- ▶ Secure: TLS, SASL, (lib-)SSH, PolicyKit
- ▶ Simple: rapid application development
- ▶ Open: LGPLv2+



## Basic structure



- ▶ 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 + ebttables)
- ▶ CGroups: CPU, memory, disk I/O limits
- ▶ PCI/USB device passthrough
- ▶ Guest agent
- ▶ Host management



## 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



```
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
```

```
virsh # █
```

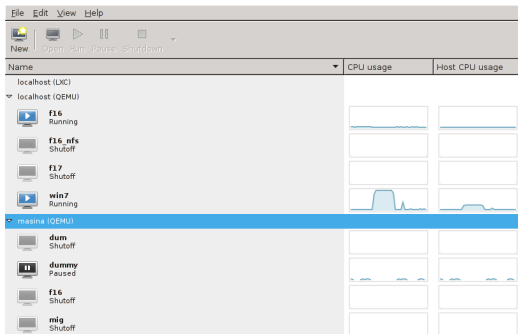
CLI for managing libvirt



- ▶ 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



`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

```
zippy@bart ~ $ virt-sandbox -p -c lxc:/// /bin/date  
Mon Apr 30 21:21:46 CEST 2012  
zippy@bart ~ $ █
```

- ▶ 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?

