



Virtualization on Desktops

Michal Privozník
mprivozn@redhat.com

Linuxwochen Wien 2012

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

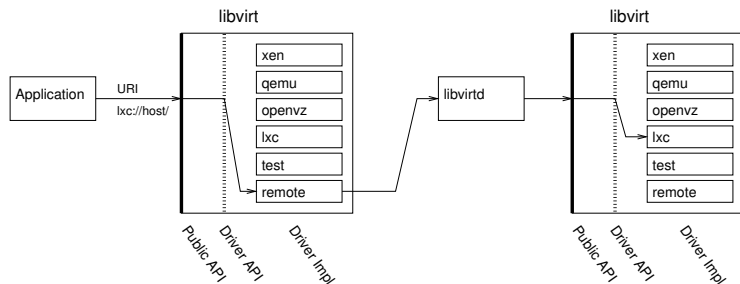




- ▶ Stable: protection from hypervisor API changes
- ▶ Portable: Linux, Windows, OS-X, ...
- ▶ Secure: TLS, SASL, (lib-)SSH, PolicyKit
- ▶ Simple: rapid application development
- ▶ Open: LGPLv2+



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
```

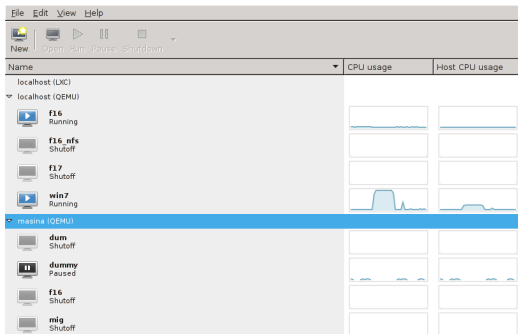
```
virsh # █
```

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?

