

Virtualization

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fedora 

What?

- Guest virtual machines
- Run multiple OSes on a single host
- Support from modern hardware



Why?

- Test rawhide
- Play with other distros
- Run windows
- Server consolidation
- Migration



How?

- `yum groupinstall Virtualization`
- `virt-manager`



Previously - Xen

- Standalone hypervisor
- Paravirtualization
- Dom0 not upstream



Now - KVM

- `kvm.ko`
- VM is just a process
- Uses Intel VT or AMD SVM
- Paravirt too
- Simple, secure, fast



Cool Features

- Save/restore
- Live migration
- PCI/USB device assignment
- Swapable guest memory
- Ballooning
- KSM



libvirt

- A VM management API
- e.g. list VMs, start/stop VM
- XML format to describe VMs
- Hypervisor independent - KVM, Xen, LXC, VirtualBox, UML, ESX, ...



libvirt – There's More

- Storage and networking management too
 - Storage pools and volumes
 - Virtual networks
 - Host network interface configuration
- Remote management
- Language bindings – C, Python, Perl, Ruby, OCaml, Java, C#



Virtual Machine Manager

- Simple UI
- Easy to create a VM
- Monitoring
- Hotplug
- Remote management



Virtual Machine Manager

File Edit View Help

View: All virtual machines

Name	ID	Status	CPU usage	Memory usage
localhost	qemu	Active	22.99 %	2.00 GB 51 %
f11	4	Running	16.99 %	1024.00 MB 51 %
xp	2	Running	6.00 %	1024.00 MB 51 %

Delete New Open

New VM

Create a new virtual machine
Step 2 of 5

Provide the operating system URL

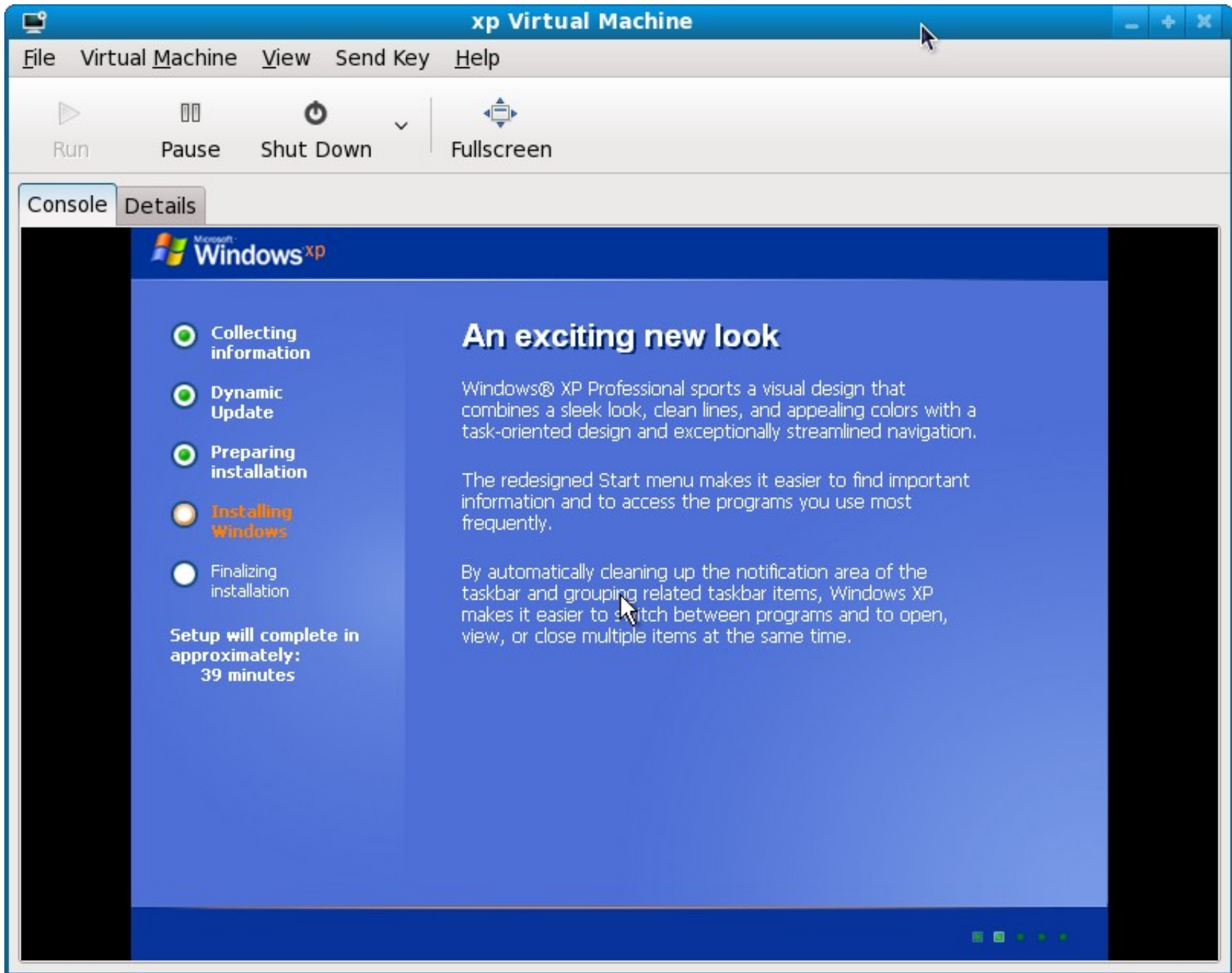
URL:

Kickstart URL:

Kernel Options:

Automatically detect operating system based on install media

OS Type: Linux
Version: Fedora 11



virt-install

- Kick off a guest install from the command line

```
$> virt-install -n MyGuest -m 512 \
```

```
    --disk pool=default,size=8 \
```

```
    --network:default \
```

```
    -l http://download.fedoraproject.org/.../x86\_64/os
```



Misc. Tools

- `virt-clone/virt-image/virt-convert`
- `xenner` – run Xen guests in KVM
- `virt-top` – 'top' for VMs
- `virt-ps/virt-uname/virt-dmesg` – poke VMs



Get Involved

- list: fedora-virt@redhat.com
- <http://fedoraproject.org/wiki/Virtualization>
- #virt on irc.oftc.net
- Test days
- Bugzilla - fedora-virt-maint@redhat.com
- Regular status reports



Foo

- Bar

fedora^f

Virtio

- Bus for paravirt devices
- PCI based
- Ring buffers
- virtio_net packet flow

KVM Memory Management

- Shadow page tables
- Cached shadow
- Out-of-sync shadow
- Paravirt MMU
- NPT/EPT



Best For Last - libguestfs

- library for accessing guest disk images
- guestfish shell
- virt-inspector
- Xen to KVM migration tools
- Go to the libguestfs hackfest
- <http://libguestfs.org>



A Word On Appliances

- Download and run a VM
- Great opportunity for developers
- Hyped too early, still in their infancy

