



Support oVirt on Ubuntu

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Agenda

- Why Ubuntu?
- Our focus and status
- Support VDSM on Ubuntu
- Support oVirt Guest Agent on Ubuntu
- Support Spice-XPI on Ubuntu
- Q&A

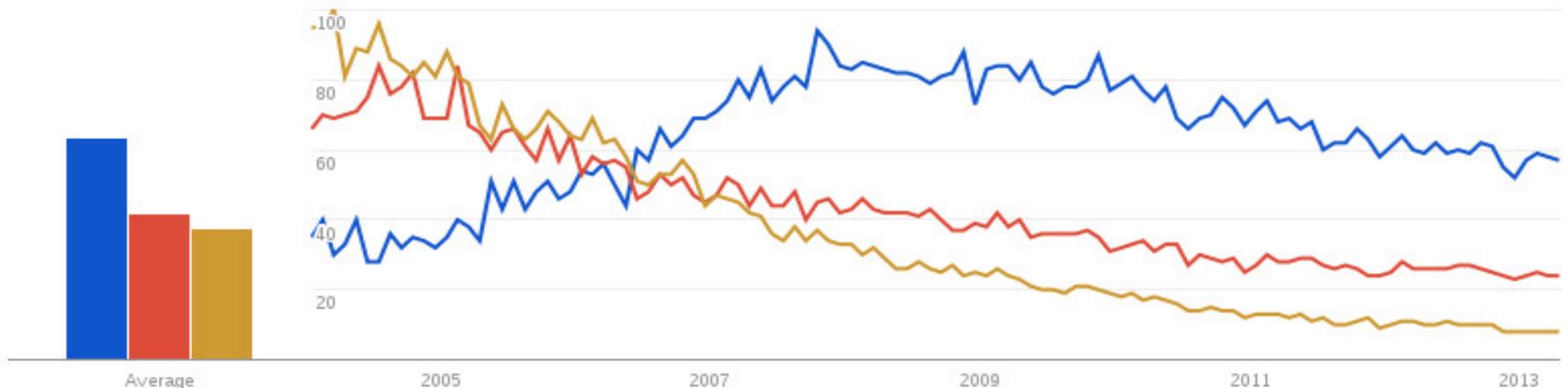
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Why Ubuntu?

- Google Trends

- Blue: Linux Debian Server + Linux Ubuntu Server
- Red: Linux Red Hat Server + Linux Fedora Server + Linux CentOS Server
- Yellow: Linux Slackware Server + Linux SUSE Server



- Trends data do not necessary mean Ubuntu is a better server distribution or gets more market share on servers, but it means that Ubuntu is really popular and is a big Linux player.

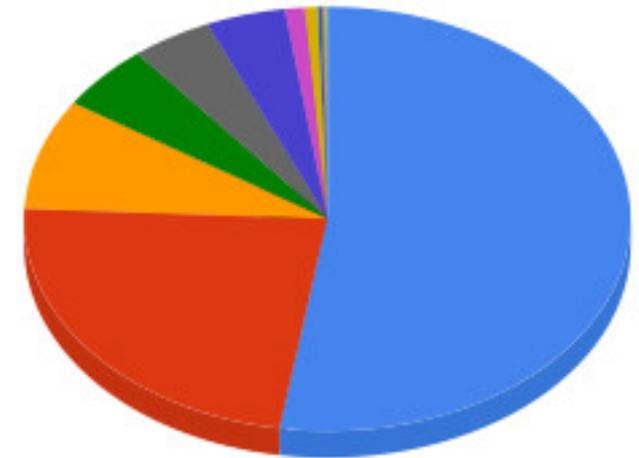
Why Ubuntu? - Benefit to oVirt



- Ubuntu is also popular as a guest OS in cloud ([Link](#))

- Benefit to oVirt:

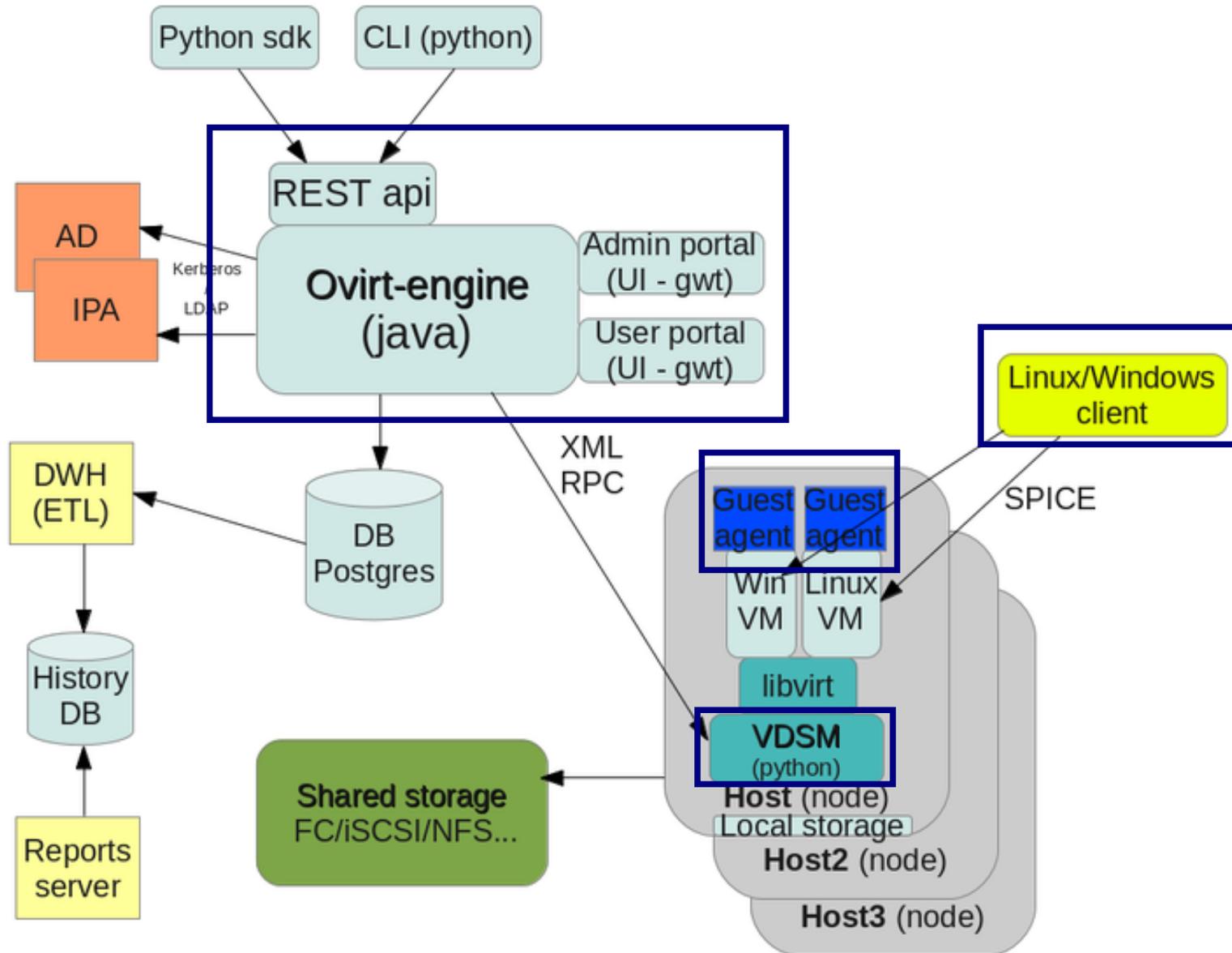
- Attract Ubuntu users
- Attract developers works on Ubuntu
- Make oVirt easier to deploy for novice
- Optimize user experience of Ubuntu guests
- Make oVirt easier to run on other systems
 - SUSE, Debian, ...
- Involve the Debian/Ubuntu community
- Improve oVirt community diversity



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Our Focus and Status - Overview



Our Focus and Status - Detail

- Targeted Ubuntu Release: 12.10 and 13.04
- VDSM
 - Build and install manually with hacks.
 - Pass most unit and functional tests (VM, NFS, iSCSI, LocalFS, GlusterFS). Upstream patches under review.
 - Add Ubuntu host to oVirt Engine with hacks.
- oVirt Guest Agent
 - Build and install manually with hacks.
 - Basic features are OK. Single Sign On does not work yet.
- Spice
 - Spice client in Ubuntu works well.
 - Spice-XPI
 - Build on Fedora and install on Ubuntu.

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Support VDSM on Ubuntu - Overview



- Storage
 - LocalFS, NFS, iSCSI, GlusterFS
- VM Life-cycle, Snapshot, Migration
- Network
- Detailed Incompatibilities
 - http://www.ovirt.org/VDSM_on_Ubuntu
- Working snapshot
 - <https://github.com/edwardbadboy/vdsm-ubuntu>
- Patches under review
 - <http://gerrit.ovirt.org/#/q/status:open+project:vdsm+branch:master+topic:ubuntu,n,z>

Support VDSM on Ubuntu - Service Management



- Complexity comes from
 - SysV init script does provide conflicting service declaration. VDSM init script have to shutdown them.
 - No respawn mechanism in SysV init system, VDSM provide its own.
 - Configure and reconfigure libvirt in the VDSM init script.
 - In RHEL6, configure libvirt to use Upstart rather than SysV. This is done in the VDSM init script.
 - Controls other service using Upstart and SysV commands.
 - Different service names, paths and command in Ubuntu.

Support VDSM on Ubuntu - Service Management



- Can not change it too dramatically, otherwise break existing products.
- Proposal
 - Implement an service management utility that covers SysV, Systemd, Upstart. Called by Init script.
 - `vdsm-tool service-start XXX`
 - Patches merged
 - Implement a `vdsm-tool` command to configure libvirt using `augtool`.
 - `vdsm-tool reconfigure`
 - Distro specific initiate/cleanup operations can be put VDSM hooks.
 - Make the service names configurable.

Support VDSM on Ubuntu - Packaging



- Complexity comes from
 - Some dependencies (build time) are in `configure.ac`, some (run time) in `vdsm.spec.in` .
 - `make install` can not install VDSM properly, have to run the post install scripts in the `vdsm.spec.in` .
 - Names of dependency packages are different in different systems.
- Proposal
 - List the common dependencies in `configure.ac`, then override the default dependencies in respective spec files. The spec files are managed by downstream distribution packagers.
 - Extract the post install actions out of `vdsm.spec.in` and put them in `vdsm-tool`, then port them to Ubuntu.

Support VDSM on Ubuntu - Packaging



- Missing dependencies in Ubuntu
 - sanlock-python and libvirt sanlock plugin
 - mom, sos, polycycoreutils-python, vhostmd, python-pthreading, tuned
- Dependencies in Ubuntu aren't new enough
 - sanlock, python-rtslib, M2Crypto
- Proposal
 - Ubuntu should provide all the dependency packages
 - Setup a Jenkins slave and run functional tests on Ubuntu host.

Step by Step - Build and Install VDSM on Ubuntu



- Prerequisites

- Install Ubuntu server 12.10

- aptitude install git git-email git-completion git-review git-man git-doc autoconf automake genisoimage gcc gdb make libtool libguestfs-tools polycoreutils sasl2-bin sysv-rc python-parted python-nose pep8 pyflakes python-libvirt python-dev python-ethtool python-pip python-m2crypto python-selinux python-rpm python-libguestfs selinux-utils fence-agents ntp iproute nfs-server nfs-client lvm2 e2fsprogs open-iscsi psmisc bridge-utils dosfstools glusterfs-client glusterfs-common multipath-tools libsanlock-dev libsanlock-client sanlock qemu-kvm-spice qemu-kvm qemu-utils python-rtlib libvirt0 libvirt-bin gnutls-bin augeas-tools
 - pip install threading rtlib-fb ; sudo add-apt-repository ppa:debugmonkeys/sosreport ; sudo apt-get update ; sudo apt-get install sosreport

- Build and install sanlock

- Uninstall existing sanlock and install libaio-dev libblkid-dev
 - git clone git://github.com/edwardbadboy/sanlock-ubuntu.git
 - run ubuntuInstall.sh to build and install sanlock.

- Build and install VDSM

- git clone git://github.com/edwardbadboy/vdsm-ubuntu.git
 - run ubuntuInstall.sh

Step by Step - Build and Install GlusterFS



- **Alternative 1: Build and Install GlusterFS from Source**
- Uninstall existing glusterfs and install prerequisites
 - `apt-get remove 'glusterfs.*'`
 - `apt-get install build-essential pkg-config 'autoconf.*' 'automake.*' 'make' '*.libtool.*' flex bison libssl-dev libreadline6-dev lvm2 liblvm2-dev libfuse-dev libxml2-dev`
- Build and Install from Source
 - `wget http://download.gluster.org/pub/gluster/glusterfs/3.4/3.4.0beta1/glusterfs-3.4.0beta1.tar.gz`
 - `./autogen.sh && ./configure --prefix=/usr --sysconfdir=/etc --localstatedir=/var --enable-bd-xlator && make && make install`
 - `update-rc.d glusterd defaults && service glusterd start`
- **Alternative 2: Install from GlusterFS Official PPA**
 - Currently GlusterFS packaged in this PPA does not enable XML, but VDSM need this. You can use this PPA once it enables XML support.
- Import the GlusterFS PPA
 - `apt-get install software-properties-common`
 - `add-apt-repository ppa:semiosis/ubuntu-glusterfs-3.4`
- Install or Upgrade to Latest GlusterFS
 - `apt-get update`
 - `apt-get install 'glusterfs.*'`
 - `initctl status glusterfs-server`

Step by Step - Setup GlusterFS Testing Volume



- Backend of the Brick
 - `mkdir /testGlusterBrick && chmod 777 /testGlusterBrick`
- Start gluster shell
 - `gluster> volume create testvol
YOUR_HOST_NAME:/testGlusterBrick`
 - `gluster> volume start testvol`
 - `gluster> volume set testvol server.allow-insecure on`
- Edit `/etc/glusterfs/glusterd.vol`
 - add `"option rpc-auth-allow-insecure on"`

Step by Step - Run VDSM Functional Tests on Ubuntu



- Make a dumb NFS export in /etc/exports then start nfs-kernel-server, otherwise the nfs server shutdown automatically when there is nothing to export.
- `chmod a+r /boot/vmlinuz-* /boot/initrd.img-*`
- Start VDSM service, `cd /usr/share/vdsm/tests`
- Storage Domain V1 Tests
 - `./run_tests.sh functional/xmlrpcTests.py`
- Storage Domain V3 Tests with sanlock
 - Edit `/usr/share/vdsm/tests/functional/xmlrpcTests.py`, find “def `_createStorageDomain`”, change “`createStorageDomain(..., 0)`” to “3” in the function body
- Cover iSCSI domain, NFS domain, LocalFS domain, GlusterFS domain, VM creation with storage. ([WIKI](#))

Step by Step - Add Ubuntu Host to Engine



- Build and install VDSM on Ubuntu
 - Edit `/usr/share/vdsm/dsaverion.py`, add 3.2 to supported engine list, restart `vdsmd`.
- Prerequisites
 - aptitude install `iproute dmidecode python-dmidecode openssl m2crypto`
 - Edit `/etc/hosts` add your Engine host name.
 - Enable root: `sudo passwd root`
- Tuned
 - aptitude install `python-decorator python-dbus python-gobject python-pyudev`
 - `git clone git://github.com/edwardbadboy/tuned-ubuntu.git`
 - `make install`

Step by Step - Add Ubuntu Host to Engine



- Add ovirtmgmt bridge
 - Edit /etc/network/interfaces
 - Comment out the lines like follow

```
# auto eth0
# iface eth0 inet dhcp
```
 - Add following lines

```
auto ovirtmgmt
iface ovirtmgmt inet dhcp
    bridge_ports eth0
    bridge_stp off
```
 - service networking restart
 - “brctl show” will list the ovirtmgmt and eth0 is the slave.

Step by Step - Add Ubuntu Host to Engine



- Unpack the hacked ovirt-host-deploy.
- Provision a cluster, add the Ubuntu host to Engine in the web admin GUI as usual.
- Manage Storage
 - Create storage domain, attach ISO domain as usual.
- Manage VM
 - Create a VM with disk, attach ISO image, and install guest OS as usual.
 - After upload guest OS .iso, add a+r to the uploaded images in the ISO_DOMAIN, otherwise VDSM ignores it. (A Bug ?)
 - Create disk snapshot, live migrate VM

Support VDSM on Ubuntu - Screen Capture



- Two Ubuntu host respectively manage iSCSI and NFS storage domains.

The screenshot displays the oVirt Open Virtualization Manager interface. The top navigation bar includes the oVirt logo, the text "Open Virtualization Manager", and a user login status "Logged in user: admin@internal | Configure | Guide | About | Sign Out". Below this is a search bar with the text "Host" and a search icon. The main content area is divided into several tabs: "Data Centers", "Clusters", "Hosts", "Networks", "Storage", "Disks", "Virtual Machines", "Pools", "Templates", "Volumes", "Users", and "Events". The "Hosts" tab is selected, showing a table of hosts. The table has columns for Name, Hostname/IP, Cluster, Data Center, Status, Virtual Machines, Memory, CPU, Network, and SPM. Two hosts are listed: ubuntuHost0 (192.168.133.2, UbuntuCluster, UbuntuCluster, Up, 0 VMs, 9% Memory, 1% CPU, 0% Network, SPM) and ubuntuHost1 (192.168.133.108, Ubuntu/ISCSICluster, ISCSICluster, Up, 0 VMs, 7% Memory, 3% CPU, 0% Network, SPM). Below the table, there are tabs for "General", "Virtual Machines", "Network Interfaces", "Host Hooks", "Permissions", and "Hardware Information". The "General" tab is selected, showing details for the selected host (ubuntuHost0). The details include OS Version (Debian - wheezy/sid), Kernel Version (3.5.0 - 27-generic), KVM Version (1.2.0+noroms-0ubuntu2.12), LIBVIRT Version (libvirt-0.9.13-0ubuntu12.2), VDSM Version ([N/A]), SPICE Version (0.12.0-0ubuntu1), iSCSI Initiator Name (iqn.1993-08.org.debian:01:5), Active VMs (0), CPU Name (Intel SandyBridge Family), CPU Type (Intel Xeon E312xx (Sandy B)), CPU Sockets (1), CPU Cores per Socket (1), CPU Threads per Core (1 (SMT Disabled)), Physical Memory (3954 MB total, 277 MB used), Swap Size (4093 MB total, 0 MB used, 4093 MB free), Shared Memory (0%), Max free Memory for scheduling new VMs (3633 MB), Memory Page Sharing (Active), and Automatic Large Pages (Always). Below the details, there is an "Action Items" section with a warning icon and the text "Power Management is not configured for this Host. [Enable Power Management](#)". The bottom status bar shows "Last Message: 2013-Apr-22, 14:52" with a green checkmark, "User admin@internal logged in.", and icons for "Alerts (0)", "Events", and "Tasks (0)".

Name	Hostname/IP	Cluster	Data Center	Status	Virtual Machines	Memory	CPU	Network	SPM
ubuntuHost0	192.168.133.2	UbuntuCluster	UbuntuCluster	Up	0	9%	1%	0%	SPM
ubuntuHost1	192.168.133.108	Ubuntu/ISCSICluster	ISCSICluster	Up	0	7%	3%	0%	SPM

General

OS Version: Debian - wheezy/sid
Kernel Version: 3.5.0 - 27-generic
KVM Version: 1.2.0+noroms-0ubuntu2.12
LIBVIRT Version: libvirt-0.9.13-0ubuntu12.2
VDSM Version: [N/A]
SPICE Version: 0.12.0-0ubuntu1
iSCSI Initiator Name: iqn.1993-08.org.debian:01:5

Active VMs: 0
CPU Name: Intel SandyBridge Family
CPU Type: Intel Xeon E312xx (Sandy B)
CPU Sockets: 1
CPU Cores per Socket: 1
CPU Threads per Core: 1 (SMT Disabled)

Physical Memory: 3954 MB total, 277 MB used,
Swap Size: 4093 MB total, 0 MB used, 4093 MB free
Shared Memory: 0%
Max free Memory for scheduling new VMs: 3633 MB
Memory Page Sharing: Active
Automatic Large Pages: Always

Action Items

Power Management is not configured for this Host. [Enable Power Management](#)

Support VDSM on Ubuntu - Summary



- VDSM
 - Lots of hacks, will submit long term solution patches to upstream.
- Tuned
 - Modify the Makefile. Add a script to build and install Tuned. Write an Upstart job.
 - Maybe I can submit patches to upstream.
- oVirt-host-deploy
 - Lots of hacks to skip package checking, service management and bridge management.
 - Lots of works to do. Need to add new backend plugins to otopi then port ovirt-host-deploy. Need help from the upstream developers.

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Support oVirt Guest Agent on Ubuntu - Overview



- Guest Information Collecting and Sampling
 - All works.
- Actions
 - Lock screen and shutdown work.
 - Single Sign On: Need to implement a LightDM plugin.
- Notifications
 - Heartbeat, user information work.
- Detailed Status
 - <http://www.ovirt.org/Ubuntu/GuestAgent>
- Working snapshot
 - <https://github.com/edwardbadboy/ovirtagent-ubuntu>

Step by Step - Build and Install oVirt Guest Agent on Ubuntu Guest



- `apt-get install openssh-server screen spice-vdagent`
- `apt-get install git git-doc git-man git-completion gitk git-gui make gcc libtool autoconf automake libpam-dev pep8 usermode python-ethtool python-dev python-dbus`
- `git clone git://github.com/edwardbadboy/ovirtagent-ubuntu.git`
- `git checkout ubuntu`
- Run `ubuntuInstall.sh` to build and install the guest-agent.
- After a few minutes, you can see the guest IP address and login user name from Engine web GUI.

Support oVirt Guest Agent on Ubuntu – Screen Capture



oVirt Open Virtualization Manager

Logged in user: admin@internal | Configure | Guide | About | Sign Out

Search: Vms: cluster = UbuntuISCSICluster

Virtual Machines

Name	Host	IP Address	Cluster	Data Center	Memory	CPU	Network	Display	Status
Diskless			UbuntuISCSICluster	iSCSICluster	0%	0%	0%		Down
UbuntuDesktop1	UbuntuHost1	192.168.133.230	UbuntuISCSICluster	iSCSICluster	53%	14%	0%	SPICE	Up

Network Interfaces

Name	Plugged	Network Type	MAC	Speed	Port Mirroring
nic1	<input checked="" type="checkbox"/>	ovirtmgi Red Hat	00:1a:4:1000		

Guest Agent Data

Name	IPv4	IPv6	MAC
eth0	192.168.133.230	fe80::21a:4aff:fea8:85c:00:1a:4a:a8:85:ca	

Last Message: 2013-Apr-22, 23:39 User admin@internal logged in. Alerts (0) Events Tasks (0)

Support oVirt Guest Agent on Ubuntu – Screen Capture



oVirt Open Virtualization Manager

Logged in user: admin@internal | Configure | Guide | About | Sign Out

Search: Vms: cluster = UbuntuSCSICluster

Virtual Machines

New Server New Desktop Edit Remove Run Once Cancel Migration Make Template Export Change CD Assign Tags 1-2

Name	Host	IP Address	Cluster	Data Center	Memory	CPU	Network	Display	Status
Diskless			UbuntuSCSICluster	iSCSICluster	0%	0%	0%		Down
UbuntuDesktop1	UbuntuHost1	192.168.133.230	UbuntuSCSICluster	iSCSICluster	54%	6%	0%	SPICE	Up

General

Create Preview Commit Undo Delete Clone

Date	Status	Description
Current	OK	Active VM
2013-Apr-22, 23:37	OK	Update packages and install ovirt-gu

General

Defined Memory: 1024MB
Physical Memory Guaranteed: 1024MB
Number of CPU Cores: 1 (1 Socket(s), 1 Core(s) per S

Last Message: 2013-Apr-22, 23:45 User admin@internal logged in. Alerts (0) Events Tasks (0)

```
root@ubuntuDesktop1: /home/edward
root@ubuntuDesktop1: /home/edward# fdisk -l

Disk /dev/vda: 21.5 GB, 21474836480 bytes
255 heads, 63 sectors/track, 2610 cylinders, total 41943040 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x0008a8dd

   Device Boot      Start         End      Blocks   Id  System
/dev/vda1  *          2048     39845887   19921920   83   Linux
/dev/vda2                39847934   41940991    1046529    5   Extended
/dev/vda5                39847936   41940991    1046528   82   Linux swap / Solaris
root@ubuntuDesktop1: /home/edward# df -lh
Filesystem      Size  Used Avail Use% Mounted on
/dev/vda1        19G  3.5G   15G  20% /
udev             489M  4.0K  489M   1% /dev
tmpfs            200M  760K  199M   1% /run
none             5.0M    0  5.0M   0% /run/lock
none             498M  152K  498M   1% /run/shm
none             100M   64K  100M   1% /run/user
/dev/sr0         763M  763M    0 100% /media/edward/Ubuntu 12.10 amd64
root@ubuntuDesktop1: /home/edward# initctl status ovirt-guest-agent
ovirt-guest-agent start/running, process 925
root@ubuntuDesktop1: /home/edward#
```

Support oVirt Guest Agent on Ubuntu - Summary



- Modify Makefile.am, the install-exec-hook target, to let make install works properly.
- Modify shell scripts, change the interpreter from /bin/sh to /bin/bash.
 - Ubuntu default shell is dash, it's faster than bash but lacks some bashism.
- Write an Upstart job .conf file.
- Write a script to build and install oVirt guest agent.
- Maybe submit upstream patches in future.
- Proposal
 - Some installation actions are in RPM .spec file, need split it out to be made use in .deb spec file.

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- **Support Spice-XPI on Ubuntu**
- Q&A

Support Spice-XPI on Ubuntu - Overview



- xulrunner is missing from Ubuntu.
- Download xulrunner-sdk, build and install on Ubuntu
 - A bit tedious
- Build Spice-XPI on Fedora, copy .xpi file to Ubuntu
 - Install .xpi from the Firefox extension dialog.
 - aptitude install spice-client virt-viewer
 - Spice-XPI invokes spicec or spice-xpi-client, which are packaged in spice-client and virt-viewer.

Step by Step – Build and install Spice-XPI on Ubuntu



- Prerequisites
 - aptitude install build-essential automake autoconf libtool git git-doc git-man git-completion gitk git-gui spice-client virt-viewer libglib2.0-dev libnspr4-dev
- Download xulrunner-sdk
 - cat /usr/lib/firefox/platform.ini to find the milestone version
 - Download xulrunner-sdk that is the same version as firefox milestone version
 - For 13.04
 - wget https://ftp.mozilla.org/pub/mozilla.org/xulrunner/releases/20.0/sdk/xulrunner-20.0.en-US.linux-x86_64.sdk.tar.bz2
 - Extract the contents to /root/src

Step by Step – Build and install Spice-XPI on Ubuntu



- Create pkg-config files manually

```
cat <<EOF > /usr/lib/x86_64-linux-gnu/pkgconfig/libxul-embedding.pc
prefix=/root/src
sdkdir=/root/src/xulrunner-sdk
includedir=/root/src/xulrunner-sdk/include
idldir=/root/src/xulrunner-sdk/idl
libdir=/root/src/xulrunner-sdk/lib
```

Name: libxul-embedding

Description: Static library for of the Mozilla runtime

Version: 20.0

Requires: nspr >= 4.9.5

Libs: -L\\${sdkdir}/lib -lxpcomglue -ldl

Cflags: -DXPCOM_GLUE -I\\${includedir}

EOF

Step by Step – Build and install Spice-XPI on Ubuntu



- Create pkg-config files manually

```
cat <<EOF > /usr/lib/x86_64-linux-gnu/pkgconfig/libxul.pc
prefix=/root/src
sdkdir=/root/src/xulrunner-sdk
includedir=/root/src/xulrunner-sdk/include
idldir=/root/src/xulrunner-sdk/idl
libdir=/root/src/xulrunner-sdk/lib

Name: libxul
Description: The Mozilla Runtime and Embedding Engine
Version: 20.0
Requires: nspr >= 4.9.5
Libs: -L\${sdkdir}/lib -lxpcomglue_s -lxul -lxpcom -lmozalloc
Cflags: -I\${includedir}
EOF
```

Step by Step – Build and install Spice-XPI on Ubuntu



- `wget http://spice-space.org/download/releases/spice-xpi-2.8.tar.bz2`
- `autoreconf -if`
- `./configure --prefix=/usr`
- `make`
- `make install`

Support Spice-XPI on Ubuntu – Screen Capture



The screenshot displays the oVirt Web Administration interface. The main content area shows a table of virtual machines:

Name	Host	IP Address	Cluster	Data Center	Memory
f18xfcquest			Default	Default	0%
ubuntu	node1	192.168.123.210	Default	Default	59%

Overlaid on the interface are two windows:

- A terminal window titled "ubuntu:0 - Press SHIFT+F12 to Release Cursor" showing a shell prompt.
- A file manager window titled "Ubuntu Start Page - Mozilla Firefox" showing the "Home" directory with folders like Desktop, Documents, Downloads, Music, Pictures, Public, src, and Templates.

Q&A



- Thanks for attending!
- Thanks reviewers and maintainers!
- About me
 - VDSM developer
 - Contribute bug fixes, functional tests and Ubuntu compatibility patches.
 - My Gerrit Dashboard
 - <http://gerrit.ovirt.org/#/dashboard/1000174>
 - Github
 - <https://github.com/edwardbadboy>