

Cloud Computing et Virtualisation

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Plan général

- Présentation orateur/élèves
- Objectifs du cours
- Plan du cours

Présentation de l'orateur



Sure, They're A Little Weird

But where would we be without them? Show the love!

Sys Admin Day

System Administrator Appreciation Day

They are the over-worked, the under-appreciated, and the misunderstood. They are also the ones we rely on to keep us working day in and day out.

The System Administrator. Whether it be restoring accidentally deleted files ("I swear I hit 'Cancel'"), answering our most basic of computer questions or staying up until all hours of the night fixing the network; the Sys Admin allows us to get our job done every day. All they ask for in return is our adoration and the occasional case of Rockstar.

GOOD MORNING

co-Fondateur de Nanocloud Software

The screenshot shows the homepage of the Nanocloud Software website. At the top, there's a navigation bar with links for HOME, PRODUCTS, CUSTOMERS, NEWS, and ABOUT, along with language options (FR / EN) and buttons for DEMO and CONTACT US. The main visual is a photograph of an astronaut standing on a rocky, reddish-orange landscape under a blue sky. Overlaid on the image is a large, abstract orange network graph with many nodes and connecting lines. In the center of the image, white text reads "TURN ANY SOFTWARE INTO A CLOUD SOLUTION. BIG LEAP, SMALL EFFORT." Below this text is a yellow "FIND OUT HOW" button. At the bottom of the page, there's a section with the text "You're striving to run your super but legacy application directly in the cloud. You're not alone. Many have this problem. Nanocloud helps large companies and software vendors to enable new uses and business models by pushing their application portfolio into the cloud."

Nanocloud

https://www.nanocloud.com

HOME PRODUCTS CUSTOMERS NEWS ABOUT

FR / EN

DEMO CONTACT US

TURN ANY SOFTWARE
INTO A CLOUD
SOLUTION.
BIG LEAP, SMALL EFFORT.

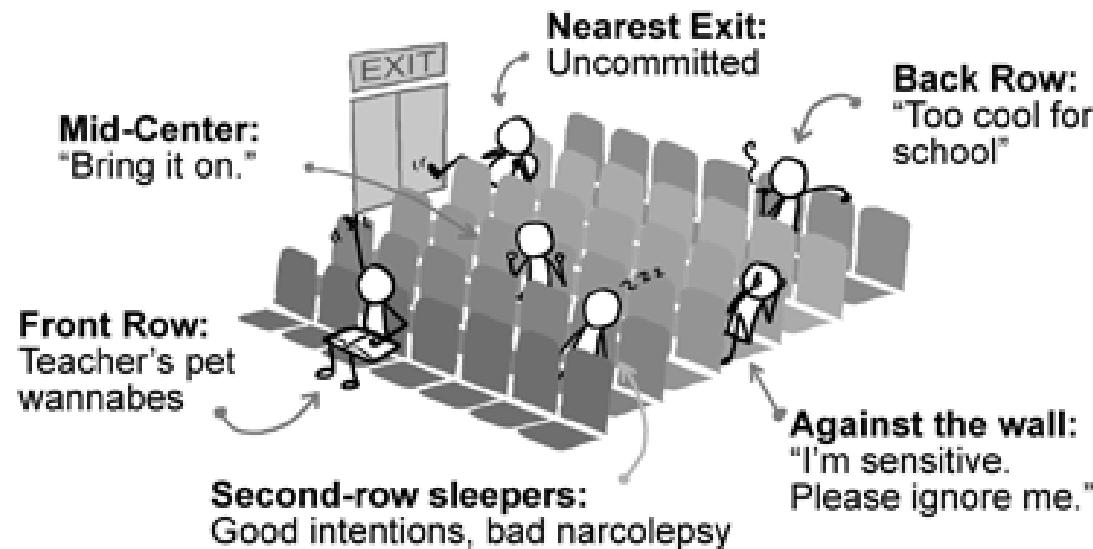
FIND OUT HOW

You're striving to run your super but legacy application directly in the cloud.
You're not alone. Many have this problem.
Nanocloud helps large companies and software vendors to enable new uses and business models by pushing their application portfolio into the cloud.

Échange avec les élèves

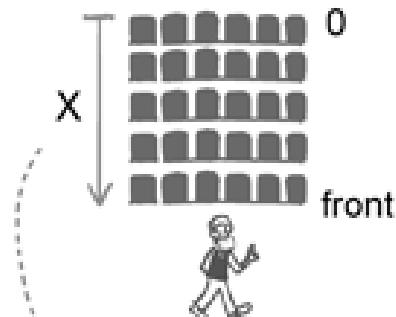
WHERE YOU SIT IN CLASS/SEMINAR

And what it says about you:



WWW.PHDCOMICS.COM

Proximity to Lecturer:



$$X = \frac{\text{How much you care}}{\text{How sleepy you are}}$$

JORGE CHAM © 2008

Objectifs du cours

- Expliquer ce qu'est la virtualisation
- Faire comprendre son intérêt et son rôle
- Donner des éléments techniques pour un maniement personnel

Plan général du cours

- Motivation : intérêt de la virtualisation
- Bref historique de la virtualisation
- Classification des types de virtualisation
- L'émulateur universel : QEMU
 - TPs sur QEMU
- Optimisation de QEMU-KVM
- Outils de déploiement de VMs
- Conteneurs

Une définition de la virtualisation

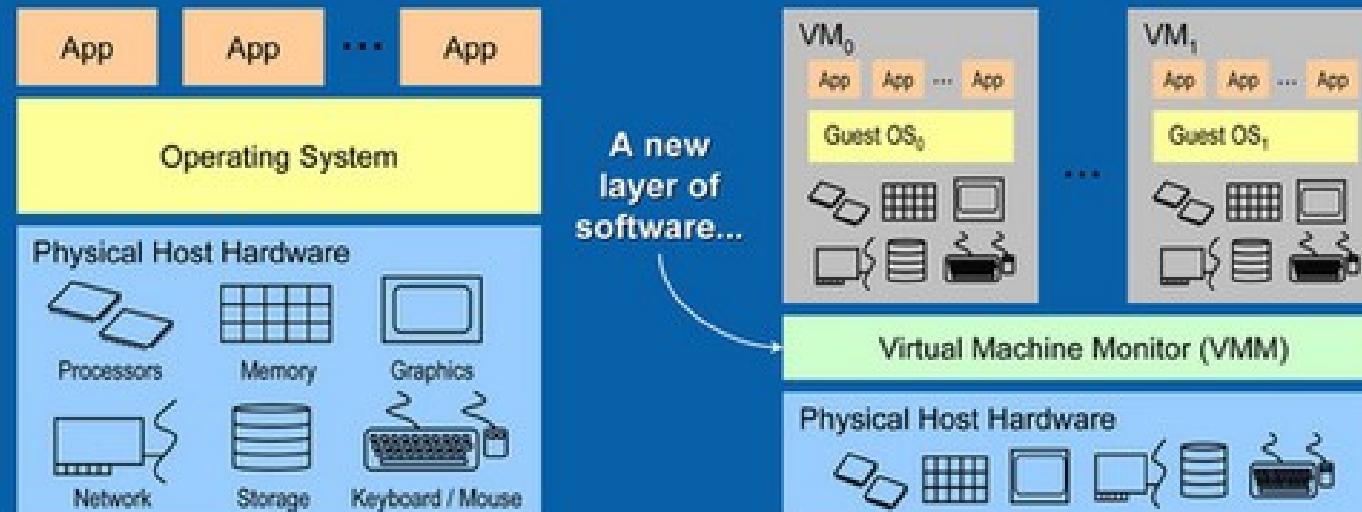
- *Définition:*

En informatique, on appelle virtualisation l'ensemble des techniques matérielles et/ou logicielles qui permettent de faire fonctionner sur une seule machine plusieurs systèmes d'exploitation et/ou plusieurs applications, séparément les uns des autres, comme s'ils fonctionnaient sur des machines physiques distinctes.

Une vue de la virtualisation

IA System Virtualization Today

Hardware Virtual Machines (VMs)



Without VMs: Single OS owns all hardware resources

With VMs: Multiple OSes share hardware resources

Virtualization enables multiple operating systems to run on the same physical platform

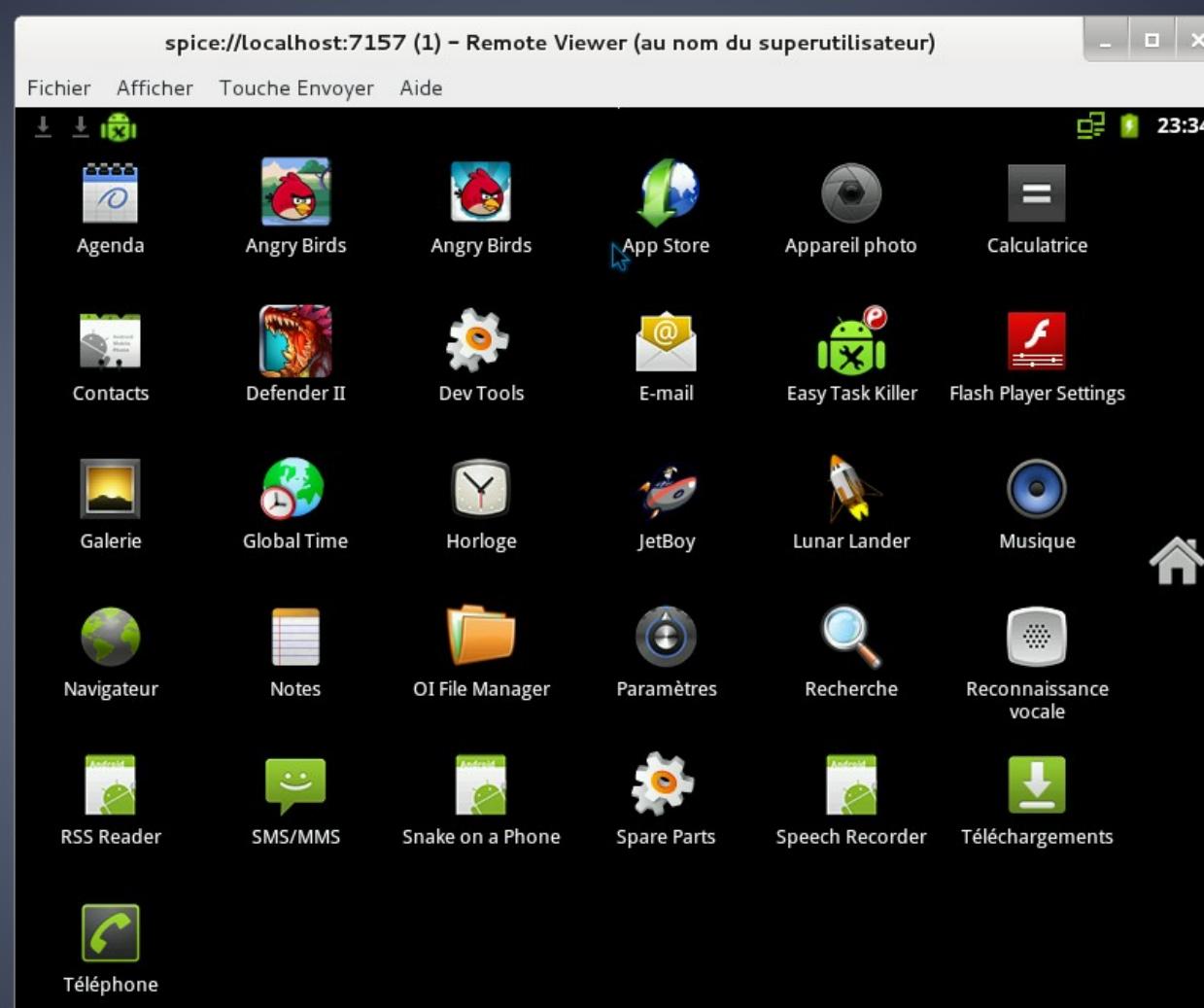
Motivation : intérêt de la virtualisation (1/2)

- Études/développements/expérimentations
 - Architectures matérielles
 - OS
 - Modélisation de systèmes

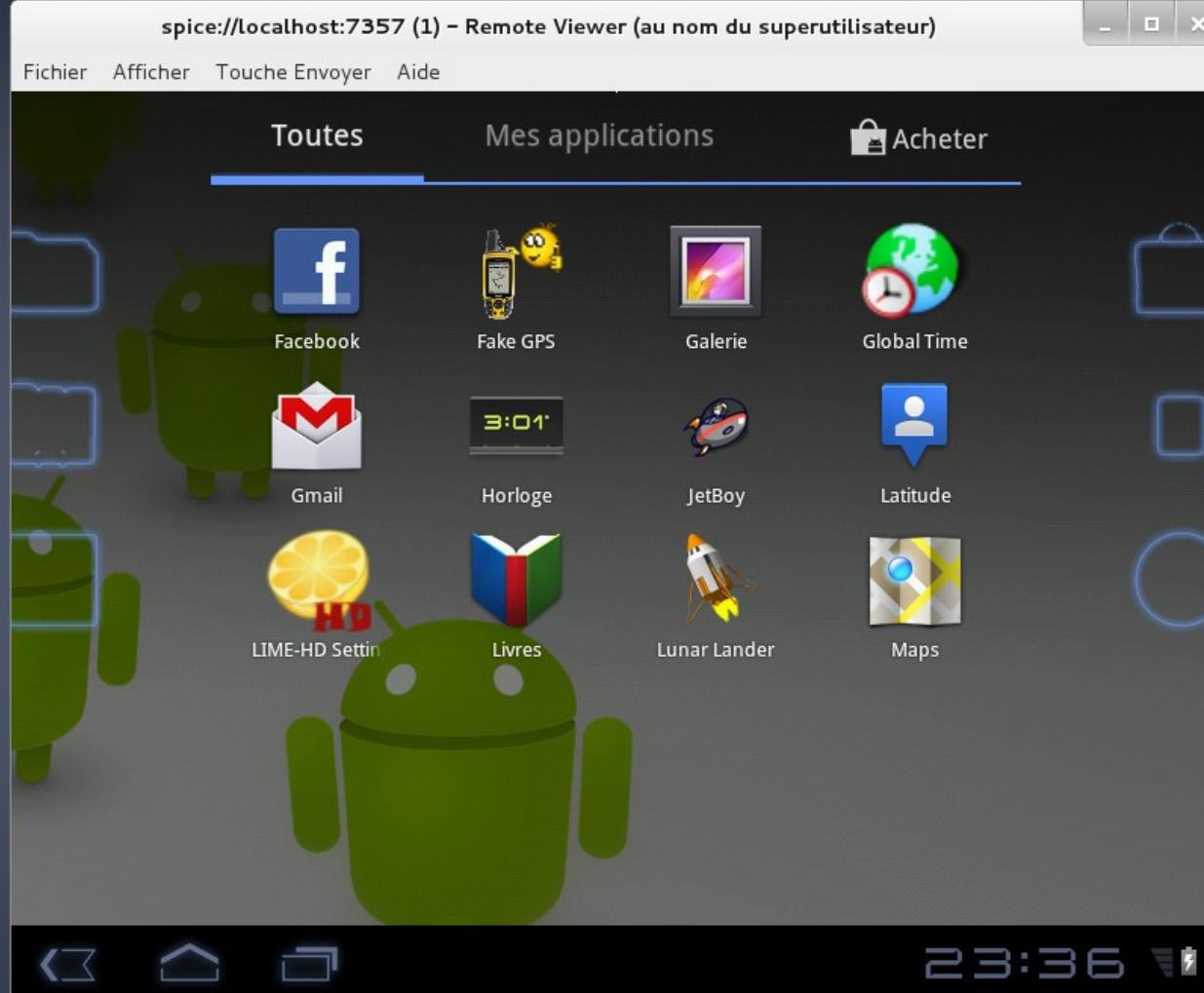
Motivation : intérêt de la virtualisation (2/2)

- Production
 - Multi-OS (applications dédiées)
 - Consolidation de serveurs
 - Élasticité (cloud computing)

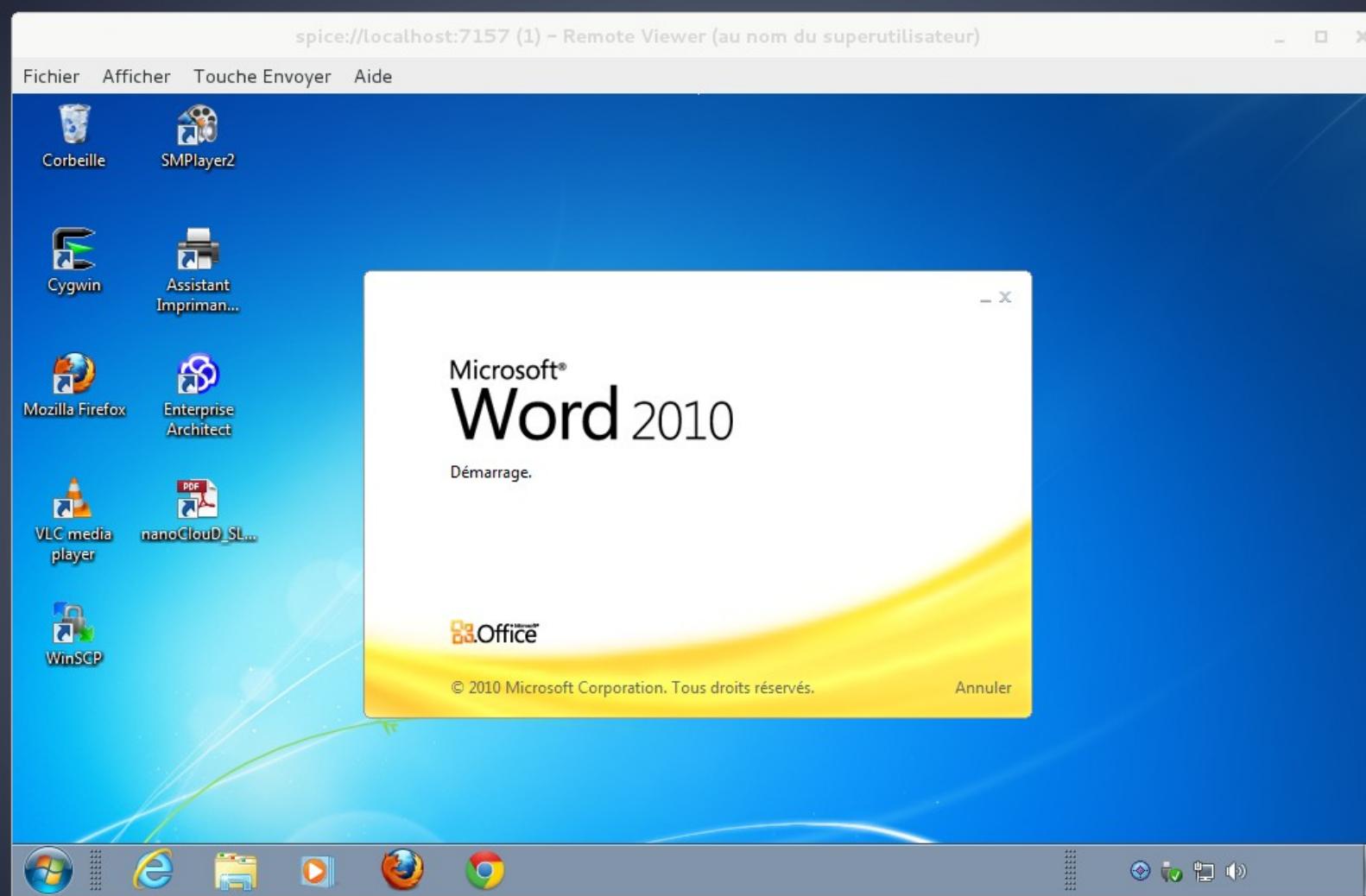
Exemple de développement : Device Android (2.3.7)



Exemple de développement : Device Android (3.2.2)

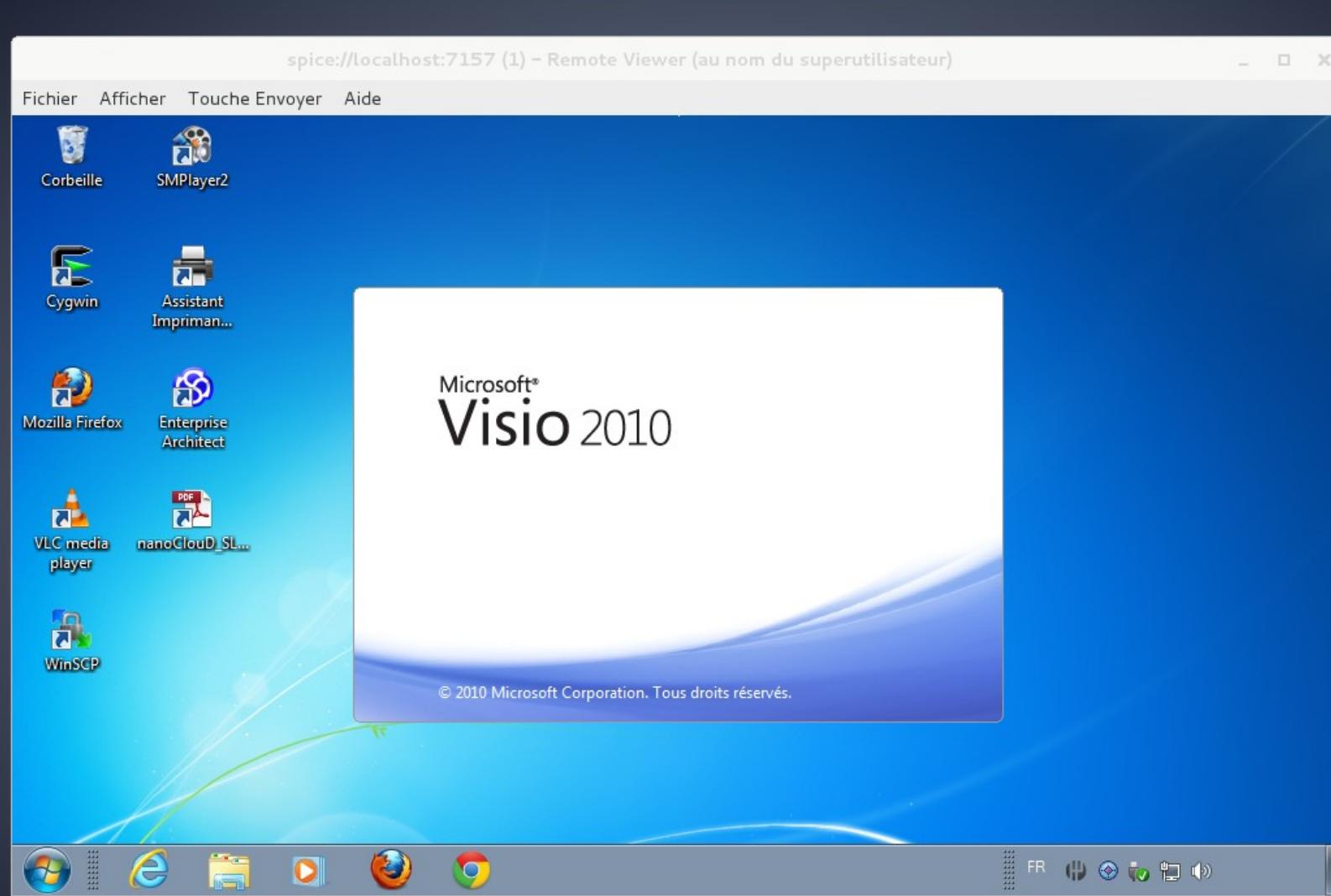


Exemple de Multi-OS pour application dédiée : Word Office 2010 (sous W7) ...



ou

Visio Office 2010 (sous W7)



Bref historique

- Quand cela a t'il donc commencé ?



Il y a fort, fort longtemps...en 1966

- IBM crée le modèle 360/67 et l'OS CP40/CMS (temps partagé entre multitâches)



Quelques dates

- 1960 → 2000 : IBM de CP/CMS à z/VM
- 1979 : chroot (Unix)
- 1982 : chroot (BSD)
- 1999 : VMware (virtualisation pour x86)
- 2000 : FreeBSD Jail (*BSD)
- 2003 : Xen (Linux)
- 2005 : Solaris Zones (Solaris et dérivés)
- 2005/2006 : Intel-VT et AMD-V (virtualisation matérielle)
- 2006 : OpenVZ (Linux)
- 2007 : KVM (Linux)
- 2008 : LxC (Linux)
- 2008 : Hyper-V (Microsoft)
- 2013 : Docker

Évolution des besoins en virtualisation

- Le recours à la virtualisation est issu de **3** besoins successifs et différents

Besoin 1 : le multi-OS

- Faire tourner des OS différents sur un même serveur
 - IBM 360 sur CP40/CMS (1966)
 - VMware sur X86 (1999)

Besoin 2 : la consolidation de serveurs

- Passer de plusieurs serveurs physiques à 1 seul
 - Expl. :

8 serveurs physiques utilisés à 10%

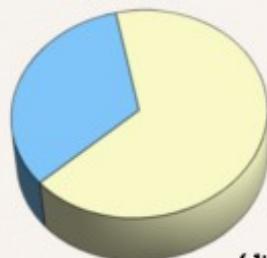


1 serveur physique utilisé à 80 % avec
8 serveurs virtuels

Consolidation de serveurs

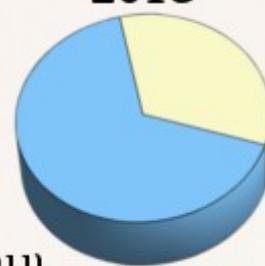
■ *Part de serveurs virtualisés*

2011



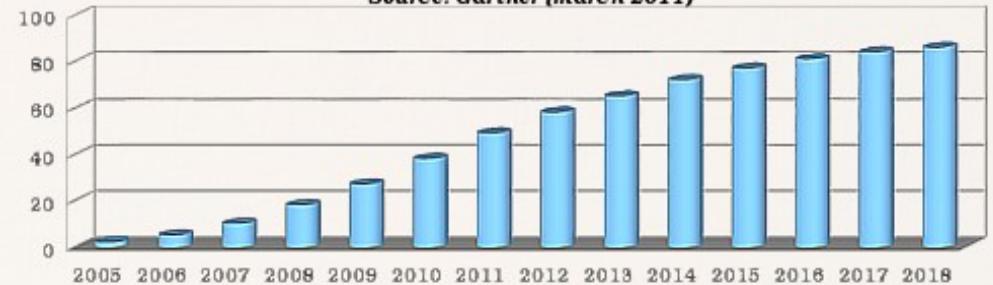
(d'après Markess - 2011)

2013



Percentage of x86-architecture workloads running in VMs

Source: Gartner (march 2011)



Besoin 3 : l'élasticité

- Les serveurs virtuels, étant des programmes, peuvent s'adapter dynamiquement à la demande



Émergence de la notion de

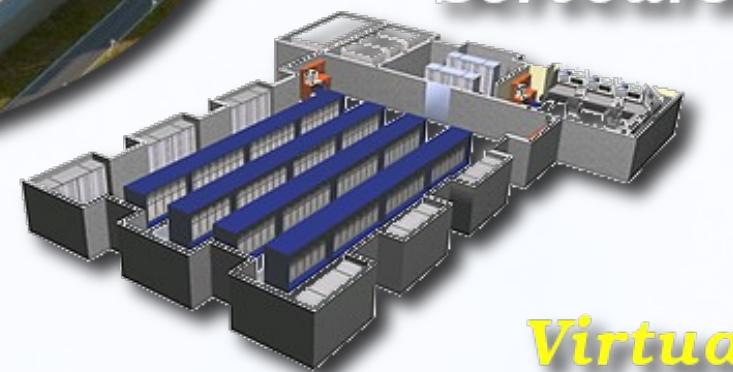
Infrastructure as a Service

(Cloud Computing - IaaS)

Bases du cloud - IaaS



Datacenter

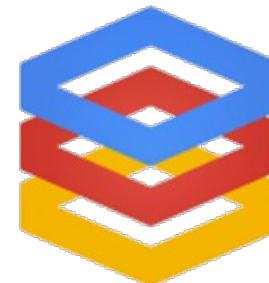


Serveurs

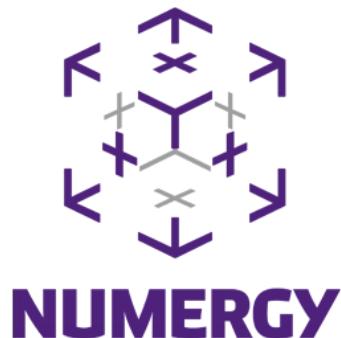
Virtualisation



IaaS : un marché en expansion depuis 2006



Google Compute Engine



Classification des types de virtualisation

- 3 grandes familles
 - Émulation
 - Conteneur/Isulateur
 - Paravirtualisation

Émulation : exemples

- Bochs
- QEMU



Conteneurs : exemples

- Jails



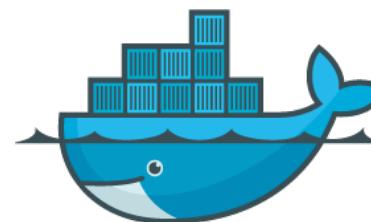
- OpenVZ



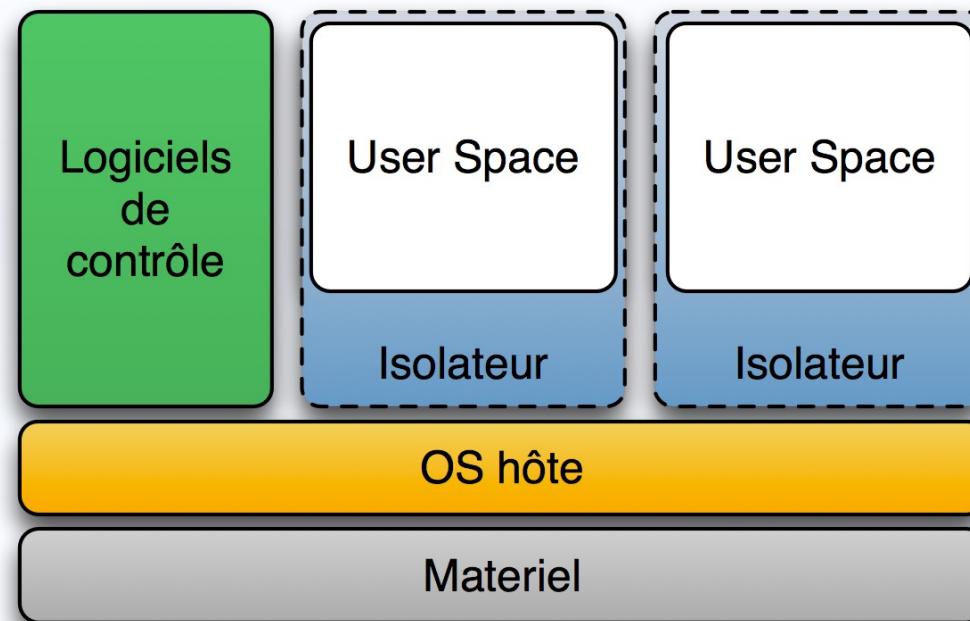
- LxC

Linux Containers

- Docker



Conteneur : architecture



Paravirtualisation : exemples

- Hyperviseur type 1

- VMware
- Xen
- KVM
- Hyper-V

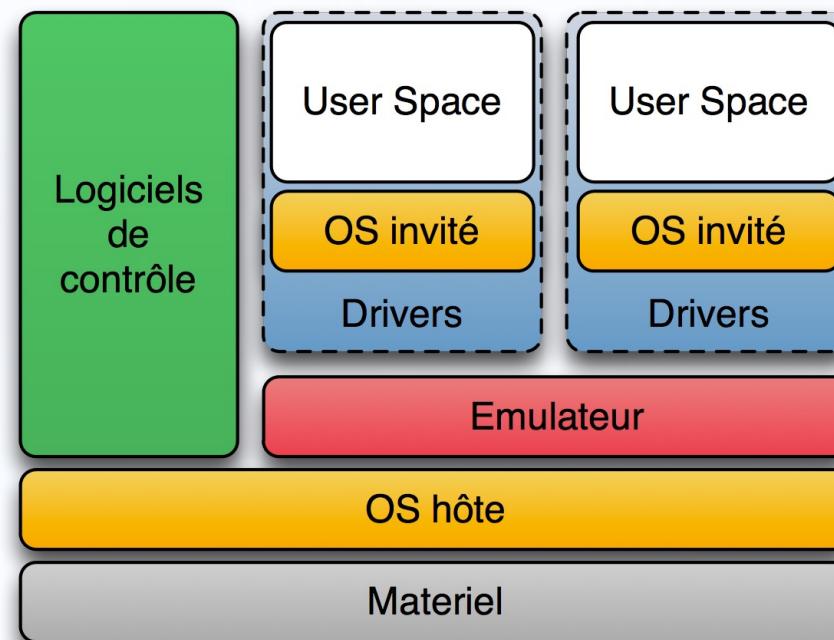


- Hyperviseur type 2

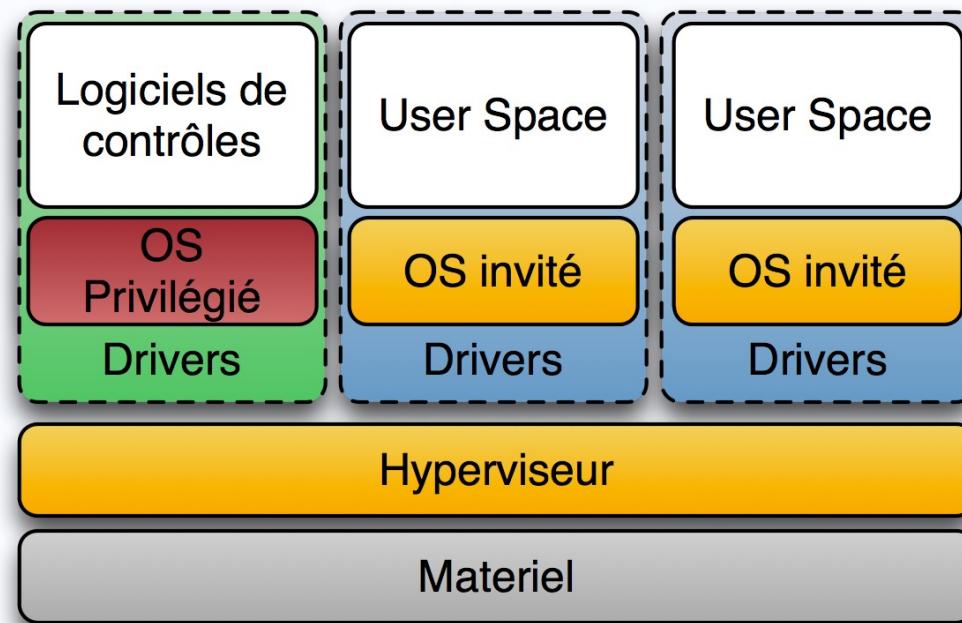
- VMware Workstation
- VirtualBox



Hyperviseur type 2 : architecture



Hyperviseur type 1 : architecture



L'émulateur universel : QEMU

- Créé par Fabrice Bellard en 2008
- Projet Open Source
- Disponible pour Linux, Windows et MacOSX
- Orienté émulation d'architectures diverses à ses débuts
- Devenu l'outil de référence de plusieurs solutions de paravirtualisation

Site QEMU

The screenshot shows a web browser window with the following details:

- Title Bar:** The title bar says "QEMU" and the address bar shows "wiki.qemu.org/Main_Page".
- Header:** The header includes the QEMU logo ("open source processor emulator"), a search bar with "Search", "Go", and "Search" buttons, and links for "Page", "Discussion", "View source", and "History".
- Left Sidebar (About):** Includes links: Home, Get, Download, Contribute, Start Here, Report a Bug, Submit a Patch, Mailing Lists, Testing QEMU.
- Left Sidebar (Virtualize):** Includes links: KVM.
- Left Sidebar (Learn):** Includes links: Documentation, Links, License.
- Left Sidebar (Toolbox):** Includes links: Toolbox, What links here, Related changes, Special pages.
- Main Content:**
 - Main Page:** Describes QEMU as a generic and open source machine emulator and virtualizer. It explains its use as an emulator (running OSes and programs on different machines) and as a virtualizer (achieving near-native performance by executing guest code directly on the host CPU). It supports KVM, Xen, and PowerPC guests.
 - Creating Accounts:** Notes that account creation is disabled; users should contact existing wiki users to request an account.
 - News:** Lists news items with dates and descriptions.
 - Sep 5th, 2012:** QEMU version 1.2.0 is out. See the [Download](#) page for more information.
 - Sep 4th, 2012:** QEMU version 1.2.0-rc3 is out. See the [Download](#) page for more information.
 - Aug 30rd, 2012:** QEMU version 1.2.0-rc2 is out. See the [Download](#) page for more information.
 - Aug 23rd, 2012:** QEMU version 1.2.0-rc1 is out. See the [Download](#) page for more information.
 - Aug 16th, 2012:** QEMU version 1.2.0-rc0 is out. See the [Download](#) page for more information.
 - Jul 17th, 2012:** (No description provided)

Téléchargement de QEMU : wiki ou git

The screenshot shows a web browser window with the title "Download - QEMU". The address bar contains "wiki.qemu.org/Download". The page itself is the QEMU wiki's "Download" page. At the top left is the QEMU logo. On the right side of the header are search fields and links for "Page", "Discussion", "View source", and "History". The main content area has a dark blue header with the word "Download" in white. Below this, there's a section titled "Releases" containing a table with two rows. The first row has a link to "qemu-1.2.0.tar.bz2" and its signature, with "Source code (ChangeLog)" next to it. The second row has a link to "qemu-1.1.2.tar.bz2" and its signature, also with "Source code (ChangeLog)". Below the releases is a section titled "Latest Source Code". It explains that QEMU is developed using git, with the main tree at <http://git.qemu.org/qemu.git>. It notes that the latest development happens on the master branch, while stable trees are in branches like "stable-0.XX". It provides a command to clone the latest development tree:

```
git clone git://git.qemu.org/qemu.git
```

. It also mentions a GitHub mirror at <http://github.com/qemu/QEMU>, with a command to clone it:

```
git clone git://github.com/qemu/QEMU.git
```

. Finally, it says to see instructions on that page for other ways to access the source.

QEMU
open source processor emulator

Search Go Search

About Home Get Download Contribute Start Here Report a Bug Submit a Patch Mailing Lists Testing QEMU Virtualize KVM Learn Documentation Links License Toolbox What links here Related changes Special pages

Log in

Download

Releases

File	Comment
qemu-1.2.0.tar.bz2 (signature)	Source code (ChangeLog)
qemu-1.1.2.tar.bz2 (signature)	Source code (ChangeLog)

Latest Source Code

QEMU is developed using [git](#). The main tree is located at <http://git.qemu.org/qemu.git>. The latest development happens on the master branch. The stable tree is located in a *stable-0.XX* branch where '0.XX' is the minor release version.

To download the latest development tree, use the following command:

```
git clone git://git.qemu.org/qemu.git
```

There is also a mirror on GitHub at <http://github.com/qemu/QEMU>. To use it, run

```
git clone git://github.com/qemu/QEMU.git
```

and also see instructions on that page for other ways to access the source.

Quelques architectures supportées

- ARM
- SPARC
- PowerPC
- MIPS
- X86 (IA-32 & X86_64)

Architecture ARM : quelques systèmes supportés

```
$ qemu-system-arm -M ?
```

Supported machines are:

```
none          empty machine
collie        Collie PDA (SA-1110)
nuri          Samsung NURI board (Exynos4210)
smdkc210     Samsung SMDKC210 board (Exynos4210)
connex        Gumstix Connex (PXA255)
verdex        Gumstix Verdex (PXA270)
highbank      Calxeda Highbank (ECX-1000)
integratorcp ARM Integrator/CP (ARM926EJ-S) (default)
kzm          ARM KZM Emulation Baseboard (ARM1136)
mainstone    Mainstone II (PXA27x)
musicpal     Marvell 88w8618 / MusicPal (ARM926EJ-S)
n800          Nokia N800 tablet aka. RX-34 (OMAP2420)
n810          Nokia N810 tablet aka. RX-44 (OMAP2420)
sx1           Siemens SX1 (OMAP310) V2
sx1-v1        Siemens SX1 (OMAP310) V1
cheetah       Palm Tungsten|E aka. Cheetah PDA (OMAP310)
realview-eb   ARM RealView Emulation Baseboard (ARM926EJ-S)
realview-eb-mpcore ARM RealView Emulation Baseboard (ARM11MPCore)
realview-pb-a8 ARM RealView Platform Baseboard for Cortex-A8
realview-pbx-a9 ARM RealView Platform Baseboard Explore for Cortex-A9
akita         Akita PDA (PXA270)
spitz         Spitz PDA (PXA270)
borzoi        Borzoi PDA (PXA270)
terrier       Terrier PDA (PXA270)
lm3s811evb   Stellaris LM3S811EVB
lm3s6965evb  Stellaris LM3S6965EVB
tosa          Tosa PDA (PXA255)
versatilepb  ARM Versatile/PB (ARM926EJ-S)
versatileab  ARM Versatile/AB (ARM926EJ-S)
vexpress-a9   ARM Versatile Express for Cortex-A9
vexpress-a15  ARM Versatile Express for Cortex-A15
xilinx-zynq-a9 Xilinx Zynq Platform Baseboard for Cortex-A9
z2            Zipit Z2 (PXA27x)
```

Architecture X86 : quelques processeurs émulés

```
$ qemu-system-x86_64 -cpu ?
```

```
x86  Opteron_G4
x86  Opteron_G3
x86  Opteron_G2
x86  Opteron_G1
x86  SandyBridge
x86  Westmere
x86  Nehalem
x86  Penryn
x86  Conroe
x86  [n270]
x86  [athlon]
x86  [pentium3]
x86  [pentium2]
x86  [pentium]
x86  [486]
x86  [coreduo]
x86  [kvm32]
x86  [qemu32]
x86  [kvm64]
x86  [core2duo]
x86  [phenom]
x86  [qemu64]
```

Création d'une image virtuelle

- Commande : **qemu-img**

qemu-img create -f format fichier.img sizeG

- Expl. :

qemu-img create -f raw file.img 2G

Information sur l'image virtuelle

- **qemu-img info**

- Expl. :

```
qemu-img info file.img
```

image: file.img

file format: raw

virtual size: 2.0G (2147483648 bytes)

disk size: 0

Formats disponibles

- Liste :

*vvfat vpc vmdk vdi sheepdog raw
host_cdrom host_floppy host_device file
qed qcows2 qcows parallels nbd dmg cow
cloop bochs blkverify blkdebug*

- Format recommandé : **qcows2**

- Élastique et performant (avec le bon paramétrage)
 - Permet les snapshots et le clonage

Création d'une VM

- Choisir l'image iso de l'OS à virtualiser
- Créer une image virtuelle de disque dur
- Choisir la puissance de sa VM (CPU, RAM) et son architecture (X86, ARM, PowerPC, ...)
- Lancer qemu en ligne de commande en intégrant le paramétrage précédent

Création d'une VM

- Expl. :

```
qemu -hda file.img -cdrom debian.iso -boot d  
-m 512 -cpu core2duo -smp 2
```



Cas particulier de l'hôte Linux : accélération matérielle avec **KVM**

- QEMU+KVM fusionnés en 2011
- Permet un contrôle complet de la virtualisation avec QEMU, avec l'accélération matérielle fournie par KVM
- Code source récupérable sur Sourceforge

QEMU-KVM

The screenshot shows a web browser window displaying the QEMU wiki's Main Page. The browser is identified as 'QEMU - Iceweasel'.

Page Content:

- Main Page**
 - QEMU is a generic and open source machine emulator and virtualizer.
 - When used as a machine emulator, QEMU can run OSes and programs made for one machine (e.g. an ARM board) on a different machine (e.g. your own PC). By using dynamic translation, it achieves very good performance.
 - When used as a virtualizer, QEMU achieves near native performances by executing the guest code directly on the host CPU. QEMU supports virtualization when executing under the Xen hypervisor or using the KVM kernel module in Linux. When using KVM, QEMU can virtualize x86, server and embedded PowerPC, and S390 guests.
 - QEMU is a member of [Software Freedom Conservancy](#).
- Creating Accounts**
 - To help control spam, we have disabled account creation on this wiki. To obtain an account, please contact a user with an existing wiki account and ask them to create an account for you with a dummy password. Immediately change the password after first login. If you need assistance, please ask on [qemu-devel](#).
- News**
 - Sep 22nd, 2015**
 - QEMU version 2.4.0.1 is out. See the [Download](#) page for more information.
 - Aug 11th, 2015**
 - QEMU version 2.4.0 is out. See the [Download](#) page for more information.
 - Aug 11th, 2015**
 - QEMU version 2.3.1 is out. See the [Download](#) page for more information.

Left Sidebar (About):

- Home
- Download
- Start Here
- Report a Bug
- Report a security issue
- Submit a Patch
- Mailing Lists
- Testing QEMU
- KVM
- Documentation
- Links
- License

Top Bar:

- Search bar with 'Rechercher' placeholder
- Buttons for 'Go' and 'Search'
- Page navigation buttons: 'Page', 'Discussion', 'View source', 'History'
- User account links: 'Log in' and 'ABP'

Utilisation de QEMU-KVM

- Commande avancée

```
qemu-system-x86_64
-drive file=file.img,media=disk
-drive file=debian-netinst.iso,media=cdrom
-boot order=dc
-m 512 -cpu host -smp 2
-netdev type=user,id=net1
-device driver=e1000,netdev=net1
-usb -device usb-tablet
-k fr
-monitor stdio
```

Utilisation de QEMU-KVM

- Console QEMU

```
VNC server running on `127.0.0.1:5900'  
QEMU 1.2.0 monitor - type 'help' for more  
information
```

```
(qemu) info kvm  
kvm support: enabled
```

```
(qemu) info network  
e1000.0:  
type=nic,model=e1000,macaddr=52:54:00:12:34:56  
\ net1: type=user,net=10.0.2.0,restrict=off  
(qemu)
```

Utilisation de QEMU-KVM

- Console QEMU

```
(qemu) info block
ide0-hd0: removable=0 io-status=ok file=file.img
ro=0 drv=qcow2 encrypted=0 bps=0 bps_rd=0 bps_wr=0
iops=0 iops_rd=0 iops_wr=0
ide0-cd1: removable=1 locked=1 tray-open=0 io-
status=ok file=debian-netinst.iso ro=1 drv=raw
encrypted=0 bps=0 bps_rd=0 bps_wr=0 iops=0 iops_rd=0
iops_wr=0
ide1-cd0: removable=1 locked=0 tray-open=0 io-
status=ok [not inserted]
floppy0: removable=1 locked=0 tray-open=0 [not
inserted]
sd0: removable=1 locked=0 tray-open=0 [not inserted]
```

console QEMU : info

(qemu) info

balloon	block	block-jobs
blockstats	capture	chardev
cpus	history	irq
jit	kvm	mem
mice	migrate	
migrate_cache_size		
migrate_capabilities	mtree	name
network	numa	pci
pcmcia	pic	profile
qdm	qtree	registers
roms	snapshots	spice
status	tlb	trace-events
usb	usbhost	usernet
uuid	version	vnc

console QEMU : aide

```
(qemu) help
acl_add          acl_policy          acl_remove
acl_reset        acl_show            balloon
block_job_cancel block_job_set_speed block_passwd
block_resize     block_set_io_throttle block_stream
boot_set         change              client_migrate_info
closefd          commit              cpu
cpu_set          c                  cont
delvm            device_add         device_del
drive_add        drive_del          dump-guest-memory
eject             expire_password   gdbserver
getfd             help               ?
host_net_add    host_net_remove   hostfwd_add
hostfwd_remove   i                  info
loadvm           log               logfile
mce               memsave            migrate
migrate_cancel   migrate_set_cache_size migrate_set_capability
migrate_set_downtime migrate_set_speed mouse_button
mouse_move       mouse_set          netdev_add
netdev_del       nmi               o
pci_add          pci_del            pcie_aer_inject_error
pmemsave          p                  print
q                 quit              savevm
screendump        sendkey           set_link
set_password      singlestep        snapshot_blkdev
stop              stopcapture       sum
system_powerdown system_reset       system_wakeup
trace-event      usb_add            usb_del
watchdog_action  wavcapture       x
```

Exemple de fin d'installation

```
QEMU - GVncViewer
Send Key View Settings

Debian GNU/Linux 6.0 debian tty2

debian login: root
Password:
Last login: Tue Oct  9 04:38:30 CEST 2012 on tty1
Linux debian 2.6.32-5-amd64 #1 SMP Sun Sep 23 10:07:46 UTC 2012 x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/**/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
root@debian:~# cat /proc/cpuinfo | grep -i model
model          : 42
model name    : Intel(R) Core(TM) i7-2630QM CPU @ 2.00GHz
model          : 42
model name    : Intel(R) Core(TM) i7-2630QM CPU @ 2.00GHz
root@debian:~# uname -a
Linux debian 2.6.32-5-amd64 #1 SMP Sun Sep 23 10:07:46 UTC 2012 x86_64 GNU/Linux
root@debian:~#
```

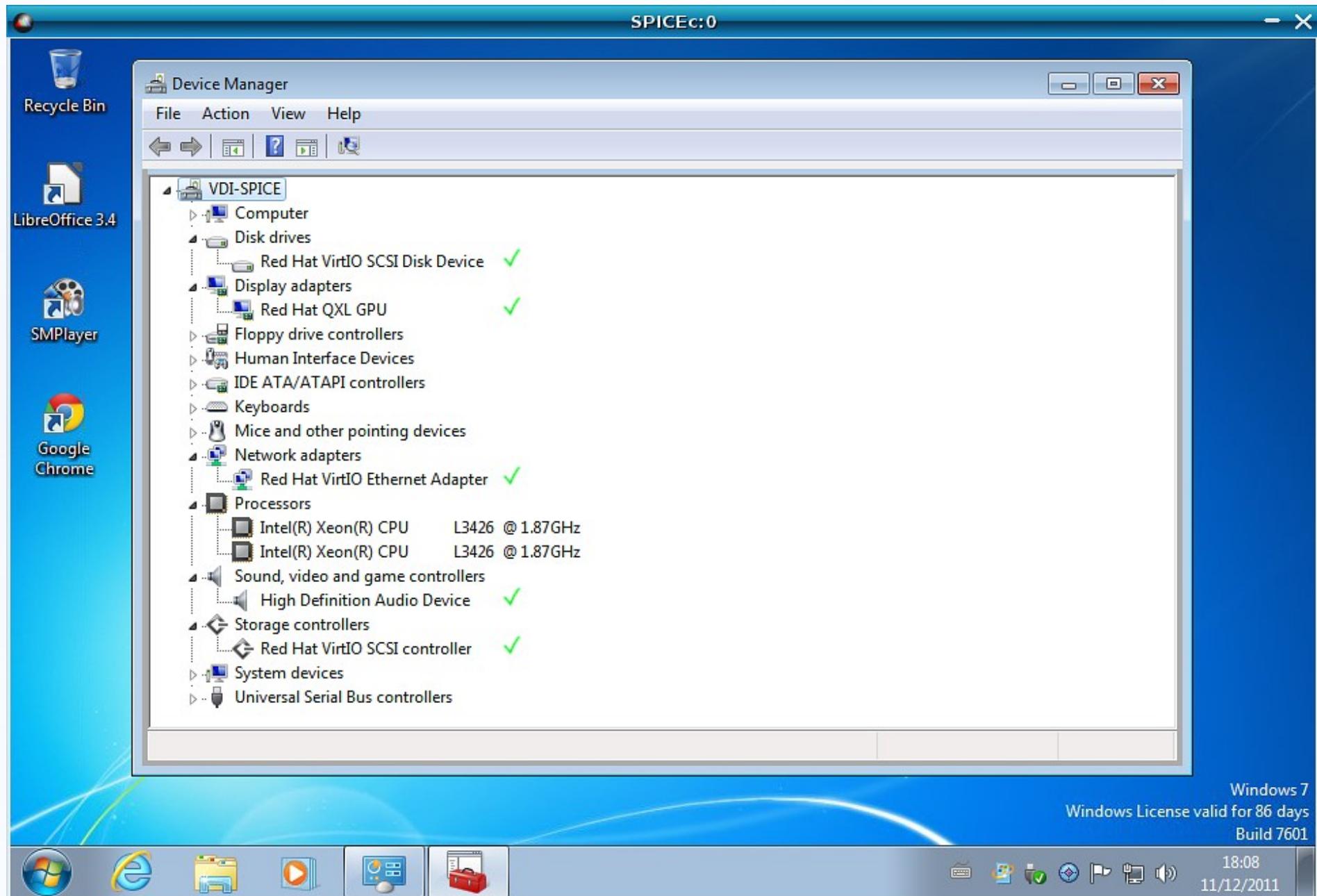
Paramètres permettant la paravirtualisation avec QEMU-KVM

- VirtIO
 - Accès disque et réseau calqués sur l'hôte
 - Drivers natifs dans Linux, portés sous Windows
- KSM
 - Partage en mémoire vive de pages de différentes VMs
 - Permet « l'overcommit »
- Hugepages
- Vhost
 - Disponible à partir du noyau Linux 3.0
 - Améliore les performances réseau
- Spice/QXL
 - Accélération matérielle du display graphique

VirtIO

- API du noyau Linux dédiée au pilotes de périphériques
 - virtio-blk-pci (disque)
 - virtio-scsi-pci (scsi)
 - virtio-net-pci (réseau)
 - virtio-balloon-pci (mémoire)
 - virtio-serial-pci (bus série)

VirtIO



VirtIO

- Exemple de ligne de commande

```
qemu-system-x86_64 -drive file=my_vm.qcow2,if=virtio \
-netdev type=tap,id=net_vm,ifname=tap0,script=no,downscript=no,vhost=on \
-device virtio-net-pci,netdev=net_vm,mac=00:52:01:02:03:04 \
-balloon virtio
```

Vhost

- Module noyau Linux augmentant les performances réseau
 - Noyau > 3.0

```
$ modprobe vhost
```

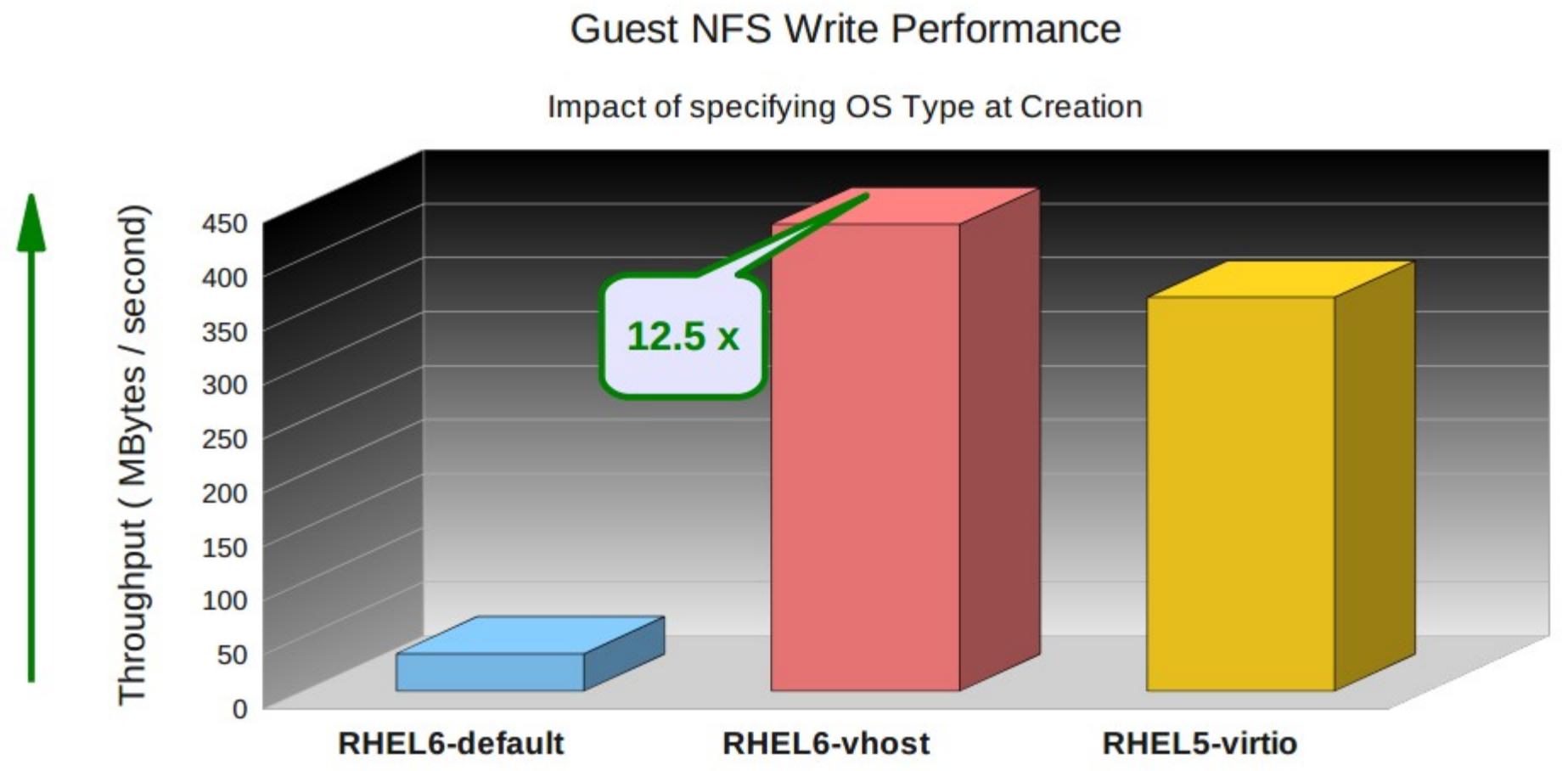
```
$ lsmod | grep vhost
```

```
vhost_net 27436 0
```

```
tun 18337 1 vhost_net
```

```
macvtap 17633 1 vhost_net
```

VirtIO/Vhost

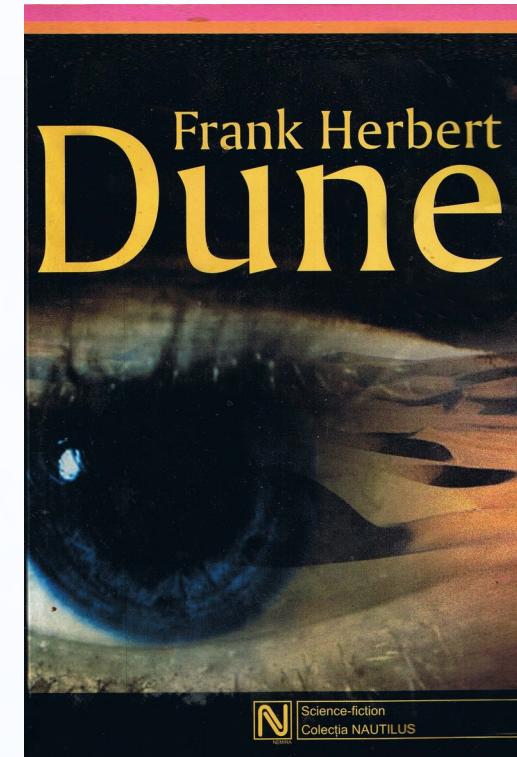
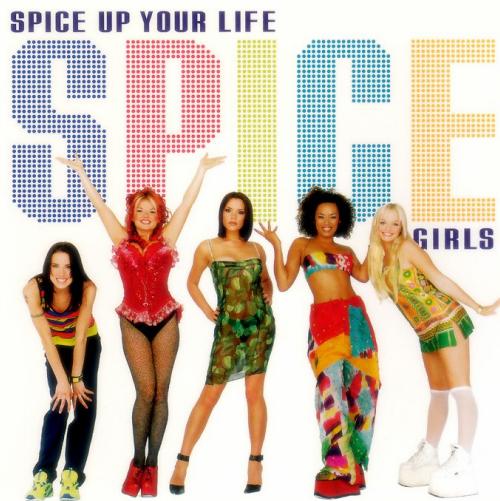


Connexion à une VM

- SSH (tous OS)
- VNC (tous OS)
- NX (NoMachine/X2Go) (Unix/Linux)
- RPD (Windows)
- SPICE (tout OS)

Focus sur un nouveau protocole : **SPICE**

SPICE ?



Welcome to spice-space.org

Spice - Home page spice-space.org/

SPICE

Home FAQ Features Documentation Support Download Developers VD-Interfaces Contact

Home

The Spice project aims to provide a complete [open source](#) solution for interaction with virtualized desktop devices. The Spice project deals with both the virtualized devices and the front-end. Interaction between front-end and back-end is done using [VD-Interfaces](#). The VD-Interfaces (VDI) enable both ends of the solution to be easily utilized by a third-party component.

The following diagram illustrates VD-Interfaces:

```
graph TD; subgraph FE [Front-End]; direction LR; VDP[Virtual Display Port] <--> BK[Back-End]; KV[Virtual Keyboard] <--> BK; VM[Virtual Mouse] <--> BK; VSD[Virtual Sound Device] <--> BK; end; subgraph BE [Back-End]; QXLDriver[QXL Driver] <--> QXLDevice[QXL Device]; VDIPort[VDI Port] <--> VDIAgent[VDI Agent]; end;
```

Currently, the project main focus is to provide high-quality remote access to [QEMU](#) virtual machine. Seeking to help break down the barriers to virtualization adoption by overcoming traditional desktop virtualization challenges, emphasizing user experience. For this purpose, Red Hat introduced the SPICE remote computing protocol that is used for Spice client-server communication. Other components developed include QXL display device and driver, etc.

The following diagram illustrates the current Spice solution on top of QEMU.

```
graph LR; subgraph QEMU_VM [QEMU VM]; direction TB; subgraph BE [VDI Back-End]; QXLDevice[QXL Device] <--> QXLDriver[QXL Driver]; VDIPort[VDI Port] <--> VDIAgent[VDI Agent]; end; subgraph FE [VDI Front-End]; SpiceServer[Spice Server] <--> Network((Network)); end; subgraph Client [Spice Client]; Client[Spice Client] <--> Network; end;
```

The Spice project plans to provide additional solutions, including:

- Remote access for a physical machine
- VM front-end for local users (i.e., render on and share devices of the same physical machine)

Like to know what's going on? Join spice-devel@lists.freedesktop.org to get information about all things related to the Spice project. For other mailing lists and irc channel see the [contact page](#)

{ goto wiki; }

@

Get SPICE

SPICE >> VNC

- Projet fondé par Qumranet (comme KVM)
- Futur protocole de display en virtualisation
- Optimisé pour le réseau
 - Dispose de codecs de compression
 - Permet un accès crypté
- Configuré pour le son et la vidéo (accélération 2D)
- Supporte les connexions sur port USB
- Bientôt disponible via un navigateur web^^

SPICE : short howto

- Utiliser une version de qemu-kvm supportant (SPICE)

```
./configure --enable-spice ...
```

- Installer le driver graphique QXL dans la VM

- Relancer la VM avec les options suivantes :

```
qemu-system-x86_64 ... --enable-kvm -vga qxl \
--spice port=5930,addr='localhost',disable-ticketing
```

- Installer spicy ou remote-viewer sur son poste client

(<http://virt-manager.org/download/sources/virt-viewer/virt-viewer-0.5.3.tar.gz>)

- Se connecter :

```
remote-viewer spice://localhost:5930
```

- Enjoy !

SPICE + remote-viewer



SPICE pour ma grand-mère ?

- Développement en cours de SPICE-HTML5

De Jeremy White★ ◀ Répondre ✉ Répondre à la liste ▾ ➡ Transférer ✉ Archiver ✖ Indésirable ⓧ Supprimer

Sujet: [Spice-devel] Announcing the first version of spice-html5 05/06/2012 16:12

Pour: spice-devel★, spice-announce@lists.freedesktop.org★ Autres actions ▾

I am happy to announce that Alon has committed my initial version of the spice html5 client.

It has many limitations and it requires a modern browser (up to date Firefox or Chrome). However, it certainly makes an interesting proof of concept, and I am hopeful that over time it will become a valuable alternate client for Spice.

You can learn more about it (and try it) by reading further here:
<http://www.spice-space.org/page/Html5>

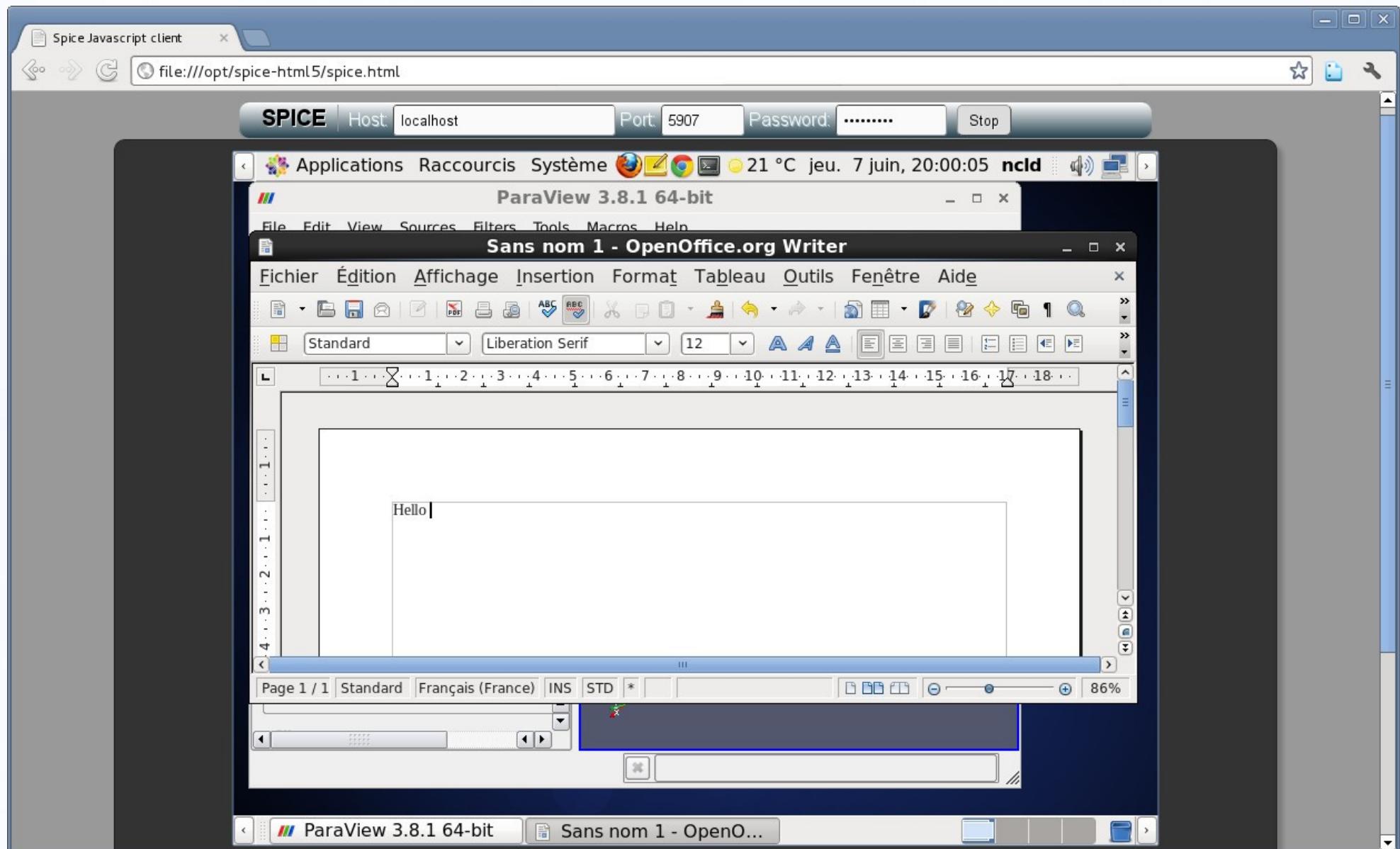
The source code is available here:
<http://cgit.freedesktop.org/spice/spice-html5>

Cheers,

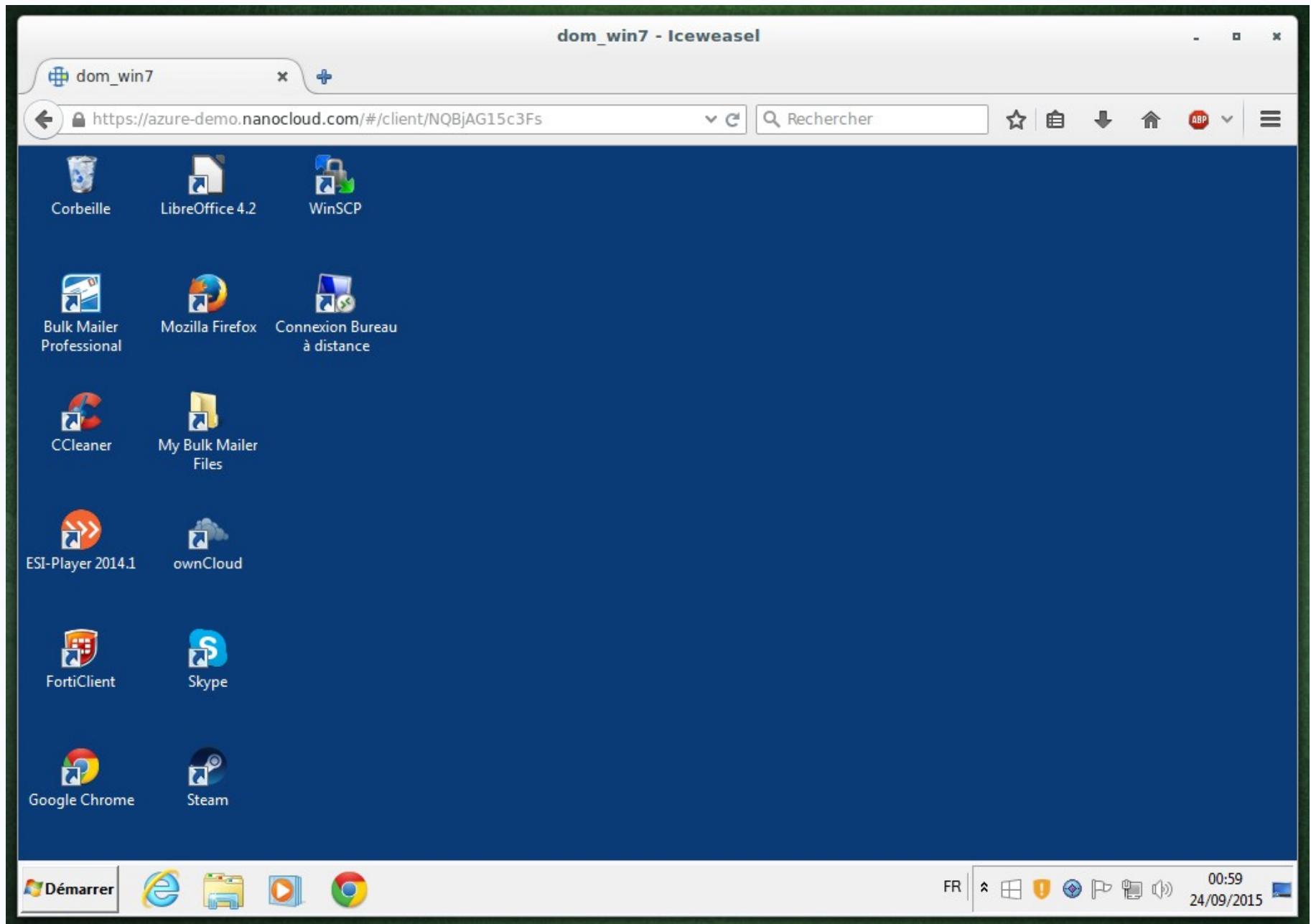
Jeremy

Spice-devel mailing list
Spice-devel@lists.freedesktop.org
<http://lists.freedesktop.org/mailman/listinfo/spice-devel>

SPICE-HTML5 : first preview



All in a browser



VirtualBox : un outil orienté desktop virtuel

The screenshot shows a web browser window titled "Oracle VM VirtualBox - Iceweasel". The address bar displays the URL <https://www.virtualbox.org>. The main content area features a large blue "VirtualBox" logo and the heading "Welcome to VirtualBox.org!". Below this, there is a paragraph about the product's history and features, followed by sections for "Guest operating systems" and "Development". A prominent blue button in the center says "Download VirtualBox 5.0". To the right, there is a "News Flash" sidebar with several items, including releases from September 8th, July 9th, and July 10th, 2015, and an "Important" item for February 2015.

VirtualBox is a powerful x86 and AMD64/Intel64 [virtualization](#) product for enterprise as well as home use. Not only is VirtualBox an extremely feature rich, high performance product for enterprise customers, it is also the only professional solution that is freely available as Open Source Software under the terms of the GNU General Public License (GPL) version 2. See "[About VirtualBox](#)" for an introduction.

Presently, VirtualBox runs on Windows, Linux, Macintosh, and Solaris hosts and supports a large number of [guest operating systems](#) including but not limited to Windows (NT 4.0, 2000, XP, Server 2003, Vista, Windows 7, Windows 8), DOS/Windows 3.x, Linux (2.4, 2.6 and 3.x), Solaris and OpenSolaris, OS/2, and OpenBSD.

VirtualBox is being actively developed with frequent releases and has an ever growing list of features, supported guest operating systems and platforms it runs on. VirtualBox is a community effort backed by a dedicated company: everyone is encouraged to contribute while Oracle ensures the product always meets professional quality criteria.

Download VirtualBox 5.0

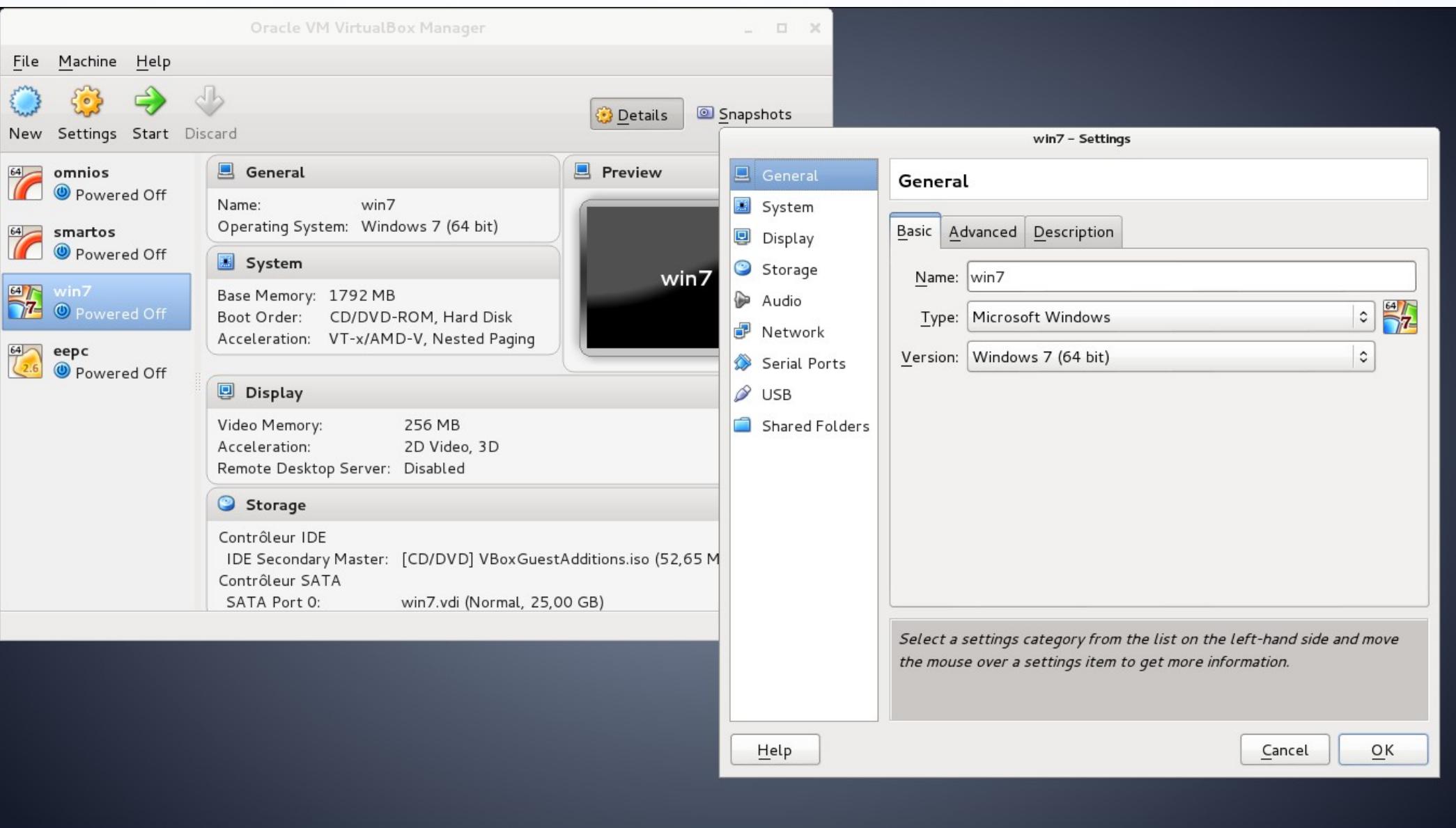
Hot picks:

News Flash

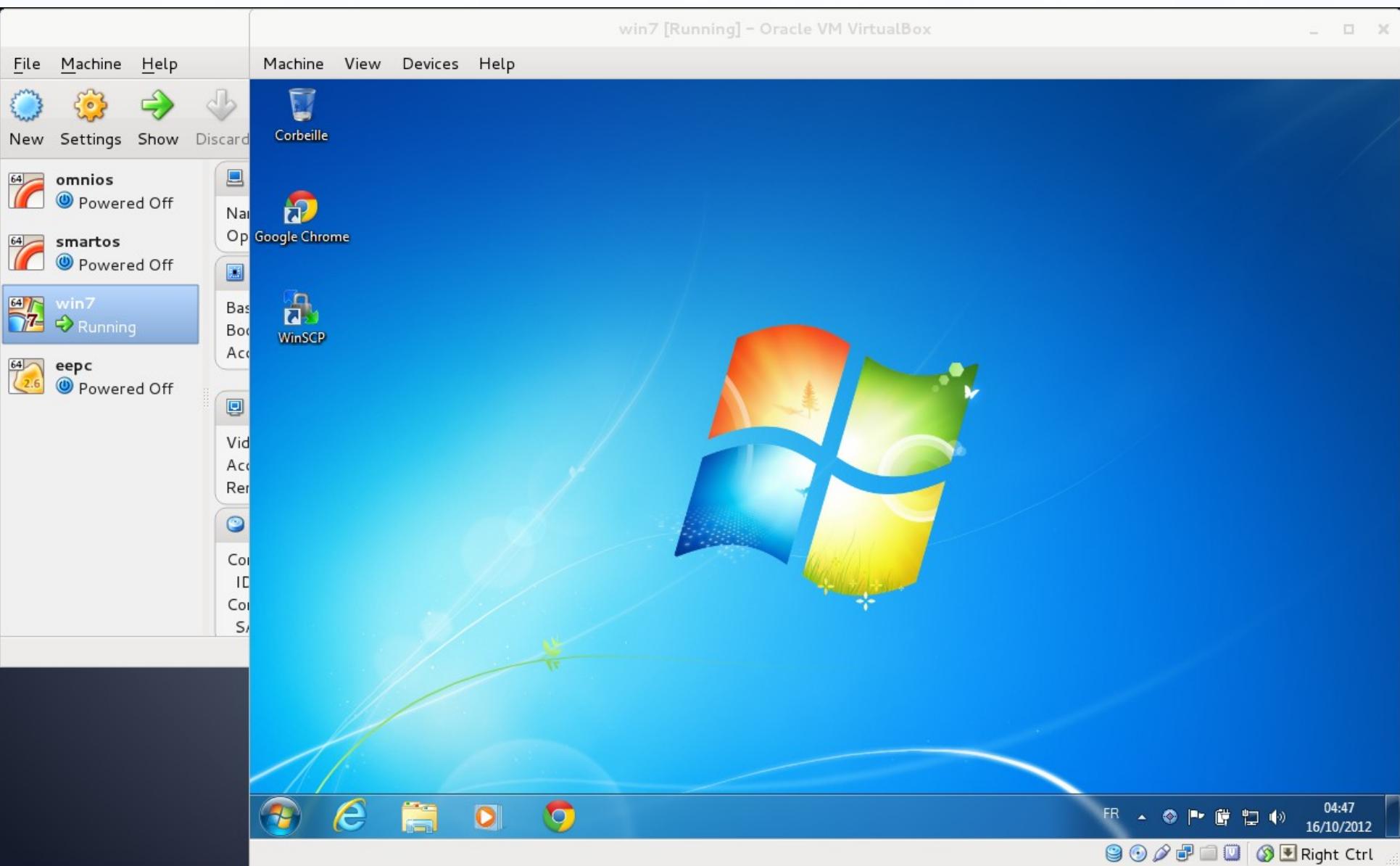
- New September 8th, 2015**
VirtualBox 5.0.4 released!
Oracle today released the first 5.0 maintenance release which improves stability and fixes regressions. See the [Changelog](#) for details.
- New July 9th, 2015**
VirtualBox 5.0 released!
Read the official [See press release](#) for details.
- New July 10th, 2015**
VirtualBox 4.3.30, 4.2.32, 4.1.30, and 4.0.32 released!
Oracle today released maintenance releases which improve stability and fixes regressions. See the respective changelogs for details.
- Important February, 2015**
We're hiring!
Looking for a new challenge? We're looking for [generic product developers](#) (Russia).

[More information...](#)

VirtualBox



VirtualBox



Outils de déploiement massif de VMs

- Eucalyptus
- CloudStack
- OpenNebula
- OpenStack

Eucalyptus

The screenshot shows the Eucalyptus website as it would appear in a web browser. The header includes a logo for 'Cloud Computing Software' and the URL 'www.eucalyptus.com'. Navigation links at the top are 'Contact Sales', 'Customer Support', 'About Us', 'Blog', and a prominent green 'Get Eucalyptus' button. Below the header is the Eucalyptus logo. A search bar with a 'SEARCH' button is also present. The main content area features a large blue background image with radiating light effects. Centered text reads 'Build Together. Run Together. Manage Together.' Below this is the large text 'Eucalyptus 3'. To the right is an orange button labeled 'Get New 3.1 Release'. At the bottom, there are four categories: 'Download', 'Who Uses Eucalyptus', 'Learn About Eucalyptus For', and 'What's Happening'. Each category has sub-links or associated logos. The 'Who Uses Eucalyptus' section includes logos for Raytheon and George Mason University.

Cloud Computing Software www.eucalyptus.com

Contact Sales Customer Support About Us Blog [Get Eucalyptus](#)

EUCALYPTUS

SEARCH

LEARN EUCALYPTUS CLOUD PARTICIPATE SERVICES PARTNERS

Build Together. Run Together.
Manage Together.

Eucalyptus 3

Get New 3.1 Release

Download

> EUCALYPTUS
> FASTSTART
> SOURCE
> PAPERS

Who Uses Eucalyptus

Raytheon

Learn About Eucalyptus For

MANAGERS
ARCHITECTS
APPLICATION ARCHITECTS
ADMINISTRATORS
DEVELOPERS
USERS

What's Happening

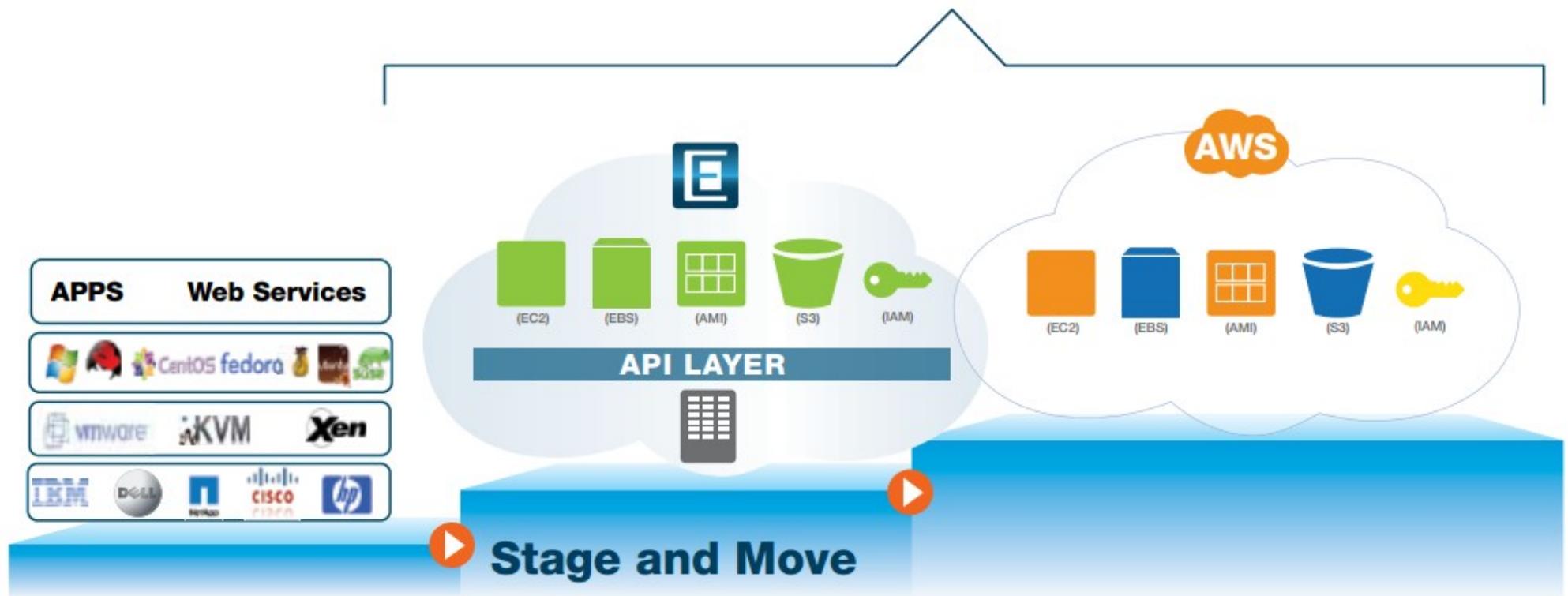
NEWS BLOGS EVENTS

[Marten Mickos Explains Eucalyptus'
Partnership with Amazon, What He Thinks
of OpenStack, And More](#)

2012/10/15

GEORGE MASON

Eucalyptus



EUCALYPTUS

Eucalyptus



CloudStack

The screenshot shows a desktop browser window displaying the official CloudStack website at www.cloudstack.org. The page features a large banner for the "BUILD A CLOUD DAY" event, followed by sections on Open Source Cloud Computing with Apache CloudStack, latest forum posts, blog posts, and events.

Header: CloudStack | Open Source | www.cloudstack.org | LOGIN | REGISTER | Apache Podling | Documentation | Bugs | Home | Software | Download | Blog | Discuss | Contribute | Partners | About

Banner: BUILD A CLOUD DAY | LEARN HOW TO BUILD, MANAGE AND DEPLOY CLOUD COMPUTING ENVIRONMENTS WITH OPEN SOURCE SOFTWARE THE DEVOPS WAY.

Text: GET FIRSTHAND INFORMATION FROM SPEAKERS FROM PUPPETLABS | ZENOSS | XEN.ORG | RED HAT GLUSTER | ENSTRATUS | CLOUDSTACK | SIGN UP NOW

Section: Open Source Cloud Computing with Apache CloudStack

Apache CloudStack is open source software written in java that is designed to deploy and manage large networks of virtual machines, as a highly available, scalable cloud computing platform. CloudStack current supports the most popular hypervisors VMware, Oracle VM, KVM, XenServer and Xen Cloud Platform. CloudStack offers three ways to manage cloud computing environments: a easy-to-use web interface, command line and a full-featured RESTful API.

Latest Forum Posts:

- billing for cs 4** In Installation at 04:10 on Oct 15, 2012 (EDT)
- Question on Cloudstack**

Latest Blog Posts:

CloudStack Configuration Vulnerability Discovered
A configuration vulnerability has been discovered in CloudStack that could allow a malicious user to execute arbitrary CloudStack API calls, such as deleting all VMs being managed by

Upcoming Events:

Geek Speak Local / Paris Other Events | 10/18 rue des Terres au curé 75013 PARIS, France

Cloudstack Connect:

[Twitter](#) [Facebook](#) [LinkedIn](#)
[YouTube](#) [Google+](#) [RSS](#)

Who's Online:

Geek Speak Local / Paris Other Events | 10/18 rue des Terres au curé 75013 PARIS, France

CloudStack

CloudStack | Open Source X

www.cloudstack.org

cloudstack
open source cloud computing

LOGIN REGISTER

Apache Podling | Documentation | Bugs

Home | Software | Download | Blog | Discuss | Contribute | Partners | About

OPSCODE TATA COMMUNICATIONS InstaCompute RIGHT SCALE TREND MICRO jclouds puppet labs ARISTA SUNGARD big switch networks ServiceMesh GLUSTER Go Daddy DATAPIPE enSTRATUS cloudsoft NEXENTA appfog HORTONWORKS uShareSoft Path EQUINIX Alcatel-Lucent Engine Yard JUNIPER NETWORKS

THESE COMPANIES ARE CREATING CLOUD SOLUTIONS WITH CLOUDSTACK, MAYBE YOU SHOULD TOO? [BECOME A PARTNER](#)

Open Source Cloud Computing with Apache CloudStack

Apache CloudStack is open source software written in java that is designed to deploy and manage large networks of virtual machines, as a highly available, scalable cloud computing platform. CloudStack current supports the most popular hypervisors VMware, Oracle VM, KVM, XenServer and Xen Cloud Platform. CloudStack offers three ways to manage cloud computing environments: a easy-to-use web interface, command line and a full-featured RESTful API.

Latest Forum Posts

 billing for cs 4
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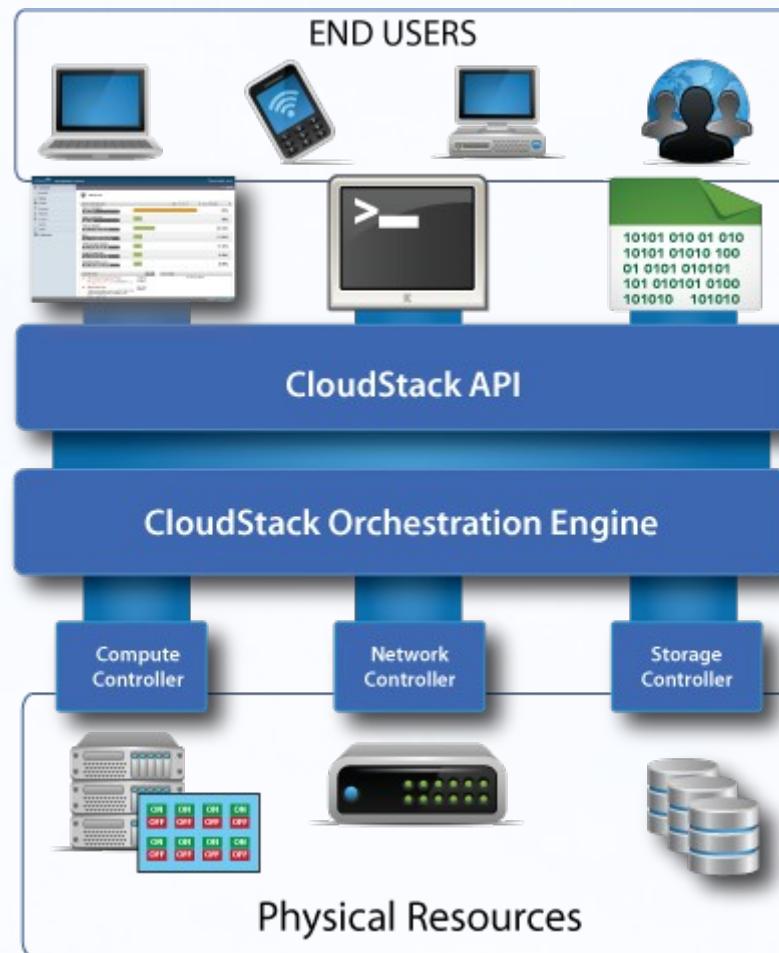
Cloudstack Connect

Who's Online



CloudStack



CloudStack

CloudStack

0 Notifications Default View Project View a ▾

Dashboard Instances Storage Network Templates Accounts Domains Events System Projects Global Settings Configuration

General Alerts view all

- System Alert...**
VM (name: i-5-1683-VM, id: 1683) stopped unexpecte...
- System Alert...**
Unable to restart r-1395-VM which was running on h...
- System Alert...**
Unable to restart r-1410-VM which was running on h...
- System Alert...**
Unable to restart i-31-1424-VM which was running o...
- System Alert...**
Unable to restart i-53-1546-VM which was running o...

Host Alerts view all

- Host Alert...**
VM (name: i-5-1683-VM, id: 1683) stopped unexpecte...
- Host Alert...**
Unable to restart r-1395-VM which was running on h...
- Host Alert...**
Unable to restart r-1410-VM which was running on h...
- Host Alert...**
Unable to restart i-31-1424-VM which was running o...
- Host Alert...**
Unable to restart i-53-1546-VM which was running o...

System Capacity

Zone: zone	 Public IP 2 / 4	Zone: zone	 Reserved System IP 40 / 10
Zone: zone	 Storage Used 15 GB / 50 GB	Zone: zone	 Secondary Storage 15 GB / 50 GB
Zone: zone	 Domain Router 100 / 30	Zone: zone	 Host 100 gHZ / 15.5 gHZ

CloudStack

CloudStack

0 Notifications Default View Project View a ▾

Dashboard Instances Storage Network Templates Accounts Domains Events System Projects Global Settings Configuration

Network sumi-network-vlan-100 IP Addresses 72.52.67.62 [Source NAT] Refresh

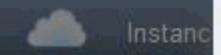
IP Details Configuration

- 72.52.67.77
- 72.52.67.62 [Source NAT]
- 72.52.67.52
- 72.52.67.51
- 72.52.67.46 [Source NAT]
- 72.52.67.45 [Source NAT]
- 72.52.67.42
- 72.52.67.37
- 72.52.67.31 [Source NAT]
- 72.52.67.23
- 72.52.67.22
- 72.52.67.20
- 72.52.126.69 [Source NAT]
- 72.52.126.68 [Source NAT]
- 72.52.126.67 [Source NAT]

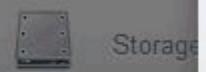
The diagram illustrates the CloudStack firewall architecture. At the top is a cloud icon labeled "Internet". A vertical line descends from it to a rectangular box labeled "Firewall". Below the "Firewall" box is a blue arrow pointing to the right labeled "View All". From the bottom of the "Firewall" box, two horizontal lines branch out to two separate boxes: "Load Balancing" on the left and "Port Forwarding" on the right. Each of these boxes also has a "View All" button below it. Arrows point from the "View All" buttons in the "Firewall" and "Port Forwarding" boxes down towards the "Load Balancing" box.



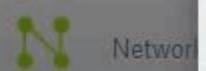
Dashboard



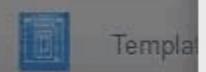
Instances



Storage



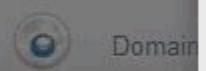
Network



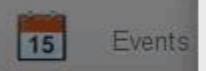
Template



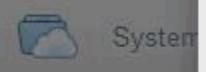
Account



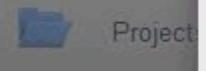
Domain



Events



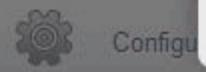
System



Project



Global



Config

Instances

Add instance

1 Setup

2 Select a template

3 Service Offering

4 Data Disk Offering

5 Network

6 Review

Please review the following information and confirm that your virtual instance is correct before launch

Name (optional)

VM1

Add to group (optional)

Zone

San Jose

Edit

Hypervisor

(None)

Edit

Template

Windows 8 (64 bit)

Edit

Service offering

Small Instance

Edit

Data disk offering

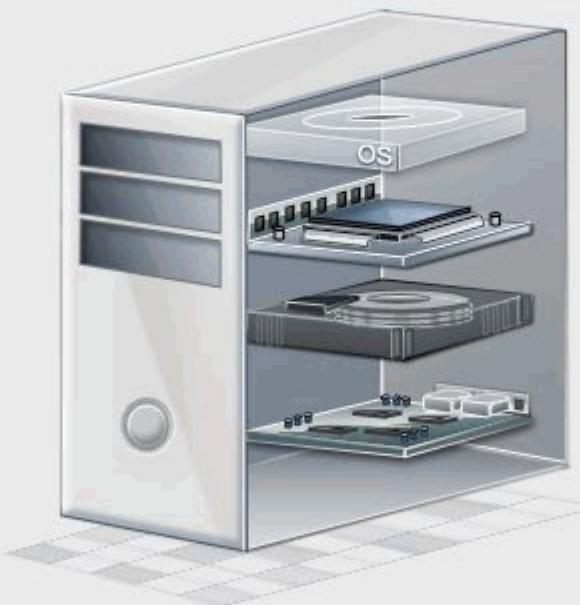
Small

Edit

Primary network

(None)

Edit

[Previous](#)[Cancel](#)

Launch VM

i-11111-VM	DEV	San Jose	Stopped				
i-27-1274-VM	Yali	San Jose	Running				
i-4072-1-VM	admin	Chicago	Running				



Dashboard



Instances



Storage



Network



Templates



Accounts



Domains



Events



System



Projects



Global Settings



Configuration

Storage

Select view: Volumes

Filter By: My volumes



+ Add volume

Name Type Zone Size Status Actions

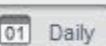
Recurring Snapshots

You can setup recurring snapshot schedules by selecting from the available options below and applying your policy preference.

Schedule:



Hourly



01 Daily



1-7 Weekly



Monthly

Time

1

00

AM

Timezone

[UTC-12:00] GMT-12:00

Keep

5

snapshot(s)

Add

Scheduled Snapshots

Time: 10 min past the hr

Timezone:
[UTC-11:00] Samoa Standard Time

Keep: 23



Time: 12:33 AM

Day 31 of month

Timezone:
[UTC-11:00] Samoa Standard Time

Keep: 23



Done

ROOT-1713

ROOT

Chicago

10485760000

Ready

ROOT-1715

ROOT

Chicago

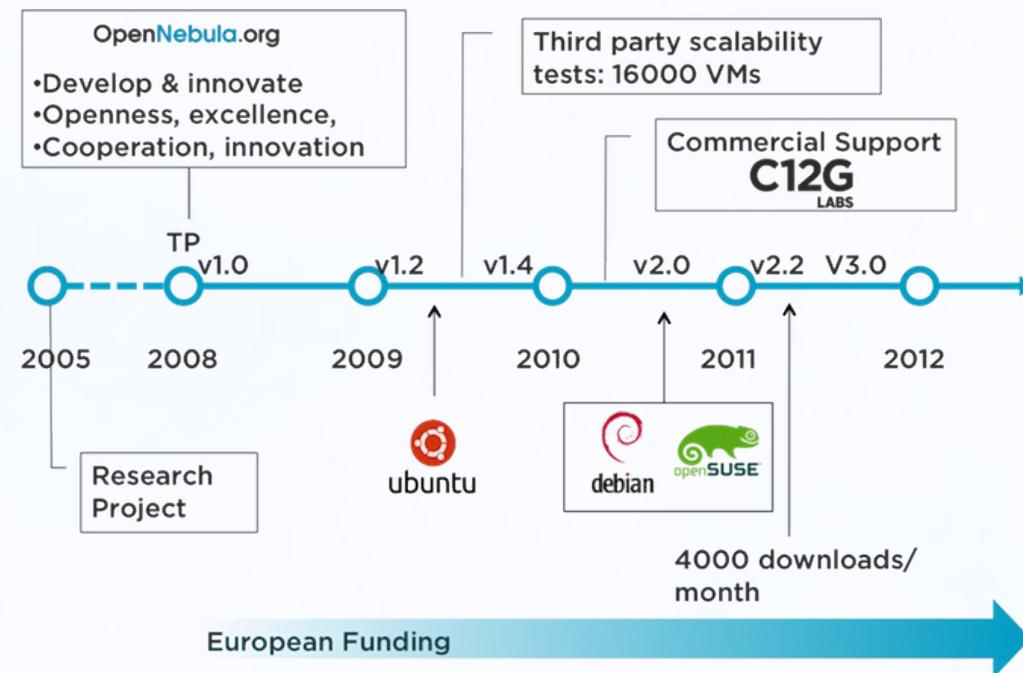
10485760000

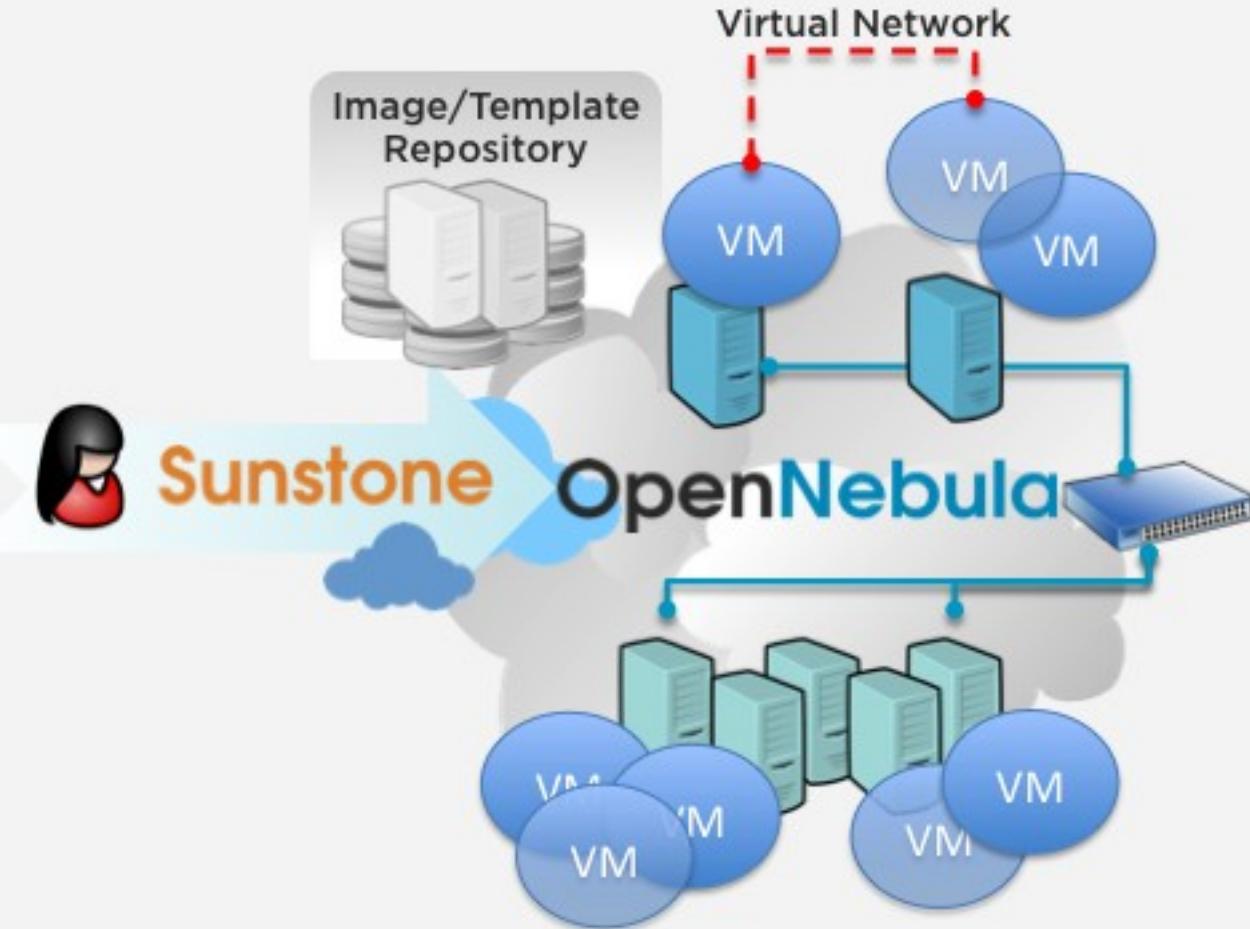
Ready

OpenNebula

The screenshot shows the homepage of the OpenNebula.org website. At the top, there's a navigation bar with links for Commercial, Contact, and social media (RSS, LinkedIn, Twitter, Facebook, YouTube, GitHub, Google+, and others). Below the navigation is a main header with the text "OpenNebula.org" in large, bold letters, followed by "The Open Source Solution for Data Center Virtualization". A green diagonal banner on the right says "ONE 3.8 Beta is Out!". The main content area features a large heading "The Cloud Data Center Management Solution" and a subtext "Most solid, powerful and flexible open-source alternative to proprietary cloud management platforms". Below this, there are six cards arranged in two rows of three, each with an icon and a title: "Open", "Adaptable", "Proven", "Powerful" in the top row; and "Interoperable", "No Lock-in", "Very Light", "Enterprise-ready" in the bottom row. Each card has a detailed description below it. At the bottom, there's a horizontal ellipsis with five dots, and a footer section with the text "Our Users are the Industry & Research Leaders".

OpenNebula





OpenNebula

OpenNebula Self-Service

selfservice.c12g.com/ui

Bienvenue | Déconnecter

OpenNebula Self-Service

Tableau de bord

Machines virtuelles

Stockage

Réseaux

Configuration

Affiche 10 éléments Rechercher:

+ Nouveau Éteindre Action précédente Supprimer

Tout	ID	Nom / État	IP
Pas d'enregistrement			

Premier Précédent Suivant Dernier

Créer une machine virtuelle

Nom MV: my_vm

Type d'instance: small

Images:

- Ubuntu 11.04 (id:1)
- CentOS-5.5-64-
- timage (id:4)
- ubuntu 10.04 (id:2)

Réseaux:

- public_vnet (id:1)
- Attune (id:7)
- public_net2 (id:2)

Créer # MVs: 1

Fermer Créer

OpenNebula 3.7.80 by C12G Labs.

The screenshot displays the OpenNebula Self-Service web interface. The left sidebar includes links for Tableau de bord, Machines virtuelles (which is currently selected), Stockage, Réseaux, and Configuration. The main content area shows a list of virtual machines with the message "Pas d'enregistrement". To the right, a modal window titled "Créer une machine virtuelle" allows the user to define a new VM named "my_vm" with a "small" instance type. Under "Images", "Ubuntu 11.04 (id:1)" is selected. Under "Réseaux", "public_vnet (id:1)" is selected. A field for creating "# MVs" is set to "1". At the bottom of the modal are "Fermer" and "Créer" buttons. The footer of the page indicates "OpenNebula 3.7.80 by C12G Labs".

OpenStack

Home » OpenStack Open S X

www.openstack.org

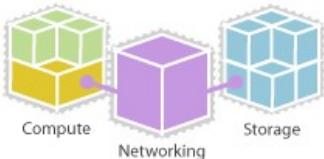
openstack™ CLOUD SOFTWARE

Home Software User Stories Community Foundation Profile Blog Wiki Documentation

Open source software for building private and public clouds.

Software

OpenStack Software delivers a massively scalable cloud operating system.



About OpenStack Software...

Community

Join our global community of technologists, developers, researchers, corporations and cloud computing experts.

6024 PEOPLE

87 COUNTRIES

Cisco WebEx Runs OpenStack

Read the case study about WebEx and other OpenStack production clouds.

User Stories

Latest Activity

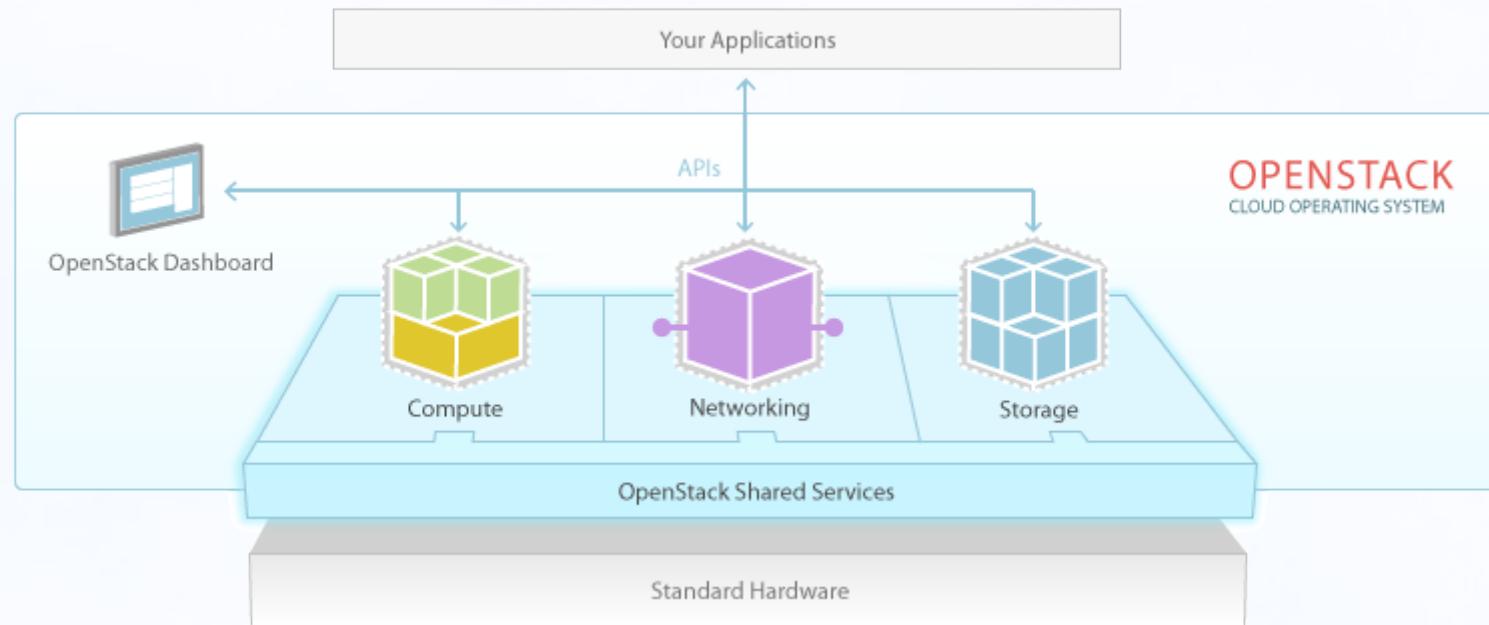
What is OpenStack?

web Back from San Diego OpenStack Summit 20 October 2012 9:36 pm

Come See Us

NEXT UP: Swiss OpenStack user

OpenStack



OpenStack

The screenshot shows the OpenStack Project Users interface. The top navigation bar includes a back button, forward button, search icon, and a magnifying glass icon. The title bar says "Project Users - OpenStack". The top right shows "Logged in as: admin" and links for "Settings" and "Sign Out". The left sidebar has a red "openstack" logo and a "DASHBOARD" button. Below it are tabs for "Project" (selected) and "Admin". Under "System Panel", there are links for "Overview", "Instances", "Services", "Flavors", "Images", "Projects" (selected), "Users" (disabled), and "Quotas" (disabled). The main content area has a header "Users for Project: demo". Below it is a table titled "Users For Project" with columns: ID, User Name, Email, Enabled, and Actions. It lists two users: "admin" and "demo". Each row has a "Remove User" button. A message at the bottom says "Displaying 2 items". Below this is a section titled "Add New Users" with a similar table. It lists several users: "nova", "glance", "swift", "scott", "jesse", and one partially visible user. Each row has an "Add To Project" button.

ID	User Name	Email	Enabled	Actions
779d6a4a2bfe407caa62256d3e9fb4ba	admin	admin@example.com	True	<button>Remove User</button>
fb9e9667d6eb4ba59ac2bbc885d7d890	demo	demo@example.com	True	<button>Remove User</button>

ID	User Name	Email	Enabled	Actions
32d92034862d4c73ad25b83f22335479	nova	nova@example.com	True	<button>Add To Project</button>
c8e76d5da6474adba9cb2161802105df	glance	glance@example.com	True	<button>Add To Project</button>
4b35949bd96d4804aac81c55d196193b	swift	swift@example.com	True	<button>Add To Project</button>
e2b1ab40b9234a5889c91f11f7f8cc52	scott	-	True	<button>Add To Project</button>
0f8f6378ebe24b8290f6ff80cf5683d3	jesse	-	True	<button>Add To Project</button>
750bhb9ac4534c2ebdd496811be2f4cf	dolph	-	True	<button>Add To Project</button>

OpenStack

Instances & Volumes - OpenStack

Instances & Volumes

Logged in as: admin Settings Sign Out

Success: Instance "test-www.demo.com" launched.

Instances

Launch Instance Terminate Instances

	Instance Name	IP Address	Size	Status	Task	Power State	Actions
<input type="checkbox"/>	test-www.demo.com	10.4.128.20	4GB RAM 2 VCPU 10.0GB Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	test-www.demo.com	10.4.128.19	4GB RAM 2 VCPU 10.0GB Disk	Build	Spawning	No State	Edit Instance
<input type="checkbox"/>	myserve	10.4.128.18	2GB RAM 1 VCPU 10.0GB Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	myserver	10.4.128.16	2GB RAM 1 VCPU 10.0GB Disk	Active	None	Running	Edit Instance

Displaying 4 items

Volumes

Create Volume

	Name	Description	Size	Status	Attachments	Actions
--	------	-------------	------	--------	-------------	---------

OpenStack : installation/test via une VM

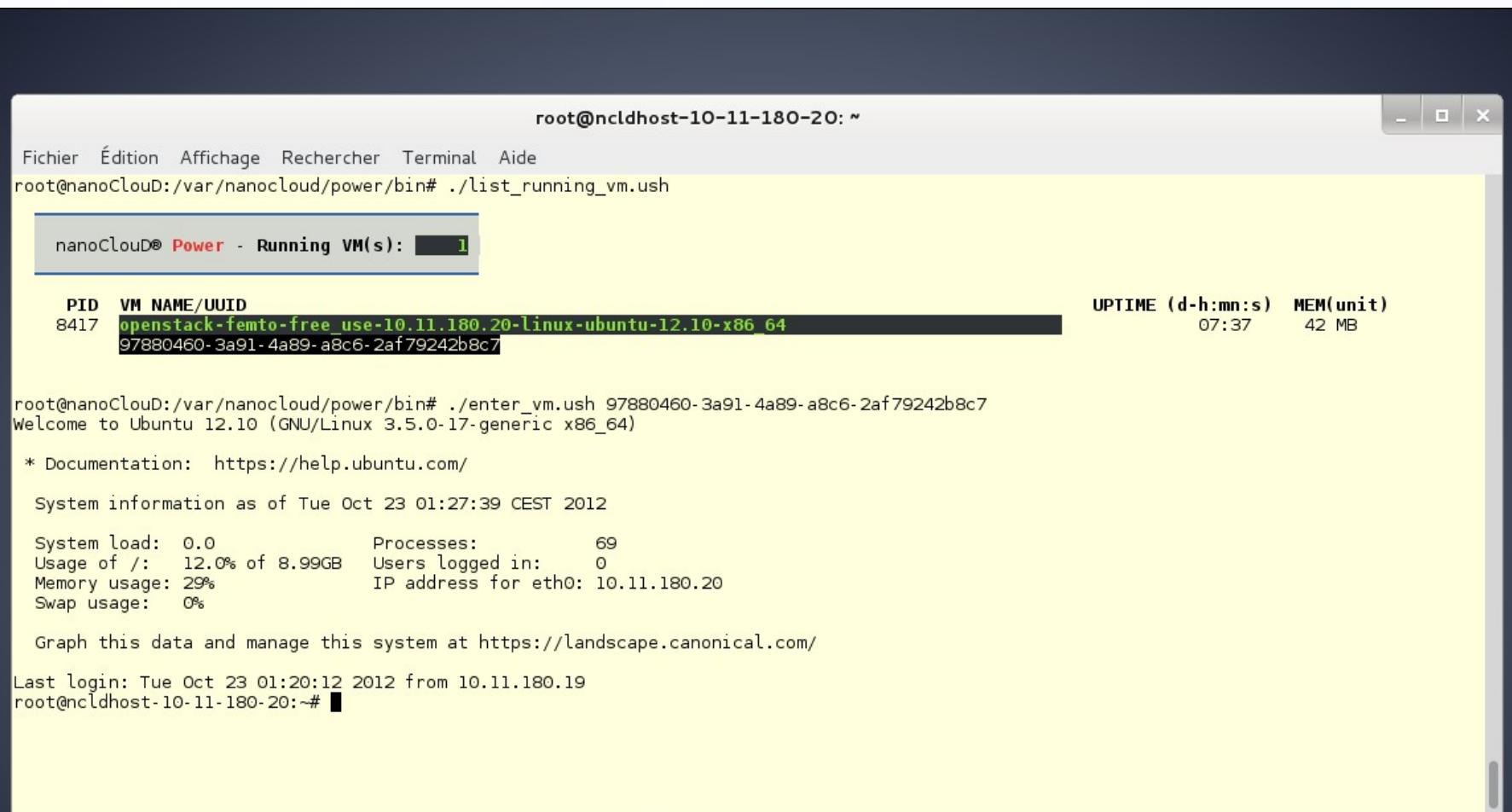
- <http://devstack.org/guides/single-vm.html>
- Choix d'OS : Ubuntu 12.10

Launching with using Userdata

The userdata script grabs the latest version of DevStack via git, creates a minimal `localrc` file and kicks off `stack.sh`.

```
#!/bin/sh
apt-get update
apt-get install -qqy git
git clone https://github.com/openstack-dev/devstack.git
cd devstack
echo ADMIN_PASSWORD=password > localrc
echo MYSQL_PASSWORD=password >> localrc
echo RABBIT_PASSWORD=password >> localrc
echo SERVICE_PASSWORD=password >> localrc
echo SERVICE_TOKEN=tokentoken >> localrc
echo FLAT_INTERFACE=br100 >> localrc
./stack.sh
```

OpenStack : installation/test via une VM



The screenshot shows a terminal window titled "root@nclhost-10-11-180-20: ~". The window has a menu bar with "Fichier", "Édition", "Affichage", "Rechercher", "Terminal", and "Aide". The main area displays the output of several commands:

```
Fichier Édition Affichage Rechercher Terminal Aide
root@nanoCloud:/var/nanocloud/power/bin# ./list_running_vm.ush

nanoCloud® Power - Running VM(s): 1

PID VM NAME/UUID                                     UPTIME (d-h:mm:s) MEM(unit)
8417 openstack-femto-free_use-10.11.180.20-linux-ubuntu-12.10-x86_64 07:37   42 MB
97880460-3a91-4a89-a8c6-2af79242b8c7

root@nanoCloud:/var/nanocloud/power/bin# ./enter_vm.ush 97880460-3a91-4a89-a8c6-2af79242b8c7
Welcome to Ubuntu 12.10 (GNU/Linux 3.5.0-17-generic x86_64)

 * Documentation: https://help.ubuntu.com/

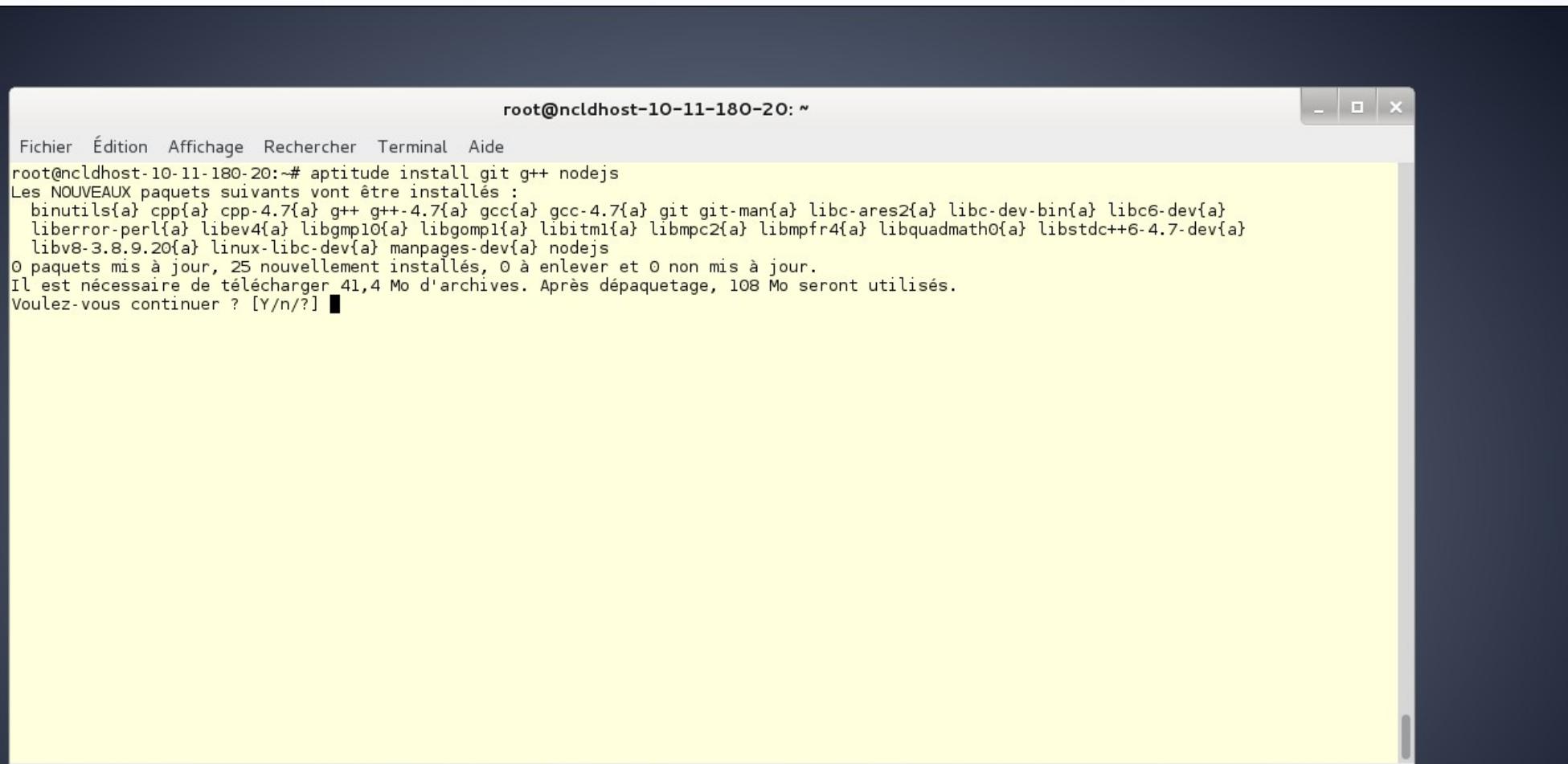
 System information as of Tue Oct 23 01:27:39 CEST 2012

 System load: 0.0          Processes:           69
 Usage of /: 12.0% of 8.99GB  Users logged in:     0
 Memory usage: 29%          IP address for eth0: 10.11.180.20
 Swap usage:  0%

 Graph this data and manage this system at https://landscape.canonical.com/

Last login: Tue Oct 23 01:20:12 2012 from 10.11.180.19
root@nclhost-10-11-180-20:~#
```

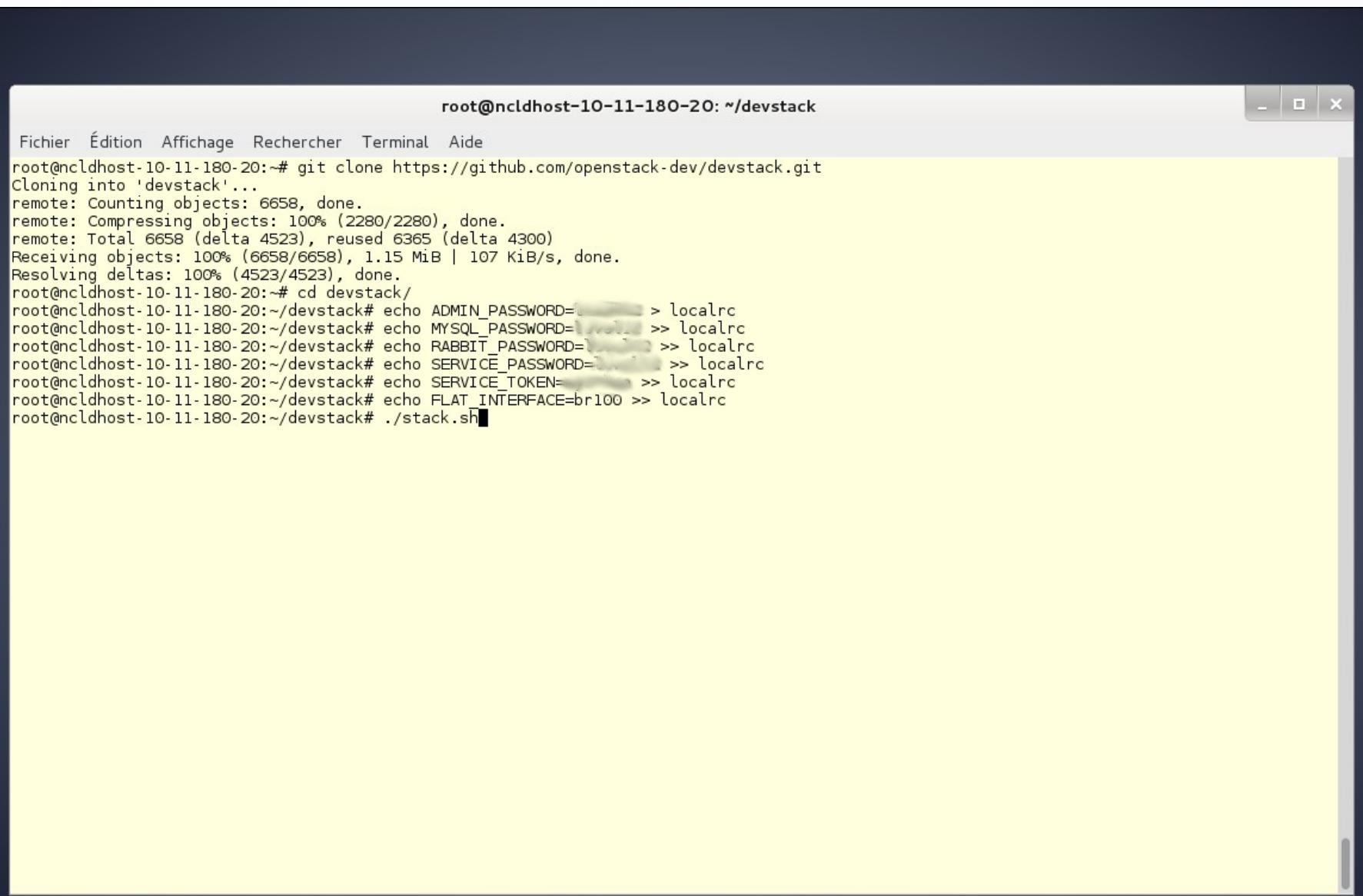
OpenStack : installation/test via une VM



A screenshot of a terminal window titled "root@nclhost-10-11-180-20: ~". The window has a dark blue header bar with standard window controls (minimize, maximize, close) on the right. The main area is white and contains the following text:

```
Fichier Édition Affichage Rechercher Terminal Aide
root@nclhost-10-11-180-20:~# aptitude install git g++ nodejs
Les NOUVEAUX paquets suivants vont être installés :
  binutils{a} cpp{a} cpp-4.7{a} g++ g++-4.7{a} gcc{a} gcc-4.7{a} git git-man{a} libc-ares2{a} libc-dev-bin{a} libc6-dev{a}
  liberror-perl{a} libev4{a} libgmp10{a} libgomp1{a} libitm1{a} libmpc2{a} libmpfr4{a} libquadmath0{a} libstdc++6-4.7-dev{a}
  libv8-3.8.9.20{a} linux-libc-dev{a} manpages-dev{a} nodejs
0 paquets mis à jour, 25 nouvellement installés, 0 à enlever et 0 non mis à jour.
Il est nécessaire de télécharger 41,4 Mo d'archives. Après dépaquetage, 108 Mo seront utilisés.
Voulez-vous continuer ? [Y/n/?] ■
```

OpenStack : installation/test via une VM



A screenshot of a terminal window titled "root@nclhost-10-11-180-20: ~/devstack". The window has a dark blue header bar with a title bar and standard window controls. The main area of the terminal shows the following command-line session:

```
Fichier Édition Affichage Rechercher Terminal Aide
root@nclhost-10-11-180-20:~/devstack#
root@nclhost-10-11-180-20:~# git clone https://github.com/openstack-dev/devstack.git
Cloning into 'devstack'...
remote: Counting objects: 6658, done.
remote: Compressing objects: 100% (2280/2280), done.
remote: Total 6658 (delta 4523), reused 6365 (delta 4300)
Receiving objects: 100% (6658/6658), 1.15 MiB | 107 KiB/s, done.
Resolving deltas: 100% (4523/4523), done.
root@nclhost-10-11-180-20:~# cd devstack/
root@nclhost-10-11-180-20:~/devstack# echo ADMIN_PASSWORD=... > localrc
root@nclhost-10-11-180-20:~/devstack# echo MYSQL_PASSWORD=... >> localrc
root@nclhost-10-11-180-20:~/devstack# echo RABBIT_PASSWORD=... >> localrc
root@nclhost-10-11-180-20:~/devstack# echo SERVICE_PASSWORD=... >> localrc
root@nclhost-10-11-180-20:~/devstack# echo SERVICE_TOKEN=... >> localrc
root@nclhost-10-11-180-20:~/devstack# echo FLAT_INTERFACE=br100 >> localrc
root@nclhost-10-11-180-20:~/devstack# ./stack.sh
```

OpenStack : installation/test via une VM

```
root@nclhost-10-11-180-20: ~/devstack

Fichier Édition Affichage Rechercher Terminal Aide
liblcms-utils pulseaudio pm-utils radvd make-doc python-amqplib-doc python-markdown python-memcache libjs-jquery-tablesorter
python-crypto-dbg python-crypto-doc texlive-latex-recommended texlive-latex-base texlive-lang-french fonts-linuxlibertine
ttf-linux-libertine python-egenix-mxdatetime-dbg python-egenix-mxdatetime-doc python-egenix-mxtools-dbg python-egenix-mxtools-doc
python-dns python-greenlet-dbg python-greenlet-dev python-greenlet-doc python-imaging-doc python-imaging-dbg python-jinja2-doc
python-django python-kombu-doc python-pika python-pymongo pyro python-lxml-dbg mysql-server-5.1 mysql-server python-mysqldb-dbg ipython
python-netaddr-docs python-nose-doc python-numumpy-doc python-numumpy-dbg gfortran python-pastewebkit libapache2-mod-wsgi
libapache2-mod-python libapache2-mod-scgi python-pgsql libjs-mochikit python-flup python-cherrypy ttf-bitstream-vera
python-psqlite2-doc python-psqlite2-dbg jsmath libjs-mathjax texlive-latex-extra texlive-fonts-recommended python-sqlalchemy-doc
python-psycopg2 python-kinterbasdb python-pymssql tix python-tk-dbg mol-drivers-macosx openbios-sparc ubuntu-vm-builder uml-utilities
debootstrap samba sgml-base-doc sqlite3-doc tcl-tclreadline zip cscope vim-doc mesa-utils debhelper xfonts-cyrillic
Paquets recommandés :
python-dev-all
Les NOUVEAUX paquets suivants seront installés :
augeas-lenses blt bridge-utils build-essential cgroup-lite cloud-utils cpu-checker distro-info distro-info-data dnsmasq-base
dnsmasq-utils docutils-common docutils-doc dpkg-dev ebttables euca2ools fakeroot fontconfig-config gawk git-core kpartx kvm kvm-ipxe
libaiol libalgorithm-diff-perl libalgorithm-diff-xs-perl libalgorithm-merge-perl libapparmor1 libasound2 libasyncns0 libaugeas0
libavahi-client3 libavahi-common-data libavahi-common3 libblas3 libblas3gf libbluetooth3 libbrlapi0.5 libcaca0 libcap2
libconfig-general-perl libdpkg-perl libdrm-nouveau2 libexpat1-dev libfile-fcntllock-perl libflac8 libfontconfig1 libfontenc1
libgfortran3 libgl1-mesa-dri libgl1-mesa-glx libglapi-mesa libibus1 libice6 libjpeg-turbo8 libjs-jquery libjs-sphinxdoc
libjs-underscore libjson0 liblapack3 liblcms1 libldap2-dev libllvm3.1 liblua5.1-0 libmysqlclient18 libnetcf1
libnetfilter-conntrack3 libnl-route-3-200 libnpr4 libnss3 libogg0 libpaper-utils libpaper1 libperl5.14 libpulse0 librados2 librbd1
librdmacm1 libruby1.9.1 libsass12-dev libSDL1.2debian libsgutils2-2 libsigsegv2 libsm6 libsndfile1 libssl-dev libtidy-0.99-0
libtxc-dxtn-s2tc0 libutempter0 libvirt-bin libvirt0 libvorbis0a libvorbisenc2 libx11-xcb1 libxaw7 libxcb-glx0 libxcb-shape0
libxcompositel libxdamage1 libxenstore3.0 libxfixed3 libxft2 libxi6 libxinerama1 libxml2 libxml2-dev libxml2-utils libxmui6 libxpm4
libxrandr2 libxrender1 libxslt1.1 libxss1 libxt6 libxtst6 libxv1 libxxf86dg1 libxxf86vm1 libyaml-0-2 locate make msr-tools
mysql-common open-iscsi open-iscsi-utils pep8 pylint python-amqplib python-anyjson python-bcrypt python-beautifulsoup python-boto
python-carrot python-cheetah python-cherrypy3 python-coverage python-crypto python-dateutil python-decorator python-dev python-dingus
python-distro-info python-docutils python-egenix-mxdatetime python-egenix-mxtools python-eventlet python-feedparser python-formencode
python-gflags python-greenlet python-imaging python-iso8601 python-jinja2 python-kombu python-libvirt python-libxml2 python-lockfile
python-logilab-astng python-logilab-common python-lxml python-m2crypto python-markupsafe python-migrate python-mox python-mysqldb
python-netaddr python-nose python-numumpy python-openid python-paramiko python-paste python-pastedeploy python-pastescript python-pip
python-pgments python-psqlite2 python-repoze.lru python-roman python-routes python-scgi python-setuptools python-sphinx
python-sqlalchemy python-sqlalchemy-ext python-stompy python-suds python-support python-tempita python-tk python-unitest2
python-utidylib python-virtualenv python-webob python-xattr python-yaml python2.7-dev qemu-common qemu-kvm qemu-utils seabios sg3-utils
sgml-base socat sphinx-common sphinx-doc sqlite3 tcl8.5 tgt ttf-dejavu-core unzip vgabios vim-nox vlan x11-common x11-utils
xbitmaps xml-core xterm zlib1g-dev
0 mis à jour, 224 nouvellement installés, 0 à enlever et 0 non mis à jour.
Il est nécessaire de prendre 98,6 Mo dans les archives.
Après cette opération, 323 Mo d'espace disque supplémentaires seront utilisés.
Réception de :1 http://fr.archive.ubuntu.com/ubuntu/ quantal/main ttf-dejavu-core all 2.33-2ubuntul [1 552 kB]
0% [1 ttf-dejavu-core 402 kB/1 552 kB 26%] □
```

OpenStack dans une VM

(plusieurs minutes + tard ...)

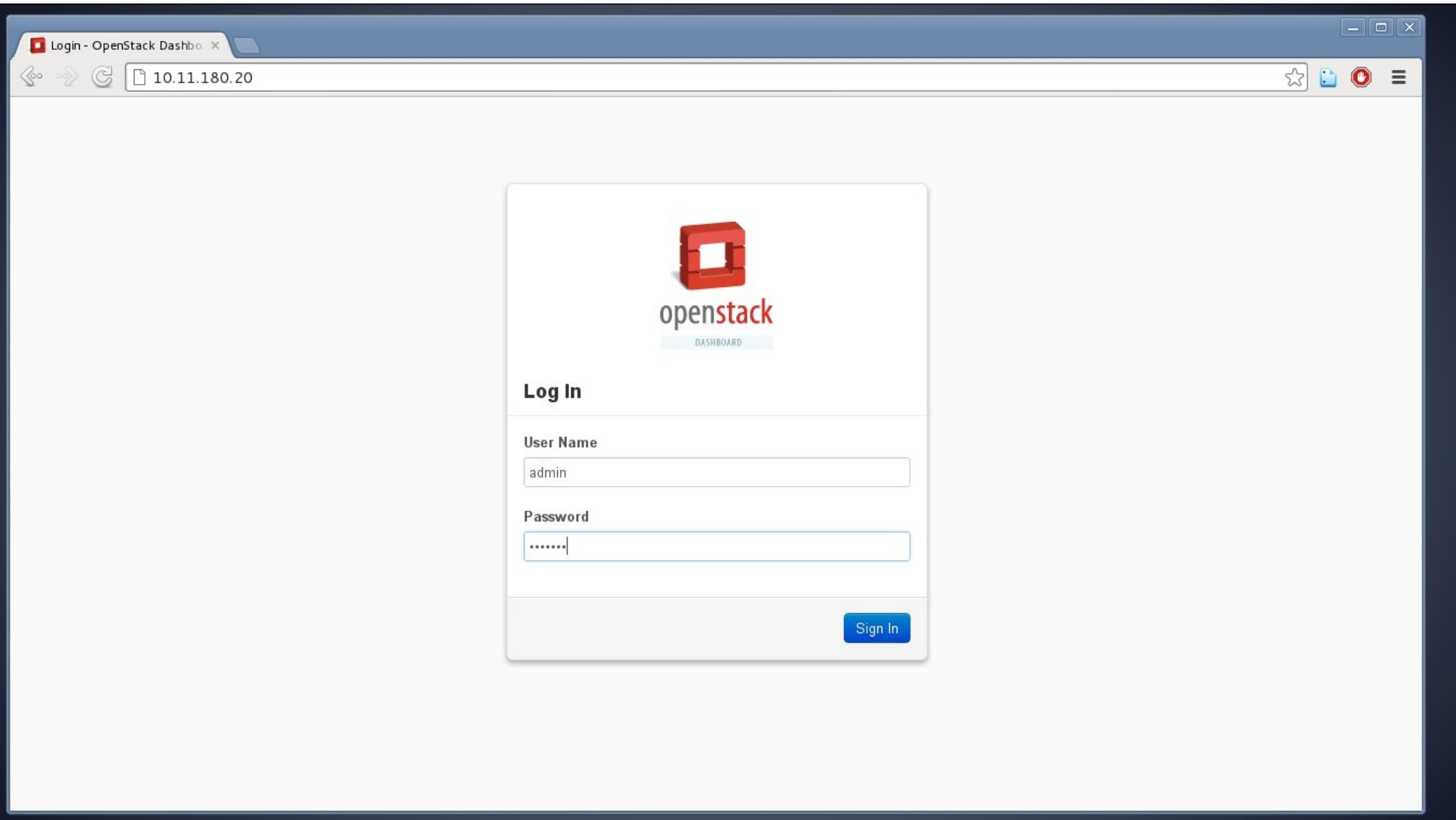
```
stack@nclhost-10-11-180-20: ~/devstack

Fichier Édition Affichage Rechercher Terminal Aide
++ echo '| id          | d68e30b2-5b36-4b7d-8135-3d1a958efb59 |'
++ read data
+ RAMDISK_ID=d68e30b2-5b36-4b7d-8135-3d1a958efb59
+ glance -os-auth-token b4d97d0d6e1c4878b63ed1760981a028 --os-image-url http://10.11.180.20:9292 image-create --name cirros-0.3.0-x86_64-uec --public --container-format ami --disk-format ami --property kernel_id=6c71bde8-07bb-4113-b990-90795e003e59 --property ramdisk_id=d68e30b2-5b36-4b7d-8135-3d1a958efb59
+-----+-----+
| Property      | Value
+-----+-----+
| Property 'kernel_id' | 6c71bde8-07bb-4113-b990-90795e003e59 |
| Property 'ramdisk_id' | d68e30b2-5b36-4b7d-8135-3d1a958efb59 |
| checksum       | 2f81976cae15c16ef0010c51e3a6c163 |
| container_format | ami |
| created_at     | 2012-10-23T00:46:52 |
| deleted        | False |
| deleted_at     | None |
| disk_format    | ami |
| id             | 0003ce48-faf2-4a4c-8d9a-779c6c0be63a |
| is_public       | True |
| min_disk       | 0 |
| min_ram        | 0 |
| name           | cirros-0.3.0-x86_64-uec |
| owner          | e17970548e3f4d4ba35clea26f6427bc |
| protected      | False |
| size           | 25165824 |
| status          | active |
| updated_at     | 2012-10-23T00:46:54 |
+-----+-----+
+ [[ -x /opt/stack/devstack/local.sh ]]
+ set +o xtrace

Horizon is now available at http://10.11.180.20/
Keystone is serving at http://10.11.180.20:5000/v2.0/
Examples on using novaclient command line is in exercise.sh
The default users are: admin and demo
The password: [REDACTED]
This is your host ip: 10.11.180.20
stack.sh completed in 3722 seconds.
stack@nclhost-10-11-180-20:~/devstack$ █
```

OpenStack (dans une VM)

login



OpenStack (dans une VM)

launch instance

The screenshot shows the OpenStack Dashboard interface. The main window displays the 'Instances' page with a single item listed. A modal dialog titled 'Launch Instance' is open in the center. The dialog has tabs for 'Details', 'Access & Security', 'Volume Options', and 'Post-Creation'. The 'Details' tab is selected. It contains fields for 'Instance Source' (set to 'Image'), 'Image' (set to 'cirros-0.3.0-x86_64-uec'), 'Instance Name' (set to 'test_cnam'), 'Flavor' (set to 'm1.tiny'), and 'Instance Count' (set to '1'). To the right of these fields is a descriptive text block and a 'Flavor Details' table. The 'Flavor Details' table shows the following resources: Name (m1.tiny), VCPUs (1), Root Disk (0 GB), Ephemeral Disk (0 GB), Total Disk (0 GB), and RAM (512 MB). Below the flavor details is a section for 'Project Quotas' with three items: Number of Instances (0) / 10 Available, Number of VCPUs (0) / 20 Available, and Total RAM (0 MB) / 51,200 MB Available. At the bottom of the dialog are 'Cancel' and 'Launch' buttons.

Instances - OpenStack Das X

10.11.180.20/project/instances/

Logged in as: admin Settings Sign Out

Instances

openstack

DASHBOARD

Project Admin

CURRENT PROJECT admin

Manage Compute

Overview

Instances

Volumes

Images & Snapshots

Access & Security

Instances

Displaying 1 item

Launch Instance

Launch Instance

Details Access & Security Volume Options Post-Creation

Instance Source

Image

Specify the details for launching an instance.

The chart below shows the resources used by this project in relation to the project's quotas.

Image

cirros-0.3.0-x86_64-uec

Instance Name

test_cnam

Flavor

m1.tiny

Flavor Details

Name	m1.tiny
VCPUs	1
Root Disk	0 GB
Ephemeral Disk	0 GB
Total Disk	0 GB
RAM	512 MB

Project Quotas

Number of Instances (0) 10 Available

Number of VCPUs (0) 20 Available

Total RAM (0 MB) 51,200 MB Available

Cancel Launch

OpenStack (dans une VM) instances

The screenshot shows the OpenStack Dashboard interface. The title bar reads "Instances - OpenStack Das X" and the URL is "10.11.180.20/project/instances/". The top right shows the user is logged in as "admin" with "Settings" and "Sign Out" links. The left sidebar has a red "openStack" logo and a "DASHBOARD" button. It also shows "Project Admin" and a dropdown for "CURRENT PROJECT admin". Under "Manage Compute", there are buttons for "Overview", "Instances" (which is selected), "Volumes", "Images & Snapshots", and "Access & Security". The main content area is titled "Instances" and shows a table with two rows:

	Instance Name	IP Address	Size	Keypair	Status	Task	Power State	Actions
<input type="checkbox"/>	test_small		m1.small 2GB RAM 1 VCPU 20GB Disk	-	Error	None	No State	<button>Associate Floating IP</button>
<input type="checkbox"/>	test_cnam		m1.tiny 512MB RAM 1 VCPU 0 Disk	-	Error	None	No State	<button>Associate Floating IP</button>

At the bottom of the main content area, it says "Displaying 2 items".

OpenStack (dans une VM) overview

The screenshot shows the 'Instance Overview' page of the OpenStack dashboard, accessible via the URL 10.11.180.20/project/. The page is titled 'Overview' and displays the following information:

- Quota Summary**:
 - Used 2 of 10 Available Instances
 - Used 2 of 20 Available vCPUs
 - Used 2,560 MB of 51,200 MB Available RAM
- Select a month to query its usage:** A dropdown menu set to 'October 2012' with a 'Submit' button.
- Active Instances: - Active RAM: - This Month's VCPU-Hours: 0.00 This Month's GB-Hours: 0.00**
- Usage Summary**:
 - A table header with columns: Instance Name, vCPUs, Disk, RAM, Uptime.
 - A message: 'No items to display.'
 - A footer message: 'Displaying 1 item'
- Download CSV Summary** button.

The left sidebar includes navigation links for Project (selected), Admin, Manage Compute (Overview, Instances, Volumes, Images & Snapshots, Access & Security), and a dropdown for CURRENT PROJECT admin.

OpenStack (dans une VM) services

The screenshot shows the OpenStack Dashboard interface, specifically the 'Services' page, accessed via the URL 10.11.180.20/admin/services/. The dashboard has a left sidebar with navigation links for Project, Admin, System Panel, Overview, Instances, Volumes, Services (which is currently selected), Flavors, Images, Projects, Users, and Quotas. The main content area displays a table of services, with the following data:

Name	Service	Host	Enabled
nova	compute	10.11.180.20	Enabled
s3	s3	10.11.180.20	Enabled
glance	image	10.11.180.20	Enabled
cinder	volume	10.11.180.20	Enabled
ec2	ec2	10.11.180.20	Enabled
keystone	identity (native backend)	10.11.180.20	Enabled

At the bottom of the table, it says 'Displaying 6 items'. The top right of the dashboard shows the user is logged in as 'admin' with 'Settings' and 'Sign Out' links.

OpenStack (dans une VM)

type d'instances

The screenshot shows the OpenStack Dashboard interface, specifically the 'Flavors' page. The URL in the browser is 10.11.180.20/admin/flavors/. The dashboard has a left sidebar with links for Project, Admin, System Panel, Overview, Instances, Volumes, Services, Flavors (which is currently selected), Images, Projects, Users, and Quotas. The main content area displays a table of flavors with the following data:

<input type="checkbox"/>	Flavor Name	VCPUs	RAM	Root Disk	Ephemeral Disk	ID	Actions
<input type="checkbox"/>	m1.tiny	1	512MB	0	0	1	<button>Edit Flavor</button> <button>Delete</button>
<input type="checkbox"/>	m1.small	1	2048MB	20	0	2	<button>Edit Flavor</button> <button>Delete</button>
<input type="checkbox"/>	m1.medium	2	4096MB	40	0	3	<button>Edit Flavor</button> <button>Delete</button>
<input type="checkbox"/>	m1.large	4	8192MB	80	0	4	<button>Edit Flavor</button> <button>Delete</button>
<input type="checkbox"/>	m1.xlarge	8	16384MB	160	0	5	<button>Edit Flavor</button> <button>Delete</button>

At the bottom of the table, it says 'Displaying 5 items'.

Les conteneurs

- Virtualisation simple et performante
- Quasiment aucun overhead dû à la virtualisation
- Même OS virtualisé que l'OS hôte
- Administration souple
- Existe pour Linux, BSD et Solaris

OpenVZ : un conteneur utilisé en production

- Projet open source avec support commercial
- Nécessite un kernel patché
- Le noyau de la VM est imposé par celui de la machine hôte
- Fonctionnalités avancées telles que snapshot/migration à chaud



OpenVZ : environnement

- Sous Debian :

- Ajoût d'un dépôt pour les paquetages openVZ

```
deb http://download.openvz.org/debian-systs lenny openvz
```

- Kernel spécifique

```
# apt-cache search openvz --names-only
```

linux-headers-2.6.32-5-common-openvz - Common header files for Linux 2.6.32-5-openvz

linux-headers-2.6.32-5-openvz-amd64 - Header files for Linux 2.6.32-5-openvz-amd64

linux-image-2.6.32-5-openvz-amd64-dbg - Debugging infos for Linux 2.6.32-5-openvz-amd64

linux-image-2.6.32-5-openvz-amd64 - Linux 2.6.32 for 64-bit PCs, OpenVZ support

linux-headers-2.6-openvz-amd64 - Header files for Linux 2.6-openvz-amd64 (meta-package)

linux-image-2.6-openvz-amd64 - Linux 2.6 for 64-bit PCs (meta-package), OpenVZ support

linux-image-openvz-amd64 - Linux for 64-bit PCs (meta-package), OpenVZ support

linux-source-2.6.18-openvz - OpenVZ Linux kernel source for version 2.6.18

OpenVZ : commandes

vzcalc

vzctl

vzdqload

vzifup-post

vzmigrate

vzpid

vzsplit

vzcfgvalidate

vzdqcheck

vzdump

vzlist

vznetaddr

vzquota

vzcpuchheck

vzdqdump

vzeventd

vzmemcheck

vznetcfg

vzrestore

OpenVZ : commandes

```
Fichier Édition Affichage Rechercher Terminal Aide
root@[REDACTED]:~# vzlist
CTID    NPROC STATUS     IP_ADDR      HOSTNAME
  67      27 running   10.191.27.67  kps-mumble
  87      33 running   10.191.27.87  kps-TS
 100      9 running    10.191.27.100 kps-27900
 133     13 running   10.191.27.133 kps-etqw
 160     11 running   10.191.27.160 kps-27960
 161      8 running   10.191.27.161 kps-27961
 162     14 running   10.191.27.162 kps-27962
 200     42 running   10.191.27.200 kps-ettv
root@[REDACTED]:~# vzctl enter 87
entered into CT 87
root@kps-TS:/# uname -a
Linux kps-TS 2.6.32-5-openvz-amd64 #1 SMP Sun May 6 05:21:56 UTC 2012 i686 GNU/Linux
root@kps-TS:/# ifconfig -a
eth0      Link encap:Ethernet HWaddr 00:18:51:93:c6:17
          BROADCAST MULTICAST MTU:1500 Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

lo       Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING MTU:16436 Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

venet0    Link encap:UNSPEC HWaddr 00-00-00-00-00-00-00-00-00-00-00-00-00-00-00-00
          inet addr:127.0.0.1 P-t-P:127.0.0.1 Bcast:0.0.0.0 Mask:255.255.255.255
          UP BROADCAST POINTOPOINT RUNNING NOARP MTU:1500 Metric:1
          RX packets:76990826 errors:0 dropped:0 overruns:0 frame:0
          TX packets:106238730 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:7339642770 (6.8 GiB)  TX bytes:10576163590 (9.8 GiB)

venet0:0  Link encap:UNSPEC HWaddr 00-00-00-00-00-00-00-00-00-00-00-00-00-00-00-00
          inet addr:10.191.27.87 P-t-P:10.191.27.87 Bcast:0.0.0.0 Mask:255.255.255.255
          UP BROADCAST POINTOPOINT RUNNING NOARP MTU:1500 Metric:1
root@kps-TS:/#
```

Proxmox



Virtually Anything Goes

Proxmox

Proxmox Virtual Environment - Iceweasel (sur nanodeb)

File Edit View History Bookmarks Tools Help

10.57.2.10 https://10.57.2.10:8006/#v1:0:18:4::::: Google

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Proxmox Virtual Environment +

PROXMOX Proxmox Virtual Environment

Déconnexion Crée VM Crée CT

Vue Serveur

Centre de données

Proxmox VE Login

Utilisateur:	<input type="text"/>
Mot de passe:	<input type="password"/>
Realm:	Linux PAM standard authentication
Langue:	French

Login

Tâches Log du Cluster

Heure de début	Heure de fin	Noeud	Utilisateur	Description	Status
Transferring data from 10.57.2.10...					

Proxmox

Proxmox Virtual Environment - Iceweasel (sur nanodeb)

File Edit View History Bookmarks Tools Help

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Proxmox Virtual Environment

PROXMOX Proxmox Virtual Environment Version: 2.1-14/f32f3f46 Vous êtes connecté en tant que 'root@pam' Déconnexion Crée VM Crée CT

Vue Serveur

Centre de données

Rechercher Résumé Options Stockage Sauvegarde Utilisateurs Groupes Pools Permissions Roles Authentication HA Support Rechercher:

Type	Description	Utilisation disque	Utilisation mémoire	Utilisation CPU	Uptime
node	proxmox210	10.7%	2.8%	0.7% of 4CPUs	00:06:15
openvz	100 (vz100.localdomain)	0.0%	-	-	-
openvz	101 (vz101.localdomain)	0.0%	-	-	-
openvz	102 (vz102_centos6.localdomain)	0.0%	-	-	-
storage	local (proxmox210)	10.4%	-	-	-

Tâches Log du Cluster

Heure de début	Heure de fin	Noeud	Utilisateur	Description	Status
Oct 23 02:51:57	Oct 23 02:51:57	proxmox210	root@pam	Start all VMs and Containers	OK
Août 01 04:57:50	Août 01 04:58:11	proxmox210	root@pam	VM/CT 102 - Console	OK
Août 01 04:57:49	Août 01 04:57:49	proxmox210	root@pam	CT 102 - Démarrer	OK
Août 01 04:57:40	Août 01 04:57:41	proxmox210	root@pam	VM/CT 102 - Console	OK
Août 01 04:56:52	Août 01 04:57:04	proxmox210	root@pam	CT 102 - Créer	OK
Août 01 04:36:25	Août 01 04:36:26	proxmox210	root@pam	CT 100 - Démarrer	OK
Août 01 04:36:07	Août 01 04:36:14	proxmox210	root@pam	CT 100 - Créer	OK

Transferring data from 10.57.2.10...

Proxmox

Proxmox Virtual Environment - Iceweasel (sur nanodeb)

File Edit View History Bookmarks Tools Help

10.57.2.10 https://10.57.2.10:8006/#v1:0:=node%2Fproxmox210:4::::: Google

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Proxmox Virtual Environment +

PROXMOX Proxmox Virtual Environment Version: 2.1-14/f32f3f46

Vous êtes connecté en tant que 'root@pam' Déconnexion Crée VM Crée CT

Vue Serveur

Noeud 'proxmox210'

Rechercher Résumé Services Réseau DNS Temps Syslog Task History UBC Subscription

Redémarrer Arrêter Shell

Centre de données

- proxmox210
 - 100 (vz100.localdomain)
 - 101 (vz101.localdomain)
 - 102 (vz102_centos6.localdomain)
 - local (proxmox210)

Type	Description	Utilisation disque	Utilisation mémoire	Utilisation CPU	Uptime
openvz	100 (vz100.localdomain)	30.2%	6.9%	0.0% of 4CPUs	00:01:14
openvz	101 (vz101.localdomain)	23.6%	3.3%	0.0% of 4CPUs	00:01:06
openvz	102 (vz102_centos6.localdomain)	32.1%	5.5%	0.1% of 2CPUs	00:00:59
storage	local (proxmox210)	10.4%	-	-	-

Tâches Log du Cluster

Heure de début	Heure de fin	Noeud	Utilisateur	Description	Status
Oct 23 02:59:09	Oct 23 02:59:18	proxmox210	root@pam	CT 102 - Démarrer	OK
Oct 23 02:59:04	Oct 23 02:59:10	proxmox210	root@pam	CT 101 - Démarrer	OK
Oct 23 02:59:00	Oct 23 02:59:00	proxmox210	root@pam	CT 100 - Démarrer	Erreur: command 'vzctl start 100' failed:
Oct 23 02:58:53	Oct 23 02:59:02	proxmox210	root@pam	CT 100 - Démarrer	OK
Oct 23 02:51:57	Oct 23 02:51:57	proxmox210	root@pam	Start all VMs and Containers	OK
Août 01 04:57:50	Août 01 04:58:11	proxmox210	root@pam	VM/CT 102 - Console	OK
Août 01 04:57:49	Août 01 04:57:49	proxmox210	root@pam	CT 102 - Démarrer	OK
Août 01 04:57:40	Août 01 04:57:41	proxmox210	root@pam	VM/CT 102 - Console	OK
Août 01 04:56:52	Août 01 04:57:04	proxmox210	root@pam	CT 102 - Créer	OK

Done

Proxmox

Proxmox Virtual Environment - Iceweasel (sur nanodeb)

File Edit View History Bookmarks Tools Help

10.57.2.10 https://10.57.2.10:8006/#v1:0:=node%2Fproxmox210:4:5::::: Google

Most Visited Getting Started Latest Headlines

Proxmox Virtual Environment

PROXMOX Version: 2.1-14/f32f3f46

Noeud 'proxmox210'

Vous êtes connecté en tant que 'root@pam' Déconnexion Crée VM Crée CT Redémarrer Arrêter Shell

Centre de données

- proxmox210
 - 100 (vz100.localdomain)
 - 101 (vz101.localdomain)
 - 102 (vz102_centos6.localdomain)
 - local (proxmox210)

Rechercher Résumé Services Réseau DNS Temps Syslog Task History UBC Subscription Hour (average)

Résumé

Uptime	00:20:47
Load average	0.00, 0.06, 0.08
CPU	4 x Genuine Intel(R) CPU @ 2.40GHz
CPU usage	1.18%
IO delay	0.00%
RAM usage	Total: 7.30GB Used: 330MB
SWAP usage	Total: 6.25GB Used: 0
HD space (root)	Total: 12.30GB Used: 1.32GB
PVE Manager version	pve-manager/2.1-14/f32f3f46
Kernel version	Linux 2.6.32-14-pve #1 SMP Mon Aug 6 06:47:11 CEST 2012

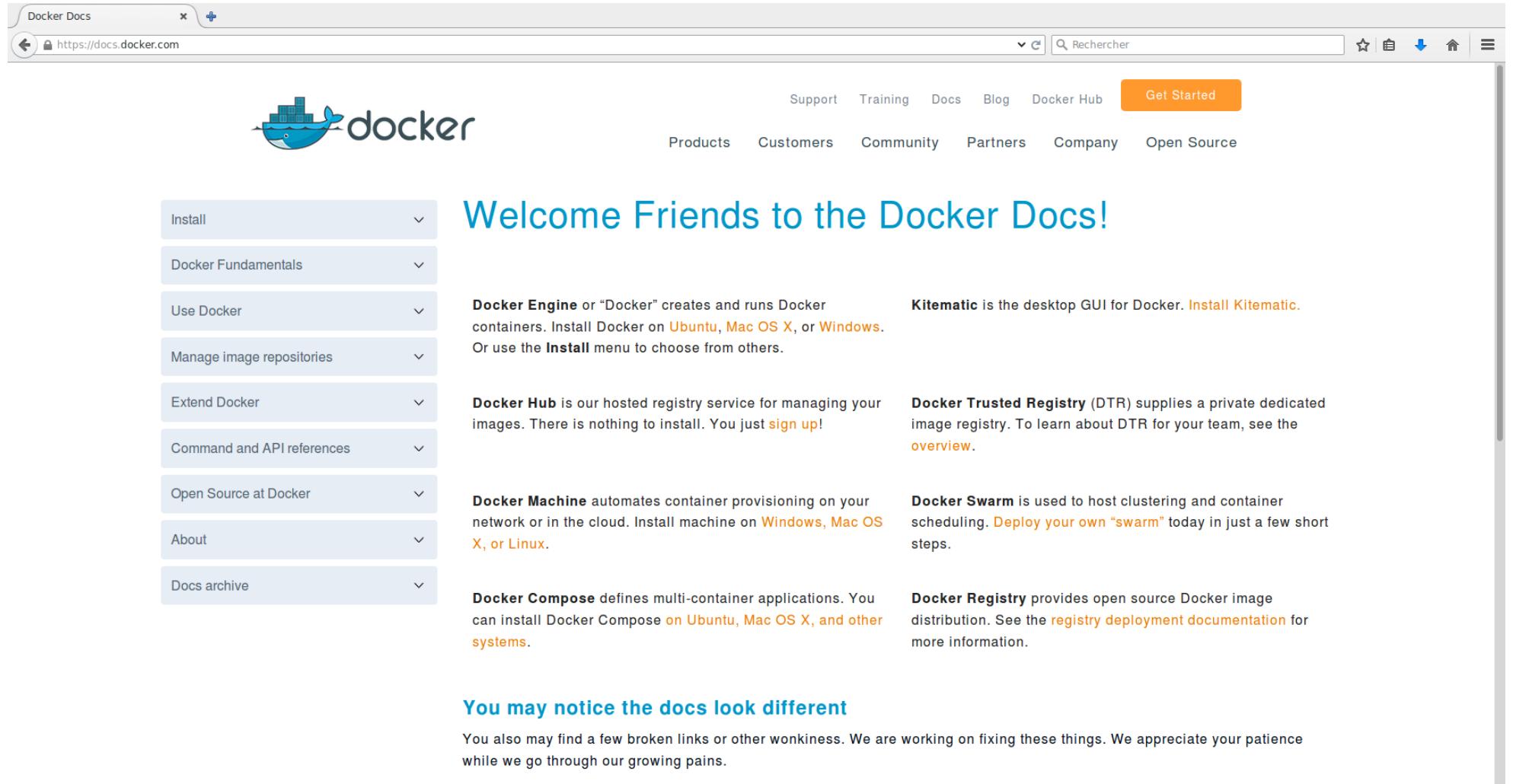
CPU usage %

Tâches Log du Cluster

Heure de début	Heure de fin	Noeud	Utilisateur	Description	Status
Oct 23 03:02:43	Oct 23 03:03:04	proxmox210	root@pam	VM/CT 102 - Console	OK
Oct 23 03:02:43	Oct 23 03:03:04	proxmox210	root@pam	VM/CT 102 - Console	OK

Done

Docker



The screenshot shows a web browser window displaying the Docker Documentation homepage at <https://docs.docker.com>. The page features a large navigation bar with links for Support, Training, Docs, Blog, Docker Hub, and Get Started. Below the navigation is a secondary row of links for Products, Customers, Community, Partners, Company, and Open Source. On the left, there's a sidebar with a dropdown menu titled "Install" containing options like Docker Fundamentals, Use Docker, Manage image repositories, Extend Docker, Command and API references, Open Source at Docker, About, and Docs archive. The main content area has a large blue header "Welcome Friends to the Docker Docs!". It contains several sections with text and links to Docker services: Docker Engine, Docker Hub, Docker Machine, Docker Compose, Kitematic, Docker Trusted Registry, Docker Swarm, and Docker Registry.

Docker Docs

https://docs.docker.com

Rechercher

Get Started

Products Customers Community Partners Company Open Source

Install

Docker Fundamentals

Use Docker

Manage image repositories

Extend Docker

Command and API references

Open Source at Docker

About

Docs archive

Welcome Friends to the Docker Docs!

Docker Engine or “Docker” creates and runs Docker containers. Install Docker on [Ubuntu](#), [Mac OS X](#), or [Windows](#). Or use the [Install](#) menu to choose from others.

Docker Hub is our hosted registry service for managing your images. There is nothing to install. You just [sign up](#)!

Docker Machine automates container provisioning on your network or in the cloud. Install machine on [Windows](#), [Mac OS X](#), or [Linux](#).

Docker Compose defines multi-container applications. You can install Docker Compose on [Ubuntu](#), [Mac OS X](#), and [other systems](#).

Kitematic is the desktop GUI for Docker. [Install Kitematic](#).

Docker Trusted Registry (DTR) supplies a private dedicated image registry. To learn about DTR for your team, see the [overview](#).

Docker Swarm is used to host clustering and container scheduling. [Deploy your own “swarm” today](#) in just a few short steps.

Docker Registry provides open source Docker image distribution. See the [registry deployment documentation](#) for more information.

You may notice the docs look different

You also may find a few broken links or other wonkiness. We are working on fixing these things. We appreciate your patience while we go through our growing pains.

Merci pour votre attention

Questions ?