

Journées Mathrice octobre 2010

BootOnHTTP / BootOnSAN

David Delavennat, Centre de Génétique Moléculaire, CNRS

Plan

- Pourquoi?
- Architecture
- gPXE
- iSCSI
- Lucid Lynx
- Windows 7

Pourquoi faire?

- En finir avec le TFTP
- Mettre les disques clients en salle machine sur des baies de disques
- Tailler les disques iSCSI, à la demande
- Faire du diskless Linux ET Windows 7 !!

BootOnHTTP

BootOnHTTP

- Utilisé pour l'installation d'un OS
- Plus rapide que TFTP
- Moins sujet à erreur que TFTP
- Plus scalable que TFTP
- Fonctionne sur un WAN

gPXE

- <http://www.etherboot.org/>

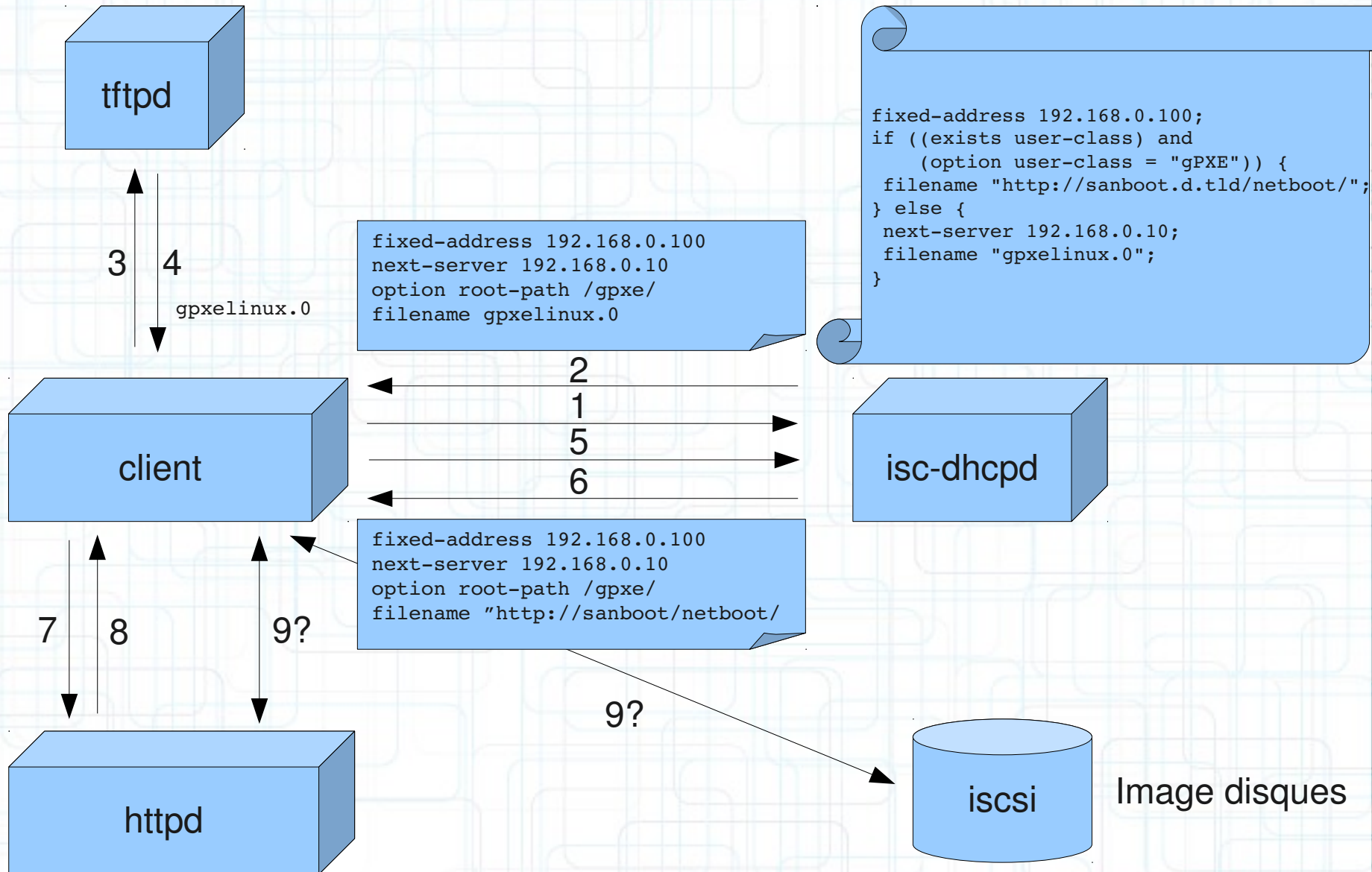
```
QEMU BIOS - build: 02/08/07
$Revision: 1.174 $ $Date: 2006/10/17 16:48:05 $
Options: apmbios pcibios eltorito rombios32

ata1 master: QEMU CD-ROM ATAPI-4 CD-Rom/DVD-Rom

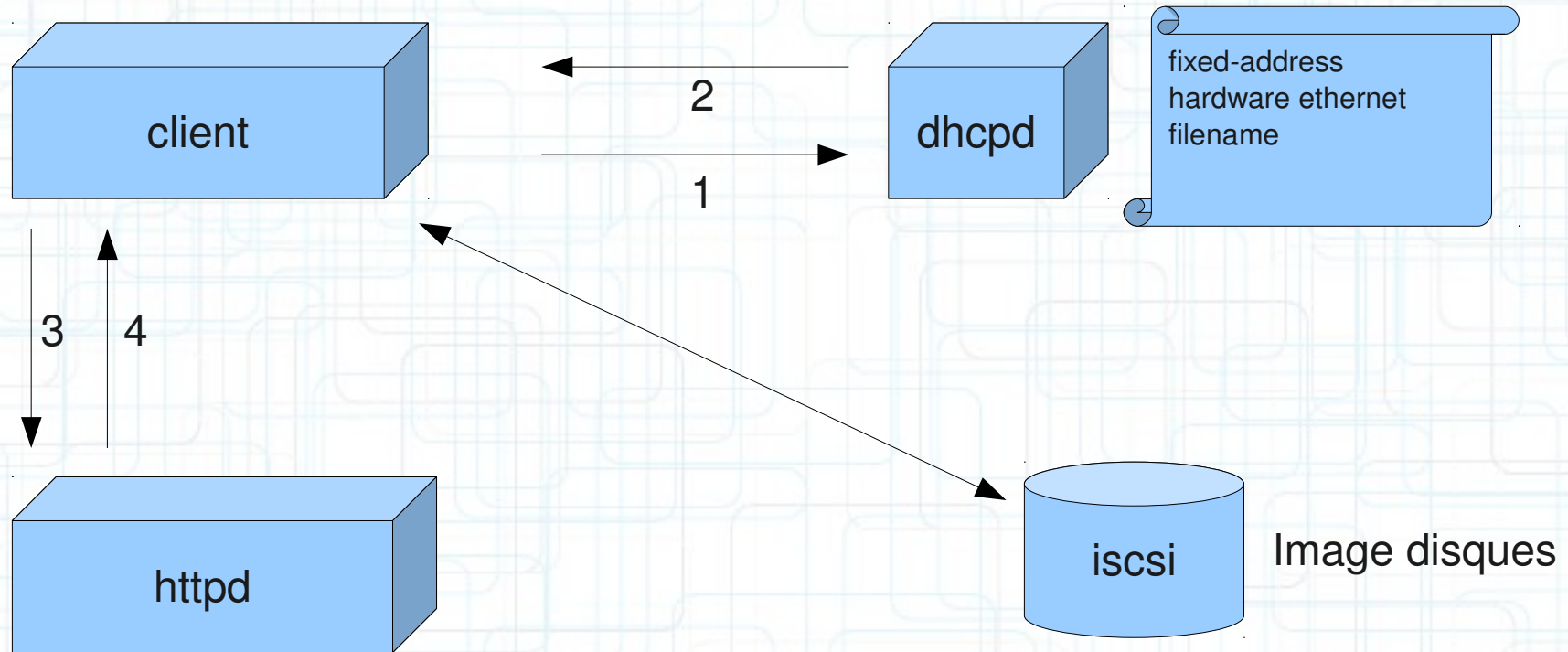
Booting from Floppy...
Loading ROM image.....

gPXE 0.5.1 -- Open Source Boot Firmware -- http://etherboot.org
Features: HTTP HTTPS DNS TFTP iSCSI AoE bzImage Multiboot PXE
net0: 52:54:00:12:34:56 on PCI00:03.0 (open) TX:0 TXE:0 RX:0 RXE:0
DHCP (net0 52:54:00:12:34:56)... ok
net0: 10.254.254.31/255.255.255.0 gw 10.254.254.2
Booting from filename "http://chipmunk.tuntap/images/uniboot/uniboot.php"
http://chipmunk.tuntap/images/uniboot/uniboot.php... ok
/kernels/vmlinuz-2.6.17-14mdv... ok
initrd.img... ok
/kernelmods/2.6.17-14mdv/kernel/drivers/net/mii.ko.gz... ok
/kernelmods/2.6.17-14mdv/kernel/drivers/net/8139too.ko.gz... ok
/kernelmods/2.6.17-14mdv/kernel/net/packet/af_packet.ko.gz... ok
http://rom.etherboot.org/share/mcb30/bootsplash-800x600... _
```


Architecture PXE+gPXE



Architecture gPXE



#!gpxe

- <http://www.etherboot.org/wiki/scripting>
- Substitution dynamique de variable
 - ip=\${net0/ip}
 - mac=\${net0/mac}
 - uuid=\${smbios/1.8.16:uuid}

```
#!gpxe
dhcp net0
set 209:string netboot/menu?client_id=${smbios/1.8.16:uuid}
set 210:string https://sanboot.labo.cnrs.fr/
chain ${210:string}pxeboot/pxelinux.0}
```

```
#!gpxe
dhcp net0
set keep-san 1
Set username iscsi_user
Set password iscsi_passowrd
sanboot iscsi:171.16.0.1:::iqn.2010-10.fr.cnrs.labo.san:${smbios/1.8.16:uuid}
```

iSCSI

- Client iscsi → initiateur gPXE,
Linux (open-iscsi),
Windows 7

- Serveur iscsi → target

- apt-get install iscsitarget
- iqn.YYYY-MM.[domainname]:[unique identifier]
- /etc/ietd.conf

```
Target iqn.2010-10.fr.cnrs.labo.san:b8b84251-e14d-4618-90db-fbfeba1ee72c
```

```
Lun 0 Path=/iscsi_store/by_uid/b8b84251-e14d-4618-90db-fbfeba1ee72c/sda.img,\
```

```
Type=fileio
```

- dd if=/dev/zero of=sda.img bs=512k count=20000

SAN iSCSI

```
Iscsi-san-server# aptitude install lsscsi

iscsi-san-server# service iscsitarget restart
* Removing iSCSI enterprise target devices [ OK ]
* Stopping iSCSI enterprise target service [ OK ]
* Removing iSCSI enterprise target modules [ OK ]
* Starting iSCSI enterprise target service [ OK ]
iscsi-san-server# service open-iscsi restart
* Disconnecting iSCSI targets [ OK ]
* Stopping iSCSI initiator service [ OK ]
* Starting iSCSI initiator service iscsid [ OK ]
* Setting up iSCSI targets [ OK ]
iscsi-san-server# lsscsi
[0:0:0:0] cd/dvd PIONEER DVD-RW DVR-111D 1.23 /dev/sr0
[2:0:0:0] disk ATA WDC WD4000YS-01M 09.0 /dev/sda
iscsi-san-server# iscsiadm -m discovery -t sendtargets -p 192.168.0.1
192.168.0.1:3260,1 iqn.2010-10.fr.cnrs-gif.cgm.san:534d4349-0002-0290-2500-02902500147a
iscsi-san-server# service open-iscsi restart
* Disconnecting iSCSI targets [ OK ]
* Stopping iSCSI initiator service [ OK ]
* Starting iSCSI initiator service iscsid [ OK ]
* Setting up iSCSI targets [ OK ]
iscsi-san-server# lsscsi
[0:0:0:0] cd/dvd PIONEER DVD-RW DVR-111D 1.23 /dev/sr0
[2:0:0:0] disk ATA WDC WD4000YS-01M 09.0 /dev/sda
[23:0:0:0] disk IET VIRTUAL-DISK 0 /dev/sdb
iscsi-san-server# iscsiadm --mode node --targetname iqn.2010-10.fr.cnrs-gif.cgm.san:534d4349-0002-0290-2500-02902500147a --portal 192.168.0.1 --logout
Logging out of session [sid: 1, target: iqn.2010-10.fr.cnrs-gif.cgm.san:534d4349-0002-0290-2500-02902500147a, portal: 192.168.0.1,3260]
Logout of [sid: 1, target: iqn.2010-10.fr.cnrs-gif.cgm.san:534d4349-0002-0290-2500-02902500147a, portal: 192.168.0.1,3260]: successful
iscsi-san-server# rm -Rf /etc/iscsi/nodes/
iscsi-san-server# service open-iscsi restart
* Disconnecting iSCSI targets [ OK ]
* Stopping iSCSI initiator service [ OK ]
* Starting iSCSI initiator service iscsid [ OK ]
* Setting up iSCSI targets [ OK ]
iscsi-san-server# lsscsi
[0:0:0:0] cd/dvd PIONEER DVD-RW DVR-111D 1.23 /dev/sr0
[2:0:0:0] disk ATA WDC WD4000YS-01M 09.0 /dev/sda
```


Lucid Lynx

- Support du iSCSI sur le CD Server
- Pour la version desktop
 - http://www.etherboot.org/wiki/sanboot/ubuntu_iscsi2
- Installeur réseau incluant le support iSCSI
 - <http://archive.ubuntu.com>
 - `/ubuntu/dists/lucid/main/installer-i386/current/images/netboot/mini.iso`

```
label lucid_installer
menu label ^Lucid Lynx
kernel pxeboot/memdisk
append iso raw
initrd pxeboot/ubuntu-10.04-i386-netboot.iso
```

```
label iscsi
menu label ^Boot on iSCSI drive
kernel pxeboot/sanboot.c32
append iscsi:192.168.0.1:::iqn.2010-10.fr.cnrs.labo.san:#{client_id}
```

Note: la syntaxe `#{client_id}` vient du fait que je génère l'entrée du menu, spécifique au client gppe, via une application scgi développée en ruby (`netboot.rb`)

Windows 7

- **Windows Automated Installation Kit**
 - <http://www.microsoft.com/downloads/details.aspx?familyid=696DD665-9F76-4177-A811-39C26D3B3B34&displaylang=en>
- **Windows Preinstallation Environment**
 - Windows PE 3.0 tourne sur une base Windows 7.
 - Inclus dans WAIK 2.0.
- WinPE permet de netbooter un système Windows

Windows 7 : WinPE création

```
C:\Program Files\Windows AIK\Tools\PETools>copyype.cmd x86 c:\temp\x86_pe
=====
Creating Windows PE customization working directory
  c:\temp\x86_pe
=====

      1 fichier(s) copié(s).
      1 fichier(s) copié(s).
C:\Program Files\Windows AIK\Tools\PETools\x86\boot\bcd
C:\Program Files\Windows AIK\Tools\PETools\x86\boot\boot.sdi
C:\Program Files\Windows AIK\Tools\PETools\x86\boot\bootfix.bin
C:\Program Files\Windows AIK\Tools\PETools\x86\boot\etfsboot.com
C:\Program Files\Windows AIK\Tools\PETools\x86\boot\fonts\chs_boot.ttf
C:\Program Files\Windows AIK\Tools\PETools\x86\boot\fonts\cht_boot.ttf
C:\Program Files\Windows AIK\Tools\PETools\x86\boot\fonts\jpn_boot.ttf
C:\Program Files\Windows AIK\Tools\PETools\x86\boot\fonts\kor_boot.ttf
C:\Program Files\Windows AIK\Tools\PETools\x86\boot\fonts\wgl4_boot.ttf
9 fichier(s) copié(s)
C:\Program Files\Windows AIK\Tools\PETools\x86\EFI\microsoft\boot\bcd
C:\Program Files\Windows AIK\Tools\PETools\x86\EFI\microsoft\boot\fonts\chs_boot.ttf
C:\Program Files\Windows AIK\Tools\PETools\x86\EFI\microsoft\boot\fonts\cht_boot.ttf
C:\Program Files\Windows AIK\Tools\PETools\x86\EFI\microsoft\boot\fonts\jpn_boot.ttf
C:\Program Files\Windows AIK\Tools\PETools\x86\EFI\microsoft\boot\fonts\kor_boot.ttf
C:\Program Files\Windows AIK\Tools\PETools\x86\EFI\microsoft\boot\fonts\wgl4_boot.ttf
6 fichier(s) copié(s)
      1 fichier(s) copié(s).

Success

Updating path to include peimg, cdimage, imagex

  C:\Program Files\Windows AIK\Tools\PETools\
  C:\Program Files\Windows AIK\Tools\PETools\..\x86

C:\temp\x86_pe>
```


Windows 7 : WinPE création

```
C:\temp\x86_pe>dir
Le volume dans le lecteur C n'a pas de nom.
Le numéro de série du volume est 44BA-7056

Répertoire de C:\temp\x86_pe

10/09/2010  10:46    <REP>        .
10/09/2010  10:46    <REP>        ..
10/06/2009  14:14             4 096  etfsboot.com
10/09/2010  10:46    <REP>        ISO
10/09/2010  10:46    <REP>        mount
13/07/2009  19:51       114 088 185 winpe.wim
           2 fichier(s)             114 092 281 octets
           4 Rép(s)   117 820 157 952 octets libres

C:\temp\x86_pe>cp winpe.wim c:\temp\iso\sources\boot.wim
```

- Creation d'une image ISO → oscdimg

```
C:\Program Files\Windows AIK\Tools\PETools>oscdimg -bc:\temp\x86_pe\etfsboot.com -n -o
c:\temp\x86_pe\iso c:\temp\x86_pe.iso

OSCDIMG 2.45 CD-ROM and DVD-ROM Premastering Utility
Copyright (C) Microsoft, 1993-2000. All rights reserved.
For Microsoft internal use only.

Scanning source tree complete (18 files in 8 directories)
Image file is 1888614656 bytes (before optimization)
Writing 18 files in 8 directories to c:\temp\x86_pe.iso
100% complete
Storage optimization saved 5 files, 11978752 bytes (7% of image)
After optimization, image file is 176635904 bytes
Done.
C:\Program Files\Windows AIK\Tools\PETools>
```

Windows 7 : WinPE modification

```
C:\Program Files\Windows AIK\Tools\PETools>imagex /mount c:\temp\x86_pe\winpe.wim 1  
c:\temp\x86_pe\mount
```

```
ImageX Tool for Windows  
Copyright (C) Microsoft Corp. All rights reserved.  
Version: 6.1.7600.16385
```

```
Mounting: [c:\temp\x86_pe\winpe.wim, 1] → [c:\temp\x86_pe\mount]...
```

```
[ 100% ] Mounting progress
```

```
Successfully mounted image.
```

```
Total elapsed time: 1min 17 sec
```

```
C:\Program Files\Windows AIK\Tools\PETools>
```

- Ajout du support iSCSI
 - [http://technet.microsoft.com/es-es/library/ee619769\(WS.10\).aspx](http://technet.microsoft.com/es-es/library/ee619769(WS.10).aspx)
- Ajout d'un serveur VNC
 - <http://depsharee.blogspot.com/2010/06/integrate-vnc-to-windows-pe.html>

```
C:\Program Files\Windows AIK\Tools\PETools>imagex /unmount c:\temp\x86_pe\mount
```

Windows 7 : WinPE netboot

- Entrée à mettre dans le fichier de config de pxelinux

```
label windows_pe
  menu label ^Windows PE
  kernel tftpboot/memdisk
  append iso raw
  initrd pxeboot/x86_pe.iso
```