

Clonezilla: A better choice than Ghost

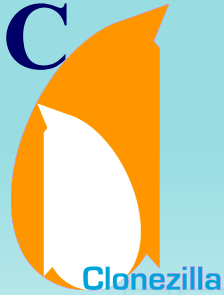
Steven Shiau, Yao-Tsug Wang,
Chen-Kai Sun and Yu-Chin Tsai

<http://clonezilla.sf.net>, <http://clonezilla.nchc.org.tw>

National Center for High-Performance Computing
(NCHC). Taiwan



Free Software Smart Classroom, FSSC



- Free software projects developed by NCHC Free Software Labs
- Our goal - FSSC (Free Software Smart Classroom)

- DRBL, Clonezilla
- Multicast VNC
- Access Grid, E-learning
- Cluster computing
- Grid computing



DRBL & Clonezilla



DRBL

(Diskless Remote Boot in Linux)

Provides a diskless or systemless environment for client machines



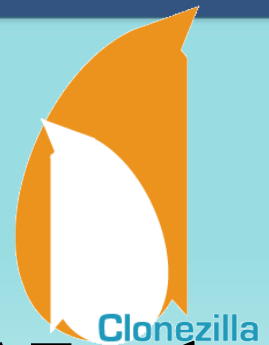
Clonezilla

Clonezilla

A partitioning and disk cloning utility similar to Ghost, True image or Rembo



Clonezilla



- Free (GPL) Software
- Filesystem supported: ext2/3, reiserfs, xfs, jfs, FAT and NTFS
- LVM2 (Linux Logical Volume Manager 2, stackable block device) is supported
- Multicast is supported in PXEBoot Clonezilla
- Save and restore not only partitions, but also whole disks
- If file system is supported, only used blocks in harddisk are saved and restored. For unsupported file system, sector-to-sector copy is done by dd
- drbl-winroll: the hostname, group, and SID of cloned MS windows machine can be automatically changed.



Clonezilla

■ Based on existing software

◆ partimage

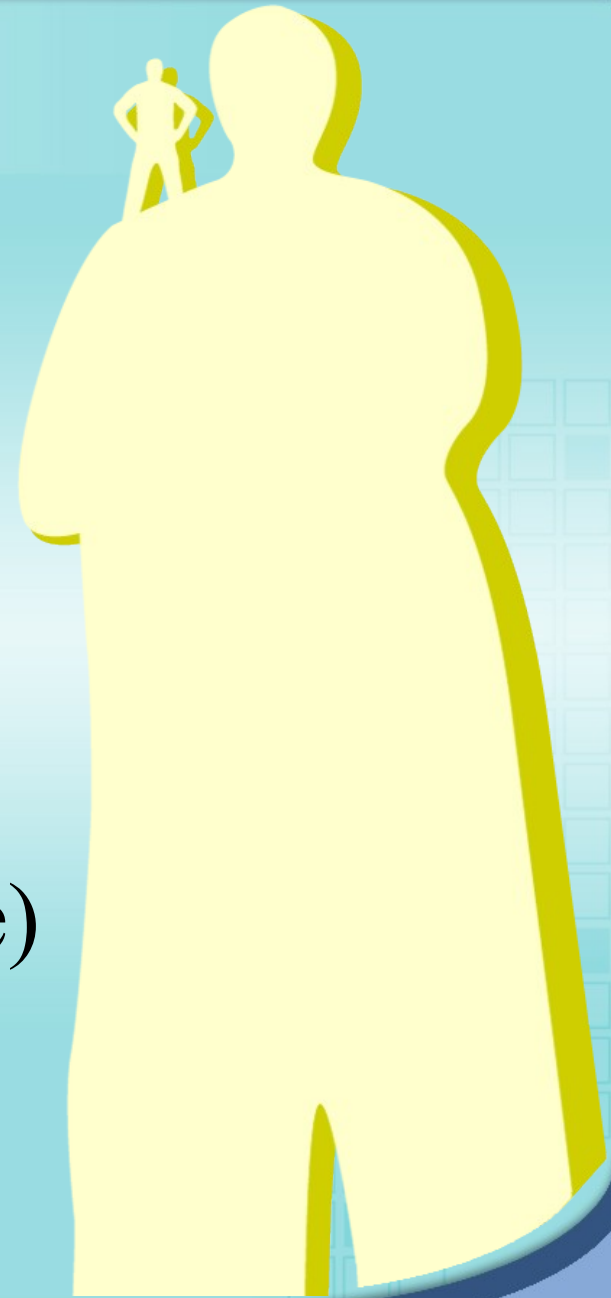
◆ ntfscclone

◆ dd

◆ updcast

◆ DRBL (For massive clone)

◆ and more...



Two types of Clonezilla

■ DRBL-based

PXEBoot Clonezilla

- ◆ Massive clone
- ◆ Network boot (PXE)
- ◆ DRBL server is required

■ Clonezilla live

- ◆ Single machine backup
- ◆ Based on Debian Live
- ◆ CD/USB flash drive is required
- ◆ Also available in GParted-Clonezilla live CD. Created by Larry@GParted

```
GNU GRUB version 0.97 (638K lower / 538366K upper memory)

GParted-liveCD 0.3.4-5
GParted-liveCD 0.3.4-5 with Frame Buffer
GParted-liveCD 0.3.4-5*Force UEFI driver*
GParted-liveCD 0.3.4-5*Force I790 driver*
GParted-liveCD 0.3.4-5*Force I610 driver*
Clonezilla live
Clonezilla live --to ram
Clonezilla live --no framebuffer
Clonezilla live --failsafe mode
Clonezilla live --etherboot
Boot MBR on first hard drive
Boot partition #1 on first hard drive

Use the ↑ and ↓ keys to select which entry is highlighted.
Press enter to boot the selected OS, 'e' to edit the
commands before booting, or 'c' for a command-line.
```

Gnome Partition Editor
& Clonezilla



DRBL-based PXEBoot Clonezilla

```
終端機
檔案(E) 編輯(E) 顯示(V) 終端機(T) 分頁(P) 求助(H)
NCHC - National Center for High-Performance Computing, Taiwan
DRBL, developed by NCHC Free Software Labs
Switch the mode:
( ) remote-linux-gra Client_remote_Linux,_graphic_mode,_powerful_client
( ) remote-linux-txt Client_remote_Linux,_text_mode,_powerful_client
( ) terminal Client_remote_Display_Linux,_terminal_mode
( ) remote-memtest Client remote boot to run MemTest86+
( ) remote-fdos Client remote boot to run FreeDOS
( *) clonezilla-start Start_clonezilla_mode
( ) clonezilla-stop Stop_clonezilla_mode
( ) netinstall Client_install_Linux_via_network
( ) local Client boots its local OS
( ) reboot Reboot
( ) shutdown Shutdown client now
( ) Wake-on-LAN Turn on client by Wake-on-LAN now
( ) more More modes or commands
< 確定 > < 取消 >
```

```
DRBL (http://drbl.nchc.org.tw, http://drbl.sf.net)
Ubuntu 7.04 Linux (DRBL mode, mostly local resources)
Clonezilla: choose save or restore later
Local operating system (if available)
Memory test using Memtest86+
```

國家高速網路與計算中心
NCHC, Taiwan
自由軟體實驗室 Free Software Labs
<http://free.nchc.org.tw>

DRBL



```
檔案(E) 編輯(E) 顯示(V) 終端機(T) 分頁(P) 求助(H)
NCHC - National Center for High-Performance Computing, Taiwan
Start the Clonezilla mode
**Clonezilla is free (GPL) software, and comes with ABSOLUTE NO WARRANTY**
Choose the mode:
( ) save-disk Save_client_entire_disk
( ) restore-disk Restore_client_entire_disk
( ) save-parts Save_client_partitions
( ) restore-parts Restore_client_partitions
( ) select-in-client Choose save/restore in client (unicast only)
< 確定 > < 取消 >
```



Clonezilla Live

<http://clonezilla.sf.net>, <http://clonezilla.nchc.org.tw>

Clonezilla live

Clonezilla live (To RAM. Boot media can be removed later)
Clonezilla live (no framebuffer)
Clonezilla live (failsafe mode)
Local operating system in harddrive (if available)
FreeDOS
Memory test using Memtest86+
Network boot via etherboot

Press [Tab] to edit options

國家高速網路與計算中心

NCHC, Taiwan

自由軟體實驗室 Free Software Labs

<http://free.nchc.org.tw>

Clonezilla

NCHC Free Software Labs, Taiwan

Mount clonezilla image directory

Mount device or remote resources as /home/partimag, where clonezilla image is saved to or read from

Choose the mode:

- local_dev Mount local device
- ssh_server Mount SSH server
- samba_server Mount SAMBA server
- enter_shell Enter command line prompt, Do it manually
- skip Skip, use existing /home/partimag (memory disk, the data will vanish after sh

<Ok>

<Cancel>

NCHC Free Software Labs, Taiwan

Clonezilla: Choose the mode

Clonezilla is free (GPL) software, and comes with ABSOLUTE NO WARRANTY

Choose the mode:

- savedisk Save_client_entire_disk
- restoredisk Restore_client_entire_disk
- saveparts Save_client_partitions
- restoreparts Restore_client_partitions
- exit Exit. Enter command line prompt

<Ok>

<Cancel>

Clonezilla



DRBL – Required by PXEBoot Clonezilla

- ✓ Saves you money
 - ◆ No harddrive in clients
 - ◆ Software is free, freedom and no charge
- ✓ Saves you time
 - ◆ All programs are on 1 server, and installed once
 - ◆ One command to shutdown/reboot/power on all clients
- ✓ Makes your life easier
 - ✓ No disk failure on client
 - ✓ Client machines are plug-and-play
 - ✓ Flexible environment in computer classroom
 - Linux & MS Windows can coexist





■ Since there is LTSP, why DRBL ?

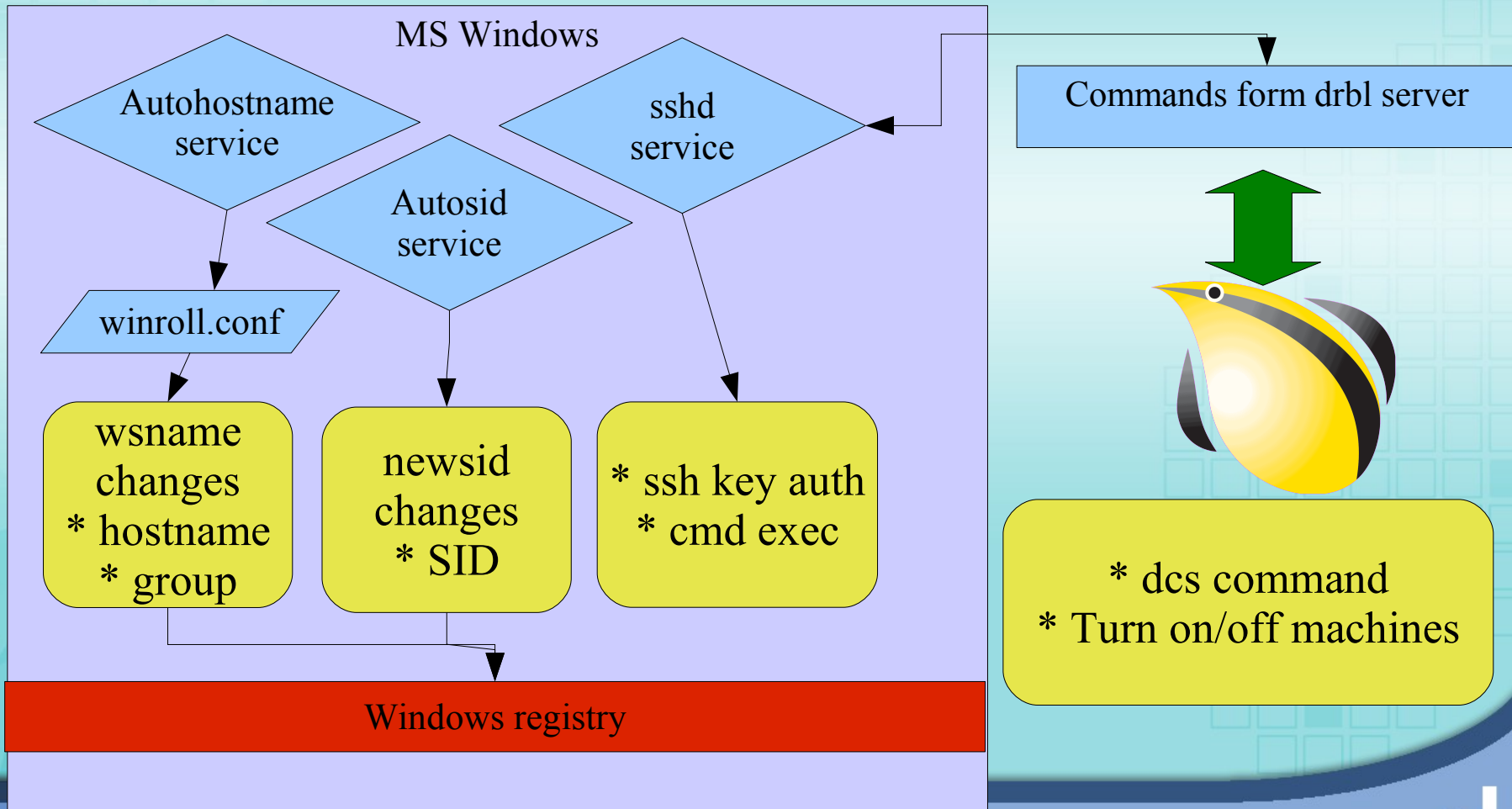
- ◆ Centralized resource vs. distributed resource
- ◆ Thin client vs. powerful client
- ◆ **Some people want to play 3D game or video in client**
- ◆ Special features of DRBL
 - ◆ Clonezilla
 - ◆ One command to switch client environment
 - DRBL, FreeDOS, OS in local HD, memtest...
 - ◆ Linux network installation
- ◆ DRBL is not suitable for old machines/thin clients
- ◆ Choose what you need



drbl-winroll

The tool in M\$ windows

- (1) Change hostname, group and SID firstboot after clone
- (2) Accept command from DRBL server



DRBL-based PXEBoot Clonezilla Installation

- <http://drbl.sf.net>

- GNU/Linux distributions, i386/X86-64

- ◆ Debian, Ubuntu, B2D, RedHat, Fedora, Mandriva, CentOS, OpenSuSE, SuSE

- 4 steps to install

- ◆ (1) Install GNU/Linux (2) Install DRBL package (3) Configure server (4) Configure client

- French document is available. Thanks to Georges Connard (0quack_at_gmail com).

- ◆ https://drbl.sf.net/related_article/

- ◆ In the future, maybe this is drbl-fr.sf.net for French doc.

- Herve Lauwerier translated French language files for Clonezilla live. We will try to merge that in the future release.



DRBL



server



switch



client nodes



pxe/etherboot

DHCP — IP →

pxe/etherboot

192.168.0.1

192.168.0.40

TFTP — kernel →

boot

boot

NFS — file system →

/, /usr, /home ...

/, /usr, /home ...

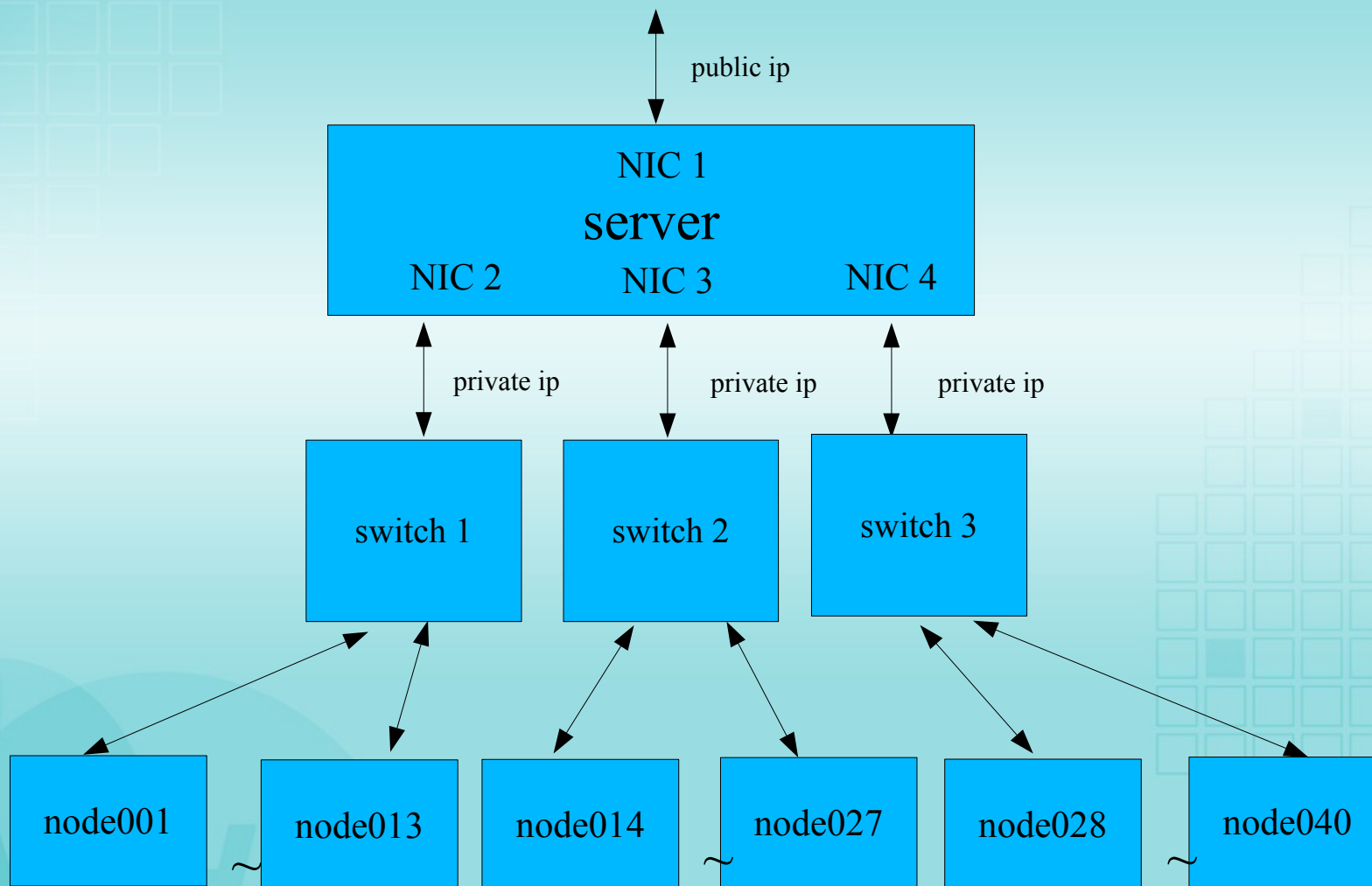
NIS — account →

user login

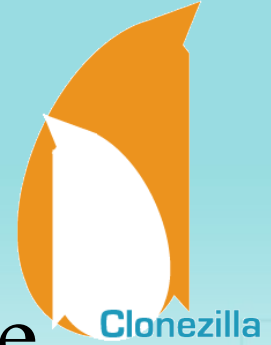
user login



DRBL/Clonezilla Schematic



Clonezilla Live



- On CD or USB flash drive
- <http://clonezilla.sf.net/clonezilla-live>
- General purpose use
 - ◆ Save or restore interactively
- Special purpose use
 - ◆ Clonezilla image embedded in CD or USB flash drive. One command to restore image.
 - ◆ Created by one command:
 - Ex: `/opt/drbl/sbin/ocs-iso sarge-image`



DRBL & Clonezilla in Taiwan

Public sectors

Primary/High school	150
University	95
Government	35
Hospital	3
TV station	1

SMB

Misc

124
2

Known sites or users > **400**



DRBL & Clonezilla worldwide



More than **40K** downloads for DRBL and Clonezilla

DRBL & Clonezilla related talk

■ Ubuntu Live Conference

- ◆ Portland, Oregon, USA

- ◆ 23 July, 2007

- ◆ Clonezilla: It's Better Than Ghost

- ◆ Speaker

- ◆ Kristian Hermansen, Security
Researcher/Developer, Cisco Systems, Inc.

- http://www.ubuntulive.com/cs/ubuntu/view/e_sess/12510



Success stories

- Da-Feng Elementary School, Taipei, Taiwan



Da-Feng Elementary School, Taipei, Taiwan



- ✓ Use DRBL and Clonezilla to manage the computer classroom
- ✓ Special report: Linux in education, 2006 on distrowatch.com
- ✓ DRBL/Clonezilla press conference @ Da-Feng on Jul/4/2007 [<play>](#)



Success stories

- Hualien County, Taiwan



Clonezilla

✓ Use Clonezilla to clone GNU/Linux

✓ 58 schools are using now (July/2007)

✓ The letter from Hualien County Government

主旨：感謝 貴中心提供本縣各校 DRBL 系統建置技術業務，請 查照。

說明：

- 一、本府教育局推廣使用校園自由軟體業務，承蒙「自由軟體實驗室」提供縣內學校建置 DRBL 技術使各校在使用自由軟體作業系統及電腦教室管理維具有穩定、快速、便捷等特色，大幅減少網管人員負荷，提升工作效率，使得自由軟體資訊教育順利特此致謝。
- 二、案經本府 95 年 12 月 11 日府教學字第 0950189 函，於 12 月 19 日回收各校填報「電腦教室作業系統調查表」統計，共有 35 所國民中小學已安裝使用系統，詳如附件所示。

正本：國家高速網路與計算中心<0076 新竹市科學園區研發六路7號>
副本：本府教育局教育網路中心

花蓮縣政府



Success Stories

 University of Louisville, Kentucky, USA



Deploy laptop local OS by Clonezilla

Photo courtesy of Matt Lockett



Feedbacks

■ A user from a semiconductor company,
Feb/2007

◆ DRBL helps us a lot! Thank you!

- ◆ I just wanted to send a message of thanks that since I found DRBL last year its use in our lab has **saved hundreds of hours of work**, not to mention having excellent support and while being a little "do it yourself" it has still only cost us our time invested to get it set up and configured and **has better functionality than most enterprise-class imaging tools, like Acronis and Symantec/Norton Ghost.**



Hand-on Workshop

- 15:00-16:30, Thu, 12/Jul/2007. Room H11
- DRBL-based PXEBoot Clonezilla
 - ◆ Setup a Clonezilla server
 - ◆ Save and restore images
- Clonezilla live
 - ◆ Backup and restore image
 - ◆ Customized live CD/USB flash drive



Questions ?

