

# DRBL

## Diskless Remote Boot in Linux

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- Introduction to DRBL
- Users in Taiwan and worldwide
- Related activities
- Success stories
- The DRBL team
- Demo



- Free software projects developed by NCHC Free Software Labs
- Our goal - FSSC (Free Software Smart Classroom)
  - DRBL, Clonezilla, DRBL-winroll, Tux2live, Partclone
  - Multicast VNC
  - Access Grid, E-learning
  - Cluster computing
  - Grid computing





- PXE/Etherboot + NFS + NIS - standing on a giant's shoulder
  - Orig: High performance computing (PC Cluster) -> Free Software Classroom
  - Multi environment in a computer classroom
    - GNU/Linux & MS Windows coexist



## DRBL

(Diskless Remote Boot in Linux)

Provides a diskless or  
systemless environment for  
client machines



## ✓ 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, then 40 clients are ready.
- 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
  - GNU/Linux & MS Windows can coexist

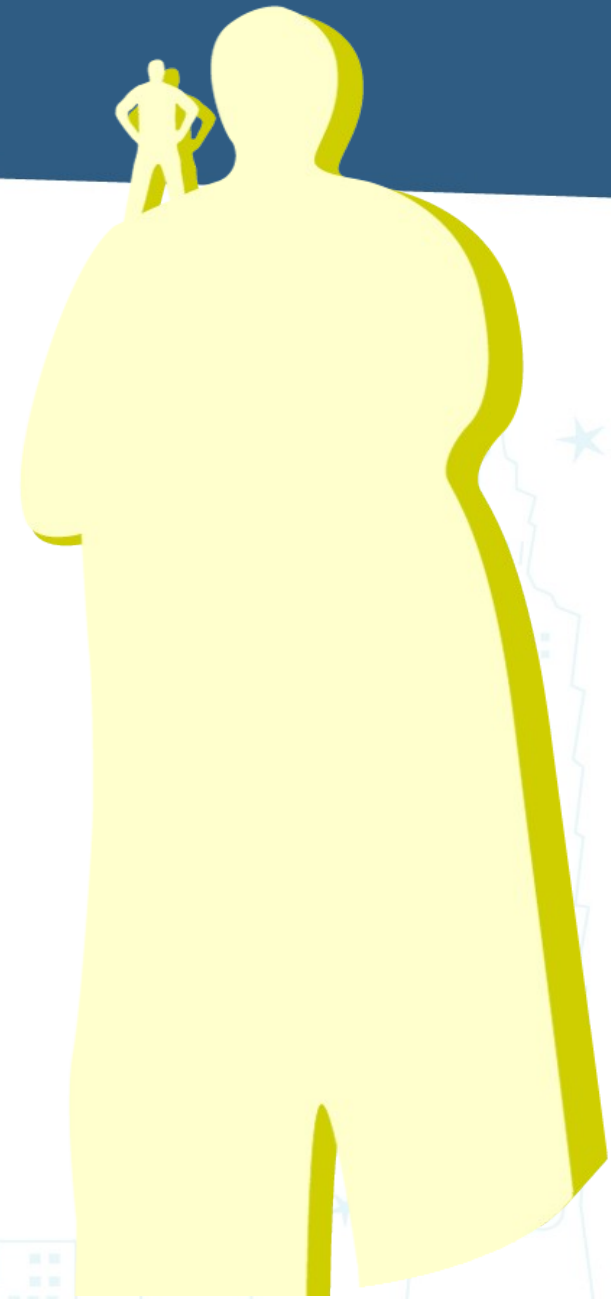


- **Since there is LTSP, why DRBL ?**
  - Centralized resource vs. distributed resource
  - Thin client vs. powerful client
  - **Some people want to play 3D game or video in client**
  - Special features of DRBL
    - **Clonezilla server edition**
    - **Small Linux diskless solution**
    - **One 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
    - From version 5 (released in 2007), fat clients are supported in LTSP.

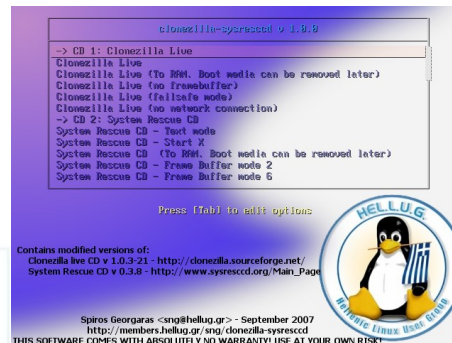
- A partition and disk cloning utility similar to Ghost, True image or Rembo
- **Free (GPL) Software**
- **Filesystem supported: ext2/3, reiserfs, xfs, jfs, FAT, NTFS**
- **LVM2** is supported
- **Multicast** is supported in Clonezilla server edition
- Save and restore not only partitions, but also whole 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 M\$ windows machine can be automatically changed.



- Based on existing software
  - partimage
  - ntfscclone
  - dd
  - updcast
  - DRBL (For massive clone)
  - and more...



- Clonezilla server edition
  - 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**
    - **Clonezilla-SysRescCD**, created by Spiros Georgaras



# DRBL (includes Clonezilla Server Edition)

```

終端機
檔案(F) 編輯(E) 顯示(V) 終端機(T) 分頁(B) 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
    
```

```

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



2007/12/6

```

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)
    
```

## Clonezilla Live

NCHC Free Software Labs, Taiwan

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

Choose the mode:

<input checked="" type="radio"/> local_dev	Mount local device
<input type="radio"/> ssh_server	Mount SSH server
<input type="radio"/> samba_server	Mount SAMBA server
<input type="radio"/> enter_shell	Enter command line prompt, Do it manually
<input type="radio"/> skip	Skip, use existing /home/partimag (memory disk, the data will vanish after sh

<Ok> <Cancel>

Clonezilla: Choose the mode

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

Choose the mode:

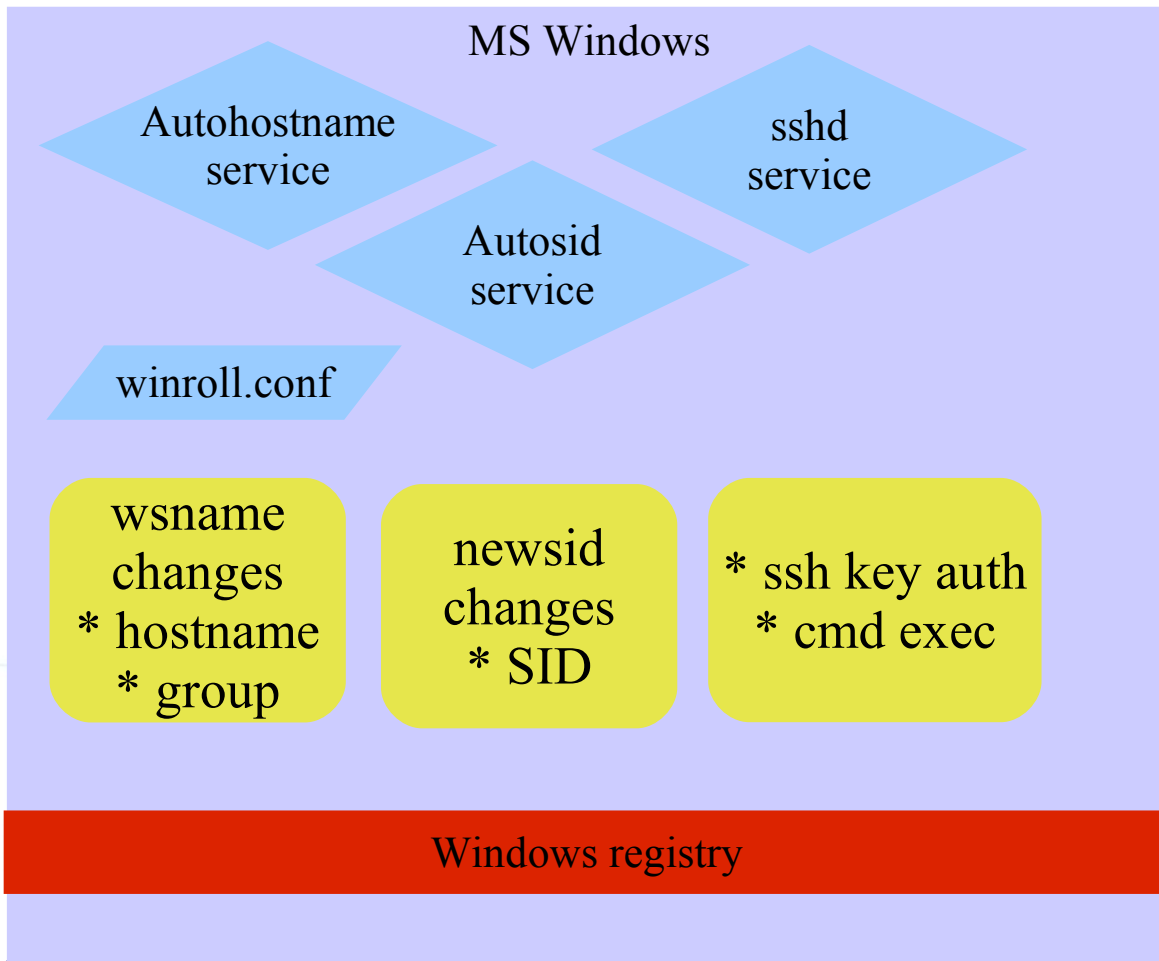
<input checked="" type="radio"/> savedisk	Save_client_entire_disk
<input type="radio"/> restoredisk	Restore_client_entire_disk
<input type="radio"/> saveparts	Save_client_partitions
<input type="radio"/> restoreparts	Restore_client_partitions
<input type="radio"/> exit	Exit. Enter command line prompt

<Ok> <Cancel>



The tool in MS windows

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



Commands form drbl server



\* dcs command  
\* Turn on/off machines

- Follow <http://drbl.sf.net> to install
  - 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
- A Live version of DRBL-'**DRBL live**' is available
  - Ready to run without installation
  - Still in beta, will be stable soon



server



switch



client nodes



DHCP

IP

pxe/etherboot

pxe/etherboot

192.168.0.1

192.168.0.40

TFTP

kernel

boot

boot

NFS

file system

/, /usr, /home ...

/, /usr, /home ...

NIS

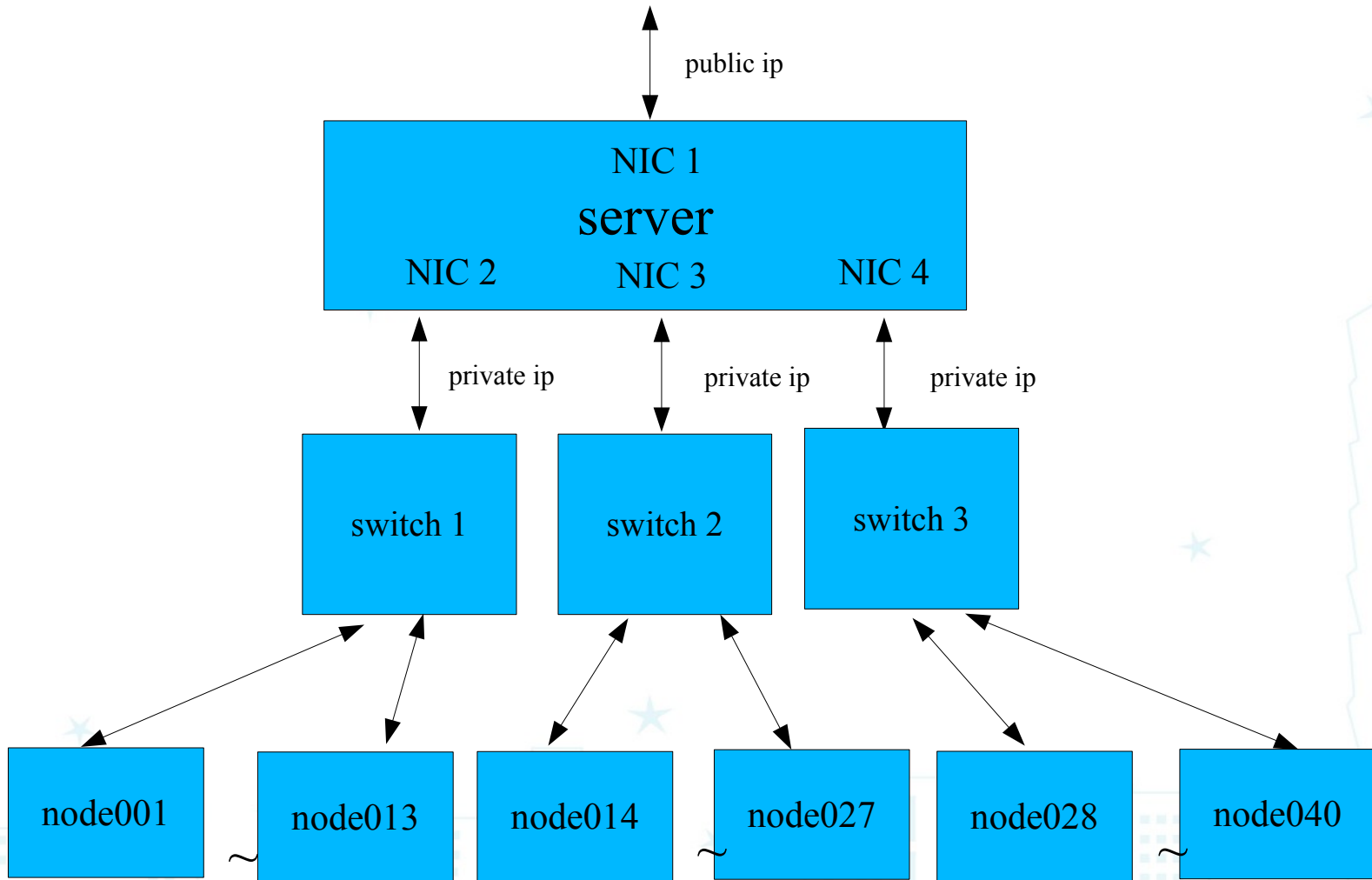
account

user login

user login



## DRBL Schematic



✓ **Public sectors**

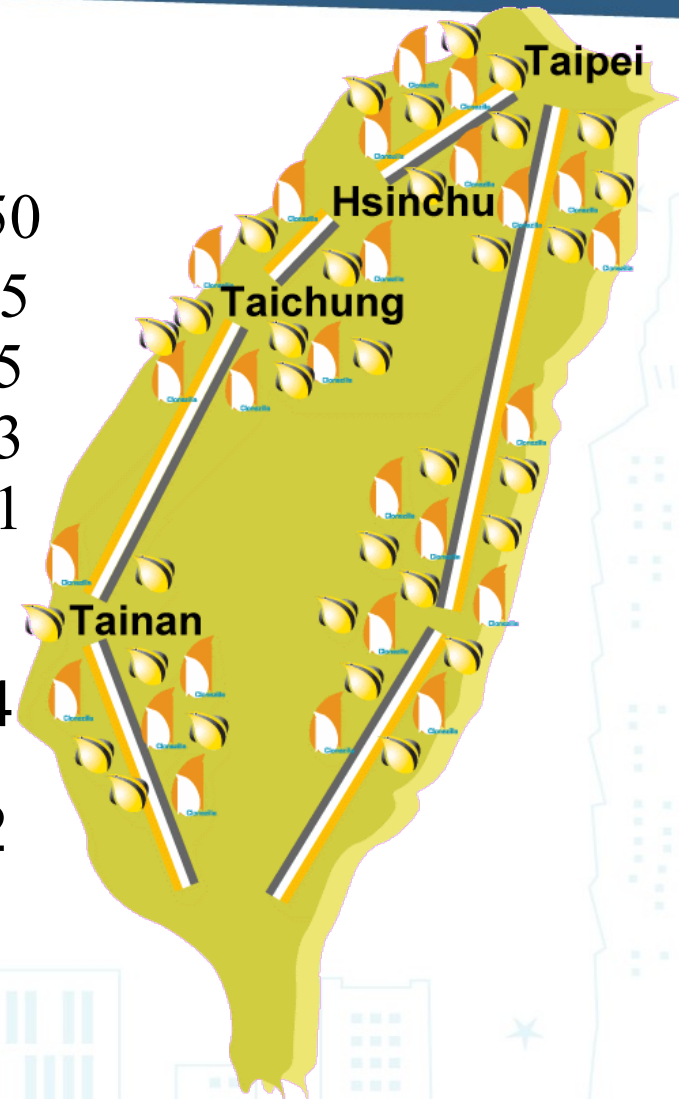
Primary/High schools	150
Universities	95
Governments	35
Hospitals	3
TV station	1

✓ **SMBs**

124

✓ **Misc**

2



**Known sites or users > 400**



More than **90K** downloads for DRBL and Clonezilla

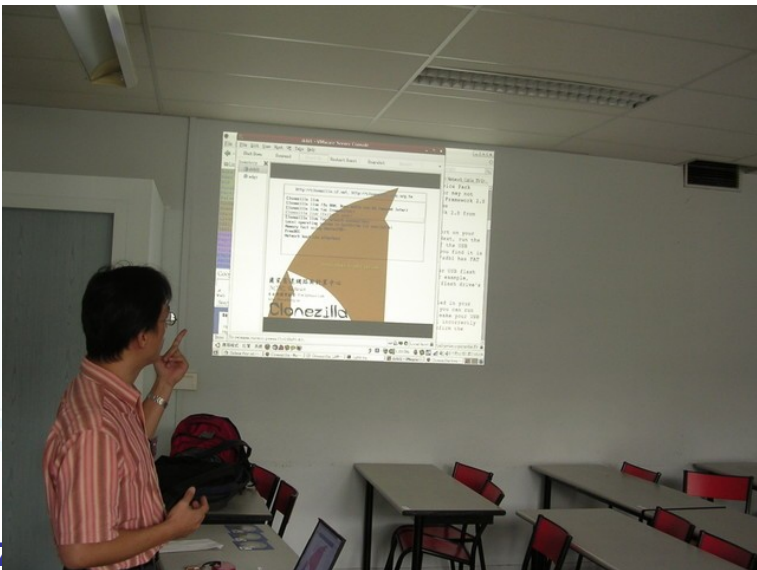
- **LSM2007, France**

- Amiens, France
- 10 July, 2007
- Clonezilla: A Better Choice Than Ghost
- Speaker: Steven Shiau

- **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](http://www.ubuntulive.com/cs/ubuntu/view/e_sess/12510)











### 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>



✓ 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

## ✓ University of Louisville, Kentucky, USA



### Deploy laptop local OS by Clonezilla

Photo courtesy of Matt Luckett





- Steven Shiau (steven \_at\_ nchc org tw)
- Ceasar Sun (ceasar \_at\_ nchc org tw)
- Jazz Wang (jazz \_at\_ nchc org tw)
- Thomas Tsai (thomas \_at\_ nchc org tw)



- DRBL Server
- Video clips in the computer classroom
- DRBL live
  - <http://free.nchc.org.tw/drbl-live>

**Thank you very much!**