

# The Massive Deployment Tools: DRBL and Clonezilla

Steven Shiau, Jazz Wang, Ceasar Sun,  
Thomas Tsai  
NCHC, Taiwan  
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# Outline

- Introduction to DRBL/Clonezilla
  - About DRBL/Clonezilla
  - Users in Taiwan and Worldwide
  - Related Activities
  - Success Stories
  - Testimonials
- Demo
  - DRBL – Diskless Linux client on a virtual machine
- Q&A



# Free Software Lab

- Free software projects developed by NCHC's Free Software Lab
- Our goal is to create a Free Software Smart Classroom (FSSC) based on our HPC experience
  - DRBL, Clonezilla, DRBL-WinRoll, Tux2Live, PartClone
  - Multicast VNC
  - Access Grid, eLearning
  - Cluster Computing
  - Grid Computing



# DRBL/Clonezilla



## DRBL

Diskless Remote Boot in Linux

Provides a “diskless”  
and/or “systemless”  
environment for client  
machines



## Clonezilla

Clonezilla

A partitioning and disk  
cloning utility similar to  
Ghost and True image

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# DRBL



## ■ Saves Money

- No HD required in the client machine(s)
- Truly “Free” Software--freedom to improve upon and free to use



## ■ Saves Time

- All programs are installed on a single server
- One command to Shutdown/Reboot/Power On/Off all client machines



## ■ Makes Life Easier

- No client disk failure
- Client machines are plug-and-play
- Computer classroom environment is extremely flexible
  - GNU/Linux & MS Windows co-exist



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# DRBL vs. LTSP

- What's the difference between DRBL and LTSP?:
  - DRBL: Distributed Resource vs. LTSP: Centralized Resource
  - DRBL: Powerful Client vs. LTSP: Thin Client
- DRBL allows 3D gaming and video playback in the client; LTSP does not



# Why DRBL?

- **DRBL** Special Features:
  - Clonezilla Server Edition (SE)
  - AoE service available using diskless MS Windows XP
  - A single command is required to switch the client environment
    - DRBL, FreeDOS, OS in local HD, memtest...
    - Linux network installation
- Not suitable for older machines and/or thin clients
- **//NOTE//** From version 5 (released '07), fat client mechanism is supported in LTSP

# “Bare Metal” Backup and Restore

- “Bare metal” restore -> A technique in the field of data recovery and restoration where the backed-up data is available in a form which allows one to restore a computer system from "bare metal" (i.e. without any requirements as to previously installed software or operating systems). – Wikipedia
- Image-based backup & restore is different from file-based (e.g. 'cp', 'tar', 'rsync'...)



# Clonezilla Features

- Free (GPL) Software
- File systems supported: Ext2/3, ReiserFS, Reiser4, XFS, jfs, HFS+, FAT and NTFS
- Linux Logical Volume Manager 2 (LVM2) stackable block device is supported
- Multicast supported in Clonezilla Server Edition (SE)



# Clonezilla Features

- Saves and restores partitions and entire disks
- If file system is supported, only the used blocks in the HD are saved and restored. For unsupported file systems, sector-to-sector copying is done via dd.
- **DRBL-Winroll:** The hostname, group, and SID of the cloned MS Windows machine can be changed automatically

# Clonezilla

- Based on existing software:
  - Partimage
  - ntfsclone
  - dd
  - updcast
  - DRBL (used for massive cloning)
  - Partclone (Developed @ the NCHC, '07)
  - and more.....

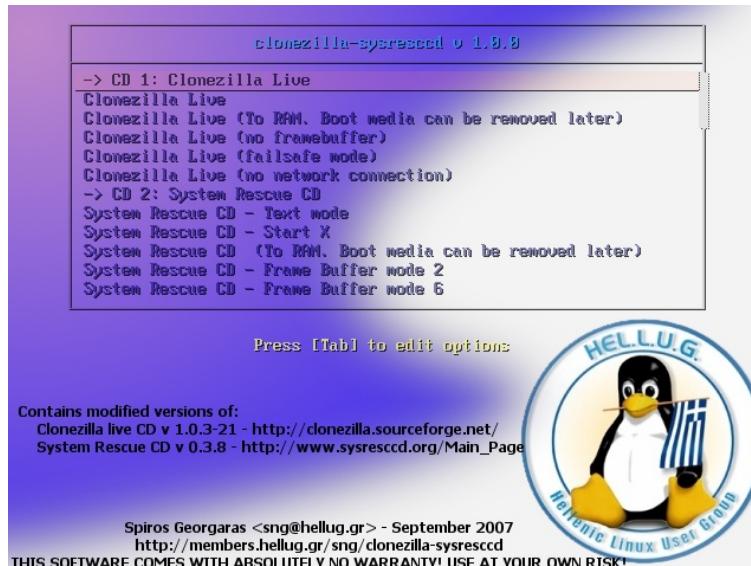


# Partclone

- <http://www.partclone.org>
- Developed by Thomas Tsai and Jazz Wang
- Only the used blocks are saved and restored
- Supports Ext2, Ext3, ReiserFS, **Reiser4**, XFS, **HFS+**, NTFS & FAT
- Will support for ZFS and BTRFS in the future!

# Two Clonezilla Types

- Clonezilla Server Edition (SE)
  - Massive cloning
  - Network boot (PXE)
  - DRBL server is required



- Clonezilla Live
  - Single machine backup
  - Based on DebianLive (live-helper and live initramfs)
  - CD/USB flash drive is required
  - Also available in
    - Clonezilla-SysRescCD, created by Spiros Georgaras

# DRBL (Includes Clonezilla SE)



server



switch  
pxe/etherboot



client nodes  
pxe/etherboot

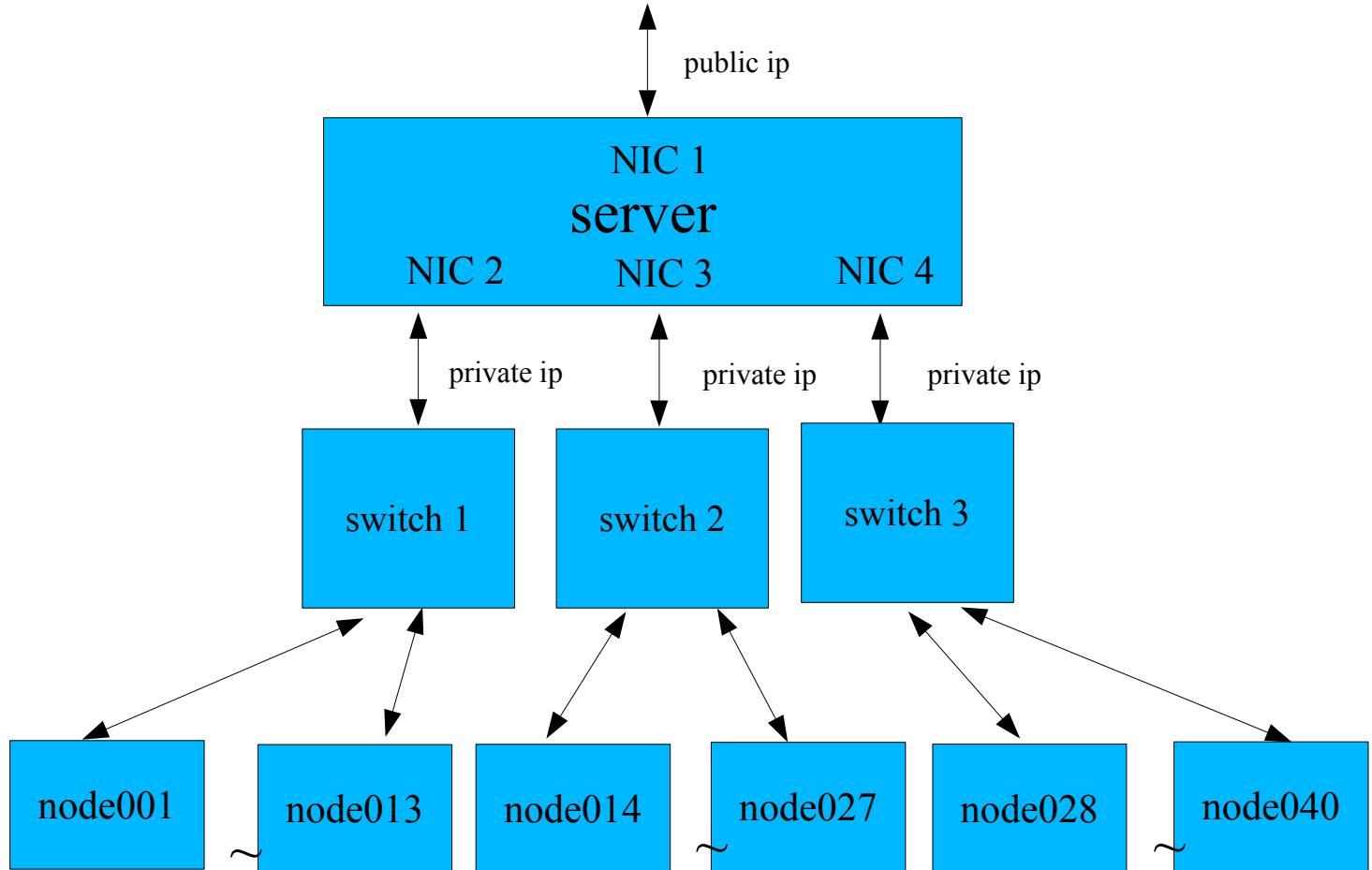
|      |    |             |              |
|------|----|-------------|--------------|
| DHCP | IP | 192.168.0.1 | 192.168.0.40 |
|------|----|-------------|--------------|

|      |        |      |      |
|------|--------|------|------|
| TFTP | kernel | boot | boot |
|------|--------|------|------|

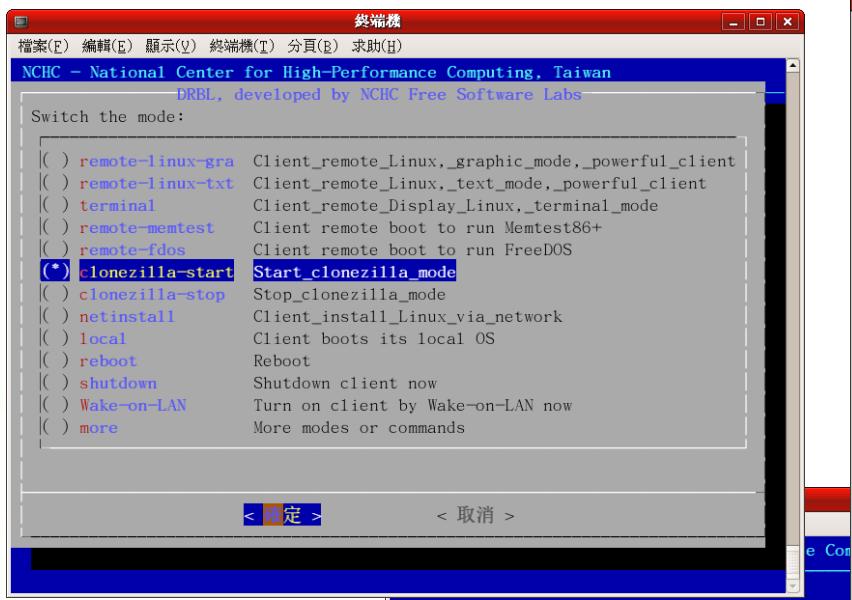
|     |             |                    |                    |
|-----|-------------|--------------------|--------------------|
| NFS | file system | /, /usr, /home ... | /, /usr, /home ... |
|-----|-------------|--------------------|--------------------|

|     |         |            |            |
|-----|---------|------------|------------|
| NIS | account | user login | user login |
|-----|---------|------------|------------|

# DRBL Schematic



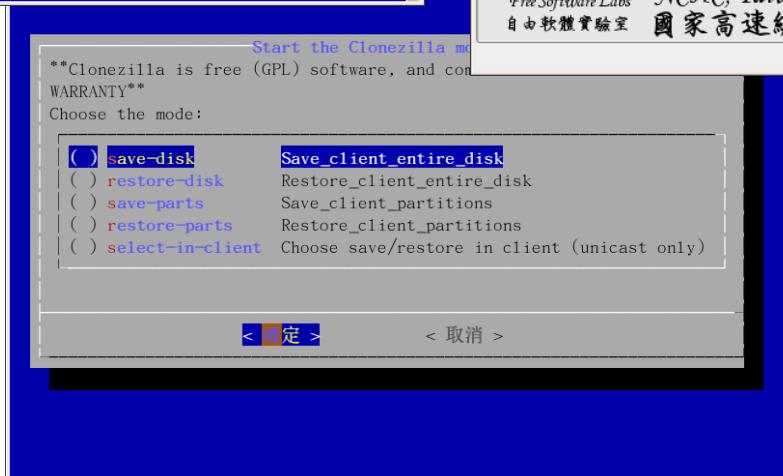
# DRBL



**DRBL**  
Free Software Labs  
NCHC, Taiwan

國家高速網路與計算中心

Right Alt



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# Clonezilla Live

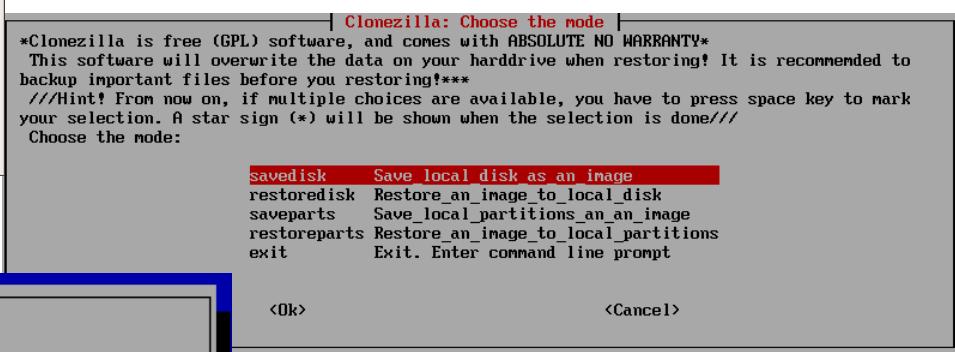
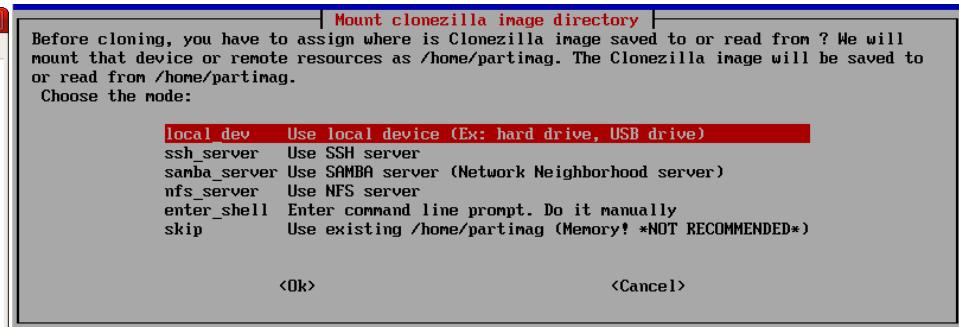
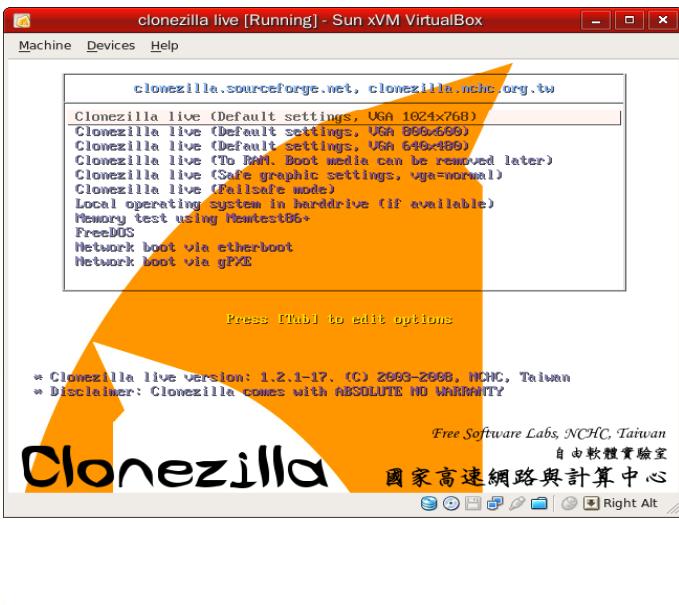
- On CD, USB flash drive, or PXE server
- Languages:
  - Traditional Chinese, Simplified Chinese (thanks to Zhiqiang Zhang and Liang Qi), English, French (thanks to Jean-Francois Nifenecker), Japanese (thanks to Akira Yoshiyama and Annie Wei), Italian (thanks to Gianfranco Gentili), Spanish (thanks Juan Ramón Martínez).
- General Purpose Use- Save or restore interactively
- Special Purpose Use- Recovery CD/USB drive
  - Clonezilla image embedded in CD or USB drive
  - One command restores the entire image!
  - One key restores the entire image!
- Completely Customizable! Make Clonezilla Live work for you!

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# Clonezilla Live



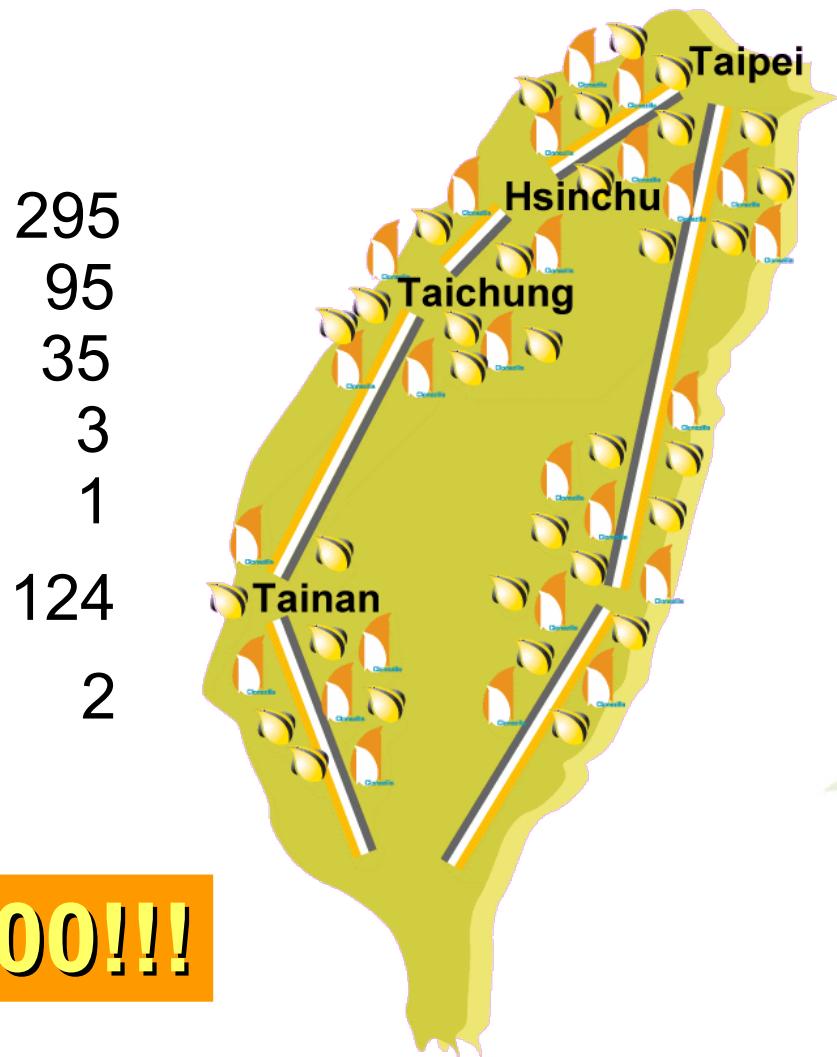
# DRBL/Clonezilla Use In Taiwan

## ✓ Public Sector:

|                      |     |
|----------------------|-----|
| Primary/High schools | 295 |
| Universities         | 95  |
| Local governments    | 35  |
| Hospitals            | 3   |
| TV stations          | 1   |

## ✓ SMBs

## ✓ Misc.



Known sites/users >500!!!

# DRBL/Clonezilla Use Worldwide



>700,000 DRBL/Clonezilla Downloads!!!

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# Related Activities

- Ubuntu Live Conference
  - Portland, Oregon, USA, July 23rd, 2007
  - **Clonezilla: It's Better Than Ghost!**
  - Speaker: Kristian Hermansen, Security Researcher/Developer, Cisco Systems, Inc.
  - <http://www.ubuntulive.com/cs/ubuntu/view/ess/12510>
- LinuxWorld Conference & Expo
  - San Francisco, USA, Aug, 2007
  - Dell booth
  - **Massive Deployments**
  - Speaker: Torsten Spindler, Canonical



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# Related Activities

- Libre Software Meeting (LSM) 2008
  - Mont-de-Marsan, France, July 1st~5th, 2008
  - “Clonezilla Live, the “Bare Metal” Backup and Recovery Tool“
  - Speaker: Steven Shiau
  - <http://2008.rmll.info/Clonezilla-live-the-bare-metal.html?lang=en>
- LinuxWorld Conference & Expo
  - San Francisco, USA, Aug, 2008
  - .org Pavilion (booth #: .org 3)
  - BoF: Clonezilla Hands-on Lab: The Universal “Bare Metal” Backup and Recovery Tool for Linux, Mac OS and MS Windows



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# Ubuntu Live, USA, Jul/07



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# LinuxWorld; “Massive Deployments;” Aug/07



# International Free Software Contest

- DRBL is the winner in the '**Public Sector Software**' category at Les Trophees du Libre 2007 in France
  - Finals and awards ceremony: Nov. 29<sup>th</sup>, 2007
  - <http://www.freesoftwareawards.com> or <http://tropheesdulibre.com/?lang=en>



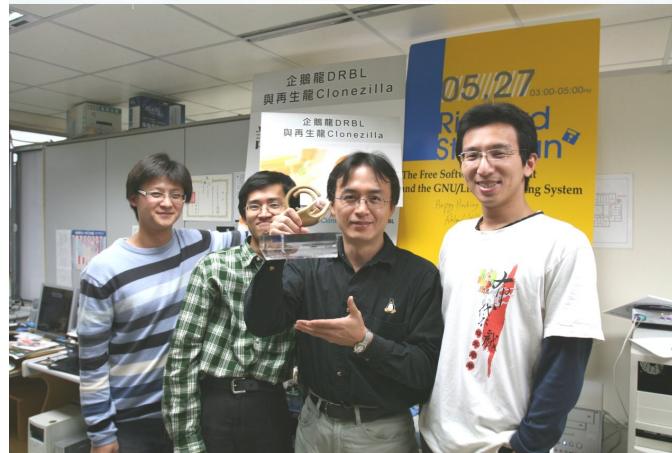
Les Trophées  
du libre 2007

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# Intrnl. Free Software Contest, France, Nov/07



Les Trophées du Libre - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Search Search Version française

Les Trophées du libre 2007 INTERNATIONAL FREE SOFTWARE CONTEST SINCE 2003

Home page | The jury | Prizes | Rules | Previous editions | Testimonials

PROJECT AREA

The winners are :

In the category "Security" :

- n°1 - [rsyncrypto](#)
- n°2 - [Unicomscap](#)
- n°3 - [Yersinia](#)

In the category "Enterprise management" :

- n°1 - [LineSurvey](#)
- n°2 - [Scenari](#)
- n°3 - [Destar](#)

In the category "Public sector applications" :

- n°1 - [DRBL](#)
- n°2 - [PMB](#)
- n°3 - [VHEFS](#)

Dans la catégorie "Education" :

- n°1 - [Chronojump](#)

FOCUS ON ..

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# LSM 2008, France

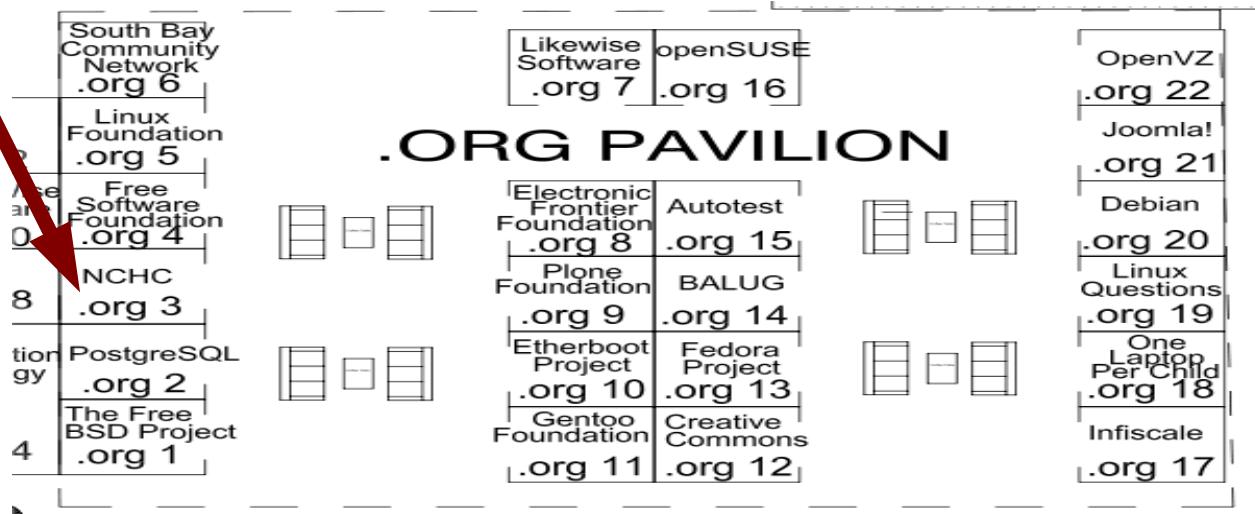


# LinuxWorld, San Fran, '08



Aug 4-7, 2008

- One of the largest Linux expos.
  - .org Pavilion (booth #: .org 3)
  - BoF: “Clonezilla Hands-on Lab: The Universal “Bare Metal” Backup and Recovery Tool for Linux, Mac OS and MS Windows” (Aug. 6th, '08)



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# National Applied Research Laboratories Award

- DRBL/Clonezilla team is the winner in the category '**Technology Development**' for 2008



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source: distrowatch.com

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# Success Stories

## Da-Feng Elementary School, Taipei, Taiwan

- DRBL/Clonezilla is used to manage computer classroom
- Special Report: Linux in Education, 2006 on distrowatch.com
- DRBL/Clonezilla press conference @ Da-Feng Elementary School 07/04/07

# Success Stories

## Hualien County, Taiwan

- Used **Clonezilla Server Edition (SE)** to clone GNU/Linux
- **145 schools** (131 Primary/Jr.; 14 Senior High) use as of June '08
- Letter of Commendation 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

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# Clonezilla Used in Taiwan's “National PCs”



Source: De-Wen Huang

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# Testimonials

- Kristian Hermansen
- Cisco Systems, Boston, MA, Sept. '07
- Cloned a 5GB image to 64 machines in 5 under minutes!!!
  - "I used Clonezilla in the design of our Cisco Computational Cloud Cluster to multicast a 5GB disk image to 64 machines simultaneously and all in under five minutes! Amazing! Thanks Clonezilla!"

# Testimonials

- Barny Sanchez
- Information Systems Security,  
Southbridge, Massachusetts
- Cloned 1,084 systems using DRBL  
(Clonezilla SE)
  - "I've used DRBL to clone 1,084 systems so far! It was simple! All I had to do was divide each system into groups of 80-100 PCs and then use multicasting to do the cloning. It took anywhere from 16-38 minutes to clone each system. The images of various operating systems averaged 1GB in size. DRBL has reduced the recovery/cloning factor by more than 500% as compared to the commercial solution I used previously! You can imagine how happy my project managers are!"

# What's New Since SEAIP 2007 ?

- DRBL
  - Supports newer GNU/Linux versions including Ubuntu 8.04/8.10, Fedora 9, Mandriva 2008.1, and OpenSuSE 11.0
  - Provides AoE booting mechanism in support of diskless MS Windows XP
- Clonezilla Live
  - Easier to create a recovery ISO/zip Clonezilla Live
  - Japanese, Simplified Chinese and French locales were added
  - Serial console is supported



# Demo

- **Diskless** Linux client on a virtual machine
  - Server: DRBL 1.9.3-30 running on Ubuntu Linux 8.10
  - Client: Virtualbox 2.0.4 as a client machine, no local hard drive
  - Boot client via PXE (network booting)

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# Questions ?



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