Clonezilla:
Clonezilla As Free As You Want!

clonezilla.org

Q3, 2013

TAIWAN www.nchc.org.tw
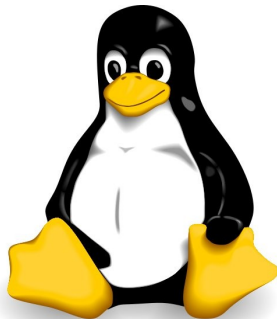National Applied
Research Laboratories NCHC

What is Clonezilla?

- A partition and disk imaging/cloning utility similar to True image® or Ghost®

- GPL license

- A bare metal recovery tool for

VMFS

VMware ESX/ESXi

*1   *2   *3   *4   *5

MINIX

*6

*Logo source: (1) Larry Ewing, Simon Budig and Anja Gerwinski, (2) Apple ,(3) Microsoft, (4) Marshall Kirk McKusick, (5) VMWare (6) Distrowatch.com

Clonezilla

Developers

- Steven Shiau
- K. L. Huang
- Ceasar Sun
- Jazz Wang
- Thomas Tsai
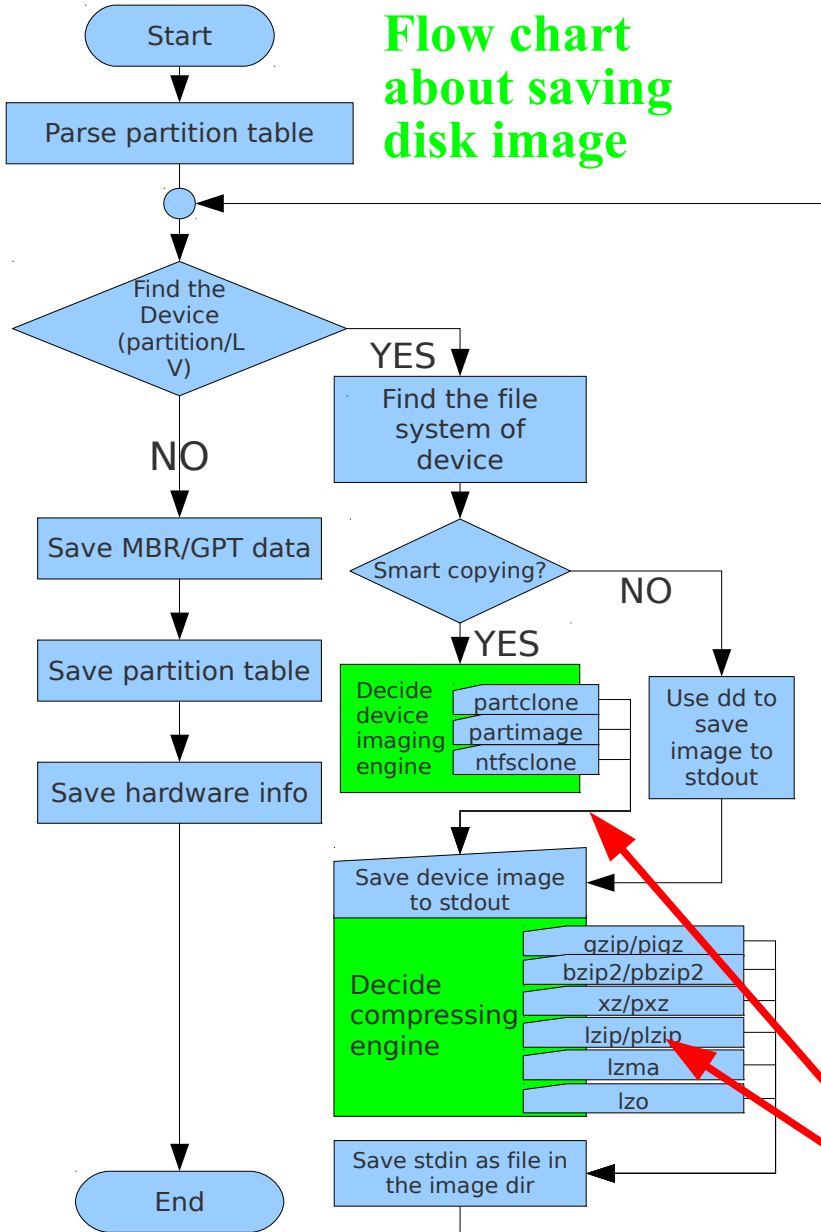- Jean-Francois Nifenecker
- Louie Chen
- Nagappan Alagappan

Clonezilla Features

- Free (GPL) Software
- File systems supported:
  - Ext2/3/4, ReiserFS, Reiser4, XFS, JFS, HFS+, BrtFS, UFS, VMFS3/5, FAT, NTFS, Minix
  - Supports LVM2
- Smart copying for supported filesystem. For unsupported file systems sector-to-sector copying is done via dd.
- Boot loader : syslinux, grub 1/2 ; MBR and hidden data (if exist)
- Serial console
- Unattended mode
- One image restoring to multiple local devices
- Multicast supported in Clonezilla Server Edition (SE)
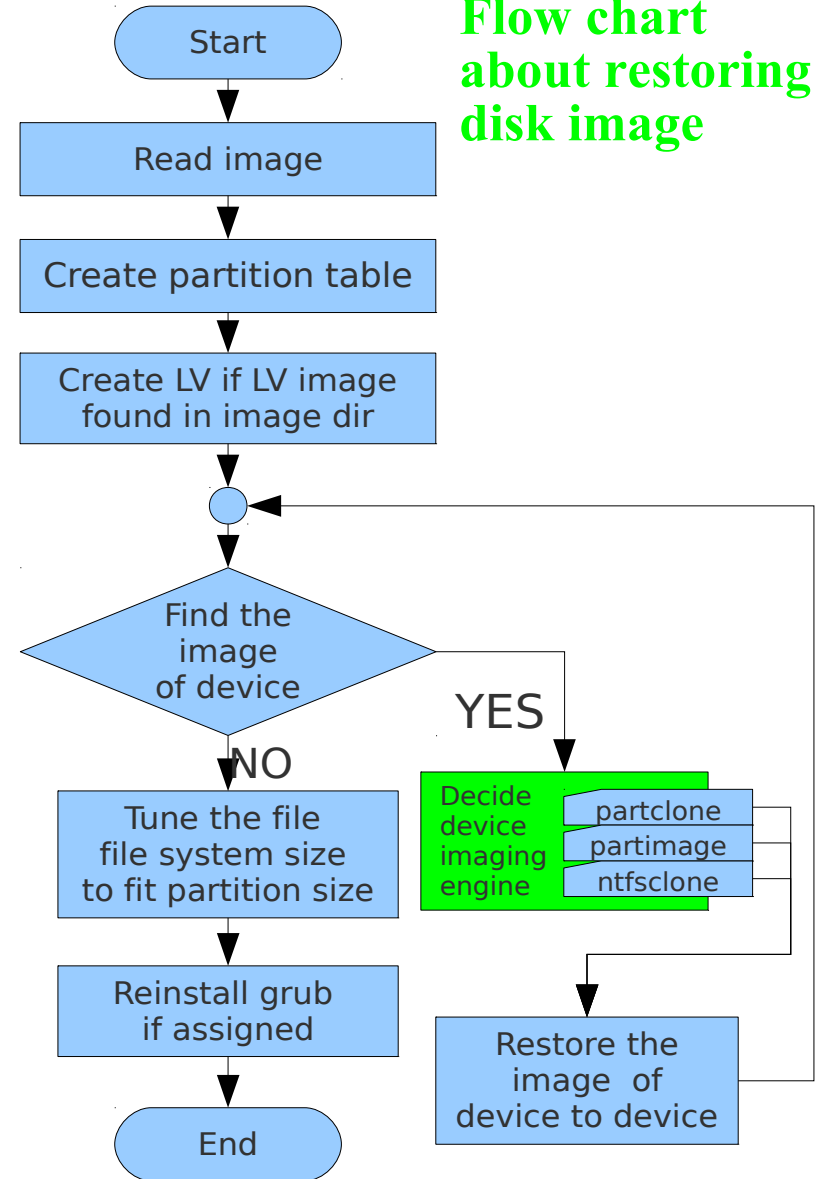- The image format is transparent, open and flexible

Save and Restore procedure of Clonezilla

Flow chart about saving disk image

Start → Parse partition table → (○) → Find the Device (partition/LV)

- NO → Save MBR/GPT data → Save partition table → Save hardware info → End
- YES → Find the file system of device → Smart copying?
  - YES → Decide device imaging engine [partclone / partimage / ntfsclone]
  - NO → Use dd to save image to stdout

→ Save device image to stdout → Decide compressing engine [gzip/pigz / bzip2/pbzip2 / xz/pxz / lzip/plzip / lzma / lzo] → Save stdin as file in the image dir

Flow chart about restoring disk image

Start → Read image → Create partition table → Create LV if LV image found in image dir → (○) → Find the image of device

- NO → Tune the file file system size to fit partition size → Reinstall grub if assigned → End
- YES → Decide device imaging engine [partclone / partimage / ntfsclone] → Restore the image of device to device

Imaging and compressing engines can be easily added

5

Language file contributors

- English (en_US): Dylan Pack.

- German (de_DE): Michael Vinzenz.

- Spanish (es_ES): Juan Ramón Martínez and Alex Ibáñez López.

- French (fr_FR): Jean-Francois Nifenecker and Jean Francois Martinez.

- Italian (it_IT): Gianfranco Gentili.

- Japanese (ja_JP): Akira Yoshiyama and Annie Wei.

- Brazilian Portuguese (pt_BR): Marcos Pereira da Silva Cruz.

- Russian (ru_RU): Anton Pryadko and Igor Melnikov.

- Simplified Chinese (zh_CN): Zhiqiang Zhang and Liang Qi.

- Traditional Chinese (zh_TW): T. C. Lin.

Bugs Report/Patches

- cbeazer
- nj-dude
- Asou Y.S. Chang
- Manuel Borchers
- Miracle Linux corporation
- Bill Marohn
- Orgad Shaneh
- Chris Cooper
- lukas666
- John Ouzts

- Juergen Chiu
- username8
- martinr88
- Yung-Jen Yu
- jeff-aptimize
- gsusterman
- wellurs
- dersucker
- Patrick Verner
- Adam Walker
- ...

Partners

- The following companies either embed Clonezilla in their products or promote Clonezilla:

  – Linmin

  – eRacks Open Source Systems

  – Miracle Linux

Limitations of Clonezilla

- The destination partition must be equal or larger than the source one

- Recovery Clonezilla live with multiple CDs or DVDs is not implemented yet

- Differential/incremental backup is not implemented yet

- Live imaging/cloning is not implemented yet

- Software RAID/fake RAID is not supported by default (extra manual processing is required)

Changes and features from July/2012

- Path changed. All the Clonezilla-related files are now in /usr/sbin/, /usr/bin/, and /usr/share/drbl/. No more in /opt/drbl/.

- With options -k1 and -icds, now it's possible to restore image from larger source image to smaller disk.

- Minix support

- Multipath devices, e.g. /dev/cciss/c0d0, are now supported natively.

- No more linking them to /dev/sd[a-z]. Therefore now LVM on cciss device are supported.

- Xen disk (/dev/xvd[a-z]) was added as a supported device.

- Three log files are added: /var/log/clonezilla.log, /var/log/ocs-netcfg.log and /var/log/ocs-mount.log

- Imaging/Cloning performance has been improved. User reported about 80% more.

Current work and planned developments

- Use live-build, live-boot and live-config 3.x (Now using 2.x).
- Updating the boot entries of EFI NVRAM after system is restored.
- Booting on a uEFI secure boot enabled machine.
- Support uEFI PXE booting in Clonezilla SE machine
- LVM without partition
- Local CCISS disk to remote CCISS disk
- Using Dnsmasq in Clonezilla SE

Clonezilla

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Wishlist

- Software RAID/FakeRAID support
- P2V friendly
- File-based imaging
- Recovery Clonezilla live with multiple CDs or DVDs
- More file systems support, ZFS, ReFS...
- Encryption file system support. Encryption for the image
- Scheduling
- WLAN setting
- ISCSI source disk
- Password protection
- Super easy mode
- GUI
- ...

Clonezilla Users Worldwide
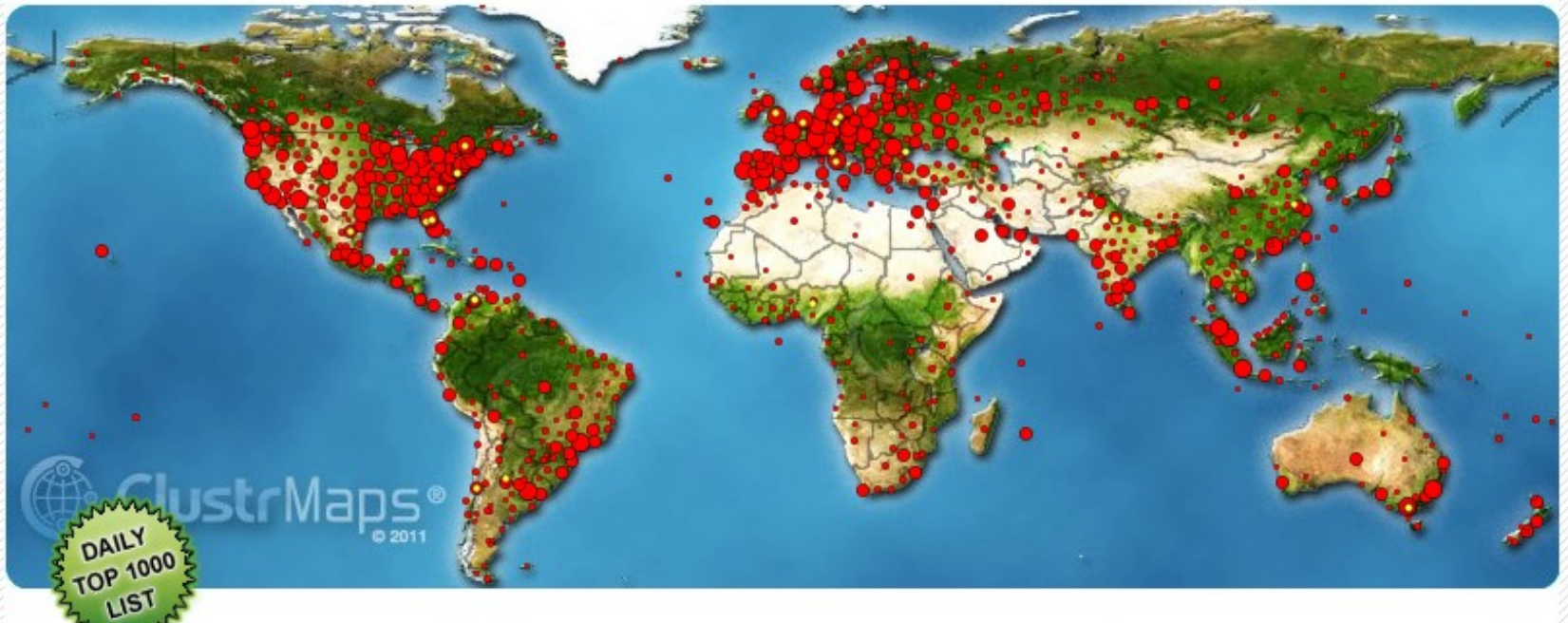
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Clonezilla

Clonezilla is a partition or disk clone tool similar to Norton Ghost. It saves and restores only the used blocks in the hard drive. Two types of Clonezilla are available, Clonezilla live and Clonezilla SE (Server Edition). The filesystem supported by Clonezilla are: ext2, ext3, ext4, reiserfs, xfs, jfs of GNU/Linux, FAT, NTFS of MS Windows, and HFS+ of Mac OS. Therefore you can clone GNU/Linux, MS windows and Intel-based Mac OS whether they be 32-bit (x86) or 64-bit (x86-64) OS. For these file systems, only the used blocks in the partition are saved and restored. For unsupported file systems, a sector-to-sector copy is done by dd in Clonezilla.

Why and how did you get started?
On the 29th of March, 2003, the computers in the computer classrooms at the National Center for High-Performance Computing (NCHC, http://www.nchc.org.tw) were all upgraded. However, the deployment software did not support the new hardware. That's why we started the Clonezilla project. In the beginning, we started the Clonezilla server edition first, then, in 2007, Clonezilla live was created.

Who is the software's intended audience?
System administrators, that being, PC cluster administrators, computer classroom administrators, and of course anyone who needs a tool to clone or image his/her computer.

What are a couple of notable examples of how people are using your software?
* The National Computer Centre Wonen, Netherlands, used Clonezilla to, "clone a 3 GB image to 27 machines with an average speed was 2.4 GB/min."

* Cisco Systems used DRBL, "...in the design of our Cisco Computational Cloud cluster to multicast a 5 GB disk image to 64 machines simultaneously."

* Information Systems Security, Southbridge, Massachusetts, USA, said, "So far, I have cloned 1,084 systems using DRBL. By carefully following the instructions on the DRBL website, and using multicasting and dividing the number of systems into groups of 80-100 PCs at the time, it took me somewhere between 16-38 minutes for each group of PCs, using images of various operating systems that averaged 1 GB in size. DRBL has reduced the recovery/cloning factor by more than 500% as compared with the previous commercial solution [we were] using"

Project name: Clonezilla

Date founded: July 2004

Project page: https://sourceforge.net/projects/clonezilla/

Project Leader

Steven Shiau
Occupation: Researcher at the NCHC, Taiwan
Location: Hsinchu, Taiwan
Education: M. S. (Nuclear Engineering), National Tsing Hua University, Taiwan

Key Developers

Blake, Kuo-Lien Huang
Occupation: Open source hobbyist
Education: M. S.
Location: Hsinchu, Taiwan

Chenkai (Ceasar) Sun
Occupation: Associate Researcher at the NCHC, Taiwan
Education: M. S. (Department of Management Information System) National Sun Yat-Sen University, Kaohsiung, Taiwan
Location: Hsinchu, Taiwan

Yao-Tsung (Jazz) Wang
Occupation: Associate Researcher at the NCHC, Taiwan

Clonezilla @ Linux Journal

- In Linux Journal, January 2011
- Report Clonezilla project and the cover headline

Clonezilla –

High Performance Open-Source Cloning

http://www.linuxjournal.com/

One of The Best Free Software of 2012

The Best Free Software of 2012

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By Eric Griffith | April 2, 2012 | 17 Comments | Email Print

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BACKUP/SYNC

24. Bvckup
http://www.bvckup.com/
Windows
Try not to think about how to pronounce Bvckup. Just know that when it comes to onsite backup, you now have a friend. It can handle real-time backup, copy only modified parts of files, and it doesn't take much memory to run. Get it now; it's only free while in beta testing.

25. Create Synchronicity
http://synchronicity.sourceforge.net
Windows | Portable
This small, multi-lingual program can run locally or portably to back up or sync files you specify when you create a profile.

26. Clonezilla Live
http://www.clonezilla.org

Contents

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- The Best Free Software of 2012
- Backup/Sync category

Clonezilla

PC PCMAG.COM

Use case in enterprise

- Nagappan Alagappan from VMware
  - Palo Alto, CA, USA
  - "As a product company, we need to test our product in all popular operating system, when exploring different opportunity, we found Clonezilla appropriate, Reason: It support all the Linux distribution (RedHat, SUSE, Ubuntu, Mandriva) and different file system, which we use (ext3, ext4, reiserfs)"
    - Initially evaluated Clonezilla live and found a very good performance, Windows XP image restoration 7 minutes, Ubuntu 3 minutes, SUSE / RHEL 5 minutes from a NFS server.
    - Later we (in VMware) have implemented a service, which will automate the Clonezilla reimaging part, without any manual intervention."

Use case in enterprise

- Juergen Chiu
- Canonical Ltd. Taipei, Taiwan
  - Clonezilla helps me a lot in system backup, recovery and ISO image creating
    - "In my job, I need to handle different type of system and create the ISO image for customers. Your great tool, Clonezilla, helps me a lot in system backup, recovery and ISO image creating. I only need to download the Clonezilla zip file, and create the bootable usb key in few easy steps, then I can use that key to backup the systems and create the ISO image by the same key. And the key is just the recovery partition as I need. All procedures take me only about 1 hour to finish all stuffs. I love your tool and that is really cover all functions what I need to have in Linux system recovery scope. Clonezilla is the best all-in-one tool that I have never seen before."

Use case in enterprise

- 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 1 GB 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!"

Clonezilla Used in Taiwan's "National PCs"
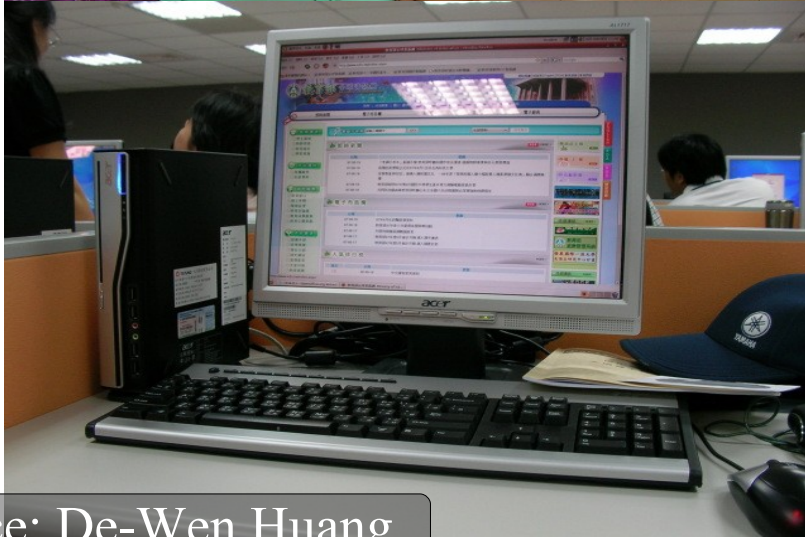
Use case in Education

- Alvin Su
  - Shen-Mei Elementary School, Taiwan
- Cloned more than 100 USB flash drives , each with 3 GB OS and data. Every batch 8 USB flash drives, ~ 30 mins

Clonezilla Live Demo (1)
Save an image

- Clonezilla Live
  - http://clonezilla.org/clonezilla-live
- A running Ubuntu 12.04 system
  - Text mode only. The whole system uses about 1.3 GB space. Using grub2 as boot loader.
  - /dev/sda1 on / and /dev/sda5 on /home with ext4
  - /dev/sda2 is used as swap partition
- Use Clonezilla live to save the whole disk as an image
  - Use NFS server as repository

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Clonezilla Live Demo (2) Restore an image

- A running Ubuntu 12.04 system
  - Text mode only. The whole system uses about 1.3 GB space
  - /dev/sda1 on / (grub2) and /dev/sda5 on / with ext4
  - /dev/sda3 is used as swap partition
- Destroy the whole system by:
  - dd if=/dev/zero of=/dev/sda1 bs=1M count=10
  - dd if=/dev/zero of=/dev/sda3 bs=1M count=10
  - dd if=/dev/zero of=/dev/sda bs=1M count=10
- Recover the whole system by Clonezilla live with a previous saved image via NFS service

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Reference

- Debian Live: http://live.debian.net/manual/
- Syslinux: http://syslinux.zytor.com
- Clonezilla: http://clonezilla.org
- DRBL: http://drbl.org
- GParted: http://gparted.org

Questions ?

Great!   ?????