Advanced Clonezilla Usage

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http://clonezilla.org

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Outline

- ## Clonezilla

  - About Clonezilla
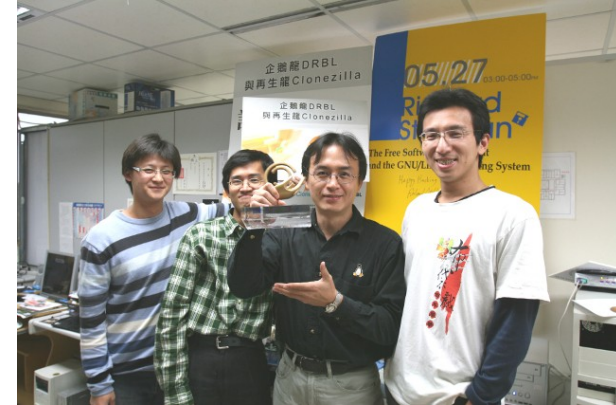 - Live system

- ## Advanced Usages

  - Unattended recovery CD or USB flash drive
  - Massively creating bootable USB flash drives on a single machine
  - Pre-process and post-process when restoring a system
  - Unattended recovery with a file server
  - A customized live CD for remote troubleshooting
  - Serial console and PXE booting usage

- ## Q&A

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Clonezilla

About us

- Developers of the free software DRBL, Clonezilla and more...
- Steven is also the maintainer of GParted live CD
- From Taiwan, working for the NPO NCHC (National Center for High-Performance Computing)

Clonezilla

Taiwan image source: wikipedia.org 3

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Clonezilla

What is Clonezilla?

- A partition and disk imaging/cloning utility similar to Ghost® and True image®
- GPL license
- A bare metal recovery tool for
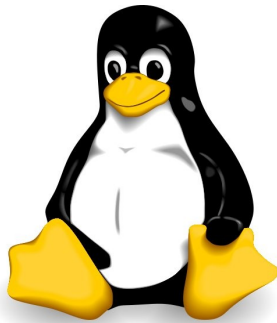
*1   *2   *3   *4   *5

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

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Clonezilla

Clonezilla Feature

- File systems supported:
    - Ext2/3/4, ReiserFS, Reiser4, XFS, JFS, HFS+, BrtFS, UFS, VMFS (v3 and v5), FAT and NTFS
    - Supports LVM2
    - Support some hardware RAID chips (by kernel)
- 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)
- One image restoring to multiple local devices
- Boot parameters for presetting
- Unattended, automatic mode
- Serial console
- Multicast supported in Clonezilla Server Edition (SE)
- The image format is transparent, open and flexible

Developers

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

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.

Clonezilla live is a downstream of Debian Live

- Debian live downstream: Amnesic Incognito, Canaima, Canonical OEM Services, Clonezilla live, Debian Eee PC, Debian KDE, DRBL live, FAI, GParted, Grml...

- Boot parameters of Debian Live also work for Clonezilla live

- More on http://live.debian.net/project/downstream/

Ref: http://live.debian.net/project/about/

GNU/Linux Live System

- A GNU/Linux live system is a storage media (CD, USB flash drive) containing a bootable computer operating system.

- No installation is required. Just boot and use it.

- Unique: the ability to run a complete, modern operating system on a computer lacking secondary storage, such as a hard disk drive.

- Suitable for special, one-time-use purpose, e.g.
  - Privacy and anonymity
  - System rescue
  - Partitions tuning
  - Imaging or cloning

Source: http://en.wikipedia.org/wiki/Live_CD, and http://gnu.org

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Clonezilla

Unattended recovery CD or USB flash drive

- Scenario: your customer need a recovery solution
- How:
  - Have an image ready first
  - Use a machine with RAM >= 768 MB
    - Boot Clonezilla live
    - Mount the image repository
    - Choose "recovery-iso-zip" option then follow the steps

```
┤ Clonezilla: Select mode ├
*Clonezilla is free (GPL) software, and comes with ABSOLUTELY NO WARRANTY*
This software will overwrite the data on your hard drive when restoring! It is recommended to
backup important files before restoring!***
///Hint! From now on, if multiple choices are available, you have to press space key to mark
your selection. An asterisk (*) will be shown when the selection is done///
Select mode:


            savedisk        Save_local_disk_as_an_image
            saveparts       Save_local_partitions_as_an_image
            restoredisk     Restore_an_image_to_local_disk
            restoreparts    Restore_an_image_to_local_partitions
            1-2-mdisks      Restore_an_image_to_multiple_local_disks
            recovery-iso-zip  Create_recovery_Clonezilla_live
            chk-img-restorable Check_the_image_restorable_or_not
            exit            Exit. Enter command line prompt



                  <Ok>                          <Cancel>
```
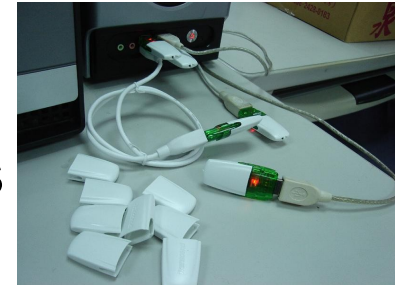
Clonezilla

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Massively creating bootable USB flash drives on a single machine

- Scenario: you want to massively creating USB sticks

- How:

  - Have an image ready first

  - Use a machine with many USB ports

    - Boot Clonezilla live

    - Mount the image repository

    - Choose "1-2-mdisks" option then follow the steps

```
                    ┤ Clonezilla: Select mode ├
*Clonezilla is free (GPL) software, and comes with ABSOLUTELY NO WARRANTY*
This software will overwrite the data on your hard drive when restoring! It is recommended to
backup important files before restoring!***
///Hint! From now on, if multiple choices are available, you have to press space key to mark
your selection. An asterisk (*) will be shown when the selection is done///
Select mode:

              savedisk          Save_local_disk_as_an_image
              saveparts         Save_local_partitions_as_an_image
              restoredisk       Restore_an_image_to_local_disk
              restoreparts      Restore_an_image_to_local_partitions
              1-2-mdisks        Restore_an_image_to_multiple_local_disks
              recovery-iso-zip  Create_recovery_Clonezilla_live
              chk-img-restorable Check_the_image_restorable_or_not
              exit              Exit. Enter command line prompt


              <Ok>                              <Cancel>
```

Photos source: Alvin Su

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Pre-process and post-process when restoring a system

- Boot parameters provide a mechanism to preset some options => Set in the config file of isolinux, syslinux, pexelinux or grub.

- Besides the boot parameters from Debian live, Clonezilla also provides ocs_prerun* and ocs_postrun* parameters

- ocs_prerun* is for pre-process, right before Clonezilla job is run and ocs_postrun* is for post-process, right after the Clonezilla job is done.

- Limitation: No double quotation mark (") or single quotation mark (') in your command.

ocs_prerun* → Clonezilla job → ocs_postrun*

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Pre-process and post-process when restoring a system (cont')

- The order to run is:
    - ocs_prerun1, ocs_prerun2, ocs_prerun3...
    - ocs_postrun1, ocs_postrun2, ocs_postrun3...
- Examples
    - To do a file system check for 1st partition, use:
      ```
      ocs_prerun1="fsck /dev/sda1"
      ```
    - To lease an IP address from a DHCP server:
      ```
      ocs_prerun1="dhclient -v eth0"
      ```
    - To mount a file system and modify a file after restoring:
      ```
      ocs_postrun1="mount /dev/sda1 /mnt"
      ocs_postrun2="sed -i -e s/old/new/ /etc/hostname"
      ocs_postrun3="umount /mnt"
      ```
- Boot parameters doc are available on http://clonezilla.org

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Unattended recovery with a file server

- Scenario: You have a file server and want to use a CD of Clonezilla (no image included) to restore different machines

- How

    - Have an image ready on the file server first

    - Use boot parameters to make that, e.g. for NFS server:
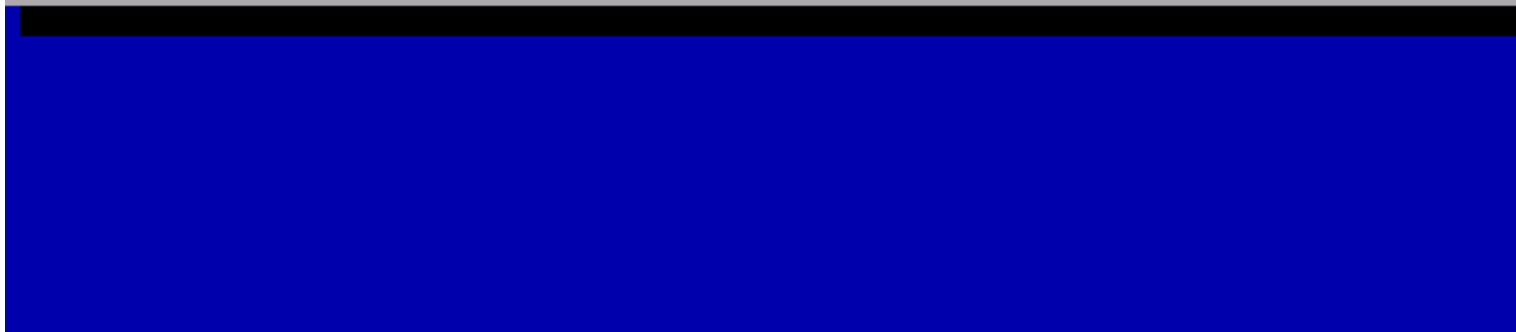
        - ```
          append initrd=/live/initrd.img boot=live config  noswap
          nolocales edd=on nomodeset noprompt ocs_prerun1="dhclient
          -v eth0" ocs_prerun2="sleep 2" ocs_prerun3="mount -t nfs
          192.168.120.254:/home/partimag /home/partimag"
          ocs_live_run="ocs-sr -g auto -e1 auto -e2 -b -r -j2 -p
          reboot restoredisk squeeze-updated-20110711 sda"
          ocs_live_extra_param="" ocs_live_keymap="NONE"
          ocs_live_batch="no" ocs_lang="en_US.UTF-8" vga=788
          ip=frommedia  nosplash
          ```

    - Here we preset (1) the keymap as default (NONE, i.e. US keymap), (2) the language as English (en_US.UTF-8), (3) configure the network, (4) mount the image repository on NFS server, and (5) run the restoring command

Unattended recovery with a file server (cont')

- The complete command for ocs_live_run can be gotten from the Clonezilla wizard

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Demo

A customized live CD for remote troubleshooting

- Scenario: Your customer want you to do a remote troubleshooting, however, he or she knows nothing about GNU/Linux.

- How

    - For remote troubleshooting, you need

        - Network connection after booting

        - Password for the account "user" need to be changed (The default password is "live")

        - Ssh service is started automatically

    - `append initrd=/live/initrd.img boot=live config noswap nolocales edd=on nomodeset noprompt ocs_prerun1="dhclient -v eth0" ocs_prerun2="sleep 2" usercrypted=WwLqQXIdMIzoo ocs_daemonon="ssh" ocs_live_run="/bin/bash" ocs_live_keymap="NONE" ocs_live_batch="no" ocs_lang="en_US.UTF-8" vga=788 ip=frommedia nosplash`

    - `The encrypted password of "user" was obtained by`

`echo YOUR PASSWORD | mkpasswd -s`

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Serial console and PXE booting usage

- Scenario: A cluster with serial console only, no VGA connection

- For serial console, 2 boot parameters are required to redirect the screen output:

  - live-getty and console, e.g. append them to the previous case:

  - ```
    append initrd=/live/initrd.img boot=live config
    noswap nolocales edd=on nomodeset noprompt
    ocs_prerun1="dhclient -v eth0" ocs_prerun2="sleep
    2" usercrypted=WwLqQXIdMIzoo ocs_daemonon="ssh"
    ocs_live_run="/bin/bash" live-getty
    console=ttyS0,38400n81 ocs_live_keymap="NONE"
    ocs_live_batch="no" ocs_lang="en_US.UTF-8" vga=788
    ip=frommedia  nosplash
    ```

What if boot parameters can not do?

- In this case, modify the root file system. The difference is, it's a read-only file system.

- How → copy then rebuild
  - Unsquashfs the root file system "filesystem.squash" of Clonezilla live, modify it.
    - `mkdir ~/zip-tmp ~/squashfs-tmp`
    - `unzip clonezilla-live-1.2.12-58-i686-pae.zip -d ~/zip-tmp`
    - `cp ~/zip-tmp/live/``filesystem.squashfs`` ~/squashfs-tmp`
    - `cd ~/squashfs-tmp; sudo unsquashfs filesystem.squashfs`
    - `Modify the files in squashfs-root, e.g. add some files.`

What if boot parameters can not do? (cont')

- Rebuild the new filesystem.squashfs and replace the original one ,then rebuild clonezilla-live zip file:

  - ```
    sudo mksquashfs squashfs-root
    filesystem.squashfs.new -b 1024k -comp xz
    -Xbcj x86 -e boot
    ```

  - ```
    sudo cp filesystem.squashfs.new ~/zip-
    tmp/live/filesystem.squashfs
    ```

  - ```
    cd ~/zip-tmp ; sudo zip -r ../clonezilla-
    live.new.zip ./*
    ```

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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

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Questions ?

Great! ?????

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