Migrate to a virtual environment with Clonezilla

clonzilla.org
Q1, 2014
Outline

- Introduction to Clonezilla
  - Features
- Migrate to a virtual environment
  - Basic ideas
  - How
  - Use cases
- Q&A
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System imaging and cloning - backup

image source: maggiesfarm.anotherdotcom.com
www.compsults.com, and jervisdabreo.com
Massive system deployment
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)
What is Clonezilla?

• A partition and disk imaging/cloning utility similar to True image® or Ghost®
• GPL license
• A bare metal recovery tool for

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

• Free (GPL) Software
• File systems supported:
  – Ext2/3/4, ReiserFS, Reiser4, XFS, JFS, HFS+, BrtFS, UFS, Minix, VMFS, 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)
• 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
DRBL live, i.e. Clonezilla Server Edition
Clonezilla Live

Clonezilla Live version: 2.1.2-42-1606-pae. (C) 2009-2013, NCHC, Taiwan
Disclaimer: Clonezilla comes with ABSOLUTELY NO WARRANTY

Free Software Labs
National Center for High Performance Computing
Taiwan

Clonezilla: Select mode

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
savemedia Save local partitions as an image
restorecust Restore any local disk
restorepnt Restore an image to local partitions
1-to-n disks Restore an image to multiple local disks
recovery.iso-zip Create recovery Clonezilla live
dk-vg-restore Check the_image restorable or not
exit Exit. Enter command line prompt

<Ok>     <Cancel>
Developers

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- Ceasar Sun
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- Thomas Tsai
- Jean-Francois Nifenecker
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Language file contributors

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- Russian (ru_RU): Anton Pryadko and Igor Melnikov.
- Simplified Chinese (zh_CN): Zhiqiang Zhang and Liang Qi.
Clonezilla Users Worldwide

>9,000,000 downloads
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Physical to Virtual (P2V)

- Migrating a physical server's operating system (OS), applications, and data from that physical server to a virtual-machine guest hosted on a virtualized platform – wikipedia
  - Hot migration
    - Source system is in **running** state
    - Recommended for static data, not good for mail server, SQL server
  - Cold migration
    - Source system is **offline**
    - Clonezilla only works for **cold migration**
P2V

Old PC With Frequently Used Programs

Physical Server(s)

Old Laptop With Important Files and Data

Backup System Images

Host Computer Running Multiple Virtual Machines

Source: http://p2vsolutions.net/
P2V – 3 steps

1. Decide the destination VM
   - Install the required drivers of VM on source machine (physical side)
2. Create VM
3. Migrate

Source: http://planetvm.net/blog/?p=2108
Which Software Shall I Use?

• No clear answer, Every P2V software has its own strengths and weaknesses.
  – VMWare vCenter Convert
  – Virt-P2V
  – OpenQRM
  – …

• Clonezilla can also be used to perform P2V, i.e. in the step 3 ”migrate” in the previous page.

image sources: vmware.com, libguestfs.org, openqrm-enterprise.com/
P2V by Clonezilla live
Physical machine side

• Basic ideas
  – Before migrating, make sure the OS on the physical machine has the required drivers for the virtual machine which you want to move to.

• OS
  – GNU/Linux
    • Initrd is important
  – MS Windows
    • Sysprep

Image source: http://img21.imageshack.us/img21/9902/400mildrivers.jpg
Virtual Machine Side
For x86/x86-64

- KVM/QEMU
- Xen
- VirtualBox
  - https://www.virtualbox.org/wiki/Migrate_Windows
    - Make use of “MergeIDE” before migrating
  - Enable “CPU PAE” and “IO APIC”
- VMWare (Workstation, Fusion, Player, ESX...)
- ...

“Migrate” by Clonezilla

- Once step 1 and step 2 are done, you can migrate the system by Clonezilla:
  
1. Imaging
   
   Ref: http://clonezilla.org/clonezilla-live-doc.php

   - Physical → Image → Restore to Virtual machine
   - Recovery iso/zip → CD or USB flash drive
P2V “migrate” by Clonezilla

2. Cloning

- Physical A → local cable → Physical B
- Physical A → network → Physical B

Ref: http://clonezilla.org/clonezilla-live-doc.php

Disk size:
- Expert mode, choose “-k1” to create the partition table proportionally
- Make sure the disk size is big enough
P2V by Clonezilla on Youtube

• Clonezilla restore from ISO, P2V
  – http://www.youtube.com/watch?v=EMT81bgZMPA

• CentOS / RHEL Linux Virtualization Part 1/3 : Creating VMWare Disk Partition using Clonezilla
  – http://www.youtube.com/watch?v=21QTnVw_EHo

• CentOS / RHEL Linux Virtualization Part 2/3: image migration to VMWare using Clonezilla - NFS
  – http://www.youtube.com/watch?v=olJSXttInEo
P2V fails?

• Possible reasons
  – Missing required **drivers**
    • E.g. "Kernel panic – not syncing : Attempted to kill init!"
    • No required modules in initrd
    • Rescue mode then
      mkinitrd –v –f initrd-${kver}.img ${kver}
  – Wrong **arch**, e.g. AMD64 OS → i686 VM
  – **MAC address** of network card
    • Network is down. Service fails to start
  – **Serial number** of proprietary software depends on hardware.
  – ...

Reference

- Clonezilla: http://clonezilla.org
- DRBL: http://drbl.org
Questions?

Great!  

Clonezilla

??????