Migrate to a virtual environment with Clonezilla

clonezilla.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

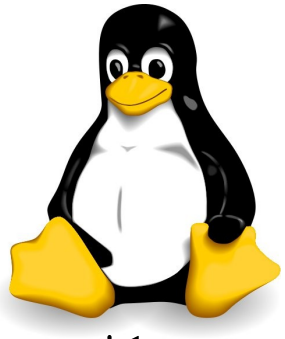
- Developers of the free software DRBL, Clonezilla and more...
- Steven is also the maintainer of GParted live CD
- From Taiwan, working for the NPO NCHC (National Center for High-Performance Computing)

財團法人國家實驗研究院
國家高速網路與計算中心
National Center for High-Performance Computing
Better HPC Better Living

Taiwan image source: wikipedia.org

What is Clonezilla?

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


*1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VMFS

VMware ESX/ESXi

*5

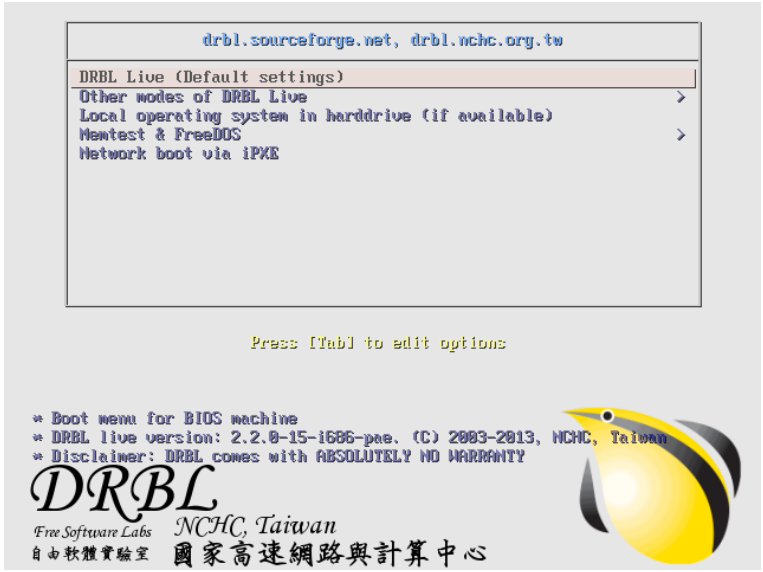
*6

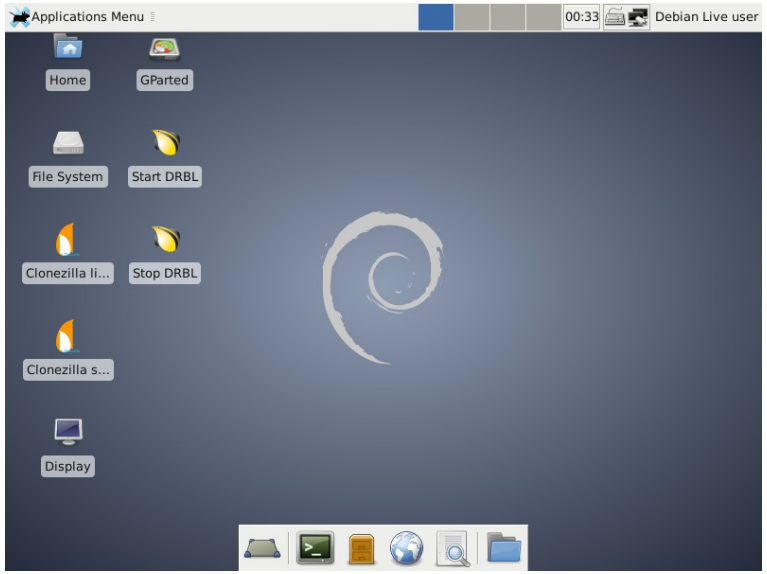
*Logo source: (1) Larry Ewing, Simon Budig and Anja Gerwinski, (2) Apple ,(3) Microsoft, (4) Marshall Kirk McKusick, (5) VMWare (6) Distrowatch.com

Clonezilla Feature

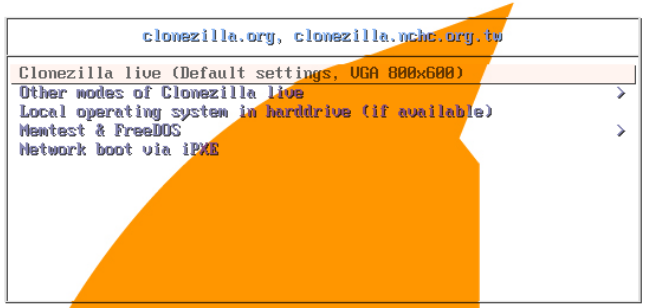
- Free (GPL) Software
- File systems supported:
  - Ext2/3/4, ReiserFS, Reiser4, XFS, JFS, HFS+, BrtFS, UFS, Minix, VMFS, FAT and NTFS
  - Supports LVM2
  - Support some hardware RAID chips (by kernel)
- Smart copying for supported filesystem. For unsupported file systems sector-to-sector copying is 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



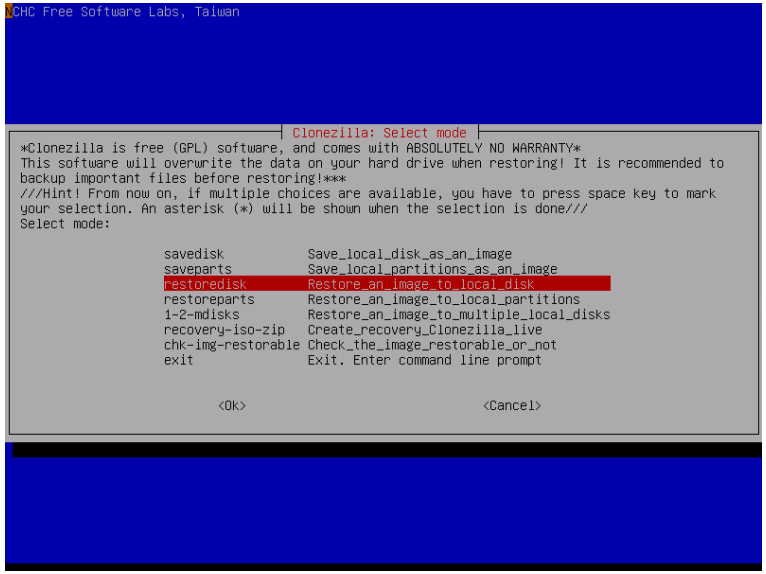


Clonezilla Live



Clonezilla

Free Software Labs
National Center for High-Performance Computing
Taiwan



Developers

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







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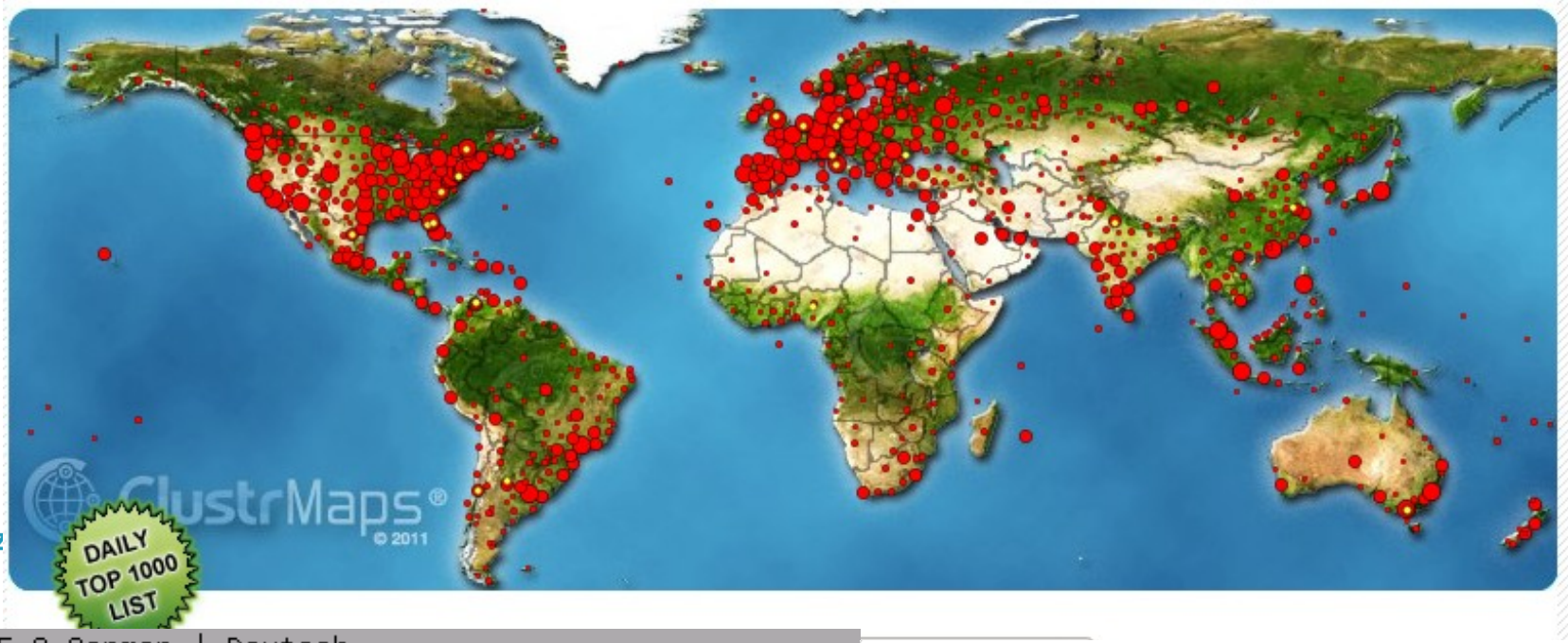
Clonezilla Users Worldwide

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it_IT.UTF-8 Italian | Italiano
ja_JP.UTF-8 Japanese | 日本語
pt_BR.UTF-8 Brazilian Portuguese | Português do Brasil
ru_RU.UTF-8 Russian | Русский
zh_CN.UTF-8 Chinese (Simplified) | 简体中文
zh_TW.UTF-8 Chinese (Traditional) | 正體中文 - 臺灣
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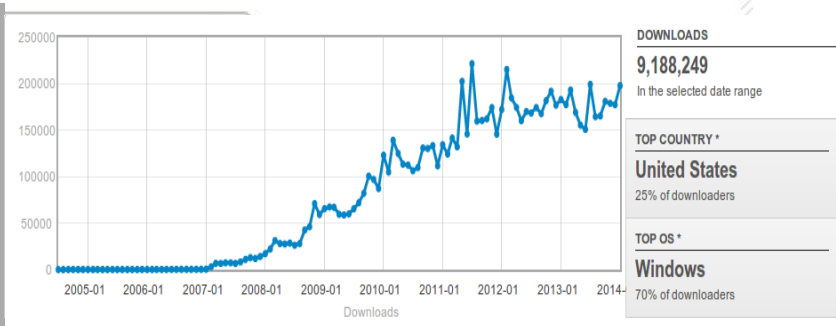

>9,000,000 downloads

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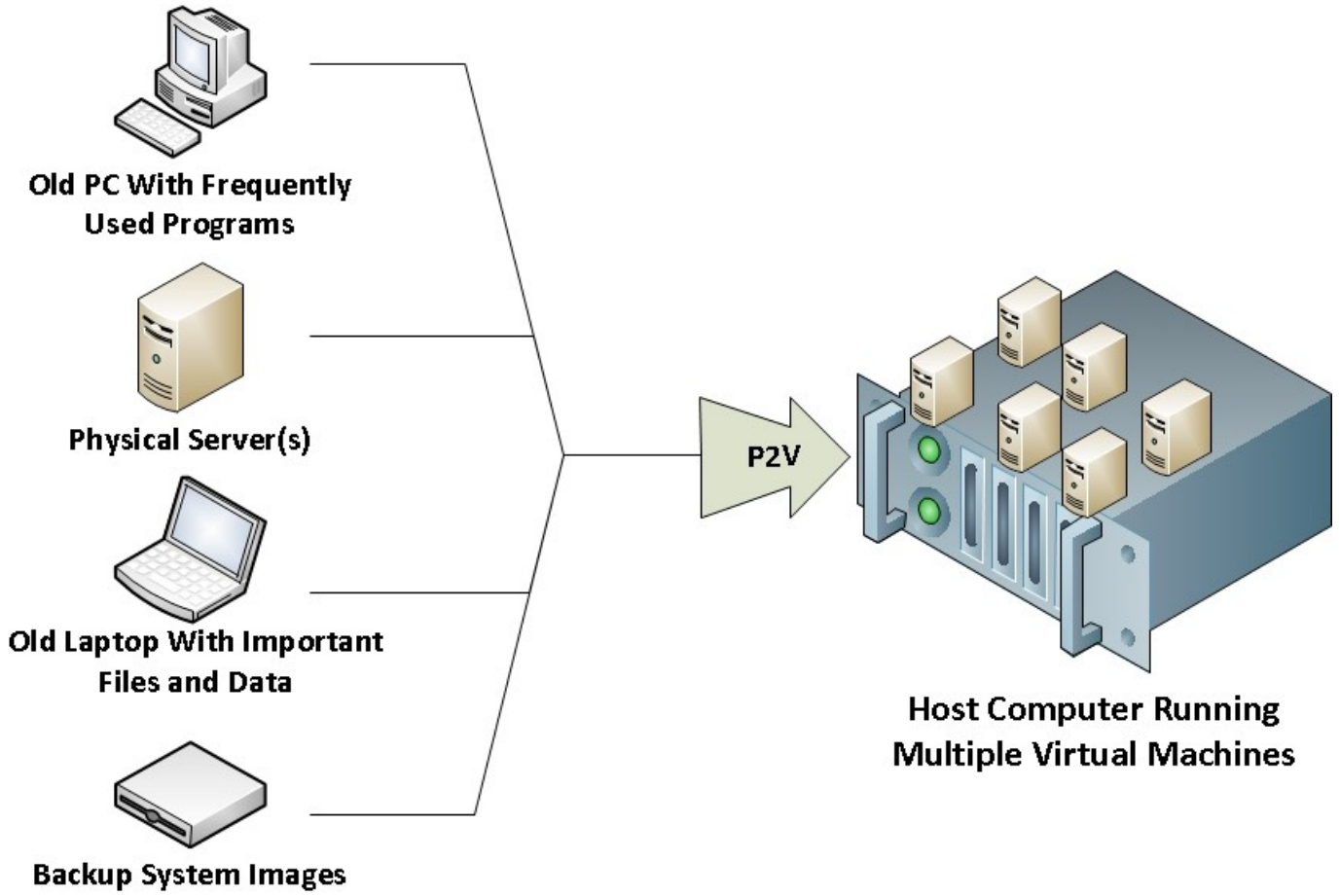
Physical to Virtual (P2V)

- 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

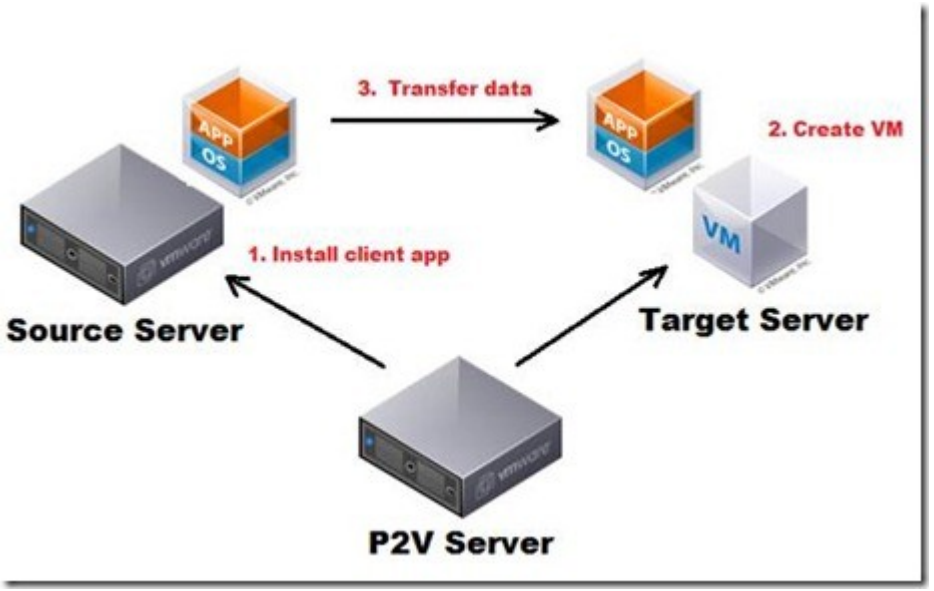
P2V



Source: http://p2vsolutions.net/

P2V – 3 steps

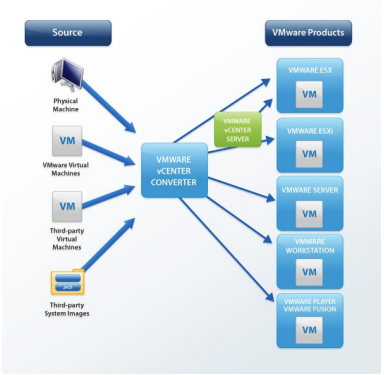
1. Decide the destination VM
   - Install the required drivers of VM on source machine (physical side)
2. Create VM
3. Migrate



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

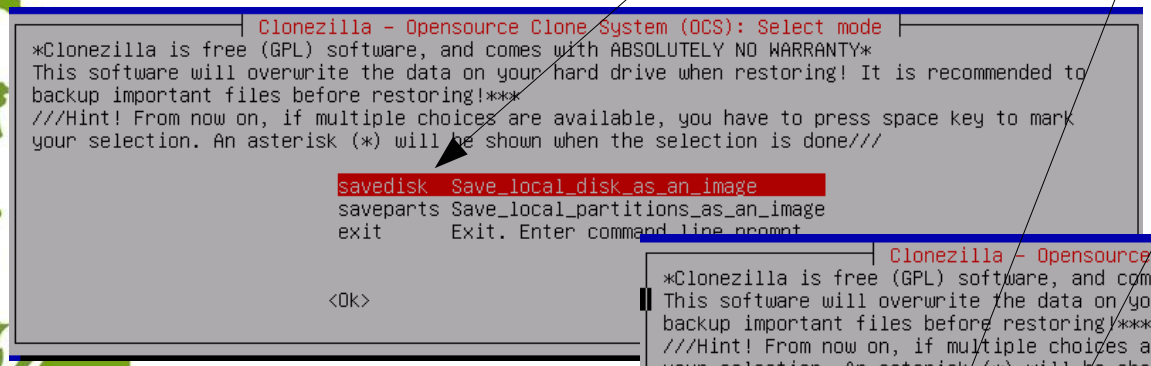
Virtual Machine Side For x86/x86-64

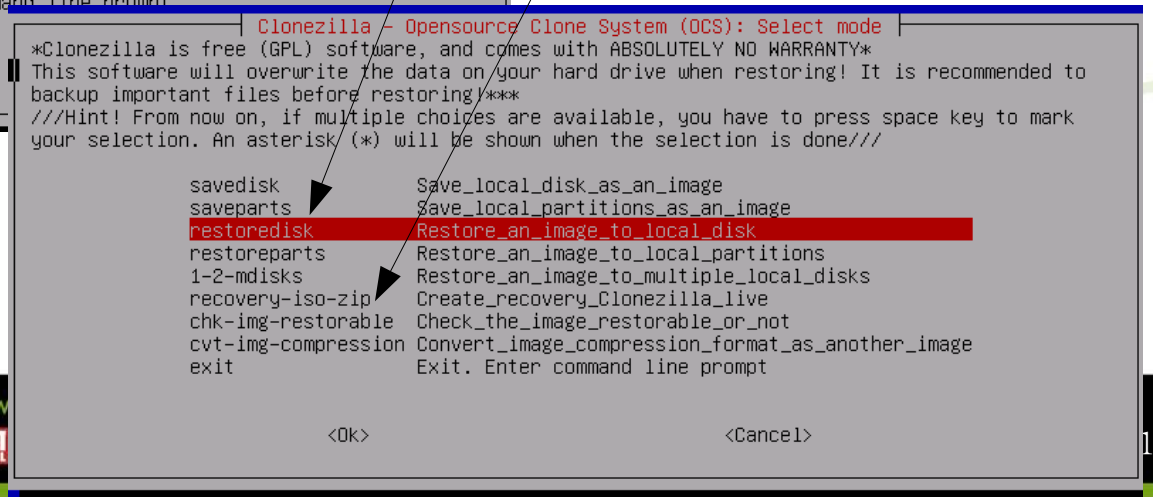
- KVM/QEMU
- Xen
- VirtualBox
  - https://www.virtualbox.org/wiki/Migrate_Windows
    - Make use of "MergeIDE" before migrating
  - Enable "CPU PAE" and "IO APIC"
- VMWare (Workstation, Fusion, Player, ESX...)
- ...

Image sources: linux-kvm.org, xenproject.org, www.virtualbox, vmware.com

“Migrate” by Clonezilla

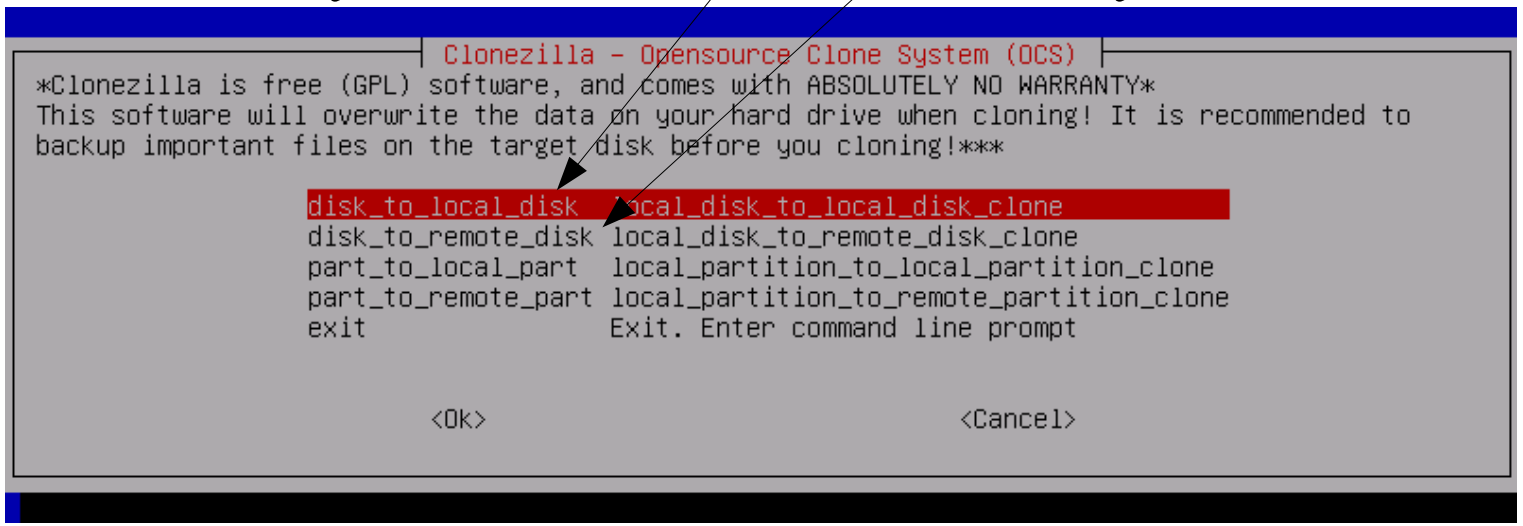
- Once step 1 and step 2 are done, you can migrate the system by Clonezilla:
  1. Imaging Ref: http://clonezilla.org/clonezilla-live-doc.php
     - Physical → Image → Restore to Virtual machine
     - Recovery iso/zip → CD or USB flash drive





P2V "migrate" by Clonezilla

- 2. Cloning Ref: http://clonezilla.org/clonezilla-live-doc.php
  - Physical A → local cable → Physical B
  - Physical A → network → Physical B



- 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!

?????