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

   • Physical → Image → Restore to Virtual machine
   • Recovery iso/zip → CD or USB flash drive

Ref: http://clonezilla.org/clonezilla-live-doc.php
P2V “migrate” by Clonezilla

2. Cloning

- Physical A → local → Virtual B
- Physical A → network → Virtual B

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

Ref: http://clonezilla.org/clonezilla-live-doc.php
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
      \[ \text{mkinitrd} \ -v \ -f \ \text{initrd-}\{\text{kver}\}.img \ \{\text{kver}\} \]
  – 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.
  – ...