Mastering Disk Imaging and Cloning with Clonezilla: A Practical Lab

Steven Shiau, Ceasar Sun, Thomas Tsai

clonezilla.org

Aug 2024

Outline

- Introduction to Clonezilla, 5 mins
- Create a Clonezilla bootable media, 5 mins
- Disk Imaging, 10 mins
- Disk Cloning, 10 mins
- Advanced Features
  - Unattended mode, 15 mins
  - Massive deployment with multicast or bittorrent mode, 15 mins
- Hands-on, Q&A, 20 mins

Outline

System imaging and cloning - backup

image source: maggiesfarm.anotherdotcom.com
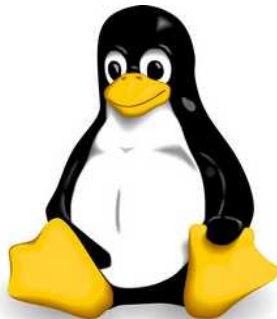www.compsults.com, and jervisdabreo.com

Massive system deployment

What is Clonezilla?

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

- GPL license

- Mainly supported by NCHC, Taiwan

- A bare metal recovery tool for

VMFS

*1   *2   *3   *4   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

What is Clonezilla live?

- A live system based on Debian Linux or Ubuntu Linux
- Created by Debian live-build package, and it contains live-boot and live-config
- Can be boot via CD, USB stick, PXE, hard drive...
- Listed in Debian derivatives census
  - https://wiki.debian.org/Derivatives/Census

Outline

- Introduction to Clonezilla
- Create a Clonezilla bootable media
- Disk Imaging
- Disk Cloning
- Advanced Features
  - Unattended mode
  - Massive deployment with multicast or bittorrent mode
- Hands-on, Q&A

Create a Clonezilla bootable media

- CD
  - Download Clonezilla live iso file
  - Burn it on a CD
- USB flash drive
  - Download Clonezilla live zip file
  - Prepare a USB flash drive with vFAT partition (~500 MB)
  - Unzip clonezilla zip file to the vFAT partiton of USB flash drive, e.g.,
    - `unzip clonezilla-live-3.1.3-16-amd64.zip -d /media/disk/`
  - If for legacy BIOS, run makeboot.sh, e.g.,
    - `sudo bash /media/disk/util/linux/makeboot.sh /dev/sda1`

Outline

Disk imaging

- Save an image
  - https://clonezilla.org//fine-print-live-doc.php?path=clonezilla-live/doc/01_Save_disk_image

- Restore an image
  - https://clonezilla.org//fine-print-live-doc.php?path=clonezilla-live/doc/02_Restore_disk_image

Outline

- Introduction to Clonezilla
- Create a Clonezilla bootable media
- Disk Imaging
- Disk Cloning
- Advanced Features
  - Unattended mode
  - Massive deployment with multicast or bittorrent mode
- Hands-on, Q&A

Disk Cloning

- Disk to disk cloning
    - https://clonezilla.org//fine-print-live-doc.php?path=clonezilla-live/doc/03_Disk_to_disk_clone

Outline

- Introduction to Clonezilla
- Create a Clonezilla bootable media
- Disk Imaging
- Disk Cloning
- Advanced Features
  - Unattended mode
  - Massive deployment with multicast or bittorrent mode
- Hands-on, Q&A

Unattended mode

- Using boot parameters to make that
  - https://clonezilla.org//fine-print-live-doc.php?path=clonezilla-live/doc/05_Preseed_options_to_do_job_after_booting
- The boot parameters of Clonezilla live
  - https://clonezilla.org//fine-print-live-doc.php?path=./clonezilla-live/doc/99_Misc/00_live-boot-parameters.doc#00_live-boot-parameters.doc

Massive deployment

- Massive deployment normally requires
  - A server
  - Installation and setup
  - Extra storage to keep the image repository
- Massive deployment straight from the source machine
  - No extra server is required
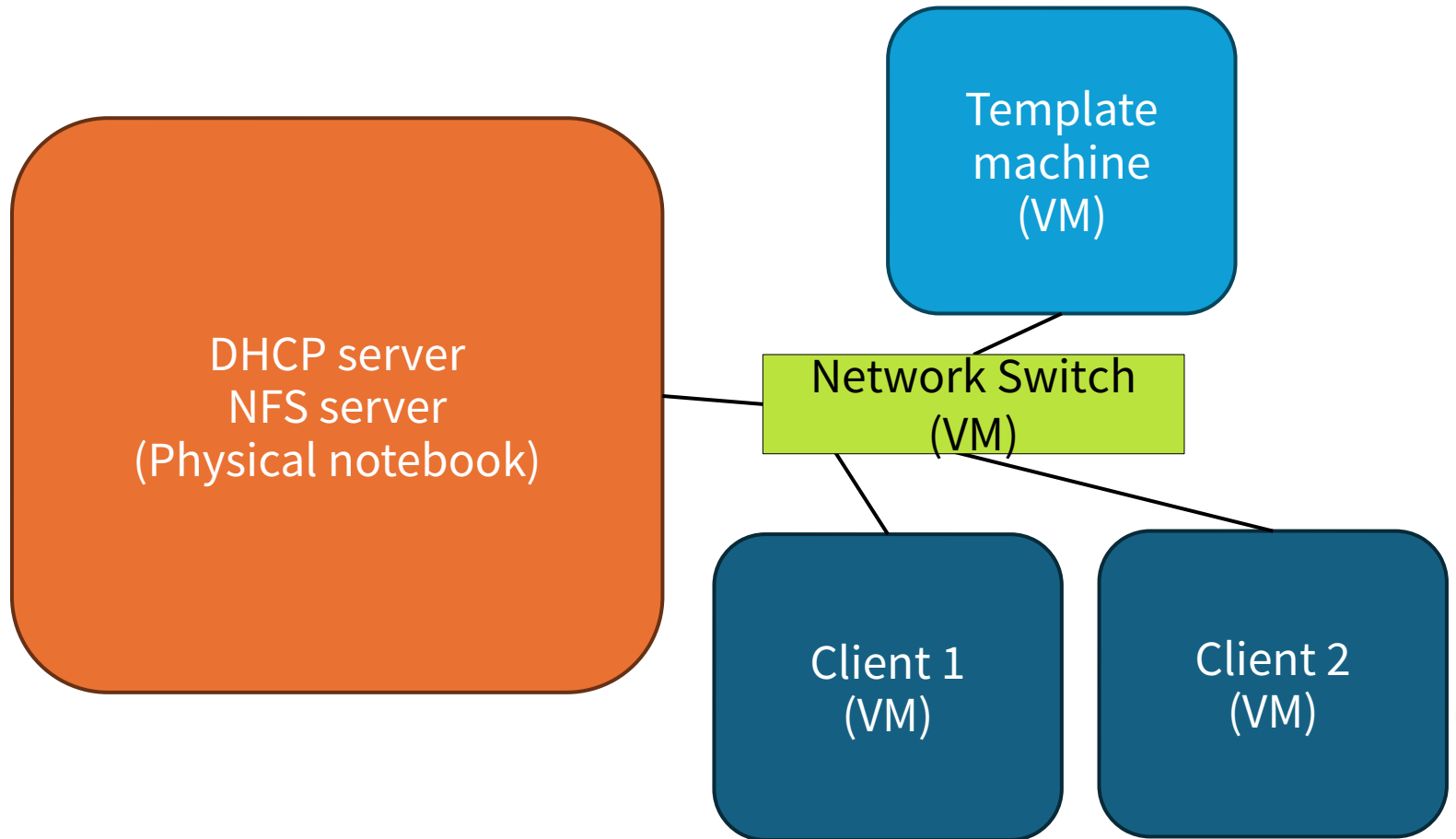 - No installation
  - No extra storage device is required

Massive deployment

- Massive deployment from an image
  - Take multicast mechanism as an example
  - https://clonezilla.org//fine-print-live-doc.php?path=clonezilla-live/doc/11_lite_server

- Massive deployment straight from the source machine
  - Take bittorrent mechanism as a example
  - https://clonezilla.org//fine-print-live-doc.php?path=clonezilla-live/doc/12_lite_server_BT_from_dev

Massive deployment schematic

Template machine (VM)

DHCP server
NFS server
(Physical notebook)

Network Switch (VM)

Client 1 (VM)

Client 2 (VM)

●NeiPu Elementary School, Taichung, Taiwan
●Clonezilla using BT from raw device. 60 GB data
●Deployment time: ~10s minutes for each machine

Thanks to Mr. Tien-Yu Chiu & Date Huang.
Ref: https://www.facebook.com/chiutienyu

Clonezilla.org

Hands-on Lab

- It's recommended to use virtual machines for testing
  - E.g., Virtualbox (https://www.virtualbox.org)
  - Give it a try. If any questions, please ask.
- On site
  - Please catch us
- After DebConf 2024
  - Please ask online: https://clonezilla.org

Ads

clonezilla.org

21

Questions ?

Great!   ?????

Appendix

Great!   ?????
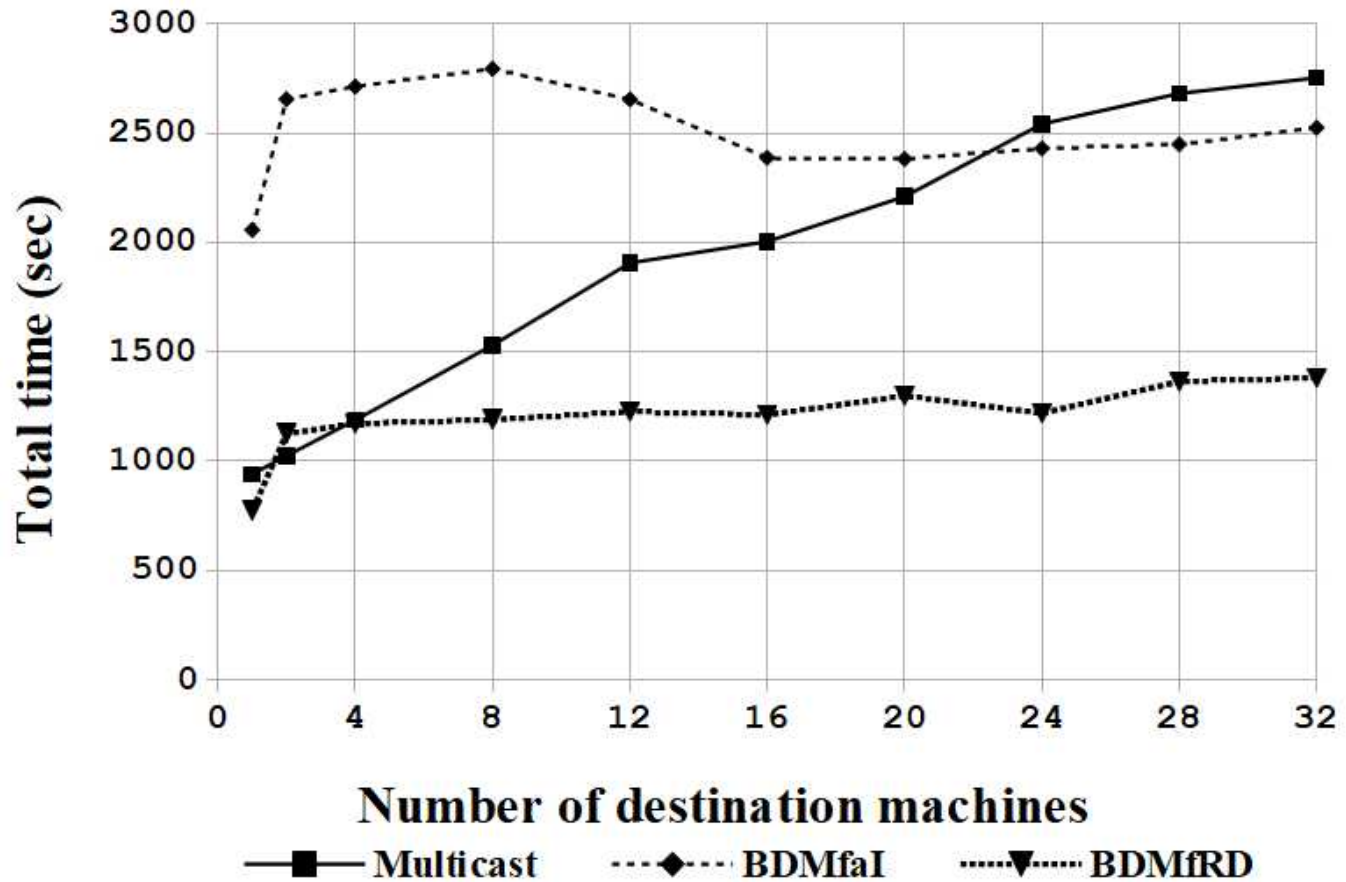
Comparisons

- Three types of experiments for massive deployment
  - Multicast
  - BT
    - BDMfaI
      - BT deployment mechanism from an image
    - BDMfRD
      - BT deployment mechanism from the raw device
- Deployed a Ubuntu Linux system (~50 GB) to 1 to 32 destination machines in a computer classroom.
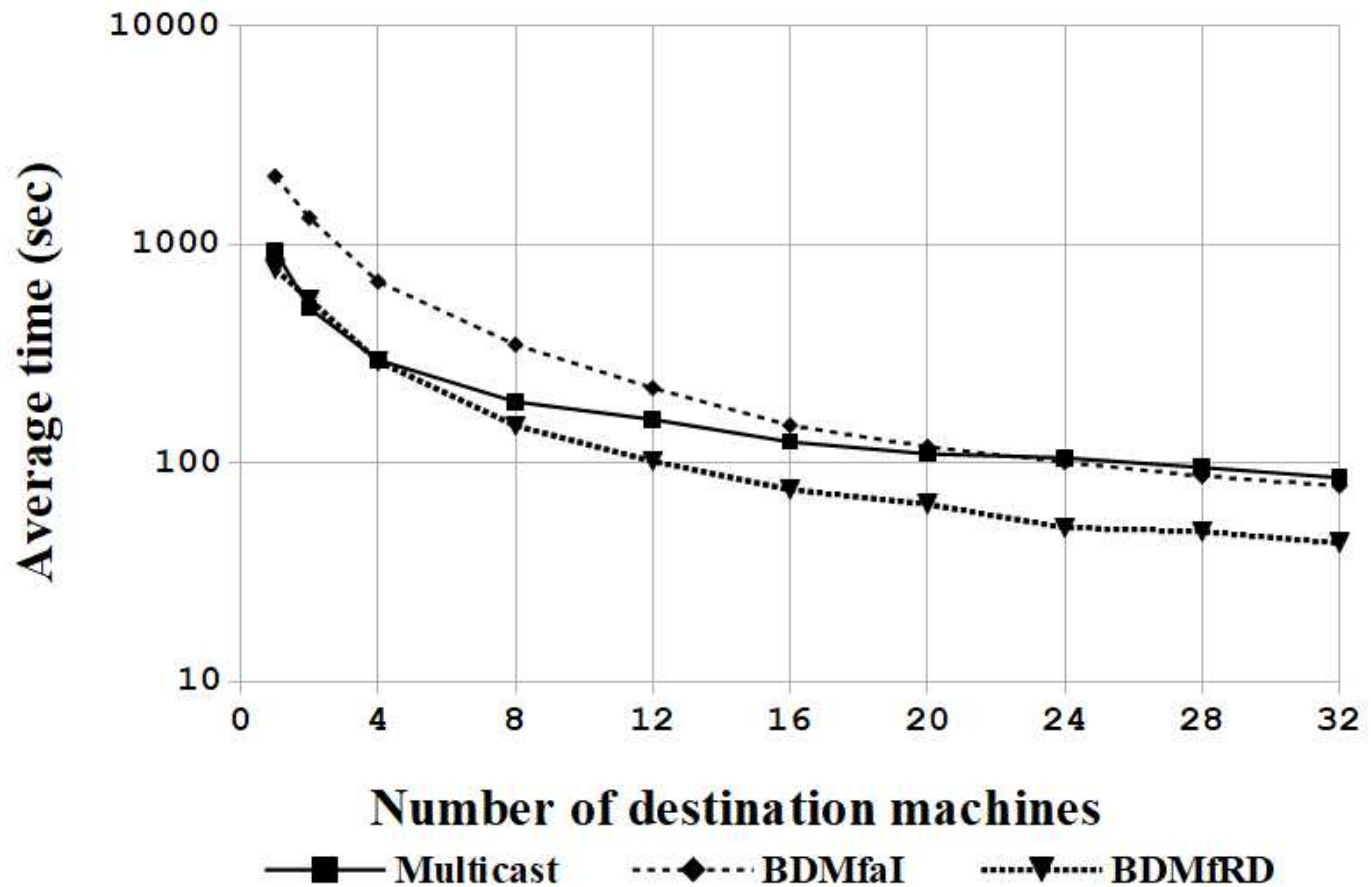
Experimental results
Total deployment time

Experimental results
Average time for each client

Average time (sec) vs Number of destination machines — Multicast, BDMfaI, BDMfRD

Experimental results
Speedup