



Mastering Disk Imaging and Cloning with Clonezilla: A Practical Lab

Steven Shiau, Ceasar Sun, Thomas Tsai

clonezilla.org

Aug 2024



clonezilla.org

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

- 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



System imaging and cloning - backup



You want to crash!!!
I show you how to crash!!!

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

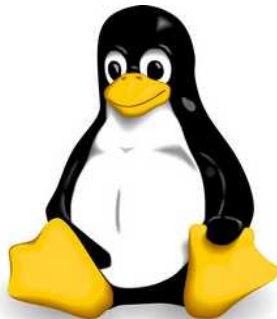


Massive system deployment



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



*1



*2



*3



*4

VMFS

VMware
ESX/ESXi

*5



MINIX

*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

- 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 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

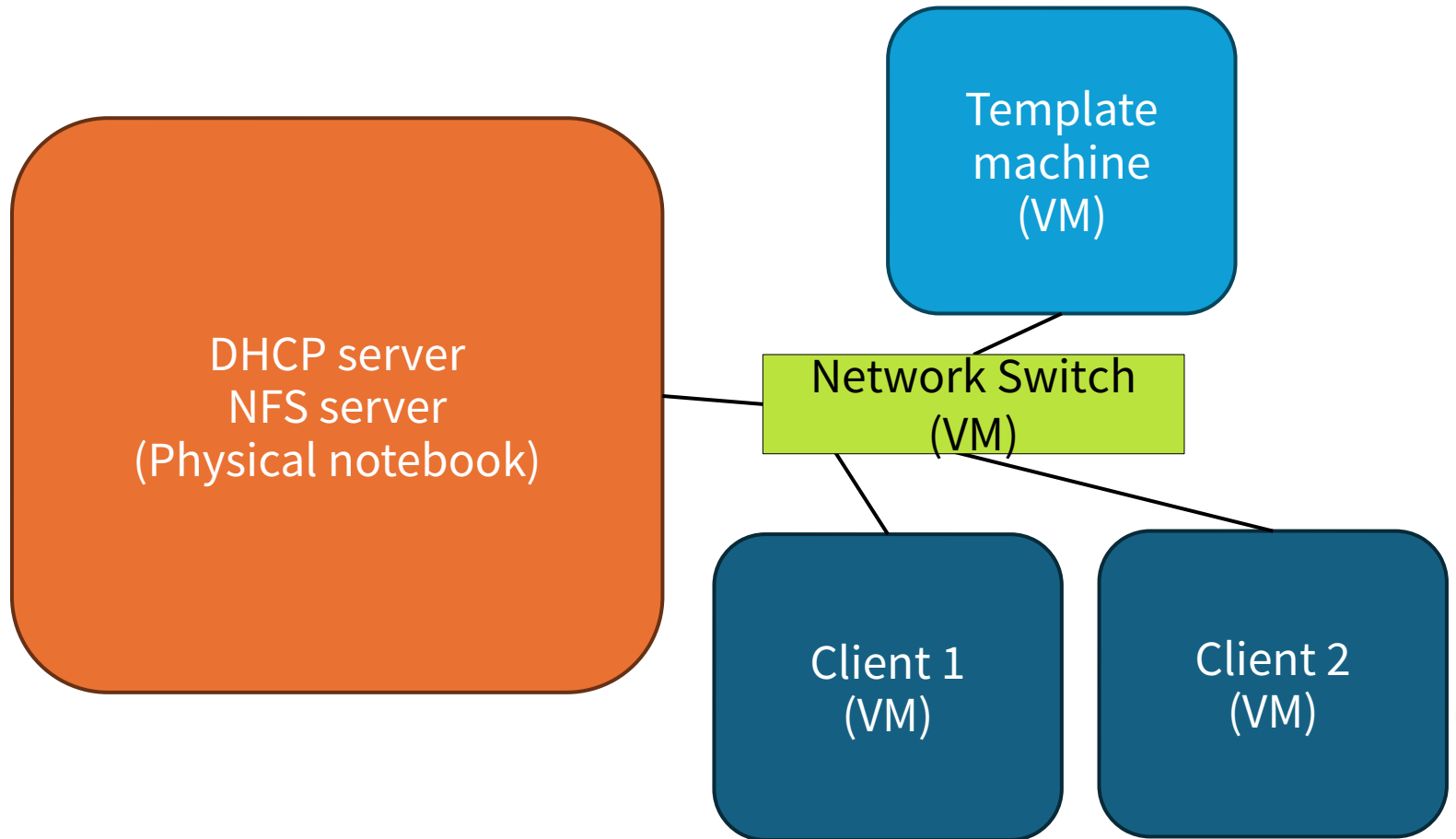


Massive deployment

- 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





- 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/chiutiennyu>



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>



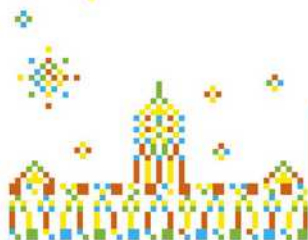
Ads



2024 Presidential Hackathon International Track



Call for Entries Now!



- ★ Showcase proposals at the Office of the President
- ★ Receive certificates and trophies presented by the President
- ★ 1-on-1 mentoring by renowned industry experts
- ★ Enjoy FREE round-trip airfare and accommodations in Taiwan

Theme Description

 **Digital and Green: Next-Generation Public Infrastructure**

The submitted proposals should focus on the core themes of “Digital” and “Green,” seeking innovative solutions that combine digital, information and communication technologies, and net-zero sustainability technologies for application in **digital public infrastructure** and services.

Eligibility

1. **Anyone can apply!** Most importantly, you have a vision and a solution to a specific problem using data that is open to the public.
2. You must also:
 - Have a team of **3-5** members.
 - Each contestant can participate in a maximum of one team.
 - At least one team member should be a **non-R.O.C. national**.

How to Sign Up

Fill out the online application form by **8/7(Wed)**.

Registration is Open Here

[Scan here for details](#)



Supervisor: Office of the President
Implementer: Ministry of Digital Affairs

Organizer: Executive Yuan
Executer: Taipei Computer Association



Questions ?

Great!



??????





Appendix

Great!



??????



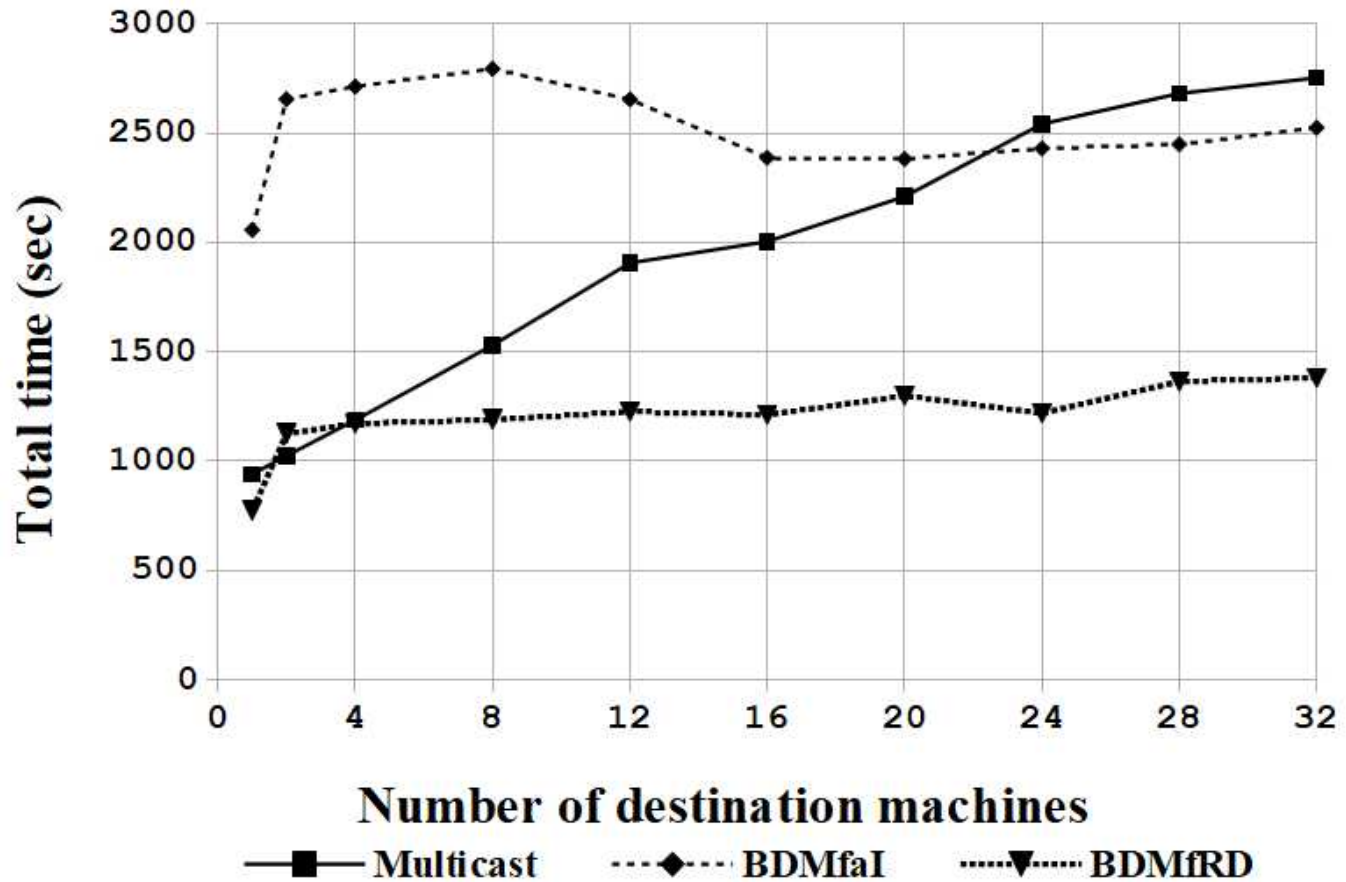
Comparisons

- 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.



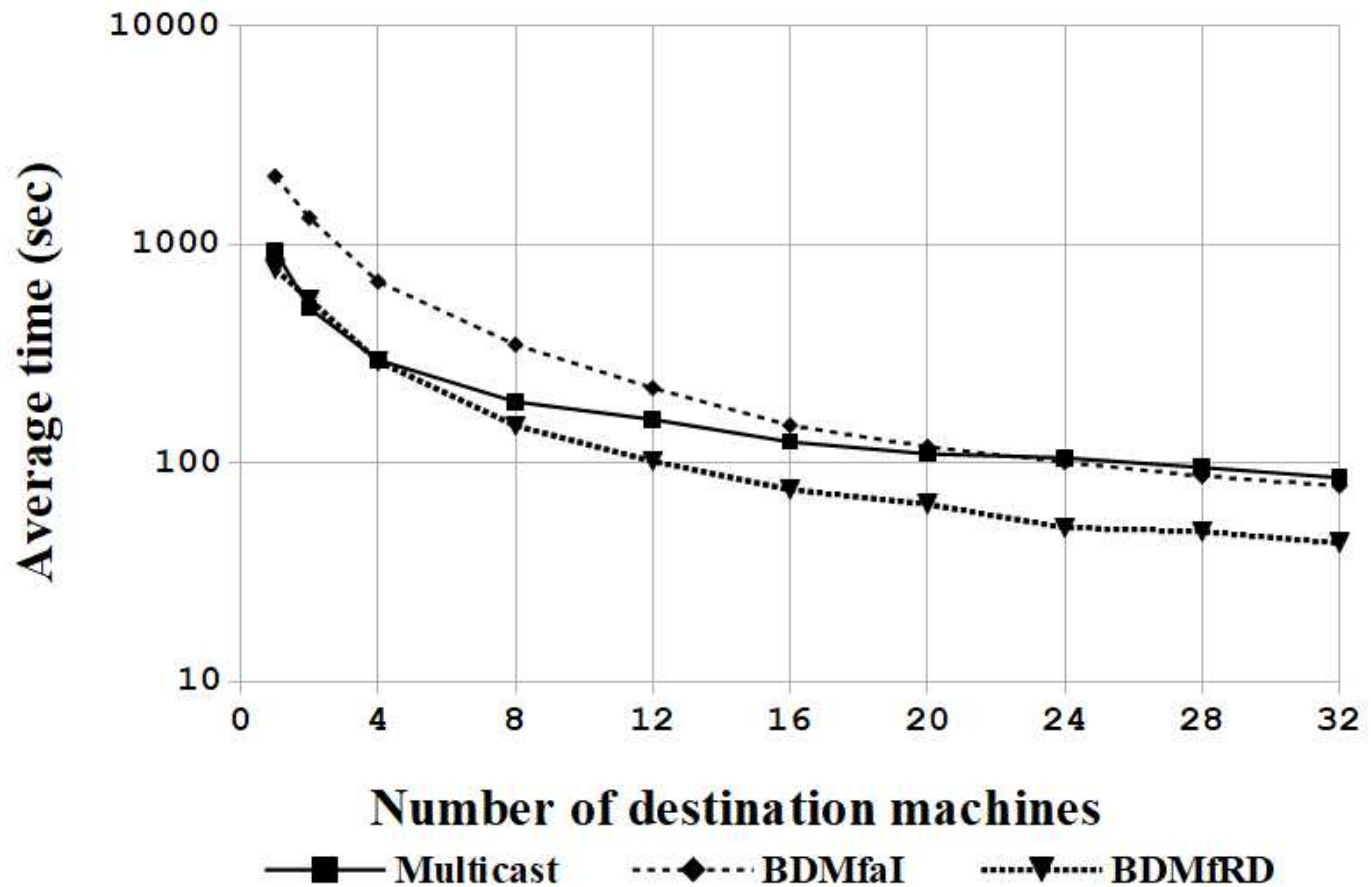
Experimental results

Total deployment time



Experimental results

Average time for each client



Experimental results

Speedup

