Install Debian Linux on Samsung Chromebook XE303C12

This procedure is based on hexdump0815's work. He has complied many linux images for various chromebook models. The procedure can be modified to support other chromebook models.

https://github.com/hexdump0815/imagebuilder
https://github.com/hexdump0815/imagebuilder/tree/main/systems/chromebook_snow
https://github.com/hexdump0815/imagebuilder/releases/tag/220619-01

Enabling developer mode

in order to boot anything else than chromeos on a chromebook one needs to enable the developer mode for it. a few things related to enabling the developer mode are important to know: first - in the process all data saved locally on the chromebook will be deleted, so important data should be backed up first - and second - in developer mode some of the advanced security features of chromeos are not enabled anymore. some more information about the developer mode and how to enable it on different devices can be found here: https://chromium.googlesource.com/chromiumos/docs/+/master/developer_mode.md

on a normal chromebook with a built in keyboard the following procedure will initiate the switch to developer mode (see: https://chromium.googlesource.com/chromiumos/docs/+/master/debug_buttons.md#firmware-keyboard-interface):

- `esc + refresh (the round circle button) and press power button`
- `ctrl d`
- `enter (to accept)`
- `it will take around 10 minutes to do the switch`

afterwards preparing everything for booting from sd card or usb looks like this by going to the command prompt (see: https://chromium.googlesource.com/chromiumos/docs/+/master/developer_mode.md#shell):

- `ctl alt ->`
- `login as user chronos (no password required)`
- `sudo su (to become root)`
- `crossystem dev_boot_usb=1 dev_boot_signed_only=0`
- `reboot`
- `ctrl u (to boot from sd card at the first initial screen after reboot)`

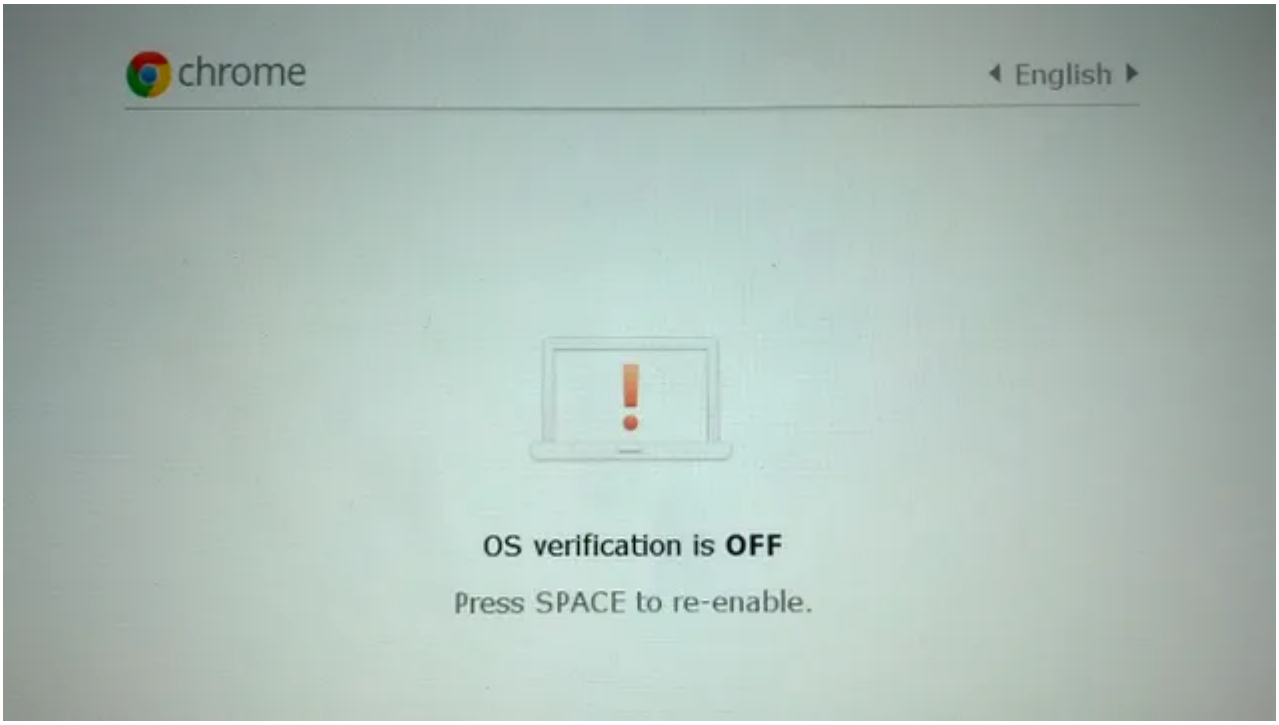
Now the chromebook can boot from external OS images.

Making bootable linux image on SD card

SD card: 8G or more is needed.
Linux image: Debian 11 (bullseye): image

You need flash the image to the sd card, not regular copy. There are many tools in Windows/MacOS/Linux that can be used to flash the image to a sd card. I used BalenaEtcher. (This Samsung chromebook seems not supporting booting from USB drive, booting from sd card works fine.)

Power up chromebook (with developer mode enabled already).



When see this scaring screen, do NOT follow the screen instruction, which is “press SPACE to re-enable OS verification”, as it will convert the chromebook back to non-developer mode. Instead, press “ctrl + u” and the chromebook will boot from external disk - sd card.

It takes about 30 seconds for the linux to boot up and prompt for user name/password.

They have a user named "linux" configured with the password "changeme" and sudo permission (use "sudo -i" to get root). the hostname is set to "changeme". They are assuming a us keyboard and are setup for english. All these can be changed easily when booted to Linux.

To use all the space on your sd card, please run the following script as root after the first boot: `"/scripts/extend-rootfs.sh"`

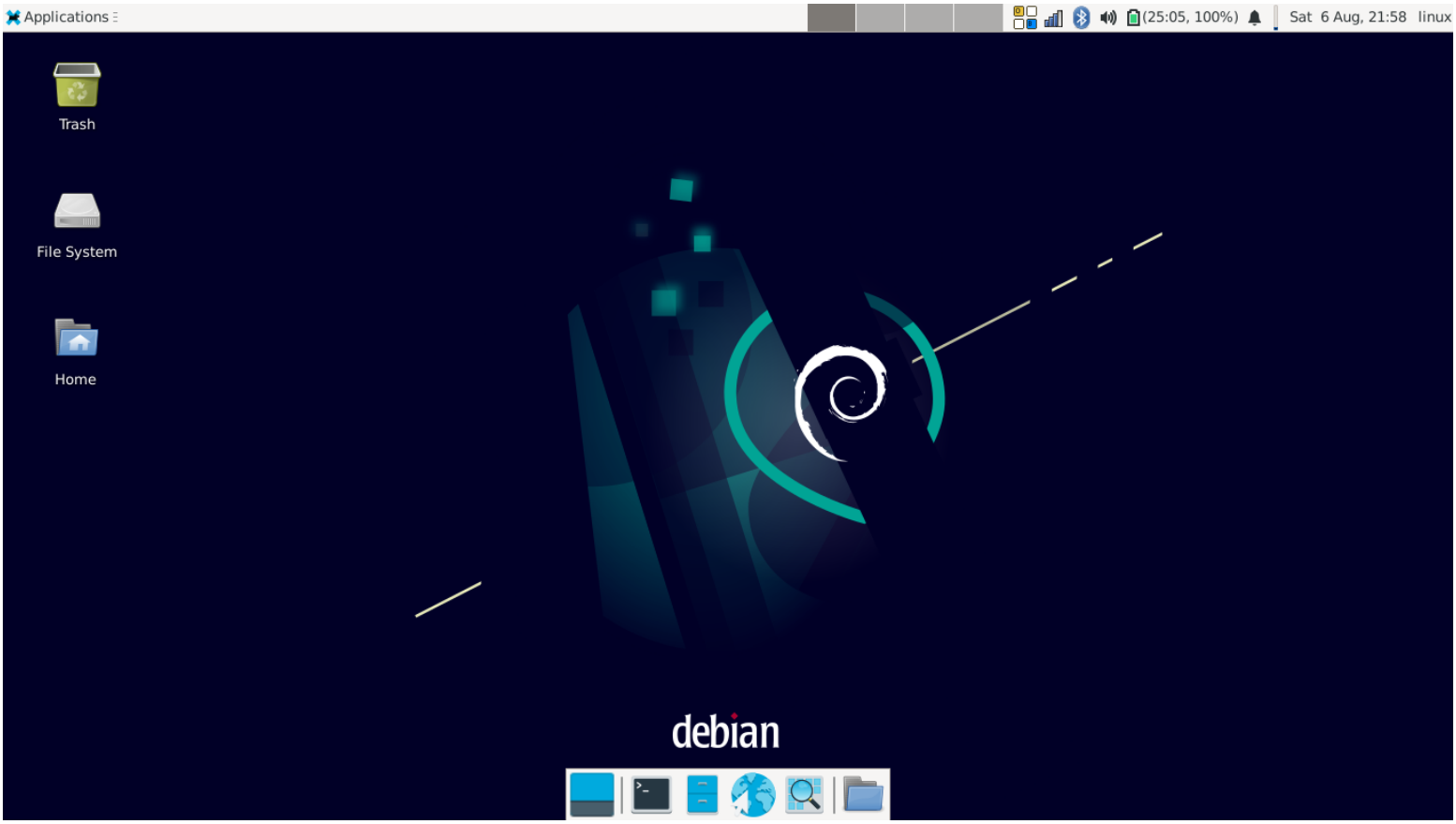
At this stage, the chromebook can be booted either from the external sd card with Linux (ctrl+u), or from the internal disk with chromeOS (ctrl+d).

Install linux on chromebook’s internal hard disk.

```
# After this procedure, the chromeOS in chromebook will be deleted.
# copy (not flash) the image file (xxx.img, not the compressed file xxx.gz) to an USB thumb drive.
```

dd the image file to chromebook’s internal hard disk. Verify the source and destination disk name first as it might not be mmcblk0. This will take quite some minutes, so be patient.

```
linux@changeme:/$ sudo dd if=/media/linux/IMAGE/chromebook_snow-armv7l-bullseye.img of=/dev/mmcblk0 status=progress; sync
[sudo] password for linux:

11534336+0 records in
11534336+0 records out
5905580032 bytes (5.9 GB, 5.5 GiB) copied, 987.591 s, 6.0 MB/s
linux@changeme:/$

reboot
crtl + d
# Now system will boot from internal hard disk image.

# to use all the space on your hard disk, please run the following script as root after the first boot:
"/scripts/extend-rootfs.sh"

# You can run system upgrade which will require an internet connection.
sudo apt update
sudo apt upgrade

# Here are a few screenshots of the new installed Linux system.
```

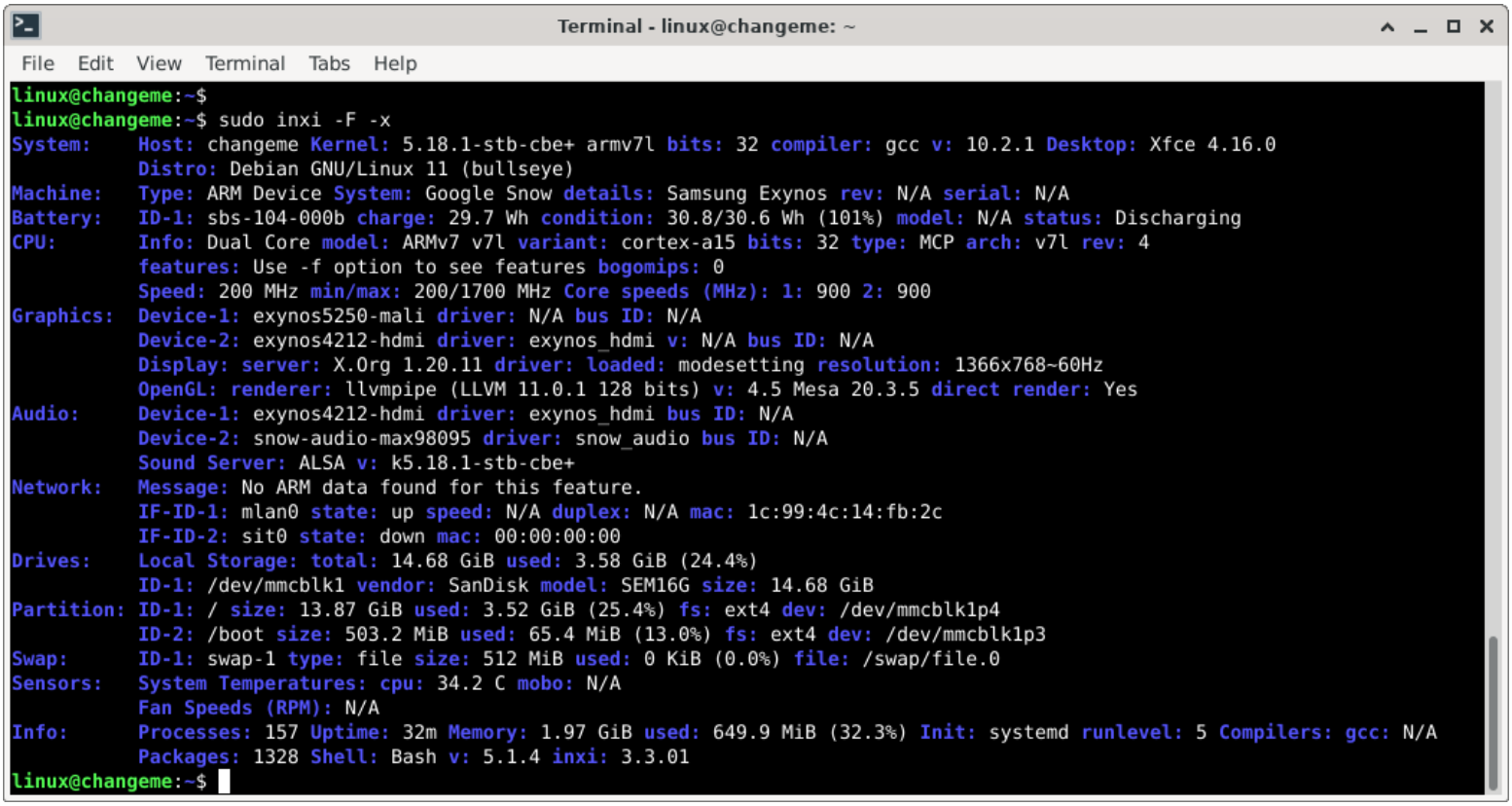

Applications
(25:05, 100%)
Sat 6 Aug, 21:58 linux
Trash
File System
Home
debian

About the Xfce Desktop Environment

System | About | Credits | Debian | Copyright

Device	changeme
OS Name	Debian GNU/Linux 11 (bullseye)
OS Type	32-bit
Xfce Version	4.16
Distributor	Debian
CPU	ARMv7 Processor rev 4 (v7l) × 2
Memory	2.0 GiB
GPU	llvmpipe (LLVM 11.0.1, 128 bits) (2.0 GiB)

Help | Close



Nasir’s Steps:

- Boot the computer and then press Ctrl + Alt + ->
- Plug in the USB thumb drive
- At the prompt, type “chronos” and press enter and then access super user permissions through `sudo su`
- `cd /tmp` to access the temporary directory
- `mkdir temp` to create a temp directory
- `mount /dev/sda1 /tmp/temp` to access the files from sda1 in directory temp
- `dd if=/tmp/xyz/chromebook_snow-armv7l-bullseye.img of=/dev/mmcblk0` to flash the chromebook hard drive which 5 to 10 min to complete
- User: “linux” Pass: “changeme”
- Fix the timezone by typing `sudo timedatectl set-timezone America/Los_Angeles`