

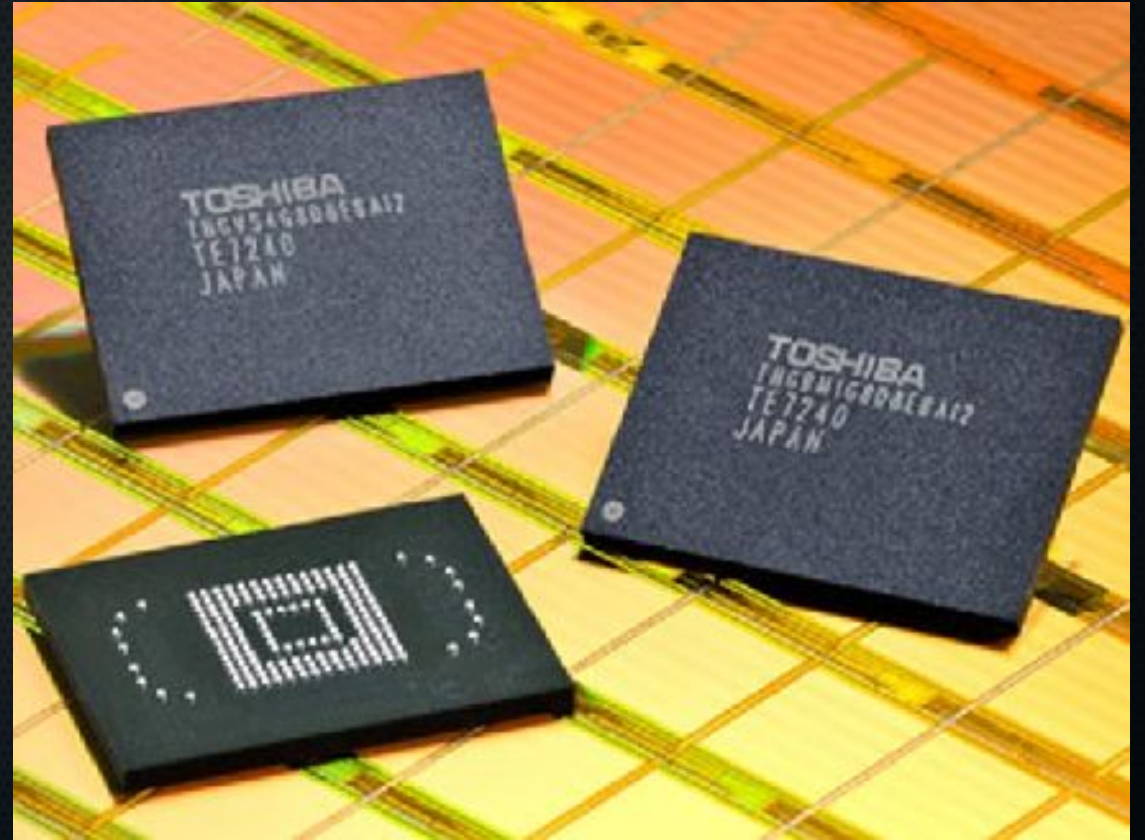
Android ROMs

Slides will be made available at <http://bob.igo.name>

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What is (a) ROM?

- Your device's ROM (Read Only Memory) stores your device's OS.
- A ROM *file* can be installed (*flashed*) to your device's ROM, giving you a different OS.
- In context, ROM refers to the ROM file or the OS that it provides.



ROMs Are Read *Only*?

- ROMs are *usually* read only.
- An Android ROM chip is NAND flash memory pretending to be a ROM.
- Special device mode and actions required to write to them (aka *flash* them).
- Could think of this like a CD-RW



Questions?

Why Install Another ROM?

- Things to lose:
 - vendor EOL
 - bloatware
 - skins (inefficiency layers)
 - stock app replacements



Why Install Another ROM?



- Things to gain:
 - stock features
 - free wifi hotspot
 - custom features
 - deny permissions
 - toggle switches in pulldown
 - landscape home screen
 - early upgrades
 - root

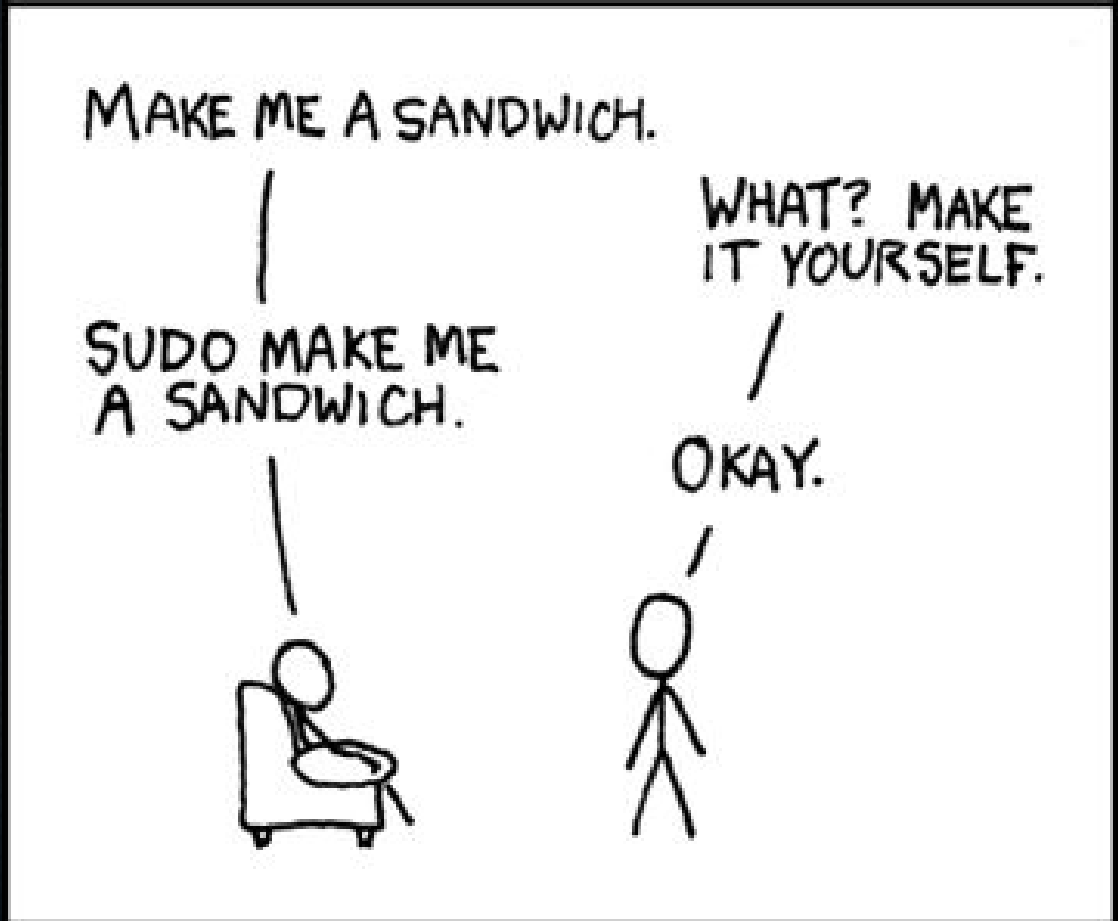
Why *NOT* Install Another ROM?

- You could potentially render your device inoperable (aka *brick* it)
 - this is *usually* a recoverable condition
 - not to be undertaken the weekend you're on call
- The new ROM might be buggy



Why root?

- Android is Linux
- Linux root user has power
 - overclocking
 - backups
 - firewall
 - ad blocker
 - bloatware removal



One Possible Snag

- The bootloader
 - like a BIOS
- Your device's bootloader is shipped locked
 - like a fascist BIOS
 - “protects” your phone from unsigned code
 - greatly limits your options unless unlocked



Questions?

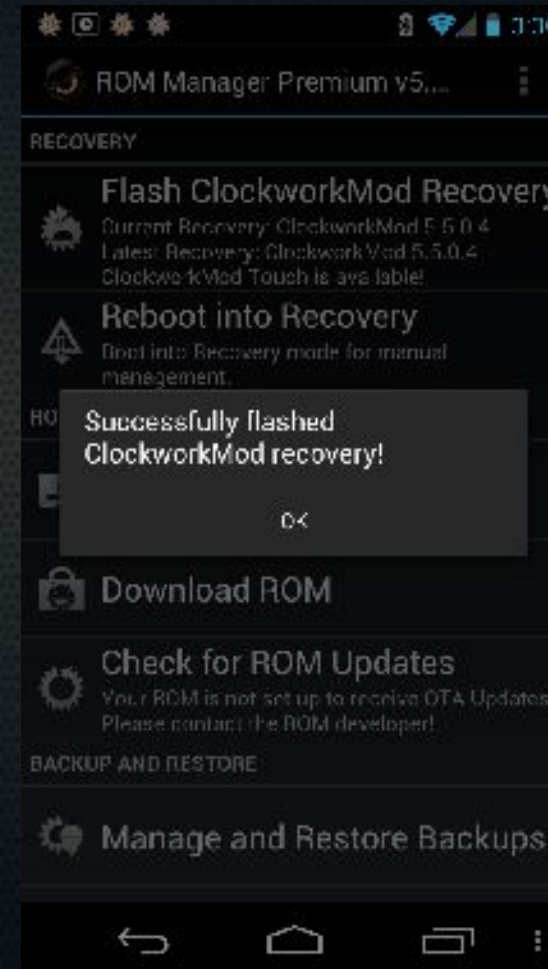
Prep: Root your current ROM

- Very device-specific process
- Try to find:
 - a set of exact steps and commands
 - a YouTube video of someone performing all the major steps
- You may need to use adb
 - Android Debug Bridge
 - part of the Android SDK
 - For ROMs, often used to
 - copy patches or images to the device
 - unlock devices



Prep: Recovery and Backups

- install ClockworkMod ROM Manager
 - flash ClockworkMod *recovery*
 - *recovery* is a powerful pre-boot menu
 - perform a NANDroid backup
 - vaguely like a disk image



Prep: Recovery and Backups

- Install Titanium Backup, SMS Backup and Restore, Call Logs Backup, and do backups.
- If your launcher has a backup feature, use it.
- Consider syncing contacts to Google.
- If paranoid, copy your backups outside the device.



Why Back Up?

- Flashing usually “formats” everything but /sdcard
 - all backups are saved to /sdcard
- NANDroid
 - You may want to return to the backed-up state.
 - Restoring a NANDroid backup gives you *everything* the flashing process took away or changed.
 - It's like an UNDO button.
- Titanium Backup
 - After flashing, you can restore individual applications and settings from your backup.

What's in the Backups?

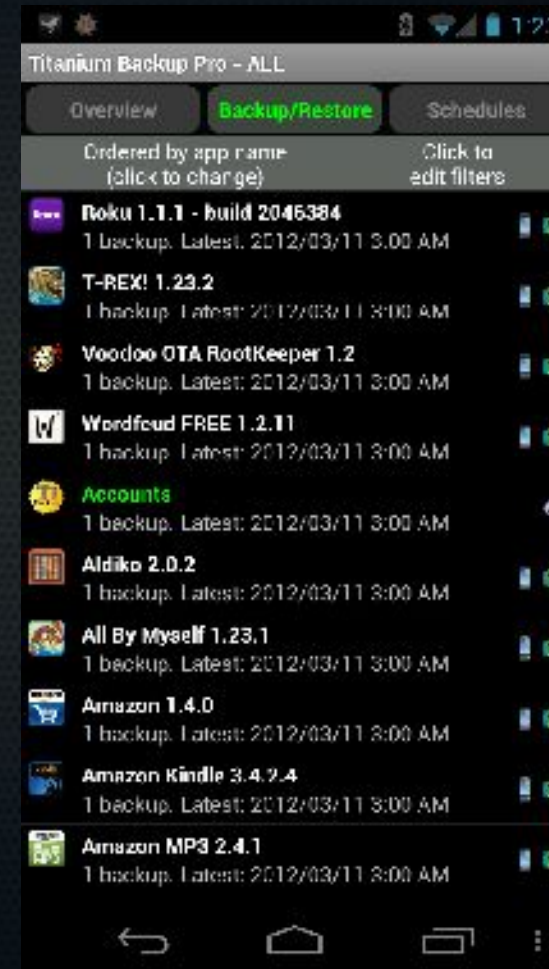
- NANDroid (via ClockworkMod)
 - `./clockworkmod/backup/NAM E/`
 - `boot.img`
 - `recovery.img`
 - `cache`
 - `/data tarfile`
 - `/system tarfile`
- Appextractor lets you access individual files



AppExtractor

What's in the Backups?

- Titanium Backup
 - ./TitaniumBackup/
 - per app:
 - gzipped APKs
 - .tar.gz data



Questions?

Prep: Unlock the Bootloader

- Very device-specific process
 - method used may require factory reset
 - but you have backups, right?

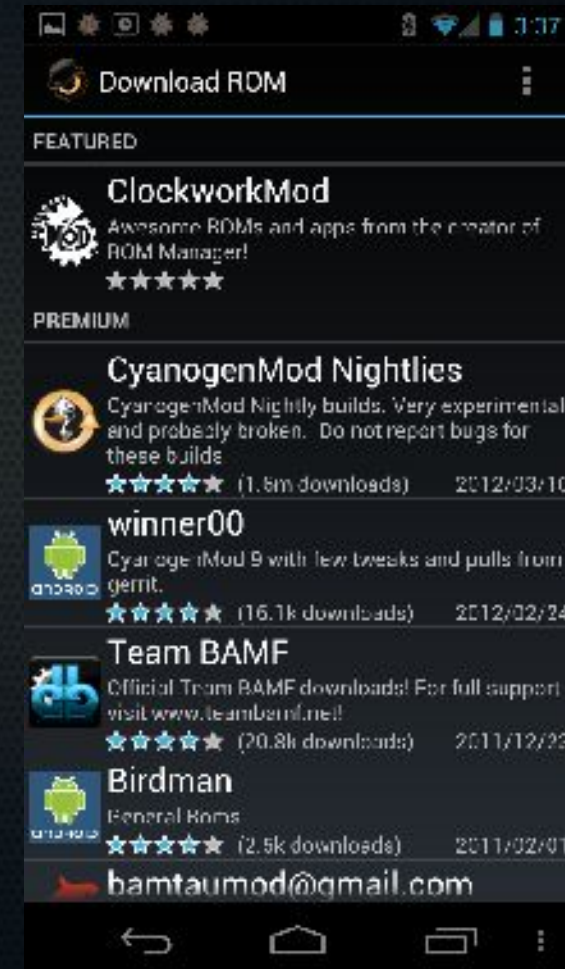


Prep: Misc

- *If* unlocking required you to factory reset, you'll need to get ROM Manager back.
 - from store
 - from backup

Installing a ROM: Choose One

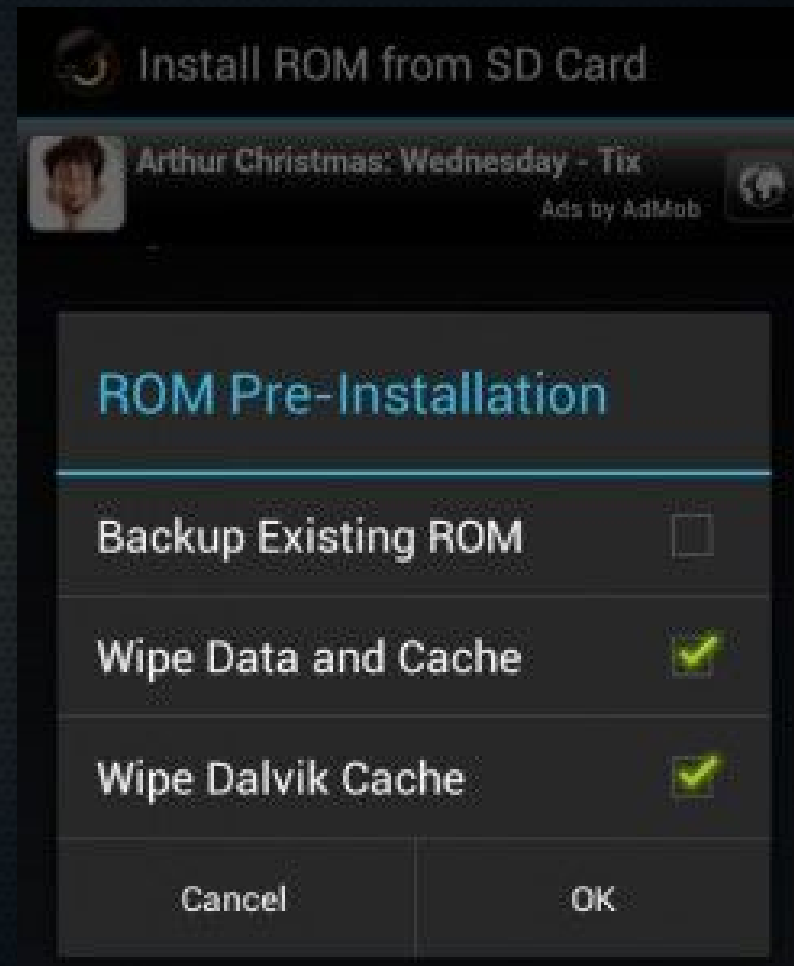
- Download ROM in ROM Manager(*)
- No one-size-fits-all way to pick your ROM, but I've used
 - stock rooted ROMs by Peter Alfonso
 - CyanogenMOD
 - requires separate Google Apps (gapps) download



* Free version may not support this.

Installing a ROM: Erase Stuff

- data and cache
 - your applications, settings, data
- dalvik cache
 - dalvik is the Java Virtual Machine (JVM) for Android
 - runs all your APKs
 - the cache speeds up program execution
 - it can get confused if you swap ROMs



Do I *have* to do that?

- Usually
- In same “family” of ROMs, not always needed
- You can try *not* doing it
 - but assume glitches and errors are your fault.
- This is why you have backups.



Questions?

Installing a ROM: Wait and Watch

- After you click OK in ROM Manager, Android reboots into recovery and installs your ROM.



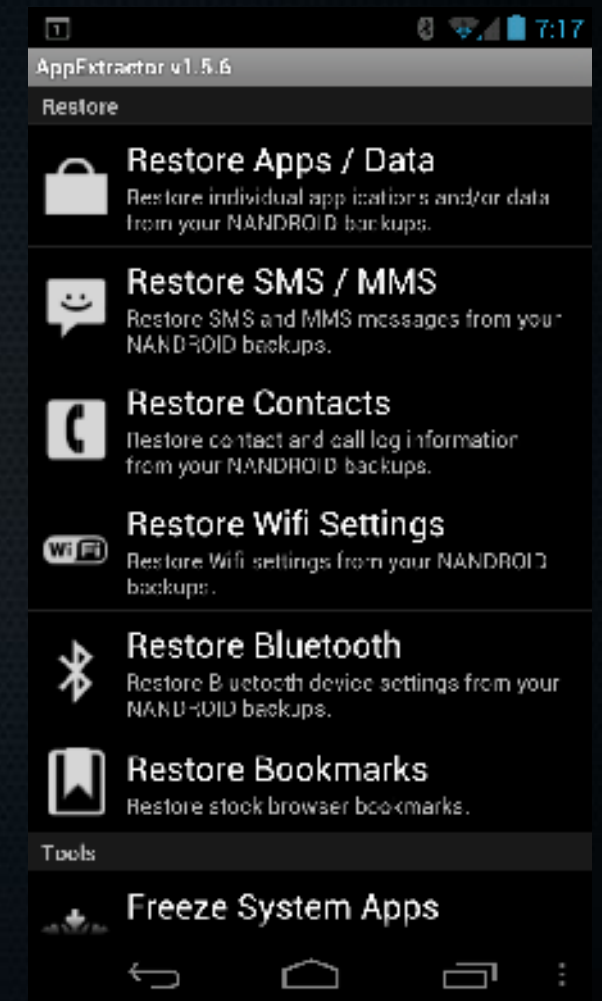
Installing a ROM: Booting the New ROM

- Boots like before, but with a different animation.
- Post-boot, your device has amnesia.
 - log into your Google account



Restoring Your Data

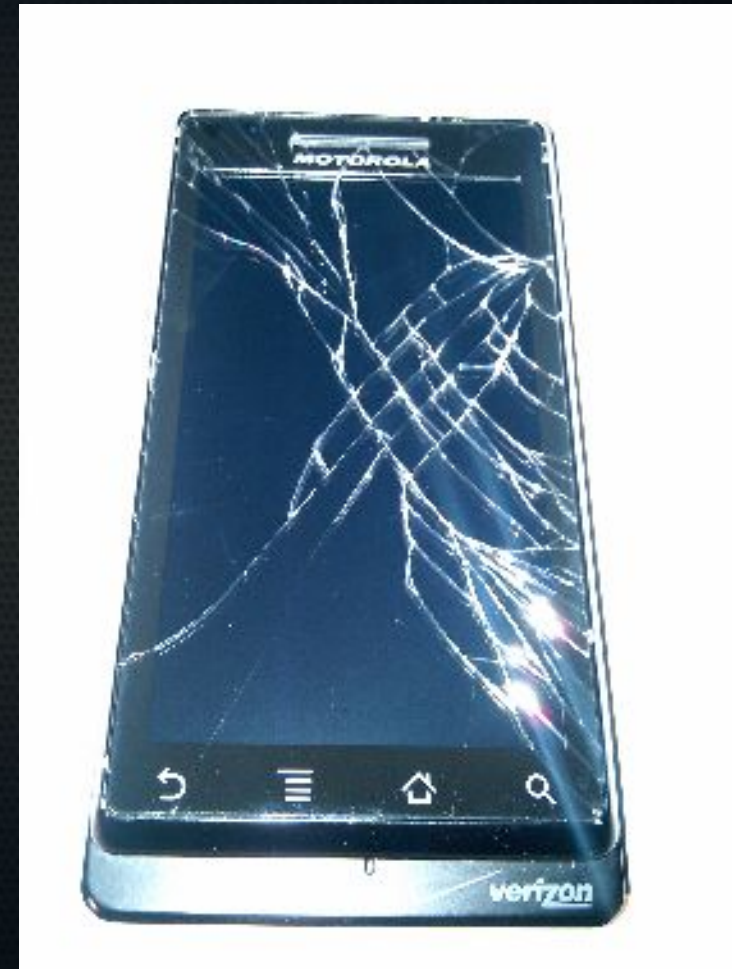
- All the apps you got from the store will automatically re-download
 - including your backup apps
- Launch each backup app and restore data as desired.
- Timing and ordering are important.



Questions?

HELP! I BROKE IT!

- You probably didn't break anything permanently.
- 90% of the time, restoring the NANDroid backup gets you unstuck.
- Other 10% of the time, the place where you found the instructions can help.



References

- XDA forum
 - forum.xda-developers.com
- CyanogenMod
 - www.cyanogenmod.com
- Peter Alfonso
 - www.peteralfonso.com
- Android SDK
 - developer.android.com/sdk/index.html

