

U3A FOSS

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An introduction to Android

Android - overview

- What is it?
- History
- What “comes out of the box”?
- Using the touchscreen
- Adding and removing apps
- File system
- Moving stuff around
- Security
- App permissions
- Anti-virus software

What is it?

- A computer operating system (OS) based on the Linux kernel
- Primarily for mobile touchscreen devices
 - Uses tap, pinch and swipe inputs rather than mouse and keyboard
 - Currently dominates the mobile phone market
 - Has been the best selling OS for tablets since 2013

Is it Open Source?

Yes but it's not like Linux

- Android is based on the Linux kernel
- Android Inc. founded in 2003, bought by Google in 2005
- Android OS released by Google in 2007
- Source code released under Open Source licences;
 - So bespoke versions and applications can be developed by other organisations;
- Most devices ship with a mixture of open source and proprietary software;
- Has no centralised update system so most Android devices receive no security updates.

Release history

Date	Name	Version no.
September 2008		1.0
February 2009		1.1
April 2009	Cupcake	1.5
September 2009	Donut	1.6
October 2009	Eclair	2.0–2.1
May 2010	Froyo	2.2-2.2.3
December 2010	Gingerbread	2.3-2.3.7
February 2011	Honeycomb	3.0-3.2.6
October 2011	Ice Cream Sandwich	4.0-4.0.4
July 2012	Jelly Bean	4.1-4.3.1
October 2013	KitKat	4.4-4.4.4
November 2014	Lollipop	5.0-5.1.1
October 2015	Marshmallow	6.0-6.0.1
?	N ...	6.x-7.x

What's in the box?

- Operating System
 - Google releases the source code at the same time as Nexus devices with the latest version are launched, so there is a time lag between releases on Google devices and those of other manufacturers;
 - Other manufacturers' devices will often have modified versions with additional functionality and applications provided;
- Apps (applications)
 - Camera & photo viewer, Audio/Video player, eBook reader, file manager, web browser, email client, Google Play (repository), various “Play” apps, etc.
- Widgets (miniature apps providing simple functionality)
 - Clocks, weather reports, calendars, etc., often embedded in the home screen

Touchscreen interface

- Swipe (or Drag) – to move a selected item
- Pinch / Expand - to zoom in and out
- Tap - to select an item (like a left mouse click)
- Long press – to select and move an icon on the screen
 - Drag icon to left or right to move it to adjacent screen;
drag to “X” or waste basket to remove it
- Virtual keyboard
 - Long press on a key will often reveal additional options

Downloading more apps

- Google Play
 - Android's default app store, 1.43 million apps;
- Other App Stores
 - GetJar – Founded in 2004 in Lithuanian, Chinese-owned since 2014, 850,000 apps;
 - Amazon Appstore – More than 330,000 apps;
 - SlideME – Started to provide an alternative to Google Play, not sure how many apps;
 - F-Droid – Open Source apps, 1,700 apps
 - F-Droid apps are built from the source code tarball and signed by F-Droid, so should be safe from interference
- Check app permissions
 - These can be a security or privacy risk

Where are your data stored?

- Emulated USB storage (sdcard0)
 - Part of the device's internal memory
- External USB storage
 - Extra memory you may be able to add (sdcard1)
 - Other storage via otg cable(usbotg)

Moving stuff around

- Cables and connections (use the correct cable)
 - micro USB (for phones and tablets, the standard charging socket)
 - mini USB (for cameras, you're unlikely to be able to plug a mini USB into a phone or tablet)
 - OTG (on the go) & MHL (mobile high definition link)
- File transfer protocols
 - FTP (for sending files to an external storage device – LAN, Cloud, etc.)
 - MTP (multi-media) & PTP (photo)
(sometimes a device will only recognise photo files, in which case you need to change the settings to MTP)
- **WARNING**
 - Android has no waste bin, so you can't easily recover deleted files

Security

- Is there a malware problem on Android?
 - Very large user base, so a tempting target for malware writers
 - Android runs apps in a sandbox, so they don't have access to the entire OS unless given permission
 - Unlike Windows, malware cannot install itself on Android, so viruses cannot spread automatically
 - Apps from Google Play are vetted and unlikely to be infected
 - ... but nothing is guaranteed
- Malware is probably a low risk as long as you're sensible
 - Keep all apps up-to-date
 - Be careful about what you download (block “unknown sources”?)
 - Review app permissions
 - Avoid unsecured public wi-fi networks
 - Lock the screen with a passcode or biometric security

App Permissions

- Most Apps require permissions to access Android functions
 - Internet, contacts list, GPS location, camera, etc.
 - Does the App really require this access?
- Check permissions on Play before installing an app
- Check permissions of apps already on device
 - Using Android Permission management (Lollipop and later?)
 - With a permission checker app
 - Permission Friendly Apps
 - App Permission Watcher
 - xPrivacy etc.

Anti-virus software

- Reasons to install AV software
 - To guard against malware (relatively low risk)
 - Protection against loss or theft of the device
- Pro's and con's of AV software
 - Cost, footprint (battery and memory usage), false positives
- Some options
 - 360 Security, Avast, ESET, Avira, AVL, Sophos, Trend Micro
 - All are free
 - Most contain other functions such as locating a lost device and remote locking / wiping

Some useful apps

- F-Droid
- K-9 Mail
- Firefox
- VLC
- MuPDF
- FBReader
- BBC Weather

Other useful apps

- Which? Recommended
 - Google Drive (cloud storage)
 - ES file explorer (one of many file managers)
 - Instagram (photo sharing)
 - Hot UK Deals (deals suggested by other users)
 - Pocket (save web articles for reading off-line)
 - VLC (audio-video player)
 - Zombies Run! (fitness)
 - Camera360 (photo-editing)
 - Busuu (learn a language with help from native speakers)
 - Avast (security and anti-virus)