Vývoj mobilných aplikácií úvod

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KAI, I-18

MS-Teams: 2sf3ph4, List, github

borovan 'at' ii.fmph.uniba.sk

Základné info o kurze

- Prémiovo-orientované vyučovanie
  - prihláste sa do L.I.S.T.
  - ak ste v ňom nikdy neboli, ozvite sa mi...
  - sledujte LIST, všetky zadania budú v ňom
  - sledujte Teams, komunikácia, oznamy budú v ňom

- prednášky budú na MS-Teams (slajduio)
  - konto (priezvisko@uniba.sk), prihlasovací kód je 2sf3ph4

- oproti 2019
  - pribudli: cvičenia a jeden kredit (6)
  - skrátené android intro cez MIT Inventor (viď web stránka)

- prémie sa budú sporadicky objavovať a sú **plnohodnotná** alternatíva k domácim úlohám
  - prvá už tam visí...

- prvá časť kurzu bude dobre sledovateľná v knihe **Android Studio 4.0 Development Essentials - Kotlin Edition: Developing Android Apps Using Android Studio 4.0, Neil Smyth**
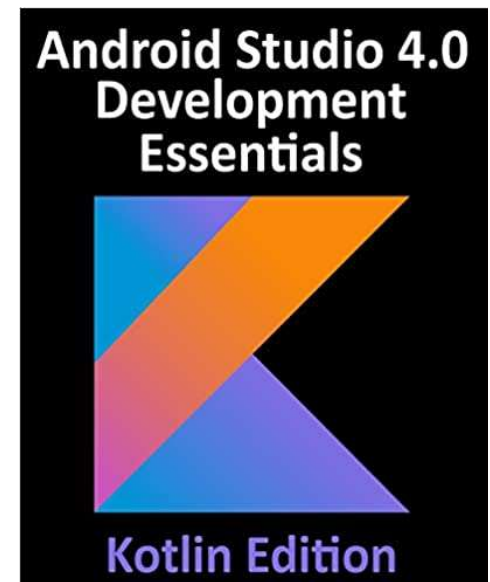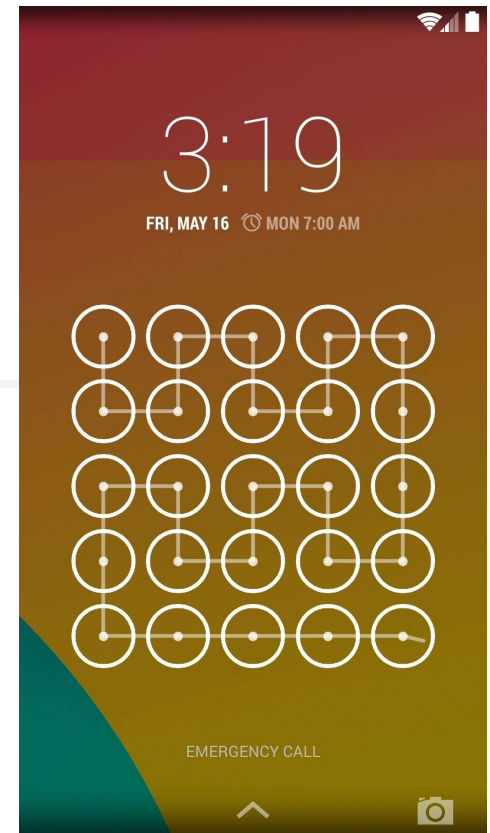
Mobilné OS

aplikácie na rôznych obmedzených HW platformách pod rôznymi OS:

- **Windows Mobile 5.0, 6** - najrôznejšie pda, hand heldy,… fy. Microsoft
- **Windows CE** – pre embeded systémy, fy. Microsoft
- **Palm OS, webOS** – propietárny OS pre Palm fy. HP, linux kernel
- **Maemo 5** – debian-like od fy.Nokia
- **Symbian** (S60, S80, S90) – open source OS pre smartphony, fy.Nokia, Samsung, SonyEricsson, Panasonic

- **iOS** – iPhone, iPod (unix-like), fy. Apple,
- **Android** - Google
- **Bada** - Samsung (odpoveď na Android)✝
- **BlackBerry OS** ✝
- **Windows Phone -> Windows 10 Mobile**✝
- **Firefox OS** ✝
- **Ubuntu Touch** ✝
- **Huawei OS**

Vývojové jazyky/nástroje

- Symbian
  - C++, Java ME, Python, …
- Windows Mobile 6
  - C# (MS Visual Studio)
- iOS
  - Objective-C -> Swift 3/4/5 (Xcode)   iOS - Apple Center kurz
- Android
  - scratch (MIT Inventor)
  - java (Android SDK + plugin pre Eclipse) -> (Android Studio)
  - java (A.I.D.E.)
  - Kotlin (Android Studio 4+)
  - C++ (Android NDK)
- Multi-platform
  - C# (Xamarin iOS, Android, Windows) – fy. MS, Visual Studio 2015
  - Pascal (Delphi XE5 iOS, Android, Windows 10) – fy. Embarcadero
  - JavaScript/TypeScript (React Native)
  - Flutter od Google
- game engine   1-AIN-303/15
  - C# (Unity 2D/3D)   …

Unity
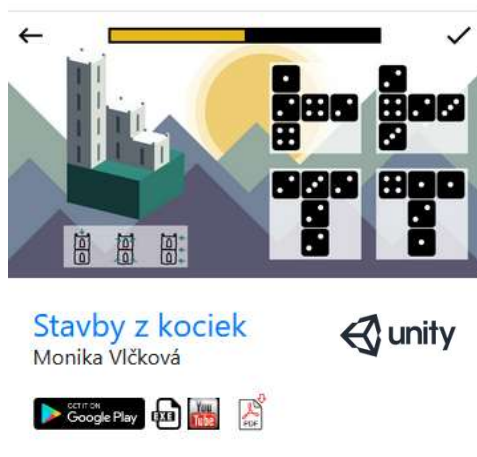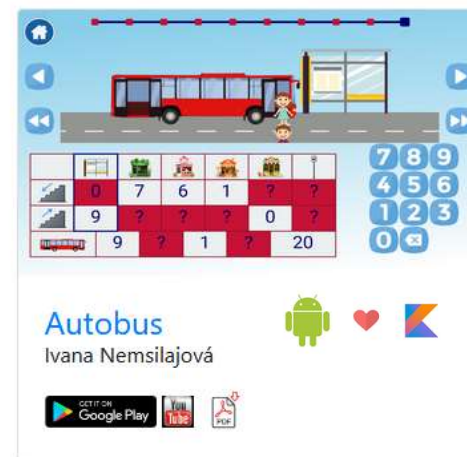## (game engine)
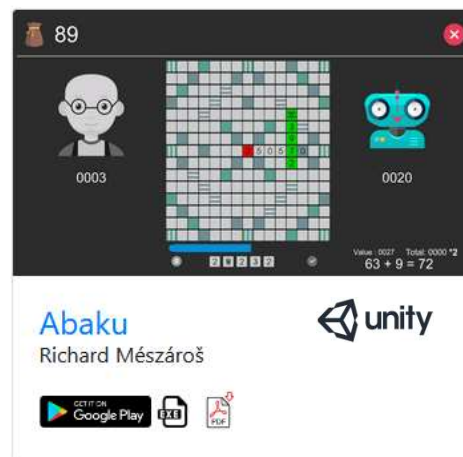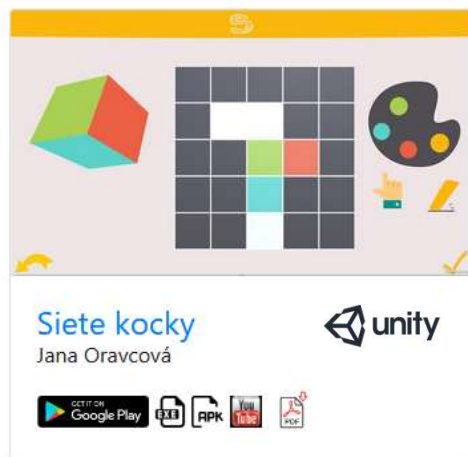
#1 Unreal Engine

#2 Unity

Obľúbený nástroj pre tvorbu multi-platform aplikácií pre bakalárske práce

- 2-INF-263/15 magisterský predmet: Tvorba a dizajn počítačových hier
  - začiatok: 26. 9. - 20. 12. 2019
  - http://sccg.sk/~mferko/tdh/
  - https://candle.fmph.uniba.sk/ucitelia/Michal-Ferko

- 1-AIN-303/15 bakalársky predmet: Game Engines
  - http://www.agentspace.org/ge/
  - https://candle.fmph.uniba.sk/ucitelia/Andrej-Lucny

Príklady bakalárskych prác
(hejny.sk)
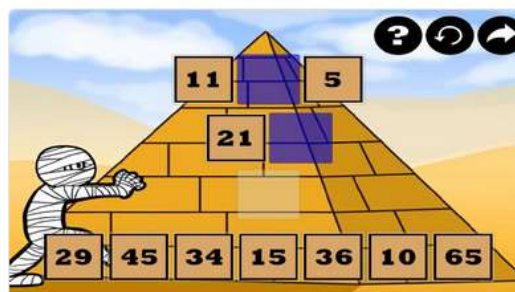
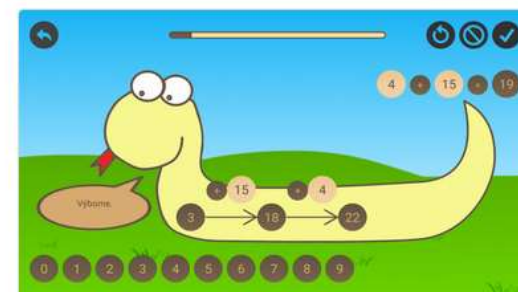# Príklady bakalárskych prác

(hejny.sk)
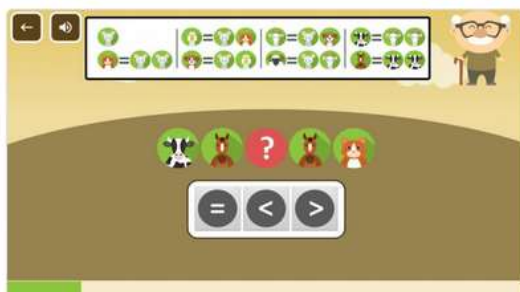
Dedo Lesoň
Alžbeta Bachroníková

Súčtové trojuholníky
Daniel Linhart

Hady
Katarína Fabianová

Násobilkové obdĺžniky
Martin Sadloň

Susedia
Kristína Karafová

Bilandia
Júlia Gablíková

Vývoj a nástroje
(detailnejšie)

- **natívne aplikácie**
  - Android
    - Java
    - Kotlin
  - iOS
    - Objective-C
    - Swift

Priamy prístup k všetkým fičúrkam a komponentom OS, aj tým najnovším ...

- **hybridné aplikácie**
  - Cordova
  - ionic

Web-app na báze .html,. css, .js, ktoré púšťame v prostredí WebView=browser/wrapper bez browserových ovládačov
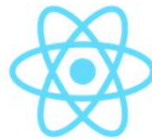
Vývoj a nástroje
(detailnejšie)

- kompilované aplikácie
  - React Native
    - JavaScript
    - Facebook
    - nekompiluje do natívneho kódu
    - obmedzená množina widgets
  - Flutter (Dart framework od Googlu)
    - Dart
    - Google
    - kompilované do ARM C++
    - bohatšia množina widgets
    - Material design (Quantum Paper)– Google 2014
  - NativeScript
    - JavaScript

Aspekty programátora

Code sharing (write once, use everywhere)
- Cordova, ionic
- Flutter (Material Design)
- ReactNative
- Java, Swift

Knowledge sharing (learn once, use everywhere)
- Cordova, ionic, ReactNative (.js), Flutter (Dart)
- Java, Kotlin, Swift

Widget library
- Java, Swift, Cordova, ionic
- Flutter (Dart)
- ReactNative (.js)   **https://www.youtube.com/watch?v=bnYJRYFsrSw&feature=youtu.be**

Aspekty programátora

Eco-system (schopnosť nájsť riešenie/radu/blog na stackoverflow,..)

- Java, Swift
- Cordova, ionic (.js)
- Kotlin
- ReactNative (.js, React)
- Flutter (nové ale zlepšuje sa)

Popularita

- Java, Swift, Kotlin
- Cordova, ionic, ReactNative, Flutter (pushujú FB a Google)

Trochu (dávnej) histórie

Android, Inc., founded in Palo Alto in Oct 2003 by Andy Rubin, Rich Miner aim to develop:

- "smarter mobile devices that are more aware of its owner's location and preferences"
- an advanced operating system for digital cameras,

founders and early employees, Android Inc. operated secretly, just working on software for mobile phones
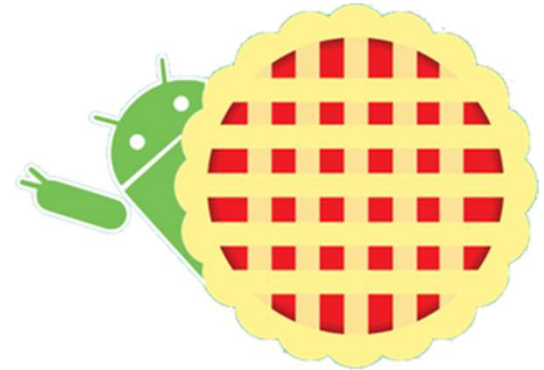
Current (!) rivals Symbian and Windows Mobile
(Apple's iPhone had not been released at the time … 2007).

Rubin ran out of money. Steve Perlman (QuickTime, WebTV, later working on iPhone, iPods), a close friend of Rubin, brought him $10,000 in cash in an envelope and refused a stake in the company.
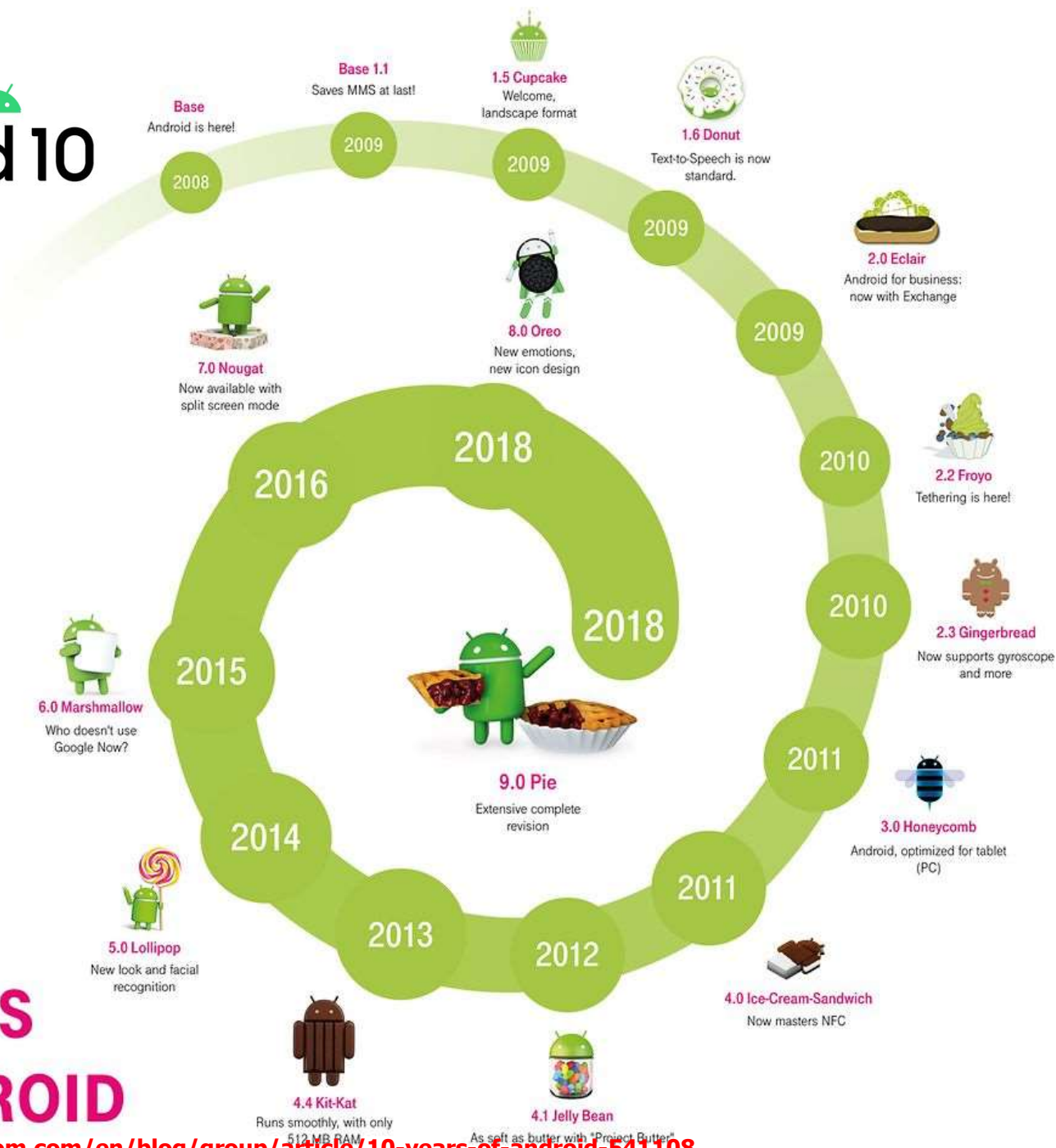
http://en.wikipedia.org/wiki/Android_%28operating_system%29

Android a Google

- 2005 Google acquired Android Inc. with Rubin, Miner et at.
- 2007 Open Handset Alliance, a consortium
  - device manufacturers: HTC, Sony and Samsung,
  - wireless carriers: T-Mobile, ...
  - chipset makers: Qualcomm, Texas Instruments,

  includes Google with a goal to develop open standards for mobile devices
- major release named in alphabetical order after a dessert or sugary treat
  - 2.3 Gingerbread
  - 4.3 *Jelly Bean, July, 2012,*
  - 4.4 *KitKat*, announced, October, 2013,
  - 5.1 Lollipop, November, 2014,
  - 6.0 Marsmallow, October, 2015,
  - 7.0 Nougat, August, 2016.
  - 8.0 Oreo, August, 2017,
  - 9.0 Pie, August, 2018,
  - 10.0 Android 10, September 2019
  - 11.0 Android 11, tba

Version history by API level

2.1 Android 1.0 (API 1)
2.2 Android 1.1 (API 2)
2.3 Android 1.5 Cupcake (API 3)
2.4 Android 1.6 Donut (API 4)
2.5 Android 2.0 Eclair (API 5)
2.6 Android 2.2 Froyo (API 8)
2.7 Android 2.3 Gingerbread (API 9)
2.8 Android 3.0 Honeycomb (API 11)
2.9 Android 4.0 Ice Cream Sandwich (API 14)
2.10 Android 4.1 Jelly Bean (API 16)
2.11 Android 4.4 KitKat (API 19)
2.12 Android 5.0 Lollipop (API 21)
2.13 Android 6.0 Marshmallow (API 23)
2.14 Android 7.0 Nougat (API 24)
2.15 Android 8.0 Oreo (API 26)
2.16 Android 9 Pie (API 28)
2.17 Android 10 (API 29)
2.18 Android 11 (API 30)

http://en.wikipedia.org/wiki/Android_version_history

android

android 10

Base
Android is here!

2008

Base 1.1
Saves MMS at last!

2009

1.5 Cupcake
Welcome, landscape format

2009

1.6 Donut
Text-to-Speech is now standard.

2009

2.0 Eclair
Android for business: now with Exchange

2009

2.2 Froyo
Tethering is here!

2010

2.3 Gingerbread
Now supports gyroscope and more

2010

3.0 Honeycomb
Android, optimized for tablet (PC)

2011

4.0 Ice-Cream-Sandwich
Now masters NFC

2011

4.1 Jelly Bean
As soft as butter with "Project Butter"

2012

4.4 Kit-Kat
Runs smoothly, with only 512 MB RAM

2013

5.0 Lollipop
New look and facial recognition

2014

6.0 Marshmallow
Who doesn't use Google Now?

2015

7.0 Nougat
Now available with split screen mode

2016

8.0 Oreo
New emotions, new icon design

2018

9.0 Pie
Extensive complete revision

2018

10 YEARS
OF ANDROID

História sa opakuje

Macworld, Boston, 1997

- https://www.youtube.com/watch?v=YV9ykB8slJE
- https://youtu.be/WxOp5mBY9IY?t=271

Raspberry PI 4
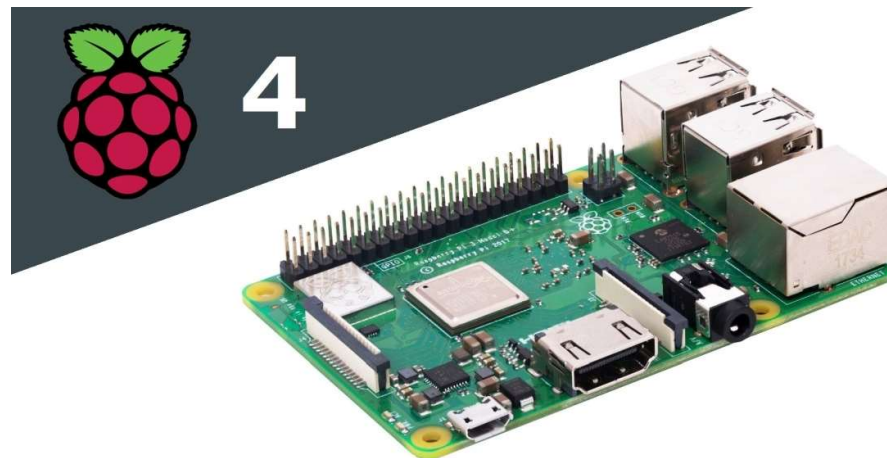## Iné (nemobilné) zariadenia

- UK, **Raspberry Pi Foundation**
charity,2009, to study of basic
computer science in schools
  - GPIO - Broadcom BCM2711
  - Quadc.ARM 1.5GHz, 64 bit RISC
  - 4GB RAM,
  - 2xUSB 2.0, 2xUSB 3.0, HDMI,
  - RJ-45, microSD slot, BT 5.0

OS:
  - Raspbian (Debian Wheezy)
  - Pidora (Fedora Remix)
  - OpenELEC (An XBMC Media Centre)
  - RaspBMC (An XBMC Media Centre)
  - Android PI
  - Microsoft Windows 10 !!!

65E

CuBox Pro
Iné (nemobilné) zariadenia

- **Solid Run, Israel** (http://www.solid-run.com/product/cubox-i4pro/)
- System On Chip   i.MX6 Quad Core
- Memory size   2GB/8GB
- GPU   GC2000, 3D GPU Type,
  OpenGL ES1.1,2.0
- HDMI 1080p with CEC 1.4, 3D support
- WiFi 11n   BlueTooth
- Ethernet   10/100/1000 Mbps (*)
- eSata II 3Gbps

OS:

Android 4.3 Jelly Bean

Linaro Ubuntu 11.10

Debian Jessie

XBMC image

GeeXboX, LinXBMC, OpenELEC