


Introduction to Android
Android Smartphone Programming

University of Freiburg


Matthias Keil
Institute for Computer Science
Faculty of Engineering
University of Freiburg
October 21, 2013





Notizen

Outline

University of Freiburg



- 1 What is Android?
- 2 Development on Android
- 3 Applications: A Quick Glimpse
- 4 Summary



Matthias Keil Introduction to Android October 21, 2013 2 / 16

Notizen

What is Android?
Background

University of Freiburg



- Mobile platform (More than an OS, has middle ware, key applications...)
- Owned by Google/ developed by Open Handset Alliance
- Linux kernel
- Latest version: 4.3.1 "Jelly Bean" (October 2013)



Matthias Keil Introduction to Android October 21, 2013 3 / 16

Notizen

What is Android? Specifications

University of Freiburg



- Media and Graphics Support.
- Telecommunication and Location Access Support.
- Very rich development environment:
 - Software Development Kit (an Application Framework).
 - Plug-in for the Eclipse IDE.
 - Debugging tools.
- A new instance of the Dalvik Virtual machine for every application on runtime.



Matthias Keil

Introduction to Android

October 21, 2013

4 / 16

Notizen

Development on Android Android SDK

University of Freiburg



- Enables manipulation of all device aspects in application.
- Build applications from scratch or use existing APIs
- Rich and Innovative aspects maintained.



Matthias Keil

Introduction to Android

October 21, 2013

5 / 16

Notizen

Development on Android Android SDK

University of Freiburg



Several libraries are included (written in C/C++) in the system's core components and are exposed to the developer in the application framework:

- System C library
- Media Libraries
- Surface Manager
- LibWebCore
- SGL
- 3D libraries
- FreeType
- SQLite



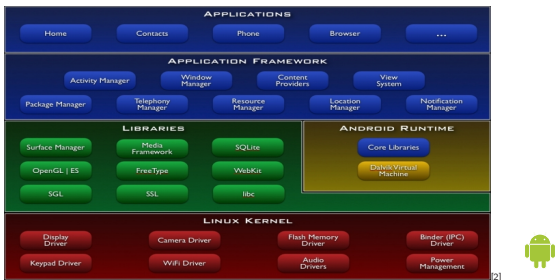
Matthias Keil

Introduction to Android

October 21, 2013

6 / 16

Notizen



Notizen

- An Android Application is built by the following components:
- Activities:** Single screen with user interface. Result in a final output for the user by working together, however each is independent of the other in terms of implementation and usability.
 - Services:** Background component without user interface. Performs long-running operations or work for remote processes.
 - Content providers:** Manages a shared set of application data.
 - Broadcast receivers:** Responds to system-wide broadcast announcements.

Notizen

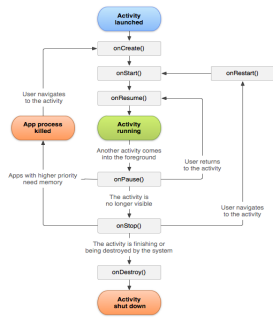
- During the runtime of applications a set of services and systems are running:
- Views:** Basically different ways for data representation to user.
 - Resource Managers:** Provides access to graphics, strings, and layout files.
 - Notification Manager:** Allows applications to display alerts in status bar to interact with user.
 - Activity Manager:** Manages Application Life Cycle.

Notizen

Applications: A Quick Glimpse

The Activity Life Cycle

University of Freiburg

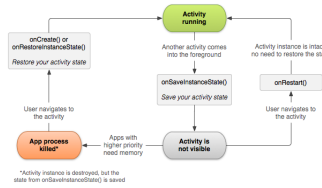


Notizen

Applications: A Quick Glimpse

Interacting with the Outside

University of Freiburg



Notizen

Applications: A Quick Glimpse

Interacting with the Outside

University of Freiburg



- Interacting with Android System or other applications.
- Use Intent Object, includes source, destination and type of interaction.
- Broadcast Receiver handles incoming Intents.
- Effective for real-time interaction.



Notizen

Applications: A Quick Glimpse

Declaring Content
University of Freiburg



AndroidManifest.xml

- Identify application requirements for user permissions.
- Declare Hardware and Software features required to run.
- Declare minimum API Level to run, and API Levels to be linked to if any.



Notizen

Applications: A Quick Glimpse

Declaring Content
University of Freiburg



Content is not only limited to the previously mentions components, other methods are used for further declarations.

drawable Directory: Contains images and drawings to be accessed by *AndroinManifest.xml*.

strings.xml : Contains application-specific and internationalization strings. Accessed by *AndroinManifest.xml*.

R.Java : Auto-generated file that keeps up with the *AndroinManifest.xml*. This makes an easy interface while writing the Application's source code.



Notizen

Summary

Summary
University of Freiburg





- Android is a Software Stack not only an Operating System.
- Application Framework on Android is very well developed and useful.
- Application Development Fundamentals and Principles provide for an organised and rich environment for developers.
- The Android Architecture makes for a very secure and stable system for all sorts of Applications to run on.




Notizen



 ANDROID DEVELOPERS.
Activity Life Cycle.
<http://developer.android.com/guide/topics/fundamentals/activities.html>.

 ANDROID DEVELOPERS.
Android Architecture.
<http://developer.android.com/guide/basics/what-is-android.html>.

 ANDROID DEVELOPERS.
Interacting Using Intents.
<http://developer.android.com/guide/topics/fundamentals/activities.html>.



Notizen

Notizen

Notizen
