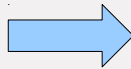# Android ist anders
-
Android Dependency Management

Fabian Klaffke

verit Informationssysteme GmbH

Agenda

- ➡️ ***Build & Dependency-Management***
- *Motivation*
- *Fallbeispiel*
- *Android*
  - *Android-Bibliotheken*
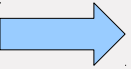 - *Bibliotheken einbinden*
  - *IDEs*

Build Management

- Organisieren des Build-Prozesses:
  - Code-Kompilierung
  - Einbinden von Bibliotheken

- Build Management Tools
  - Automatisierung des Build-Prozesses
  - Maven, Ant, Buildr, ...

Dependency Management

- Einbinden von Bibliotheken organisieren
  - Welche Version binde ich ein?
  - Transitive Abhängigkeiten
  - Mehrfach eingebundene Bibliotheken

- Dependency Management Tools
  - Maven, Gradle, Ivy, ...

Agenda

- **Build & Dependency-Management**
- **Motivation**
- Fallbeispiel
- Android
  - Android-Bibliotheken
  - Bibliotheken einbinden
  - IDEs

Klaros-Testmanagement Mobile Edition

Agenda

- ***Build & Dependency-Management***
- ***Motivation***
- ***Fallbeispiel***
- *Android*
  - *Android-Bibliotheken*
  - *Bibliotheken einbinden*
  - *IDEs*

Beispielanwendung

Android 2.2

Available System memory:

270368768 bytes

Refresh

Beispielanwendung

Available System memory:

270368768 bytes

Refresh

Bibliotheken einbinden

1) ActionBarSherlock

2) Support Library

Test

Available System memory:

270368768 bytes
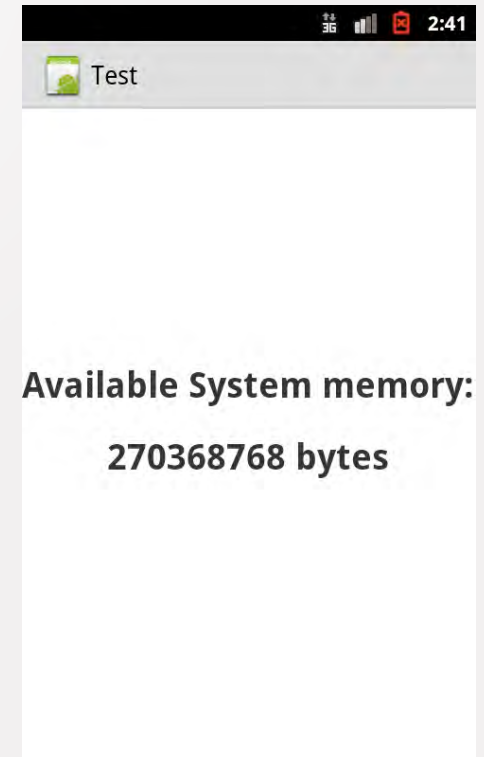
Beispielanwendung

Refresh
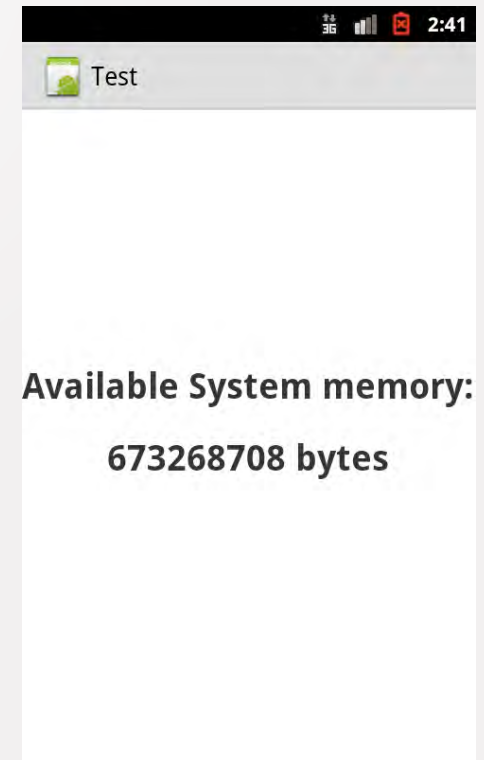
Agenda

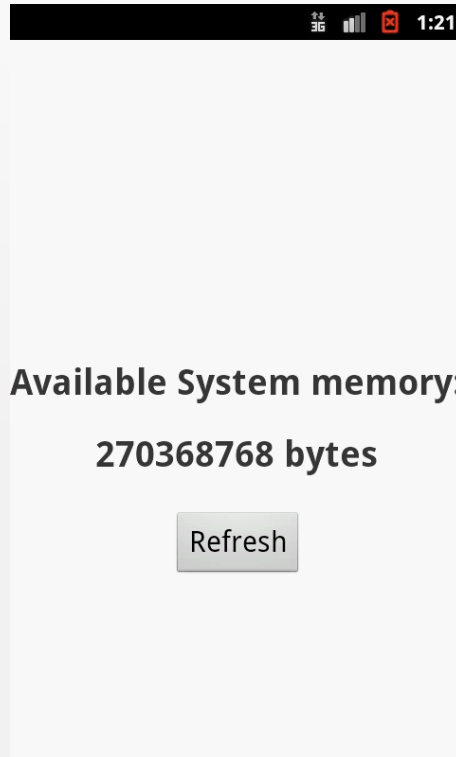- *Build & Dependency-Management*
- *Motivation*
- *Fallbeispiel*
- *Android*
  - *Android-Bibliotheken*
  - *Bibliotheken einbinden*
  - *IDEs*
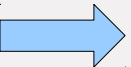
Hello World

Java
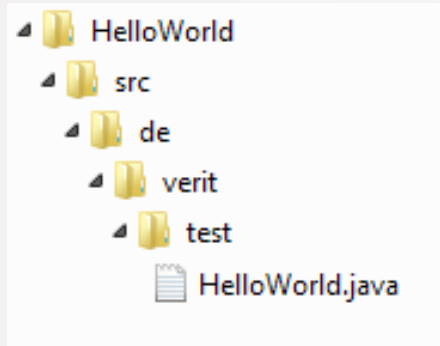
Android
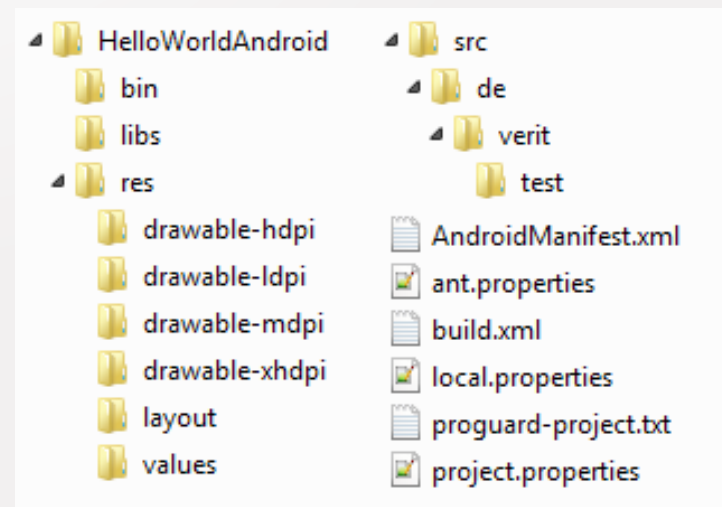
Bibliotheken

- Java
  - Class-Dateien

  - jar

- Android
  - Class-Dateien, Ressourcen

  - jar, apklib, aar, Library Project

- Tools

- Maven, Gradle, Ant, ...

- Maven, Gradle, Ant, …
- **Android-Plugins**

Agenda

- ***Build & Dependency-Management***
- ***Motivation***
- ***Fallbeispiel***
- ***Android***
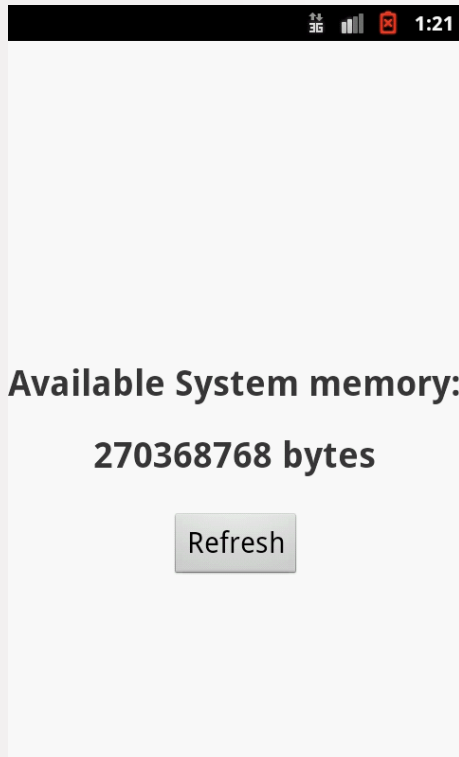 - ***Android-Bibliotheken***
  - *Bibliotheken einbinden*
  - *IDEs*

Android-Bibliotheken

Android-Bibliotheken

jar

- class files

Android-Bibliotheken

jar	Library Project
• class files	• Quellcode • Ressourcendateien

Library Project

Name

- libs
- res
- src
- test
- AndroidManifest.xml
- ant.properties
- build.xml
- lint.xml
- local.properties
- pom.xml
- proguard-project.txt
- project.properties

- Quellcode
- Ressourcendateien

- Standard Android Projekt
- Einziger Unterschied:

project.properties enthält den Eintrag:
  - android.library=true

Android-Bibliotheken

jar	**Library Project**
• class files	• Quellcode
	• Ressourcendateien

apklib   *Maven*
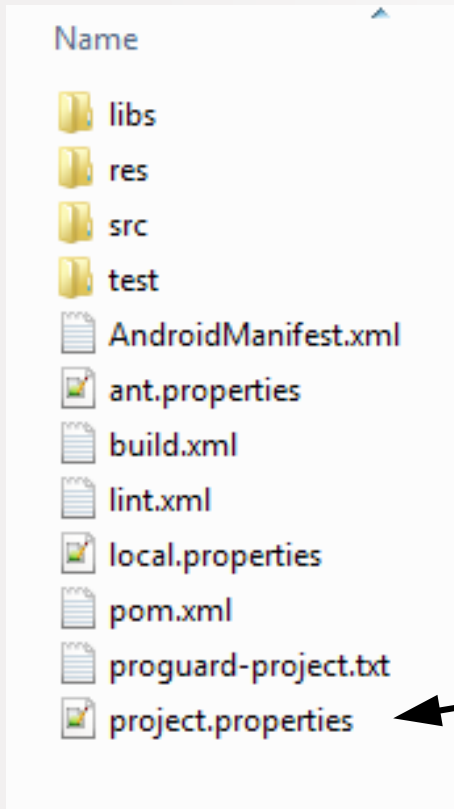
• Quellcode

• Ressourcendateien
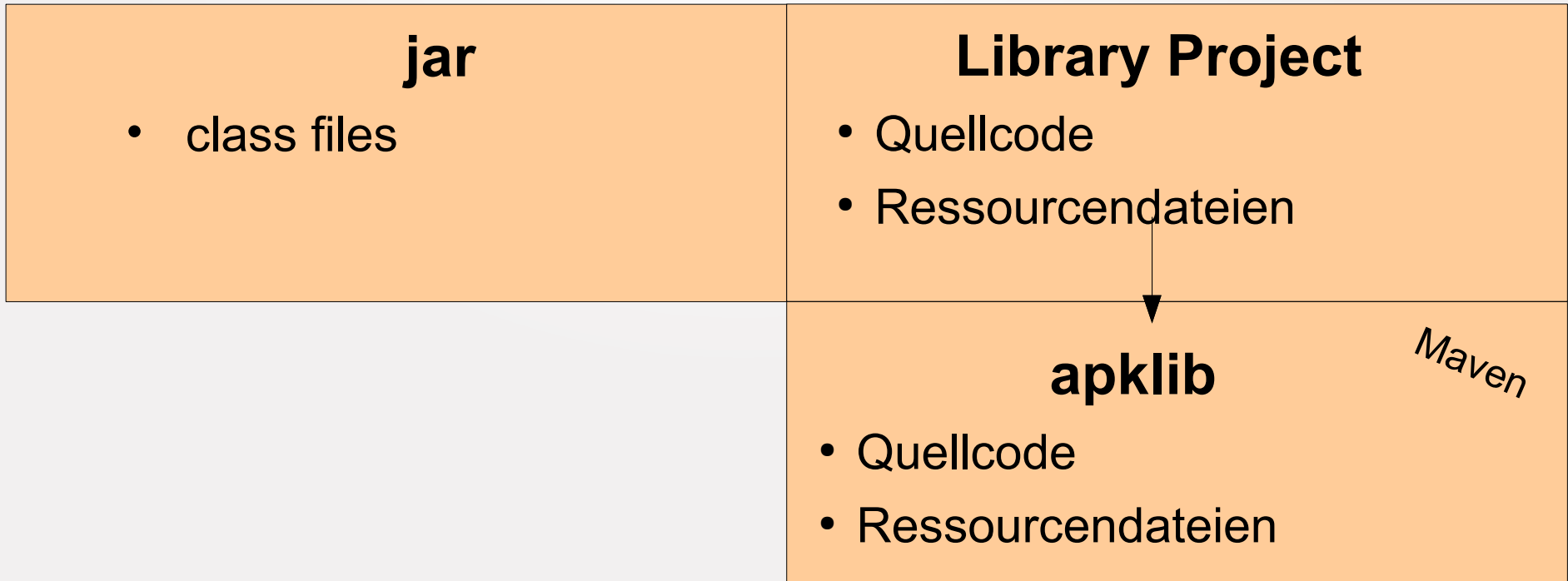
apklib

- Quellcode

- Ressourcendateien

- Herkunft: maven-android-plugin

Android-Bibliotheken

jar • class files	**Library Project** • Quellcode • Ressourcendateien
Gradle **aar** (**A**ndroid **Ar**chive) • class files • Ressourcendateien	**apklib** *Maven* • Quellcode • Ressourcendateien

aar

Android-Bibliotheken

jar	**Library Project**
aar (**A**ndroid **Ar**chive)	↓ **apklib**
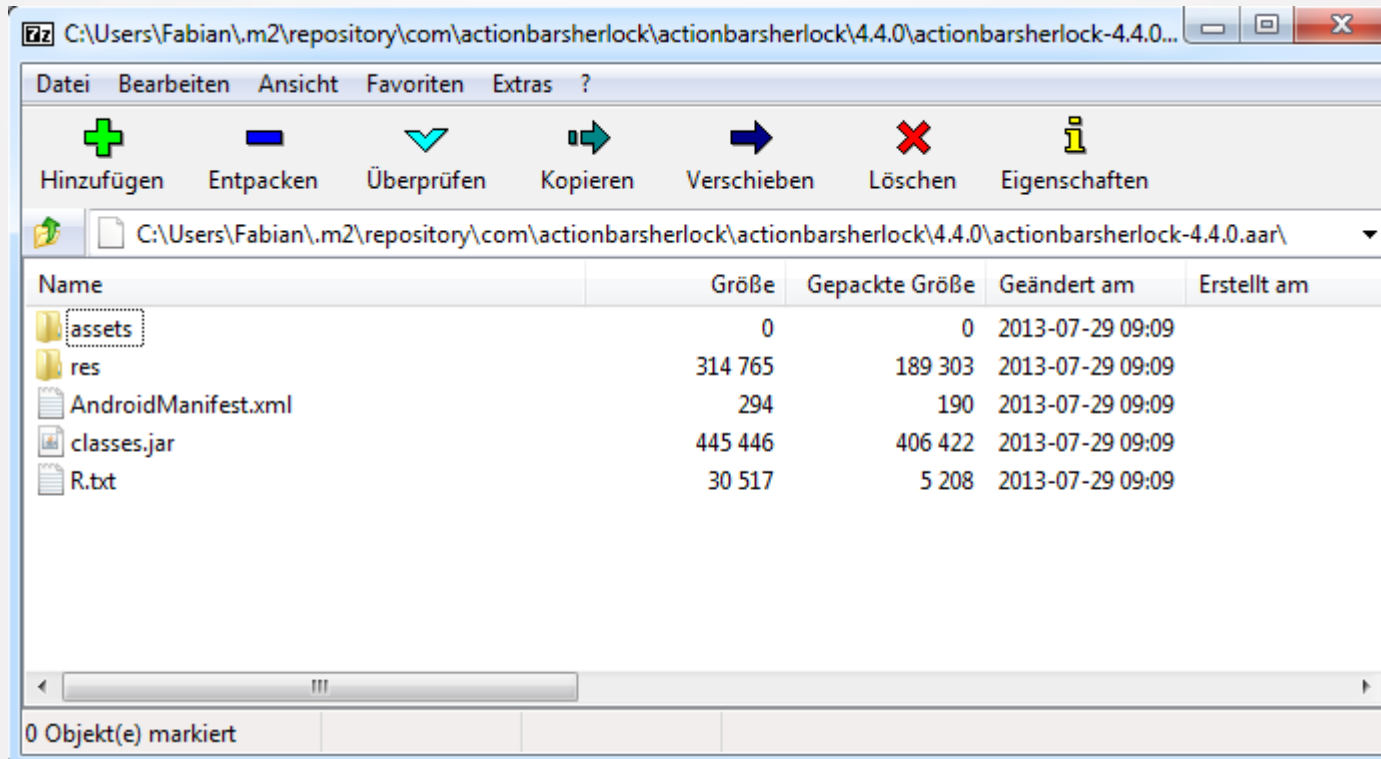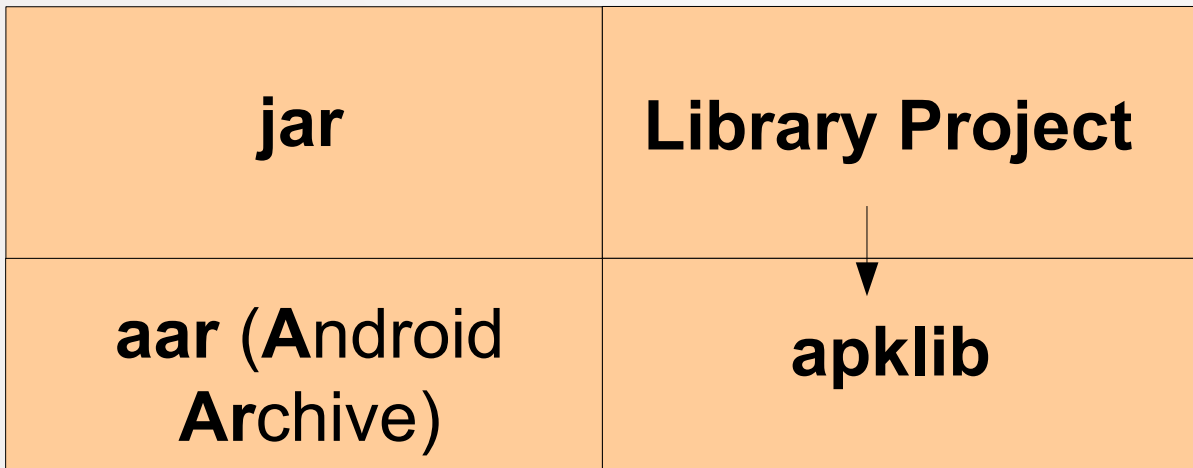
- Maven-Repositories
- Projektseiten
- SDK-Manager
- SDK-Repositories

Agenda

- *Build & Dependency-Management*
- *Motivation*
- *Fallbeispiel*
- *Android*
  - *Android-Bibliotheken*
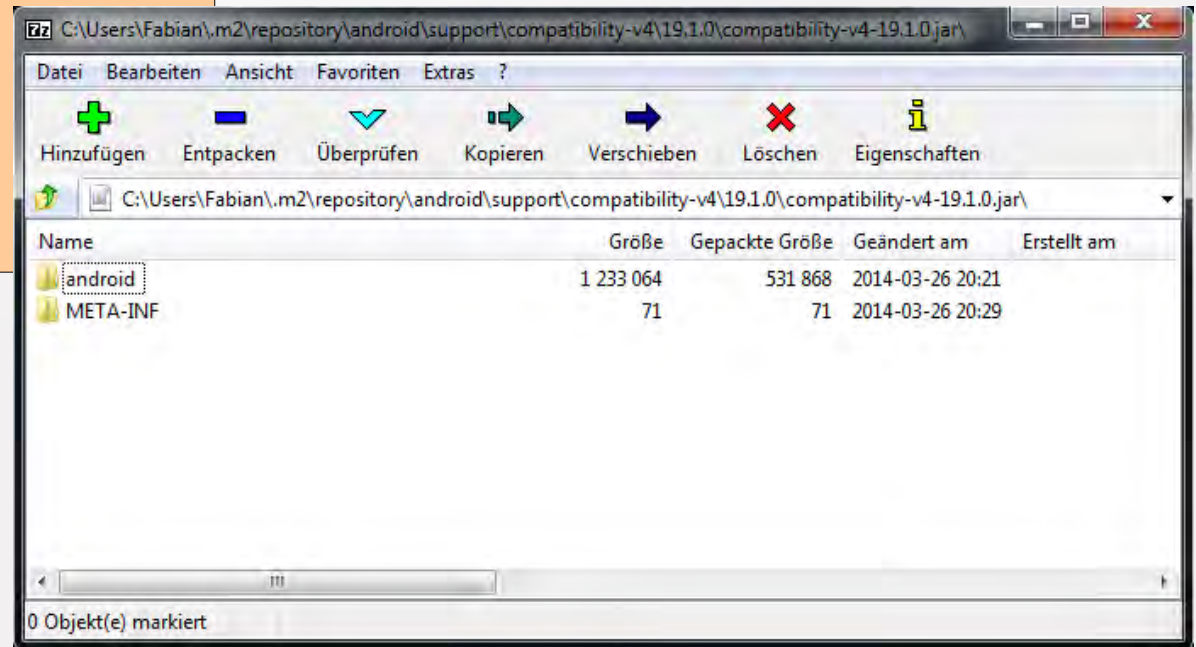 - *Bibliotheken einbinden*
  - *IDEs*
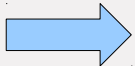
Kommandozeile & Ant

	Library-Project	jar	aar	apklib
Ant				
maven				
Gradle				

Library Project

Ant

Library Project einbinden

http://actionbarsherlock.com/

📁 libs	Dateiordner
📁 res	Dateiordner
📁 src	Dateiordner
📁 test	Dateiordner
📄 AndroidManifest.xml	XML-Datei
📄 build.gradle	GRADLE-Datei
📄 lint.xml	XML-Datei
📄 pom.xml	XML-Datei
📄 project.properties	PROPERTIES-Datei
📄 README.md	MD-Datei

android update project -path .

android update project
--target 14 --path <path to
the project> --library
..actionbarsherlock

jar
Ant

jar einbinden

- **v4 support library**
  - v4 support library **r19.1.0** → **SwipeRefreshLayout**

jar

Ant

Build-Fehler

jar

Ant

Ursache??

Android Support Library

Version 6

apklib einbinden

Maven **apklib**

- Quellcode

- Ressourcendateien

1) unzip →

2) Für Ant vorbereiten

Library-Project

- Quellcode

- Ressourcendateien
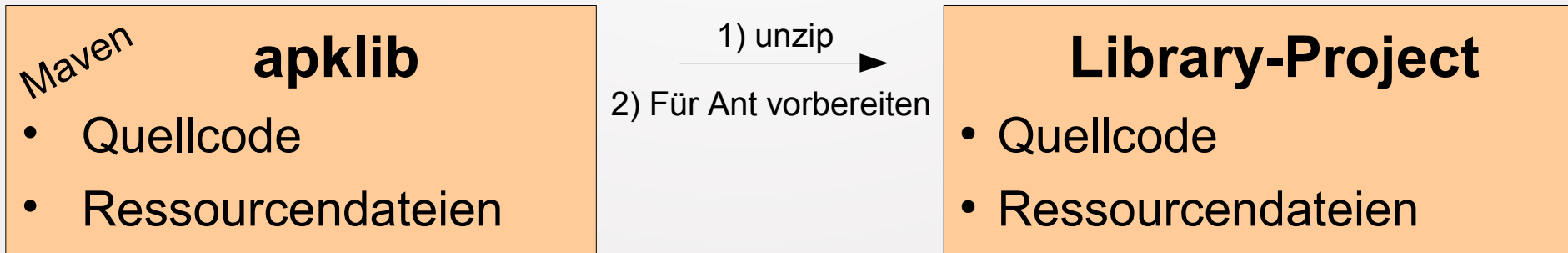
(Ant unterstützt keine apklibs)

aar

Ant

aar einbinden

aar (Android Archive)		Library Project
• class files	1) unzip →	• Quellcode
• Ressourcendateien *Gradle*	**2) Klassen einbinden** 3) Für Ant vorbereiten	• Ressourcendateien

(Ant unterstützt keine aars)

aar – Klassen einbinden

actionbarsherlock.aar (entpackt)
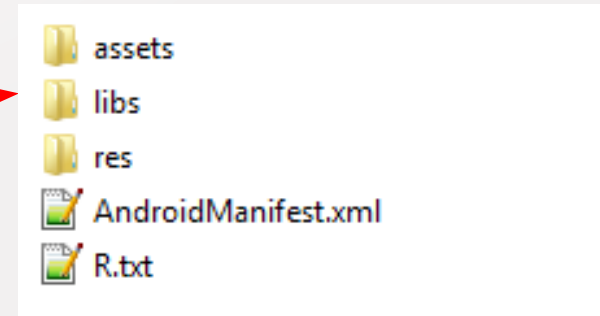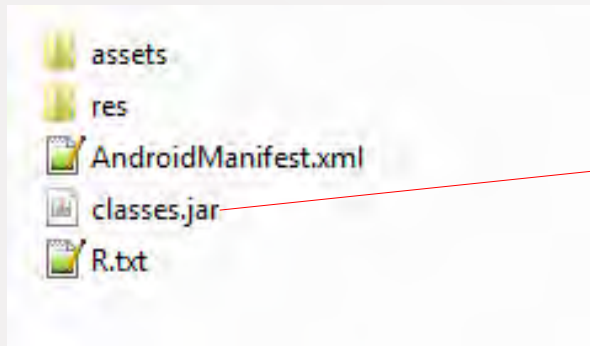
Maven

	Library-Project	jar	aar	apklib
Ant	+	+	o	o
maven				
Gradle				

jar / apklib / aar

jar, apklib, aar

m**a**ven

…

<dependencies>

  <dependency>

    <groupId>com.actionbarsherlock</groupId>

    <artifactId>actionbarsherlock</artifactId>

    <version>4.4.0</version>

    <type>apklib</type>

  </dependency>

  …

</dependencies>

…

local.properties
out.txt
pom.xml
proguard-project.txt
project.properties
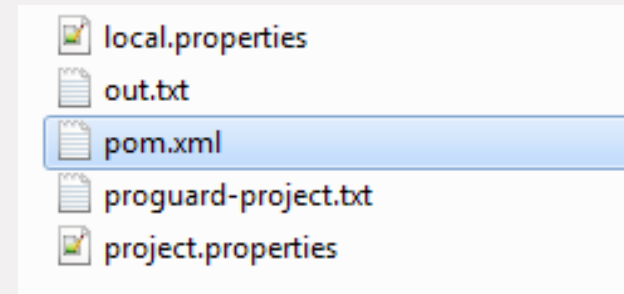
jar

m**a**ven

support-v4

```
<dependency>
        <groupId>com.google.android</groupId>
        <artifactId>support-v4</artifactId>
        <version>r6</version>
</dependency>
```
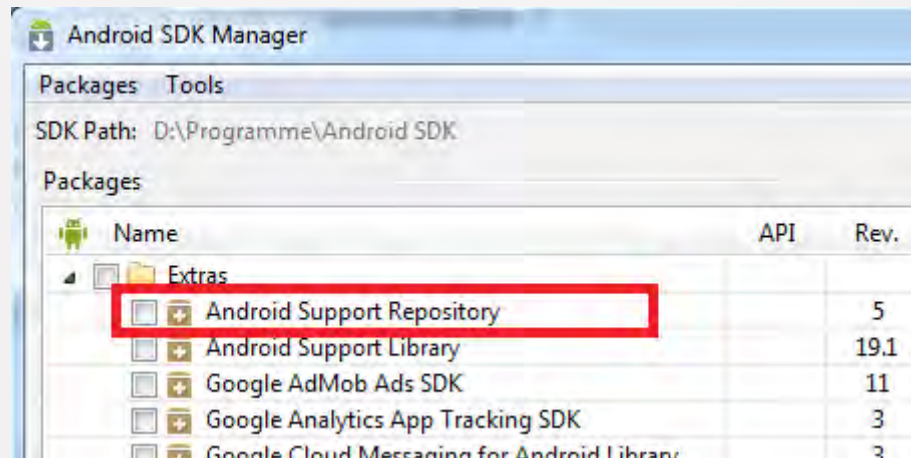
jar, aar

m**a**ven

maven-android-sdk-deployer

- *Kopiert Bibliotheken aus dem **Support Repository** in das **lokale Repository (.m2)***

```
<dependency>
    <groupId>com.android.support</groupId>
    <artifactId>support-v4</artifactId>
    <version>19.1.0</version>
    <scope>compile</scope>
</dependency>
```

https://github.com/mosabua/maven-android-sdk-deployer

jar

m**a**ven

SwipeRefreshLayout

MavenCentral: Android 4.1.1.4

SDK Manager: Android 4.4.2

Library Projects einbinden
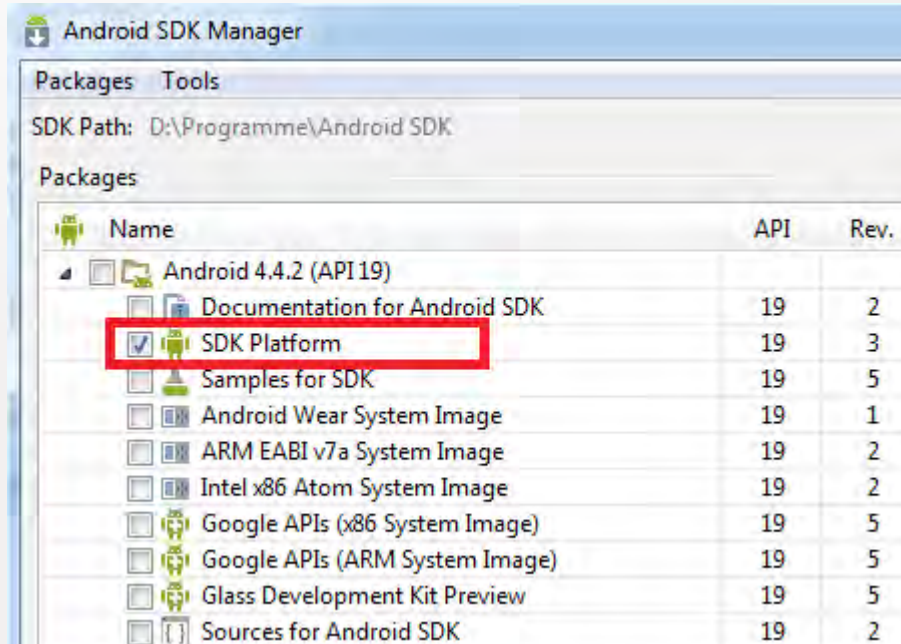
Library Project
m**a**ven

Library Project		apklib
• Quellcode	zip →	• Quellcode
• Ressourcendateien		• Ressourcendateien

https://code.google.com/p/maven-android-plugin/wiki/ApkLib

Gradle

	Library-Project	jar	aar	apklib
Ant	+	+	o	o
maven	o	+	+	+
Gradle				

jar

Gradle

Einbinden von jars

build.gradle

```
dependencies {
    compile files('libs/android-support-v4.jar')
}



dependencies {
    compile 'com.android.support:support-v4:19.1.0'
}
```

jar

Gradle

Einbinden von jars
(aus einem Repository)

Wird von Gradle erkannt!

https://plus.google.com/+AndroidDevelopers/posts/4Yhpn6p9icf

aar
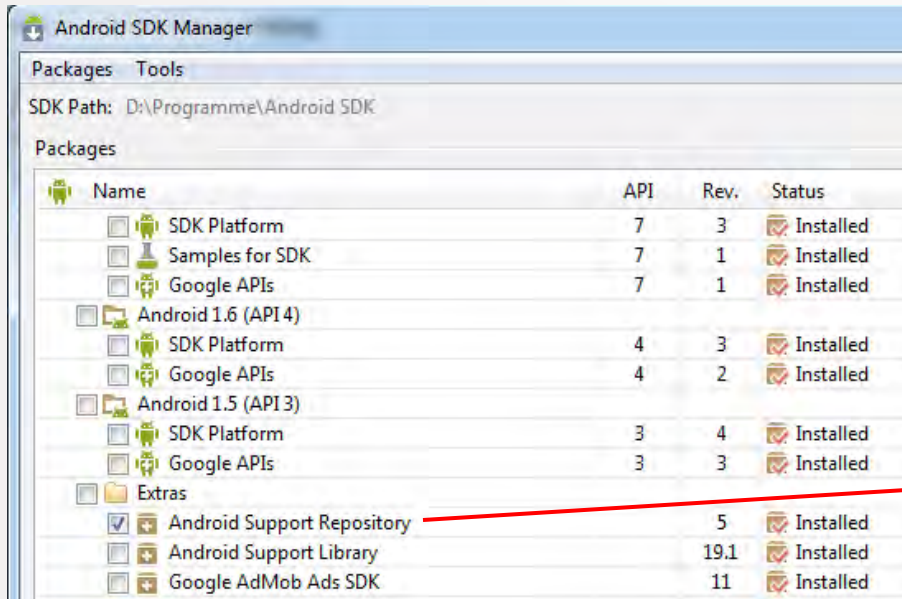
Gradle

Einbinden von aars I

build.gradle

```
repositories {

        mavenCentral()

}


dependencies {

        compile 'com.actionbarsherlock:actionbarsherlock:4.4.0@aar'

}
```

aar

Gradle

Einbinden von aars II

```
[D:\TestSwipeGradle\AndroidManifest.xml:1, D:\TestSwipeGradle\build\exploded-aar
\com.actionbarsherlock\actionbarsherlock\4.4.0\AndroidManifest.xml:2] Main manif
est has <uses-sdk android:targetSdkVersion='1'> but library uses targetSdkVersio
n='17'
```

- **minSdkVersion**
  - Älteste unterstützte Android-Version
- **targetSdkVersion**
  - Zielplattform

Multi project setup (Library-Projects)

Library Project

Gradle

TestProject
libraries
actionbarsherlock
libs
res
src
test
build.gradle
Test
libs
res
src
build.gradle
settings.gradle
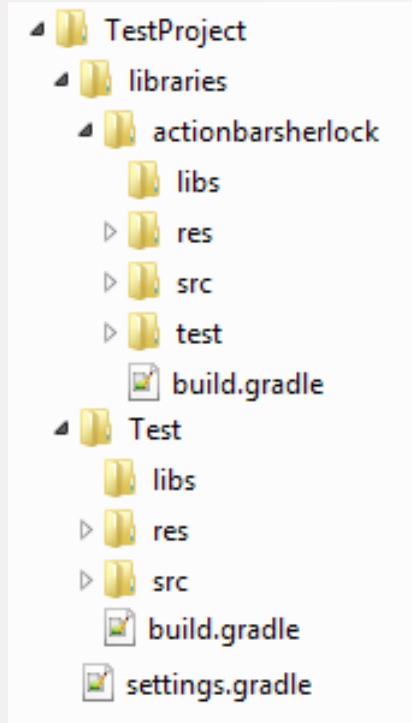
:libraries:actionbarsherlock

:Test

```
dependencies {
    compile project(':libraries:actionbarsherlock')
}
```

http://tools.android.com/tech-docs/new-build-system/user-guide#TOC-Dependencies-Android-Libraries-and-Multi-project-setup

apklibs einbinden

- Android **Maven** plugin

apklib	**aar (Android Archive)**
• Quellcode	• class files
• Ressourcendateien	• Ressourcendateien
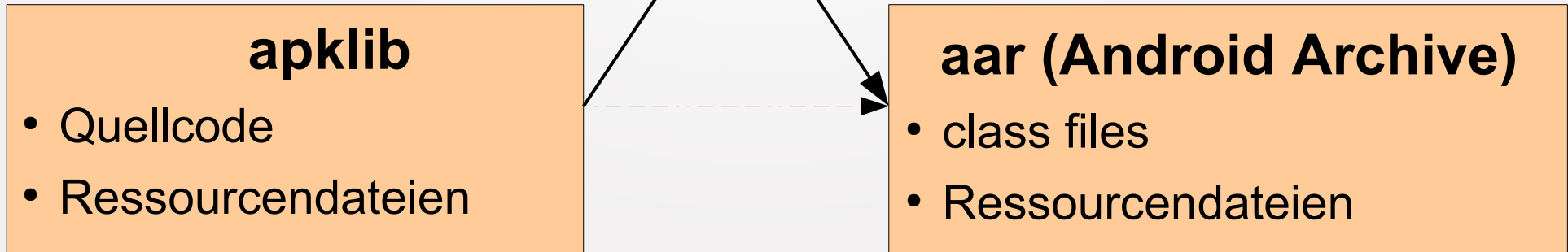
https://github.com/carrot-garden/android_maven-android-plugin-samples/blob/master/libraryprojects/aar-from-apklib/pom.xml

Fazit

	Library-Project	jar	aar	apklib
Ant	+	+	o	o
maven	o	+	+	+
Gradle	+	+	+	o

Agenda

- *Build & Dependency-Management*
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- *Android*
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  - *Bibliotheken einbinden*
  - *IDEs*
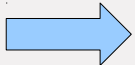
maven, Gradle

Eclipse

Eclipse

Android:

- **Eclipse ADT Plugin**

Maven:

- **Maven Eclipse Plugin**
- **Android for Maven Eclipse** connector (m2e-android)

Gradle:

- **Gradle IDE Pack , Nodeclipse/Enide Gradle for Eclipse**

Netbeans

- Voraussetzungen:
  - **NBAndroid** (http://nbandroid.org/wiki/index.php/Installation)

maven

Netbeans

Netbeans – Maven

- Maven Plugin wird mitgeliefert

- Keine Unterstützung von apklibs:

https://netbeans.org/bugzilla/show_bug.cgi?id=220446

	Description
🔴	package com.actionbarsherlock.app does not exist
🔴	method does not override or implement a method from a supertype
🔴	cannot find symbol symbol: variable super location: class de.verit.test.Test
🔴	package R does not exist
🔴	package R does not exist
🔴	incompatible types: de.verit.test.Test cannot be converted to android.support.v4.widget.SwipeRefreshLayout.OnRefreshListener
🔴	package R does not exist
🔴	cannot find symbol symbol: variable ACTIVITY_SERVICE location: class de.verit.test.Test
Error: 8 (in Test)	

Gradle

Netbeans

Netbeans – Gradle

Voraussetzung:

- **Gradle Support Plugin**
    - http://plugins.netbeans.org/plugin/44510/gradle-support

ABER:

- Android-Gradle-Kompatibilität des **NBAndroid-Plugins** kostenpflichtig! (http://nbandroid.org/wiki/index.php/Subscriptions)

IntelliJ (Community Edition)

Inklusive Gradle, Android, Maven Plugins

- Import von Gradle, Maven und Eclipse-Projekten
- Nahtlose Gradle-Unterstützung
- Maven-Android Unterstützung inkl. aar, apklib
- Einbinden von Library-Projekten

Android Studio

- Basiert auf IntelliJ
- Nur für Android-Entwicklung ausgelegt
- *„Early Access Preview"* (Alpha)

Fazit

Agenda

- ***Build & Dependency-Management***
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- ***Android***
  - ***Android-Bibliotheken***
  - ***Bibliotheken einbinden***
  - ***IDEs***
  - *Tipps & Tricks*

Java 7

- Android SDK Tools, Revision 22.6 (March 2014)

minsdversion = 8

→ try-with-resources: minsdkversion = 19

http://developer.android.com/tools/sdk/tools-notes.html

Android API Levels

Plattform Version	API Level	Version Code	Android Target ID
Android 4.4	19	KITKAT	18
Android 4.3	18	JELLY_BEAN_MR2	17
Android 4.2, 4.2.2	17	JELLY_BEAN_MR1	16
Android 4.1, 4.1.1	16	JELLY_BEAN	15
...	...	...	...

http://developer.android.com/guide/topics/manifest/uses-sdk-element.html#ApiLevels