

Understanding Android Build Process, KTX, and Support Libraries



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What to Expect from This Module



Android build process and Gradle

Modifying Gradle parameters

Specifying dependencies in Gradle

Android Support Library

AndroidX and Android KTX libraries

Android Build Process



Android build process is somewhat involved

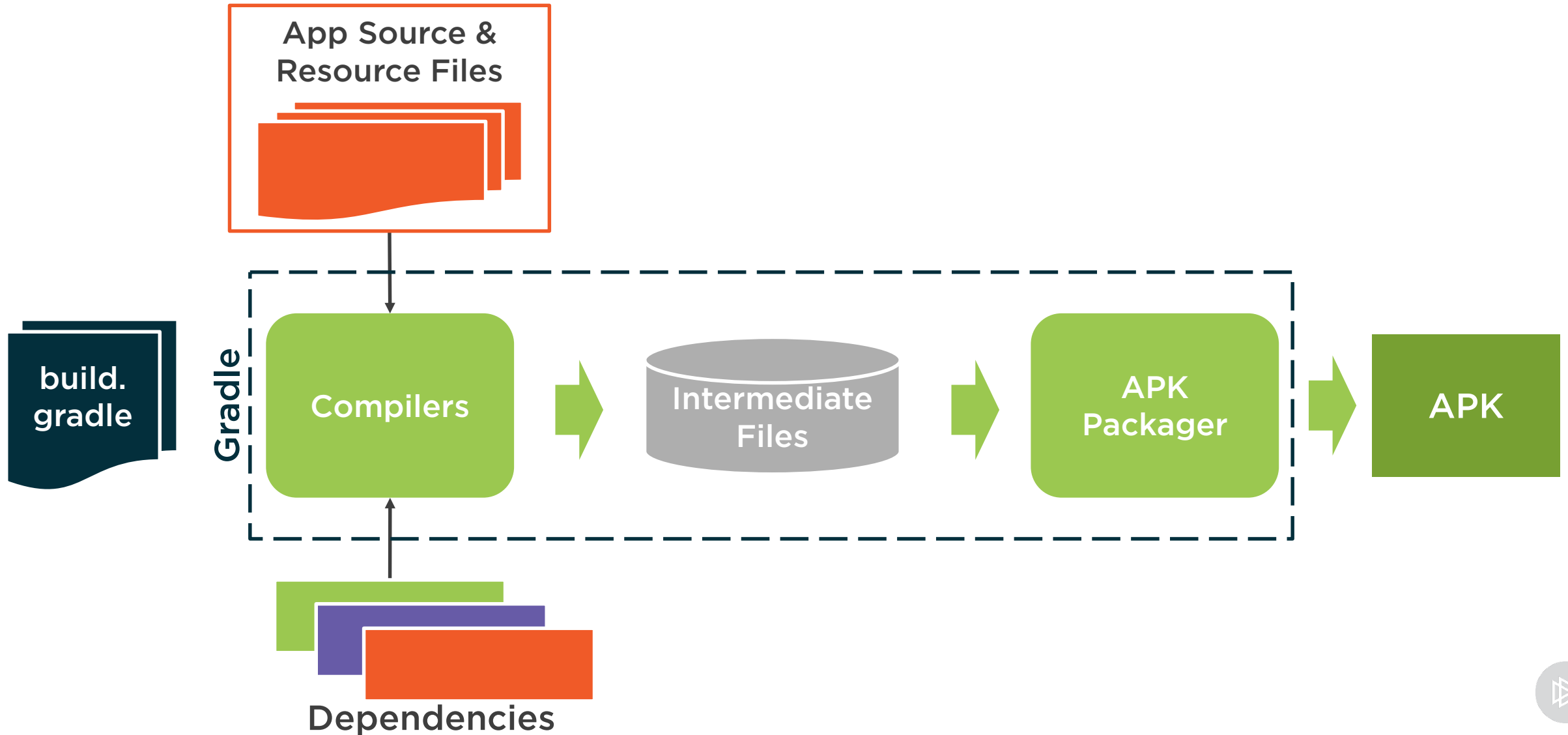
- Manually managing details is challenging

Gradle simplifies managing build process

- A general purpose build system
- Android-oriented features from plug-in



Android Build Process



Configuring Gradle



Gradle is powerful

Very flexible
Uses a domain specific
language (DSL)



Settings easily managed

Projects include build.gradle files
Changes often simple edits

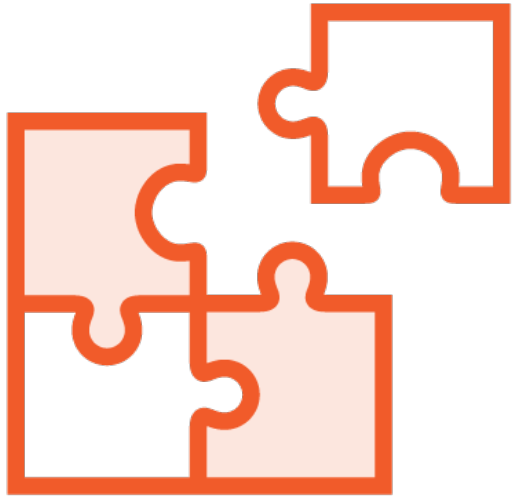


Android Studio UI

Many changes can be
made with UI
Use File/Project Structure...



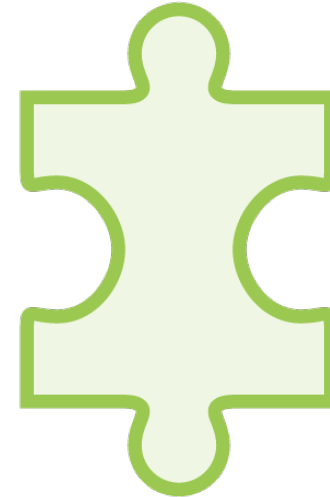
Dependencies



App builds rarely stand alone

May rely on external binaries

May rely on other project libraries

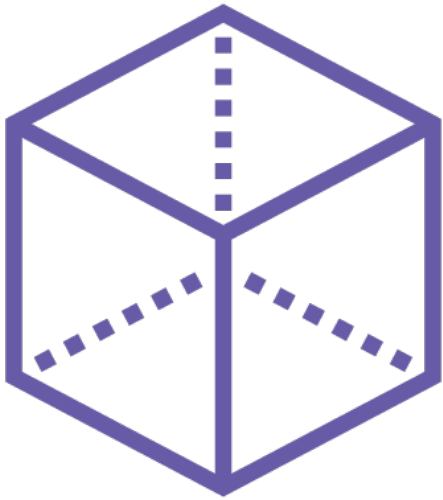


Listing dependencies in Gradle

In build.gradle dependencies block

Automatically includes
dependency dependencies

Dependency Types



Module dependency

Module from your project



Jar dependency

Java jar file



Library dependency

Pull from a repository



Library Dependencies



Will use local machine for some
Android Support repository
Google repository



Other repositories must be specified
Normally leverages jcenter repository
Can add others

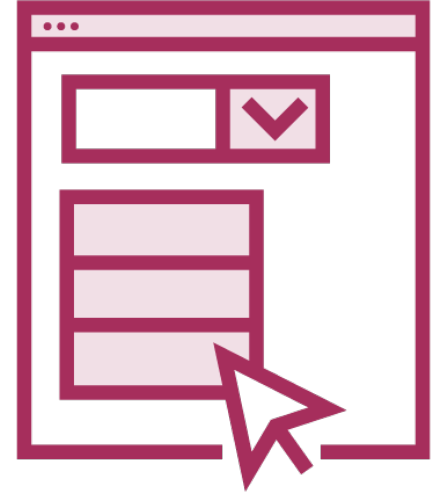
Associating Dependencies



All build variants
Use implementation

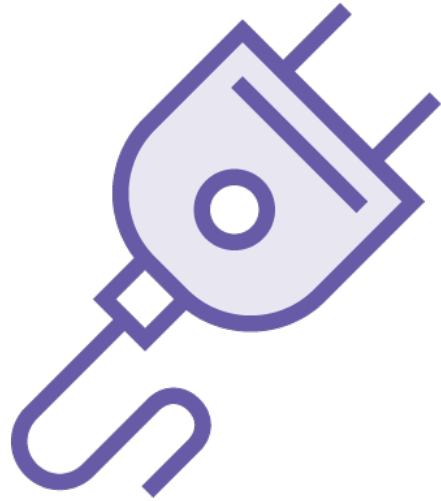


JVM test
Use testimplementation



Instrumentation Test
Use androidTestImplementation

Android Support Library



Backward Compatibility

New features available on
older platform versions
Uses alternate classes



Convenience and helper classes

Features not part of
platform
Especially UI features



Debugging, testing, and utilities

Testing Support Library
Enhanced code checks
Special case utilities



Android Support Library Organization

A large orange rounded square with the text "Android Support Library" centered inside it.

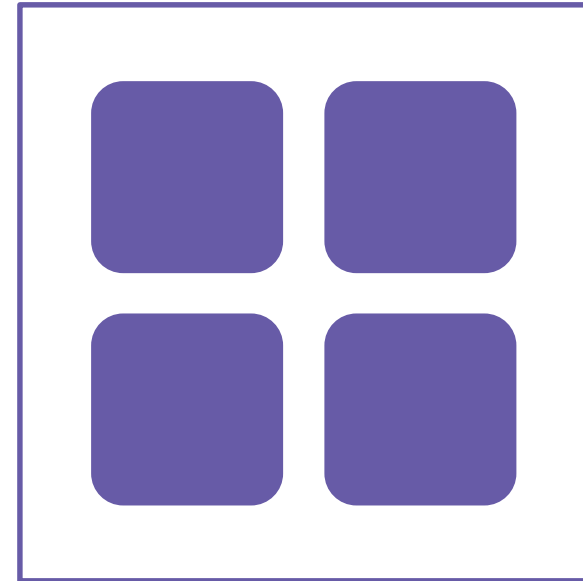
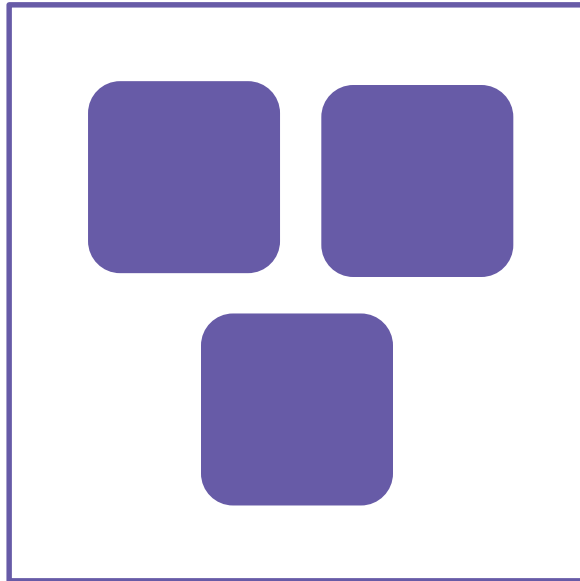
Android
Support
Library



Android Support Library Organization

Much of grouping based on platform support

Name historically indicates minimum platform



Android Support Library Organization

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V4 Support libraries

API 4 and up

V7 Support libraries

API 7 and up

V13 Support libraries

API 13 and up

Changed with latest releases

Minimum API support is API 14



Android Support Library Organization

App compatibility
library

Support library
release version

implementation 'com.android.support:appcompat-v7:27.1.0'

Support Library's main
namespace group

Minimum supported
platform: ~~API 7~~

API 14



Refactoring to AndroidX

Android Support Library

Organization has become
difficult to manage

Tightly coupled library versioning
slows feature releases

AndroidX

Organization refactored for
simpler management

Libraries independently versioned
to speed feature releases



Refactoring to AndroidX

```
// Android Support Library dependency  
implementation '
```

```
// AndroidX dependency  
implementation '
```



Refactoring to AndroidX

```
// Support Library import
import android.support.v7.app.AppCompatActivity

class MainActivity : AppCompatActivity() {
    // code elided for clarity
}
```

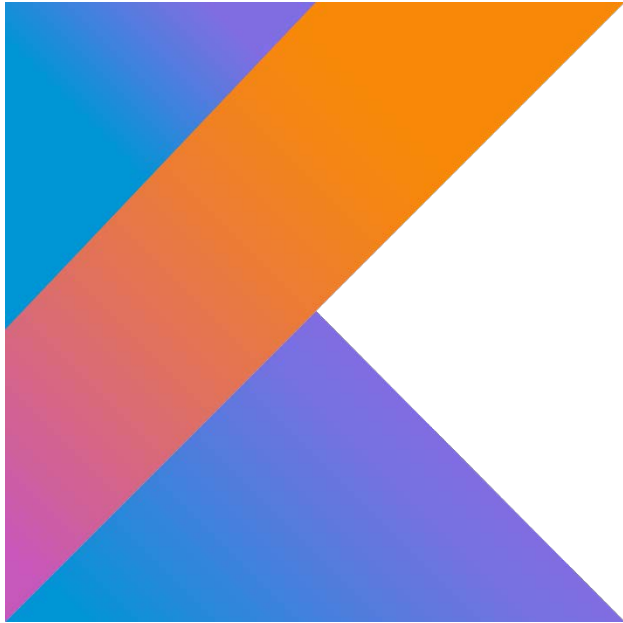


Refactoring to AndroidX

```
// AndroidX import
import androidx.appcompat.AppCompatActivity

class MainActivity : AppCompatActivity() {
    // code elided for clarity
}
```





Android KTX

- Part of AndroidX
- Kotlin library to simplify Android dev
- Leverages Kotlin language features
- In many cases substantially reduces the amount of code

Required dependency

- `androidx.core:core-ktx:0.0.0`



Summary



Gradle

- Simplifies managing Android builds
- Insulates developers from the details

Gradle is extremely flexible

- Settings stored within build.gradle
- Can edit build.gradle directly
- Many settings available through Android Studio UI



Summary



Dependencies

- Builds rarely stand alone

Dependency types

- Other modules within same project
- Java jar files
- Libraries from a repository

Associating dependencies

- Can associate with all builds
- Can associate with test builds



Summary



Android Support Library

- Improves compatibility across API levels
- Provides many valuable features
- Organization has become complex

AndroidX

- Refactors Android Support Library
- Adds new features as well

Android KTX

- Kotlin library to simplify Android dev
- In many cases greatly reduces code

