Understanding the Android Studio Build Process

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What to Expect from This Module

Android Build Process and Gradle

Modifying Gradle Parameters

Dependencies in Gradle

Android Support Library

AndroidX

Android Build Process

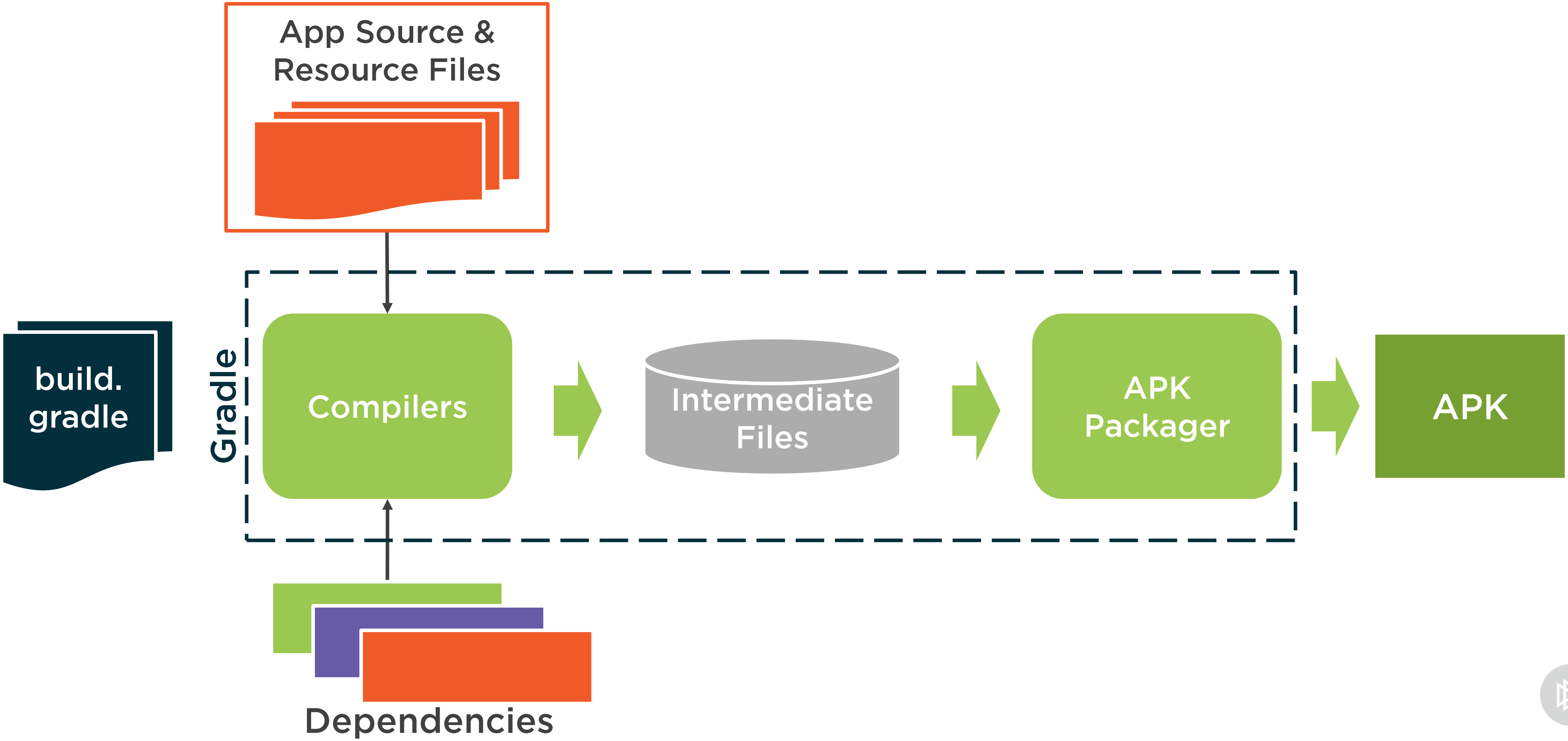
Android build process is somewhat involved

- 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 extremely powerful

- Very flexible
- Uses a domain specific language (DSL)

Common 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

Applications 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

Dependency for all build variants

- Use implementation

Dependency for JVM test

- Use testImplementation

Dependency for Instrumentation test

- Use androidTestImplementation

Android Support Library

Backward compatibility

- Makes some newer platform features available to older platform versions
- Uses alternate classes

Convenience and helper classes

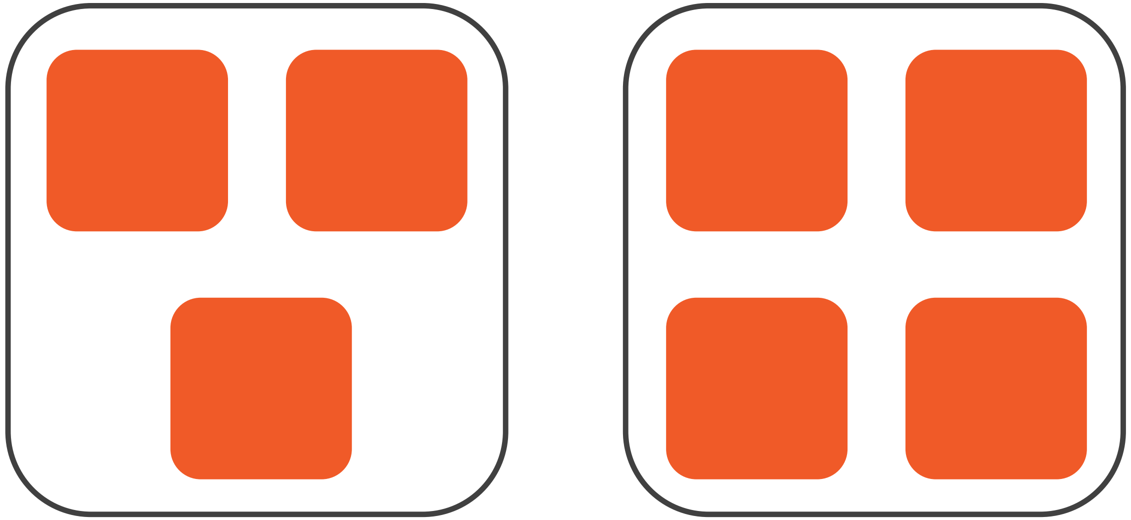
- Provides features not part of platform
- Especially in the area of the UI

Debugging, testing, and utilities

- Testing Support Library
- Enhanced code checks
- Special case utilities

Android Support Library Organization

Historically grouped by supported platform



Android Support Library Organization

Historically grouped by supported platform

- Name indicates minimum platform
- v4 Support libraries – API 4 & up
- v7 Support libraries – API 7 & up
- v13 Support libraries – API 13 & up
- Changed with latest releases
  - None support less than API 14

Specific libraries tied to features

- Multiple libraries within each group
- We reference specific library in Gradle

Android Support Library Challenges

Organization is complicated

- Each library contains a lot of classes

Cumbersome to work with

- Often difficult to identify needed library
- Sometimes little or no obvious relationship between those classes

Updates are slow to release

- Updates must be synchronized across the many classes in each library

AndroidX

AndroidX replaces the Support Library

- Includes existing capabilities & features
- Adds new as well

AndroidX

Organization is completely refactored

- Libraries divided into smaller subsets

Simpler to work with

- Libraries organized by features

Accelerates updates

- Each library can be updated independently of other libraries

AndroidX vs. Support Library

Both used for the same purpose

- Provide libraries and features beyond those of the Android SDK

Support Library

- Existing apps that already use it

AndroidX

- All new app development
- The only option for API 28 (Android 9) and newer

AndroidX vs. Support Library

Time is running out for the Support Library

Summary

Gradle manages the build process

Common settings are in build.gradle

- Android Studio project level settings
- Android Studio module level settings
  - Most changes made at module level

Changing common settings

- Edit build.gradle file directly
- Use Android Studio UI

Summary

Dependency types

- Module: module from your project
- Jar: Java jar file
- Library: pulled from repository

Associating dependencies

- All build variants
  - Use implementation
- JVM test
  - Use testImplementation
- Instrumentation test
  - Use androidTestImplementation

Summary

Android Support Library

- Backward compatibility
- Convenience and helper classes
- Debugging, testing, and utilities

AndroidX

- Replaces the Android Support Library
- Better organized & easer to work with
- Preferred for new app development
- Required for API 28 and newer