



# HUST

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HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

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TRƯỜNG ĐẠI HỌC  
BÁCH KHOA HÀ NỘI  
HANOI UNIVERSITY  
OF SCIENCE AND TECHNOLOGY

# LẬP TRÌNH ỨNG DỤNG DI ĐỘNG

## Mobile Application Programming

ET4710

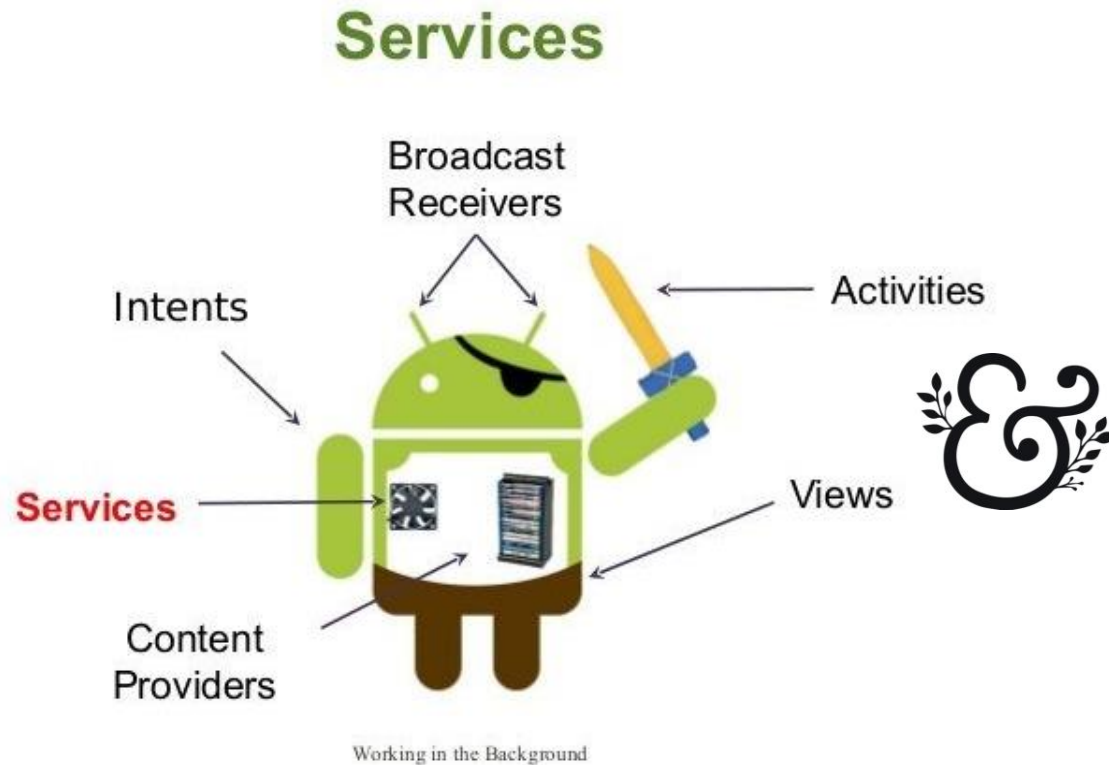
PGS. TS. Đỗ Trọng Tuấn

Viện Điện tử Viễn thông \* Đại học Bách Khoa Hà Nội

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## CHƯƠNG 7.

### Lập trình xử lý dịch vụ và thông báo (Programming with services and notifications)



## CHƯƠNG 7.

### Lập trình xử lý dịch vụ và thông báo (Programming with services and notifications)

7.1. Lập trình với thoại và tin nhắn text

(Telephony and SMS Applications Programming)

7.2 Lập trình với các dịch vụ hệ thống và điều khiển thiết bị

(System and device control)

## App Component

### Activities

An activity represents a single screen with a user interface, in-short Activity performs actions on the screen.

### Broadcast Recievers

Broadcast Receivers simply respond to broadcast messages from other applications or from the system.

### Services

A service is a component that runs in the background to perform long-running operations.

### Content Providers

A content provider component supplies data from one application to others on request.



# Lập trình xử lý dịch vụ và thông báo - Services and Notifications



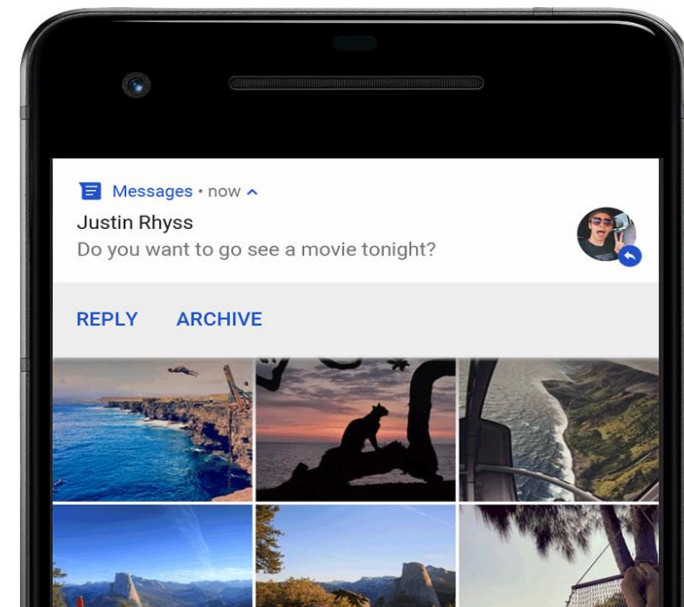
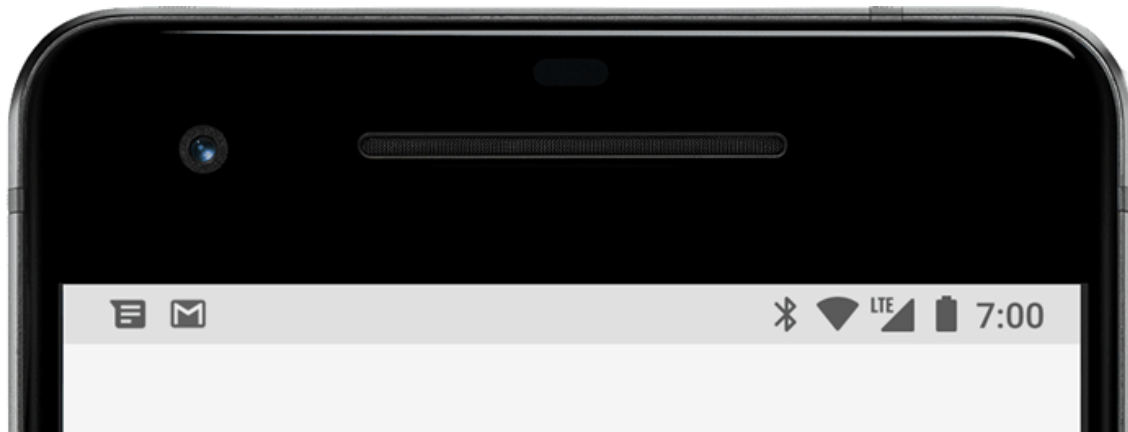
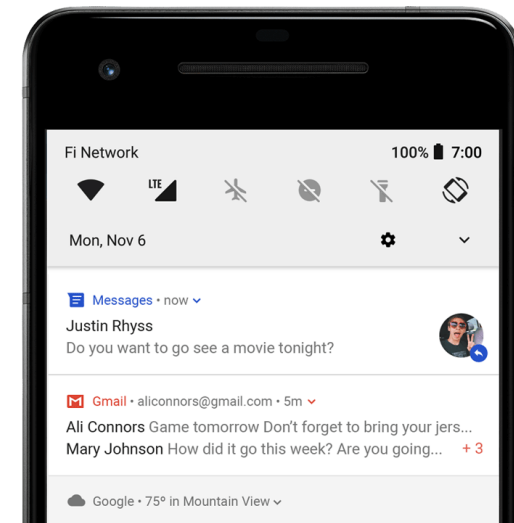
## Services overview

- A Service is an application component that can perform long-running operations in the background. It does not provide a user interface.
- Once started, a service might continue running for some time, even after the user switches to another application.
- Additionally, a component can bind to a service to interact with it and even perform interprocess communication (IPC).
- For example, a service can handle network transactions, play music, perform file I/O, or interact with a content provider, all from the background.



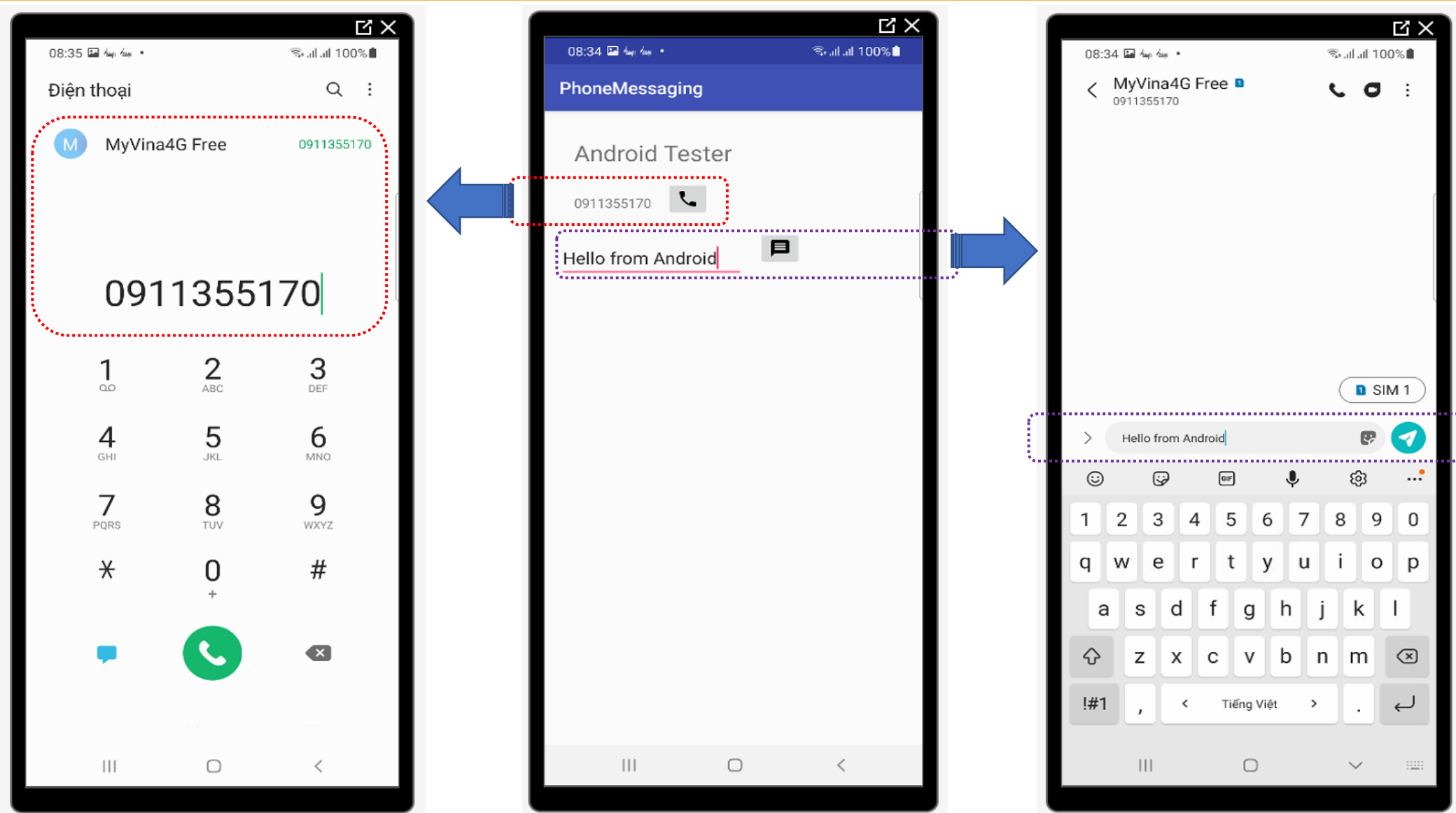
## Notifications Overview

- A notification is a message that Android displays outside your app's UI to provide the user with reminders, communication from other people, or other timely information from your app.
- Users can tap the notification to open your app or take an action directly from the notification.

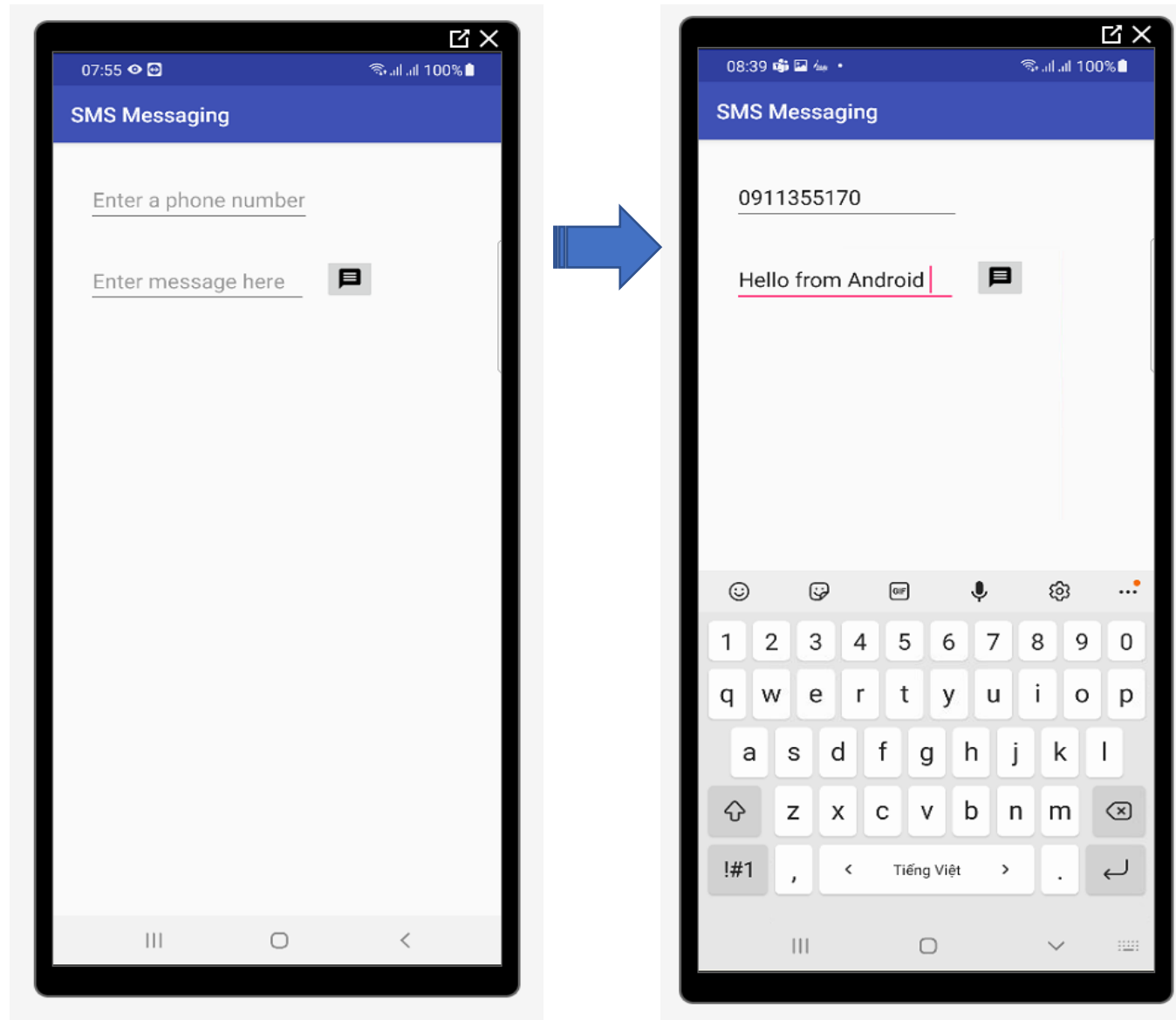




# Lập trình xử lý dịch vụ và thông báo - Services and Notifications



# Lập trình xử lý dịch vụ và thông báo - Services and Notifications





## PhoneMessaging Project:: How to open & compile in Android Studio 4.1.3

PhoneMessaging					Search PhoneMessaging	
	Name	Date modified	Type	Size		
	.gradle	14/05/2021 8:00 AM	File folder		Xóa 02 thư mục này	
	.idea	14/05/2021 8:46 AM	File folder			
	app	14/05/2021 8:08 AM	File folder		Xóa 02 files này	
	gradle	14/05/2021 7:56 AM	File folder			
	build.gradle	14/05/2021 8:03 AM	GRADLE File	1 KB		
	gradle.properties	12/12/2020 6:02 AM	PROPERTIES File	1 KB		
	gradlew	12/12/2020 6:02 AM	File	5 KB		
	gradlew.bat	14/05/2021 7:53 AM	Windows Batch File	3 KB		
	local.properties	14/05/2021 8:00 AM	PROPERTIES File	1 KB		
	README.md	12/12/2020 6:02 AM	MD File	2 KB		
	settings.gradle	12/12/2020 6:02 AM	GRADLE File	1 KB		

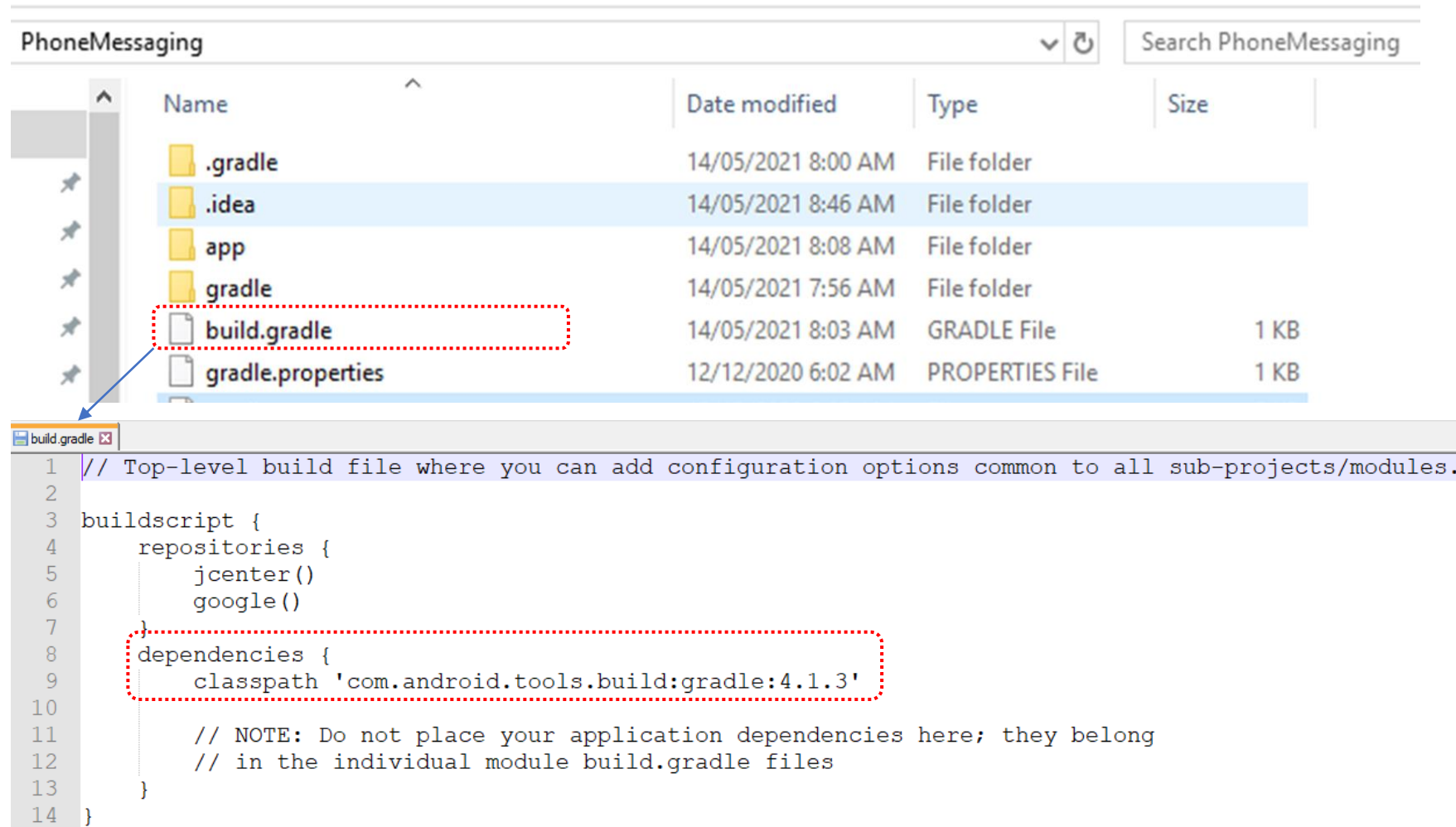
## PhoneMessaging Project:: How to open & compile in Android Studio 4.1.3

PhoneMessaging > gradle > wrapper

	Name	Date modified	Type	Size
	gradle-wrapper.jar	12/12/2020 6:02 AM	Executable Jar File	53 KB
	gradle-wrapper.properties	14/05/2021 7:57 AM	PROPERTIES File	1 KB

```
gradle-wrapper.properties
1 #Fri Mar 03 08:41:35 PST 2017
2 distributionBase=GRADLE_USER_HOME
3 distributionPath=wrapper/dists
4 zipStoreBase=GRADLE_USER_HOME
5 zipStorePath=wrapper/dists
6 distributionUrl=https\://services.gradle.org/distributions/gradle-6.5-all.zip
7
```

## PhoneMessaging Project:: How to open & compile in Android Studio 4.1.3



The screenshot displays the Android Studio interface for the 'PhoneMessaging' project. The top toolbar shows a dropdown menu with a refresh icon and a search bar labeled 'Search PhoneMessaging'. Below this, a table lists the project's files and folders:

Name	Date modified	Type	Size
.gradle	14/05/2021 8:00 AM	File folder	
.idea	14/05/2021 8:46 AM	File folder	
app	14/05/2021 8:08 AM	File folder	
gradle	14/05/2021 7:56 AM	File folder	
build.gradle	14/05/2021 8:03 AM	GRADLE File	1 KB
gradle.properties	12/12/2020 6:02 AM	PROPERTIES File	1 KB

A red dashed box highlights the 'build.gradle' file in the table. A blue arrow points from this box to the 'build.gradle' tab in the editor. The editor shows the following code:

```
1 // Top-level build file where you can add configuration options common to all sub-projects/modules.
2
3 buildscript {
4     repositories {
5         jcenter()
6         google()
7     }
8     dependencies {
9         classpath 'com.android.tools.build:gradle:4.1.3'
10     }
11     // NOTE: Do not place your application dependencies here; they belong
12     // in the individual module build.gradle files
13 }
14 }
```

A red dashed box highlights the 'dependencies' block in the code.

# Lập trình xử lý dịch vụ và thông báo - Services and Notifications

PhoneMessaging > app

Name	Date modified	Type	Size
src	14/05/2021 7:56 AM	File folder	
build.gradle	12/12/2020 6:02 AM	GRADLE File	1 KB

build.gradle

```
1 apply plugin: 'com.android.application'
2
3 android {
4     compileSdkVersion 30
5     buildToolsVersion "30.0.3"
6     defaultConfig {
7         applicationId "com.example.android.phonemessaging"
8         minSdkVersion 23
9         targetSdkVersion 30
10        versionCode 1
11        versionName "1.0"
12        testInstrumentationRunner "android.support.test.runner.AndroidJUnitRunner"
13    }
14    buildTypes {
15        release {
16            minifyEnabled false
17            proguardFiles getDefaultProguardFile('proguard-android.txt'), 'proguard-rules.pro'
18        }
19    }
20 }
21
22 dependencies {
23     compile fileTree(dir: 'libs', include: ['*.jar'])
24     compile 'com.android.support:appcompat-v7:25.2.0'
25 }
26
```

# Lập trình xử lý dịch vụ và thông báo - Services and Notifications

The screenshot shows the Android Studio interface with the 'PhoneMessaging' project open. The main editor displays the 'README.md' file, which contains the following text:

```
1 PhoneMessaging - Solution Code
2 =====
3
4 App for demonstrating how to pass a phone number
5 and a text message to an SMS messaging app to send
6 the message.
7
8 Introduction
9 -----
10
11 This app passes a hard-coded phone number to an installed
12 messaging app to send an SMS message. The messaging app
13 sends the message. No permissions are needed.
14
15 The app is an extension of PhoneCallDial,
16 which passes a phone number to the Phone app
17 for dialing.
18
19 Pre-requisites
20 -----
21
22 You need to know:
23 - How to open, build, and run apps with Android Studio.
24 - How to create an intent.
25
26 Getting Started
27 -----
28
29 1. Download the code.
```

The bottom panel shows the 'Build' tab with a red error message:

```
Build: Sync
PhoneMessaging: failed at 14/05/2021 8:00 AM
Could not find com.android.tools.build:gradle:4.0.0. Searched in the following locations:
- https://jcenter.bintray.com/com/android/tools/build/gradle/4.0.0/gradle-4.0.0.pom If the artifact you are trying to retrieve can be found in the repository but without metadata in 'Maven POM'
Required by:
project :
Add google Maven repository and sync project
Open File
```

The status bar at the bottom indicates the error details: 'Gradle sync failed: Could not find com.android.tools.build:gradle:4.0.0. // Searched in the following locations: // - https://jcenter.bintray.com/com/android/tools/build/gradle/4.0.0/gradle-4.0.0.pom // If the artifact you are trying to retrieve can be found in the repository but without metadata... (moments ago) 1:1 LF UTF-8 4 spaces'.



# Lập trình xử lý dịch vụ và thông báo - Services and Notifications

PhoneMessaging - README.md - Android Studio - Administrator

PhoneMessaging > README.md

Project: PhoneMessaging C:\Users\DoTrongTuan\Desktop\AndroidDemo\PhoneMessaging

Gradle Scripts

Resource Manager

README.md

```
1 PhoneMessaging - Solution Code
2 -----
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4 App for demonstrating how to pass a phone number
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26 Getting Started
27 -----
28
29 1. Download the code.
```

Find: Refactoring Preview

File to add Google repository to (1 file found) 1 usage

- Usage in Gradle build script 1 usage
  - PhoneMessaging 1 usage
    - 1 usage
      - build.gradle 1 usage
        - 1 // Top-level build file where you can add configuration options common to all sub-projects/modules.

Do Refactor Cancel

Grandle sync failed: Could not find com.android.tools.build:gradle:4.0.0. // Searched in the following locations: // - https://jcenter.bintray.com/com/android/tools/build/gradle/4.0.0/gradle-4.0.0.pom // If the artifact you are trying to retrieve can be found in the repository but without metada... (a minute ago) 1:1 LF UTF-8 4 spaces

# Lập trình xử lý dịch vụ và thông báo - Services and Notifications

PhoneMessaging - README.md - Android Studio - Administrator

PhoneMessaging > README.md

Android

PhoneMessaging C:\Users\DoTrongTuan\Desktop\AndroidDemo\PhoneMessaging

Gradle Scripts

Resource Manager

Build Variants

Structure

Favorites

Gradle project sync in progress...

1 PhoneMessaging - Solution Code

2 =====

3

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25

26 Getting Started

27 =====

28

29 1. Download the code.

30 2. Open the code in Android Studio.

31 3. Run the app.

32

33

34 License

35 =====

36

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38

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41 additional information regarding copyright ownership. The ASF licenses this

42 file to you under the Apache License, Version 2.0 (the "License"); you may not

43 use this file except in compliance with the license. You may obtain a copy of

TODO Terminal Build

Gradle sync started (moments ago)

Gradle: Configure projects...

1:1 LF UTF-8 4 spaces

Event Log

# Lập trình xử lý dịch vụ và thông báo - Services and Notifications

PhoneMessaging - README.md [PhoneMessaging] - Android Studio - Administrator

Project: PhoneMessaging

app

Gradle Scripts

Resource Manager

Build Variants

Z-Favorites

Gradle

Emulator

Device File Explorer

1 PhoneMessaging - Solution Code

2

3

4 App for demonstrating how to pass a phone number

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29 1. Download the code.

30 2. Open the code in Android Studio.

31 3. Run the app.

32

33

34 License

35

36

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38

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41 additional information regarding copyright ownership. The ASF licenses this

42 file to you under the Apache License, Version 2.0 (the "License"); you may not

43 use this file except in compliance with the License. You may obtain a copy of

44 the license at

1:1 LF UTF-8 4 spaces

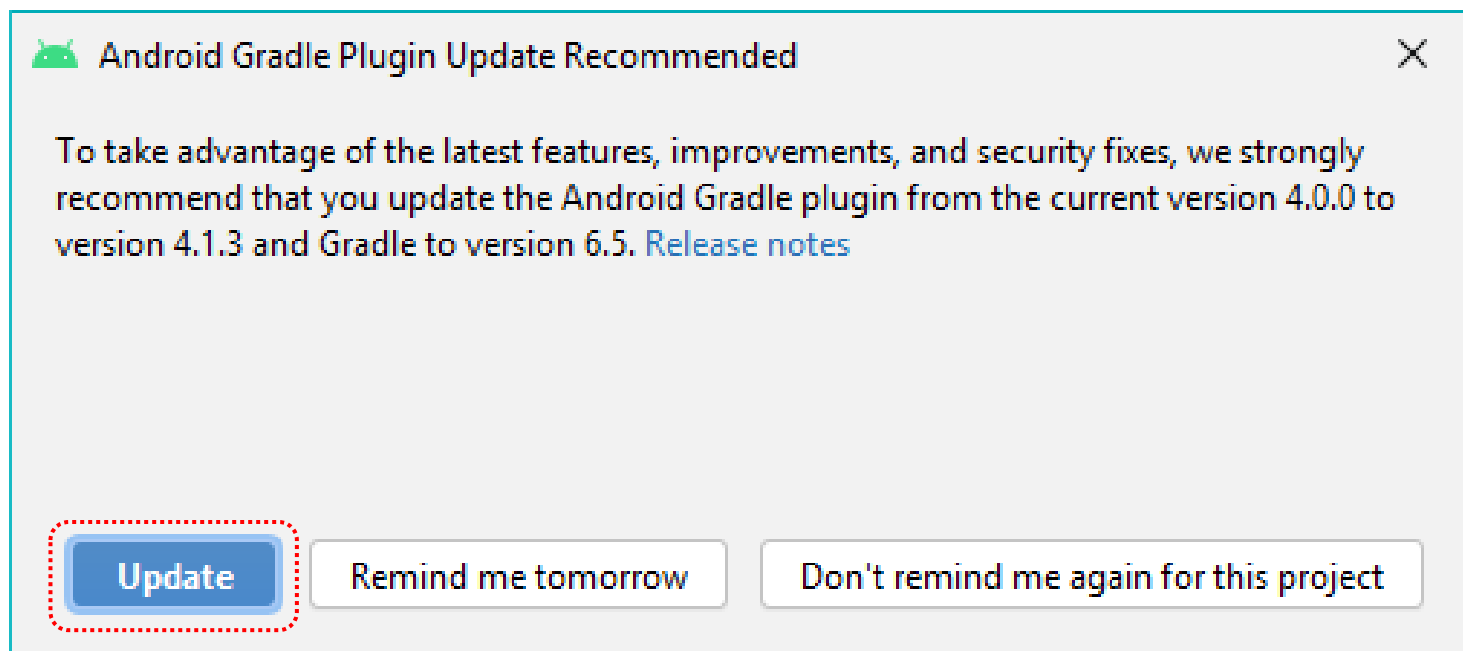
Gradle sync finished in 26 s 290 ms (moments ago)

Event Log Layout Inspector

Plugin Update Recommended

Android Gradle Plugin is ready to [update](#).

# Lập trình xử lý dịch vụ và thông báo - Services and Notifications

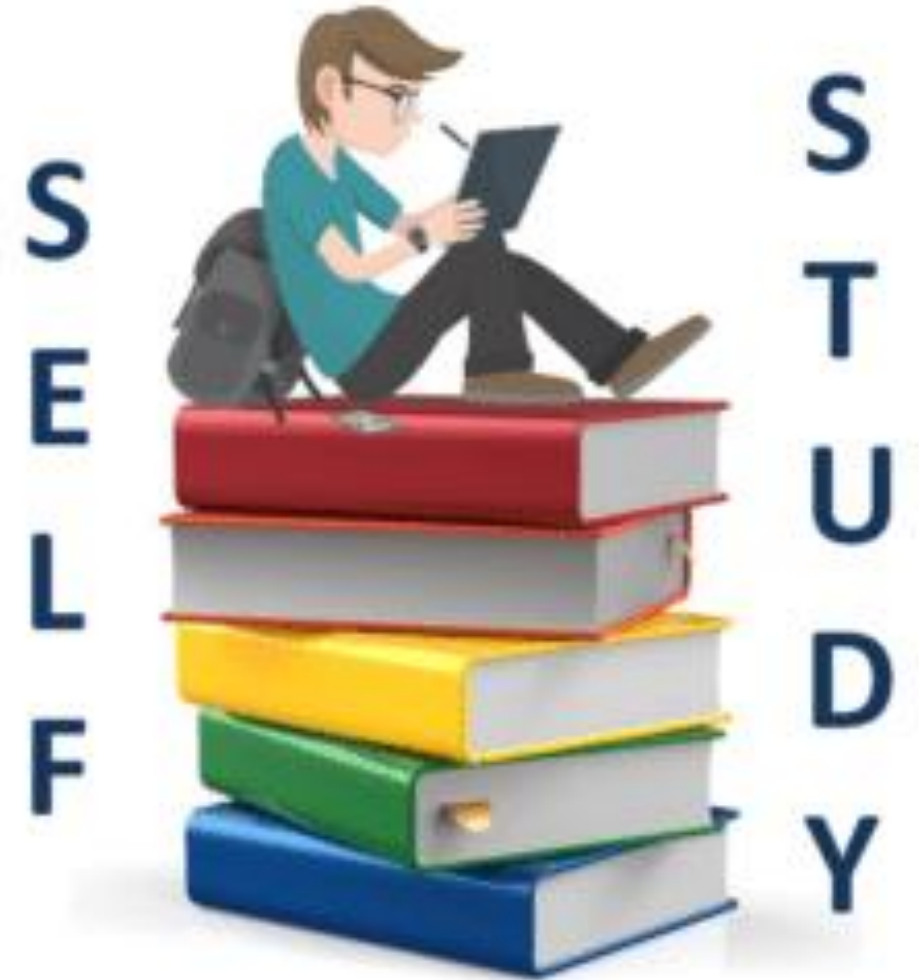
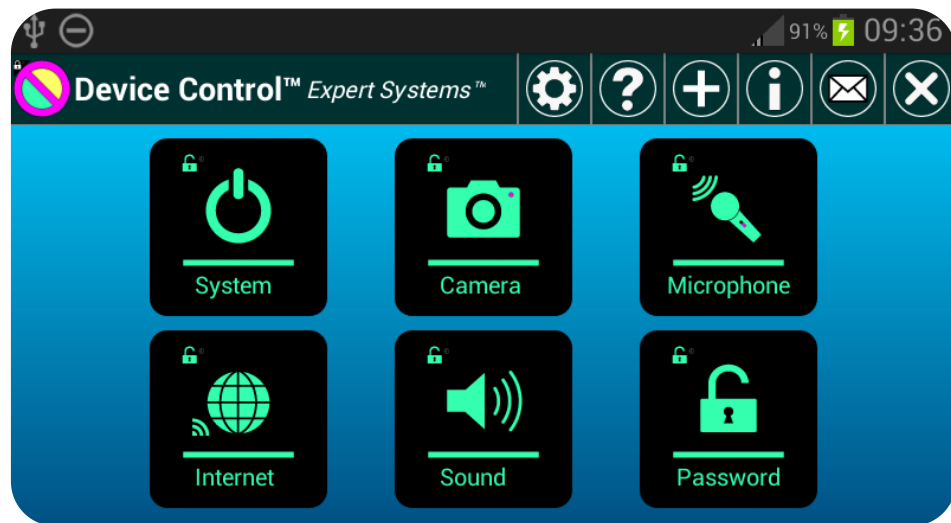


# Lập trình với các dịch vụ hệ thống và điều khiển thiết bị

## Control external devices

In Android 11 and later, the Quick Access Device Controls feature allows the user to quickly view and control external devices such as lights, thermostats, and cameras from a user affordance within three interactions from a default launcher.

<https://developer.android.com/guide/topics/ui/device-control>





**HUST**

**THANK YOU !**

# Lập trình ứng dụng di động

# Mobile Application Programming

## ET4710

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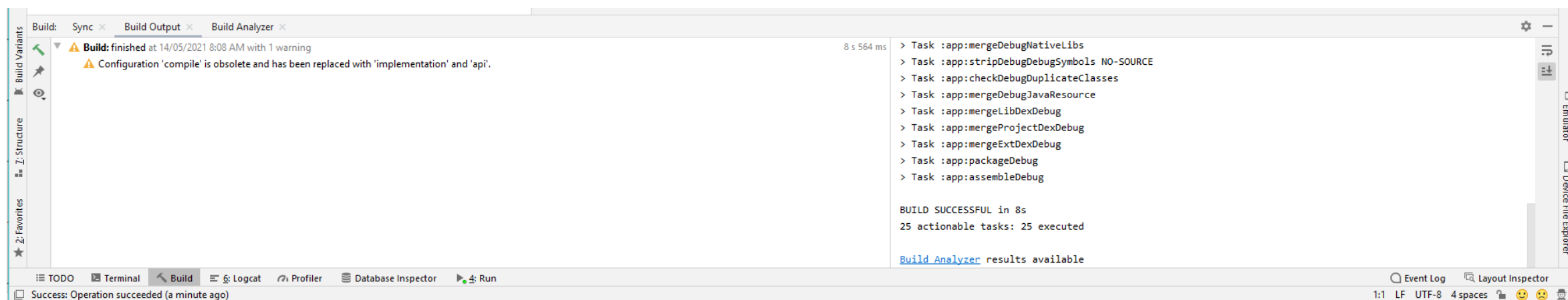
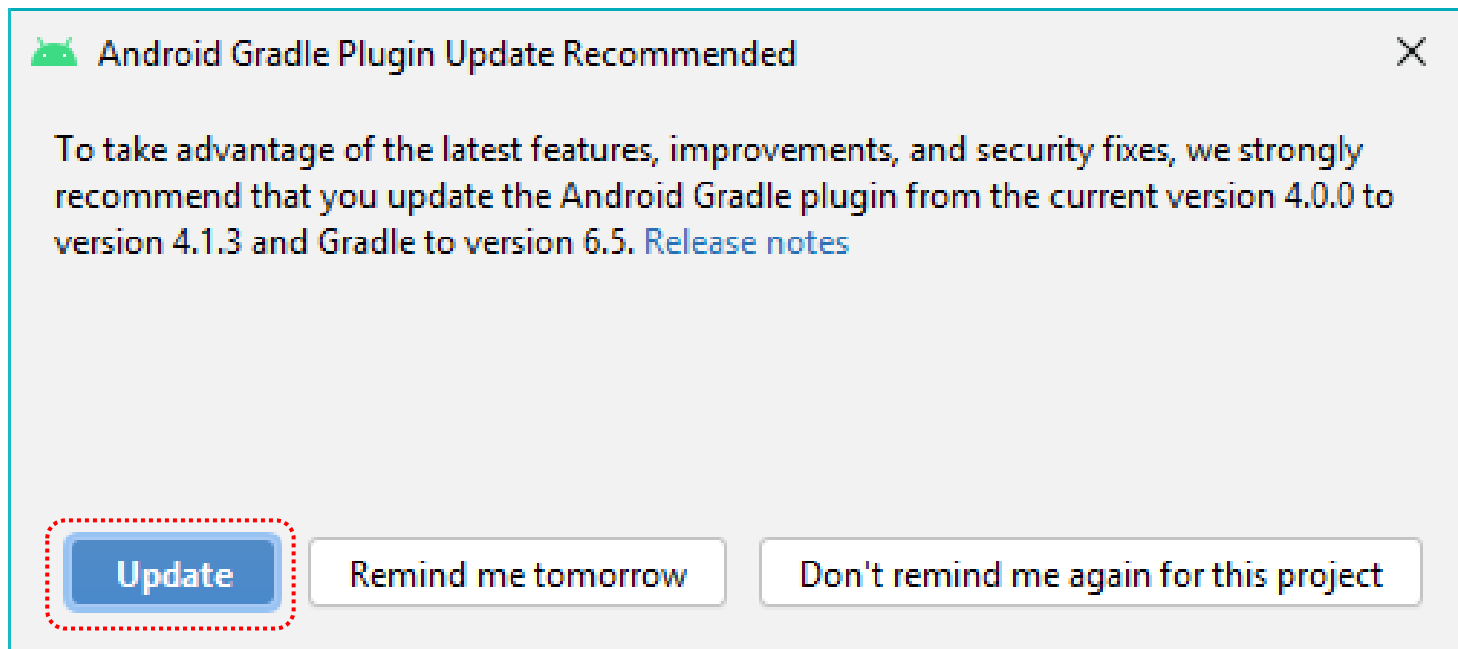


<https://github.com/shishirthedev/sms-verification-api-android>

<https://stackoverflow.com/questions/848728/how-can-i-read-sms-messages-from-the-device-programmatically-in-android>

<https://viblo.asia/p/tong-quan-service-trong-android-maGK7M8elj2>

# Lập trình xử lý dịch vụ và thông báo - Services and Notifications



# Lập trình xử lý dịch vụ và thông báo - Services and Notifications

The screenshot shows the Android Developer website with the URL `developer.android.com/reference/android/content/pm/PackageManager.html#resolveActivity(android.content.Intent,%20int)`. The page is titled "PackageManager" and is part of the "Reference" section. The left sidebar lists various classes and methods, with "PackageManager" highlighted. The main content area shows the `resolveActivity` method signature: `public abstract ResolveInfo resolveActivity (Intent intent, int flags)`. Below the signature, there is a description: "Determine the best action to perform for a given Intent. This is how `Intent#resolveActivity` finds an activity if a class has not been explicitly specified." A note follows: "Note: if using an implicit Intent (without an explicit ComponentName specified), be sure to consider whether to set the `MATCH_DEFAULT_ONLY` only flag. You need to do so to resolve the activity in the same way that `Context.startActivity(Intent)` and `Intent.resolveActivity(PackageManager)` do." The bottom of the page shows a "Parameters" section.

PackageManager | Android Dev x +

developer.android.com/reference/android/content/pm/PackageManager.html#resolveActivity(android.content.Intent,%20int)

Apps 1.4. NumPy: creatin... BCPy2000: Migration (20+) Trường THCS... Trường THCS Ngoại... Thầy và trò Trường... Lớp bồi dưỡng kiến... Nam Mô Bụt Thích... GitHub - robmarkc... [Kinh Tiếng Phạn ~... Tổng Hợp Những B... Tổng hợp các bài P...

developers Platform Android Studio Docs More Search English Do

Overview Guides Reference Samples Design & Quality

SessionCallback  
PackageInstaller.  
SessionInfo  
PackageInstaller.  
SessionParams  
PackageItemInfo  
PackageItemInfo.  
DisplayNameComparator  
**PackageManager**  
PackageManager.Property  
PackageStats  
PathPermission  
PermissionGroupInfo  
PermissionInfo

**resolveActivity** Added in API level 1

```
public abstract ResolveInfo resolveActivity (Intent intent,
                                             int flags)
```

Determine the best action to perform for a given Intent. This is how `Intent#resolveActivity` finds an activity if a class has not been explicitly specified.

Note: if using an implicit Intent (without an explicit ComponentName specified), be sure to consider whether to set the `MATCH_DEFAULT_ONLY` only flag. You need to do so to resolve the activity in the same way that `Context.startActivity(Intent)` and `Intent.resolveActivity(PackageManager)` do.

Parameters

Type here to search

6:13 AM 14/05/2021