**Android Intent and Filter**

Android Intent là một đối tượng mang một intent ví dụ một message từ một thành phần này đến thành phần khác bên trong một ứng dụng hoặc bên ngoài ứng dụng. các intent có thể trao đổi các message giữa ba thành phần của ứng dụng: activity, service, broadcast receiver.

Ví dụ: bạn có một activity để khởi động email client và gửi một email. Activity của bạn sẽ gửi một ACTION\_SEND cùng với chooser thích hợp đến Android Intent Resolver

Nếu Activity muốn mở một URL trong trình duyệt web, nó gửi một intent ACTION\_WEB\_SEARCH đến Android Intent Resolver để mở URL.

Có nhiều cơ chế để khởi động intent với mỗi loại activity, service hay broadcast receiver.

startActivity(intent): khởi tạo một activity mới hoặc yêu cầu activity làm một việc gì đó

startService(): khởi tạo một service hoặc gửi một lệnh mới tới service đang chạy

sendBroadcast(): gửi message đến tât cả các broadcast receiver

Intent object: là một khối thông tin được sử dụng bởi thành phần nhận thông tin kèm theo của Android. Một Intent object có thể chứa các thành phần sau, phục thuộc vào thông tin sẽ trao đổi hoặc công việc sẽ thực thi.

ACTION: là phần chính của intent object

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| --- | --- |
| 1 | **ACTION\_ALL\_APPS**  List all the applications available on the device. |
| 2 | **ACTION\_ANSWER**  Handle an incoming phone call. |
| 3 | **ACTION\_ATTACH\_DATA**  Used to indicate that some piece of data should be attached to some other place |
| 4 | **ACTION\_BATTERY\_CHANGED**  This is a sticky broadcast containing the charging state, level, and other information about the battery. |
| 5 | **ACTION\_BATTERY\_LOW**  This broadcast corresponds to the "Low battery warning" system dialog. |
| 6 | **ACTION\_BATTERY\_OKAY**  This will be sent after ACTION\_BATTERY\_LOW once the battery has gone back up to an okay state. |
| 7 | **ACTION\_BOOT\_COMPLETED**  This is broadcast once, after the system has finished booting. |
| 8 | **ACTION\_BUG\_REPORT**  Show activity for reporting a bug. |
| 9 | **ACTION\_CALL**  Perform a call to someone specified by the data. |
| 10 | **ACTION\_CALL\_BUTTON**  The user pressed the "call" button to go to the dialer or other appropriate UI for placing a call. |
| 11 | **ACTION\_CAMERA\_BUTTON**  The "Camera Button" was pressed. |
| 12 | **ACTION\_CHOOSER**  Display an activity chooser, allowing the user to pick what they want to before proceeding. |
| 13 | **ACTION\_CONFIGURATION\_CHANGED**  The current device Configuration (orientation, locale, etc) has changed. |
| 14 | **ACTION\_DATE\_CHANGED**  The date has changed. |
| 15 | **ACTION\_DEFAULT**  A synonym for ACTION\_VIEW, the "standard" action that is performed on a piece of data. |
| 16 | **ACTION\_DELETE**  Delete the given data from its container. |
| 17 | **ACTION\_DEVICE\_STORAGE\_LOW**  A sticky broadcast that indicates low memory condition on the device. |
| 18 | **ACTION\_DEVICE\_STORAGE\_OK**  Indicates low memory condition on the device no longer exists. |
| 19 | **ACTION\_DIAL**  Dial a number as specified by the data. |
| 20 | **ACTION\_DOCK\_EVENT**  A sticky broadcast for changes in the physical docking state of the device. |
| 21 | **ACTION\_DREAMING\_STARTED**  Sent after the system starts dreaming. |
| 22 | **ACTION\_DREAMING\_STOPPED**  Sent after the system stops dreaming. |
| 23 | **ACTION\_EDIT**  Provide explicit editable access to the given data. |
| 24 | **ACTION\_FACTORY\_TEST**  Main entry point for factory tests. |
| 25 | **ACTION\_GET\_CONTENT**  Allow the user to select a particular kind of data and return it. |
| 26 | **ACTION\_GTALK\_SERVICE\_CONNECTED**  A GTalk connection has been established. |
| 27 | **ACTION\_GTALK\_SERVICE\_DISCONNECTED**  A GTalk connection has been disconnected. |
| 28 | **ACTION\_HEADSET\_PLUG**  Wired Headset plugged in or unplugged. |
| 29 | **ACTION\_INPUT\_METHOD\_CHANGED**  An input method has been changed. |
| 30 | **ACTION\_INSERT**  Insert an empty item into the given container. |
| 31 | **ACTION\_INSERT\_OR\_EDIT**  Pick an existing item, or insert a new item, and then edit it. |
| 32 | **ACTION\_INSTALL\_PACKAGE**  Launch application installer. |
| 33 | **ACTION\_LOCALE\_CHANGED**  The current device's locale has changed. |
| 34 | **ACTION\_MAIN**  Start as a main entry point, does not expect to receive data. |
| 35 | **ACTION\_MEDIA\_BUTTON**  The "Media Button" was pressed. |
| 36 | **ACTION\_MEDIA\_CHECKING**  External media is present, and being disk-checked. |
| 37 | **ACTION\_MEDIA\_EJECT**  User has expressed the desire to remove the external storage media. |
| 38 | **ACTION\_MEDIA\_REMOVED**  External media has been removed. |
| 39 | **ACTION\_NEW\_OUTGOING\_CALL**  An outgoing call is about to be placed. |
| 40 | **ACTION\_PASTE**  Create a new item in the given container, initializing it from the current contents of the clipboard. |
| 41 | **ACTION\_POWER\_CONNECTED**  External power has been connected to the device. |
| 42 | **ACTION\_REBOOT**  Have the device reboot. This is only for use by system code. |
| 43 | **ACTION\_RUN**  Run the data, whatever that means. |
| 44 | **ACTION\_SCREEN\_OFF**  Sent after the screen turns off. |
| 45 | **ACTION\_SCREEN\_ON**  Sent after the screen turns on. |
| 46 | **ACTION\_SEARCH**  Perform a search. |
| 47 | **ACTION\_SEND**  Deliver some data to someone else. |
| 48 | **ACTION\_SENDTO**  Send a message to someone specified by the data. |
| 49 | **ACTION\_SEND\_MULTIPLE**  Deliver multiple data to someone else. |
| 50 | **ACTION\_SET\_WALLPAPER**  Show settings for choosing wallpaper. |
| 51 | **ACTION\_SHUTDOWN**  Device is shutting down. |
| 52 | **ACTION\_SYNC**  Perform a data synchronization. |
| 53 | **ACTION\_TIMEZONE\_CHANGED**  The timezone has changed. |
| 54 | **ACTION\_TIME\_CHANGED**  The time was set. |
| 55 | **ACTION\_VIEW**  Display the data to the user. |
| 56 | **ACTION\_VOICE\_COMMAND**  Start Voice Command. |
| 57 | **ACTION\_WALLPAPER\_CHANGED**  The current system wallpaper has changed. |
| 58 | **ACTION\_WEB\_SEARCH**  Perform a web search. |

Có thể đặt thuộc tính ACTION bằng method setAction(), đọc thuộc tính bằng method getAction()

DATA: setData(), getData(), getType()

CATEGORY:

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| --- | --- |
| 1 | **CATEGORY\_APP\_BROWSER**  Used with ACTION\_MAIN to launch the browser application. |
| 2 | **CATEGORY\_APP\_CALCULATOR**  Used with ACTION\_MAIN to launch the calculator application. |
| 3 | **CATEGORY\_APP\_CALENDAR**  Used with ACTION\_MAIN to launch the calendar application. |
| 4 | **CATEGORY\_APP\_CONTACTS**  Used with ACTION\_MAIN to launch the contacts application. |
| 5 | **CATEGORY\_APP\_EMAIL**  Used with ACTION\_MAIN to launch the email application. |
| 6 | **CATEGORY\_APP\_GALLERY**  Used with ACTION\_MAIN to launch the gallery application. |
| 7 | **CATEGORY\_APP\_MAPS**  Used with ACTION\_MAIN to launch the maps application. |
| 8 | **CATEGORY\_APP\_MARKET**  This activity allows the user to browse and download new applications. |
| 9 | **CATEGORY\_APP\_MESSAGING**  Used with ACTION\_MAIN to launch the messaging application. |
| 10 | **CATEGORY\_APP\_MUSIC**  Used with ACTION\_MAIN to launch the music application. |
| 11 | **CATEGORY\_BROWSABLE**  Activities that can be safely invoked from a browser must support this category. |
| 12 | **CATEGORY\_CAR\_DOCK**  An activity to run when device is inserted into a car dock. |
| 13 | **CATEGORY\_CAR\_MODE**  Used to indicate that the activity can be used in a car environment. |
| 14 | **CATEGORY\_DEFAULT**  Set if the activity should be an option for the default action (center press) to perform on a piece of data. |
| 15 | **CATEGORY\_DESK\_DOCK**  An activity to run when device is inserted into a car dock. |
| 16 | **CATEGORY\_DEVELOPMENT\_PREFERENCE**  This activity is a development preference panel. |
| 17 | **CATEGORY\_EMBED**  Capable of running inside a parent activity container. |
| 18 | **CATEGORY\_FRAMEWORK\_INSTRUMENTATION\_TEST**  To be used as code under test for framework instrumentation tests. |
| 19 | **CATEGORY\_HE\_DESK\_DOCK**  An activity to run when device is inserted into a digital (high end) dock. |
| 20 | **CATEGORY\_HOME**  This is the home activity, that is the first activity that is displayed when the device boots. |
| 21 | **CATEGORY\_INFO**  Provides information about the package it is in. |
| 22 | **CATEGORY\_LAUNCHER**  Should be displayed in the top-level launcher. |
| 23 | **CATEGORY\_LE\_DESK\_DOCK**  An activity to run when device is inserted into a analog (low end) dock. |
| 24 | **CATEGORY\_MONKEY**  This activity may be exercised by the monkey or other automated test tools. |
| 25 | **CATEGORY\_OPENABLE**  Used to indicate that a GET\_CONTENT intent only wants URIs that can be opened with ContentResolver.openInputStream. |
| 26 | **CATEGORY\_PREFERENCE**  This activity is a preference panel. |
| 27 | **CATEGORY\_TAB**  Intended to be used as a tab inside of a containing TabActivity. |
| 28 | **CATEGORY\_TEST**  To be used as a test (not part of the normal user experience). |
| 29 | **CATEGORY\_UNIT\_TEST**  To be used as a unit test (run through the Test Harness).  EXTRACT:   |  |  | | --- | --- | | 1 | **EXTRA\_ALARM\_COUNT**  Used as an int extra field in AlarmManager intents to tell the application being invoked how many pending alarms are being delievered with the intent. | | 2 | **EXTRA\_ALLOW\_MULTIPLE**  Used to indicate that a ACTION\_GET\_CONTENT intent can allow the user to select and return multiple items. | | 3 | **EXTRA\_ALLOW\_REPLACE**  Used as a boolean extra field with ACTION\_INSTALL\_PACKAGE to install a package. | | 4 | **EXTRA\_BCC**  A String[] holding e-mail addresses that should be blind carbon copied. | | 5 | **EXTRA\_CC**  A String[] holding e-mail addresses that should be carbon copied. | | 6 | **EXTRA\_CHANGED\_COMPONENT\_NAME\_LIST**  This field is part of ACTION\_PACKAGE\_CHANGED, and contains a string array of all of the components that have changed. | | 7 | **EXTRA\_DATA\_REMOVED**  Used as a boolean extra field in ACTION\_PACKAGE\_REMOVED intents to indicate whether this represents a full uninstall or a partial uninstall | | 8 | **EXTRA\_DOCK\_STATE**  Used as an int extra field in ACTION\_DOCK\_EVENT intents to request the dock state. | | 9 | **EXTRA\_DOCK\_STATE\_CAR**  Used as an int value for EXTRA\_DOCK\_STATE to represent that the phone is in a car dock. | | 10 | **EXTRA\_DOCK\_STATE\_DESK**  Used as an int value for EXTRA\_DOCK\_STATE to represent that the phone is in a desk dock. | | 11 | **EXTRA\_EMAIL**  A String[] holding e-mail addresses that should be delivered to. | | 12 | **EXTRA\_HTML\_TEXT**  A constant String that is associated with the Intent, used with ACTION\_SEND to supply an alternative to EXTRA\_TEXT as HTML formatted text. | | 13 | **EXTRA\_INTENT**  An Intent describing the choices you would like shown with ACTION\_PICK\_ACTIVITY. | | 14 | **EXTRA\_KEY\_EVENT**  A KeyEvent object containing the event that triggered the creation of the Intent it is in. | | 15 | **EXTRA\_LOCAL\_ONLY**  Used to indicate that a ACTION\_GET\_CONTENT intent should only return data that is on the local device. | | 16 | **EXTRA\_ORIGINATING\_URI**  Used as a URI extra field with ACTION\_INSTALL\_PACKAGE and ACTION\_VIEW to indicate the URI from which the local APK in the Intent data field originated from. | | 17 | **EXTRA\_PHONE\_NUMBER**  A String holding the phone number originally entered in ACTION\_NEW\_OUTGOING\_CALL, or the actual number to call in a ACTION\_CALL. | | 18 | **EXTRA\_SHORTCUT\_ICON**  The name of the extra used to define the icon, as a Bitmap, of a shortcut. | | 19 | **EXTRA\_SHORTCUT\_INTENT**  The name of the extra used to define the Intent of a shortcut. | | 20 | **EXTRA\_SHORTCUT\_NAME**  The name of the extra used to define the name of a shortcut. | | 21 | **EXTRA\_STREAM**  URI holding a stream of data associated with the Intent, used with ACTION\_SEND to supply the data being sent. | | 22 | **EXTRA\_SUBJECT**  A constant string holding the desired subject line of a message. | | 23 | **EXTRA\_TEMPLATE**  The initial data to place in a newly created record. Use with ACTION\_INSERT. | | 24 | **EXTRA\_TEXT**  A constant CharSequence that is associated with the Intent, used with ACTION\_SEND to supply the literal data to be sent. | | 25 | **EXTRA\_TITLE**  A CharSequence dialog title to provide to the user when used with a ACTION\_CHOOSER. | | 26 | **EXTRA\_UID**  Used as an int extra field in ACTION\_UID\_REMOVED intents to supply the uid the package had been assigned. | |

FLAGS: các cờ là phần không bắt buộc quy định cách thức khởi chạy activity, và hành động sau khi khởi động.

COMPONENT NAME: thay thế cho Activity, service hoặc lớp BroadcastReceiver. Đặt thuộc tính này bằng hàm setComponent(), setClass(), setClassName(), đọc bằng hàm: getComponent().

Các loại Intent: có hai loại:

* Explicit intent: intent này gọi target bằng tên

// Explicit Intent by specifying its class name

Intent i = new Intent(this, TargetActivity.class);

i.putExtra("Key1", "ABC");

i.putExtra("Key2", "123");

// Starts TargetActivity

startActivity(i);

**Implicit Intents**

Intent này không gọi tên target . Intent này thường dùng để kích hoạt các thành phần trong các ứng dụng khác. Ví dụ:

// Implicit Intent by specifying a URI

Intent i = new Intent(Intent.ACTION\_VIEW,

Uri.parse("http://www.example.com"));

// Starts Implicit Activity

startActivity(i);

Thành phần đích nhận intent có thể sử dụng getExtras() để lấy extra data. Ví dụ:

// Get bundle object at appropriate place in your code

Bundle extras = getIntent().getExtras();

// Extract data using passed keys

String value1 = extras.getString("Key1");

String value2 = extras.getString("Key2");

Ví dụ mẫu:

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| Bước | Mô tả |
| 1 | Sử dụng Android Stuido tạo một ứng dụng mới, đặt tên là intentDemo |
| 2 | Thay đổi nội dung của file MainActivity.java, thêm code định nghĩa hai listener tương ứng với hai nút Start Browser và Start Phone |
| 3 | Thêm 3 button vào file activity\_main.xml |
| 4 | Định nghĩa các chuỗi trong strings.xml |
| 5 | Chạy thử ứng dụng |

Nội dung MainActivity.java

package com.example.intentdemo;

import android.net.Uri;

import android.os.Bundle;

import android.app.Activity;

import android.content.Intent;

import android.view.Menu;

import android.view.View;

import android.widget.Button;

public class MainActivity extends Activity {

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);

Button startBrowser = (Button) findViewById(R.id.start\_browser);

startBrowser.setOnClickListener(new View.OnClickListener() {

public void onClick(View view) {

Intent i = new Intent(android.content.Intent.ACTION\_VIEW,

Uri.parse("http://www.example.com"));

startActivity(i);

}

});

Button startPhone = (Button) findViewById(R.id.start\_phone);

startPhone.setOnClickListener(new View.OnClickListener() {

public void onClick(View view) {

Intent i = new Intent(android.content.Intent.ACTION\_VIEW,

Uri.parse("tel:9510300000"));

startActivity(i);

}

});

}

@Override

public boolean onCreateOptionsMenu(Menu menu) {

// Inflate the menu; this adds items to the action

// bar if it is present.

getMenuInflater().inflate(R.menu.main, menu);

return true;

}

}

Nội dung file **activity\_main.xml:**

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"

android:layout\_width="fill\_parent"

android:layout\_height="fill\_parent"

android:orientation="vertical" >

<Button android:id="@+id/start\_browser"

android:layout\_width="fill\_parent"

android:layout\_height="wrap\_content"

android:text="@string/start\_browser"/>

<Button android:id="@+id/start\_phone"

android:layout\_width="fill\_parent"

android:layout\_height="wrap\_content"

android:text="@string/start\_phone" />

</LinearLayout>

Nội dung file **strings.xml**

<?xml version="1.0" encoding="utf-8"?>

<resources>

<string name="app\_name">IntentDemo</string>

<string name="action\_settings">Settings</string>

<string name="hello\_world">Hello world!</string>

<string name="start\_browser">Start Browser</string>

<string name="start\_phone">Start Phone</string>

</resources>

Nội dung file **AndroidManifest.xml**

<?xml version="1.0" encoding="utf-8"?>

<manifest xmlns:android="http://schemas.android.com/apk/res/android"

package="com.example.intentdemo"

android:versionCode="1"

android:versionName="1.0" >

<uses-sdk

android:minSdkVersion="8"

android:targetSdkVersion="17" />

<application

android:allowBackup="true"

android:icon="@drawable/ic\_launcher"

android:label="@string/app\_name"

android:theme="@style/AppTheme" >

<activity

android:name="com.example.intentdemo.MainActivity"

android:label="@string/app\_name" >

<intent-filter>

<action android:name="android.intent.action.MAIN" />

<category android:name="android.intent.category.LAUNCHER" />

</intent-filter>

</activity>

</application>

</manifest>