AppWidget is the class: https://developer.android.com/guide/topics/appwidgets

"Disconnected Views" on the home screen or other apps

Updated by a background process

Usually updated on a regular basis

Examples:

Weather widget, Time Widget, E-mail Widget, Google search bar

Basic Components

View (@layout/bday_widget) -- for the widget view

Appwidget definition (res/xml -- appwidget-provider)

```xml
<appwidget-provider xmlns:android="http://schemas.android.com/apk/res/android"
    android:minWidth="150dp"
    android:minHeight="120dp"
    android:updatePeriodMillis="100000"
    android:initialLayout="@layout/bday_widget"
    android:label="My Birthday widget"
    android:configure="com.androidbook.BDayWidget.ConfigureBDayWidgetActivity"
>
</appwidget-provider>
```

AppWidgetProvider -- "receiver" for app widget control

Optional Activity to configure the widget

RemoteView -- Access to the widget views from Provider/Activity
AppWidgetProvider life cycle

- `void onEnabled(Context context)` -- called when first widget is to be created
- `void onDisabled(Context context)` -- called after last widget has been deleted
- `void onUpdate(Context c, AppWidgetManager awm, int[] Ids)`
  - called at update time as scheduled in appwidget-provider
  - provider may be recreated each time an `onUpdate()` is called
    - can’t use instance variable or static variables
  - `onUpdate()` called once for ALL instances of widgets for this app
- On creation of app widget (via the creation method, context menu ...)
  - one of the following will happen
    - Configuration Activity is started
    - OR `onUpdate()` will be called
  - Regardless of which one is called, it must instantiate the initial view
  - Configuration Activity can create a different view to get user input ...
  - Each app widget gets its own unique id (int)
- `void onDelete(Context context, int[] widgetIds)` -- called when widgets deleted
Remote Views ...

RemoteViews views = new RemoteViews(context.getPackageName(),
    R.layout.bday_widget);
views.setTextViewText(R.id.bdw_w_name,
    widgetModel.getName() + ":" + widgetModel.iid);
views.setTextViewText(R.id.bdw_w_date, widgetModel.getBday());
views.setTextViewText(R.id.bdw_w_days,
    Long.toString(widgetModel.howManyDays()));

Intent defineIntent = new Intent(Intent.ACTION_VIEW,
    Uri.parse("http://www.google.com"));
PendingIntent pendingIntent =
    PendingIntent.getActivity(context,
        0 /* no requestCode */,
        defineIntent,
        0 /* no flags */);
views.setOnClickPendingIntent(R.id.bdw_w_button_buy, pendingIntent);
(setOnClickFillInIntet() for collections...)
appWidgetManager.updateAppWidget(widgetModel.iid, views);
StackWidget example from Google

- No configuration Activity
- Check out the remote views
- Can do a toast action!
- Android studion won’t "run" this app

adb (/home/youruser/Android/Sdk/platform-tools/adb) installs
  - Build -> Build APKs
  - find .apk ( find . -name *.apk )
  - adb install app/build/outputs/apk/debug/app-debug.apk

To run it:
  - Long click on home screen
  - select "widgets"
  - Look for your widget!
  - Add it to the home screen
  - interact with your widget