



# SMART DEVICE PROGRAMMING

6133

# ANDROID APPLICATION COMPONENTS

- ✓ Android application components are basic, but essential, building blocks of any android application.
- ✓ Each component is an entry point through which the system or user can enter your app.
- ✓ There are 4 main components of any android application.
  1. Activities
  2. Services
  3. Broadcast Receivers
  4. Content Providers

# 1. Activities

- ✓ An activity is single screen with user interface.
- ✓ All activity are independent from each other i.e. they do not depend on each other to show something.
- ✓ They are standalone. However, one activity can start another activity when required.
- ✓ An activity provides following features :
  1. It keeps track of the what the user currently using..i.e. what is on the screen right now.
  2. It keeps track of the previously visited activities or other things so that user may return to it whenever needed. It also store the state of the activity before closing the activity so that it can restore the state whenever needed.

3. It also provides a way for apps to implement user flows between each other, and for the system to coordinate these flows.

- ✓ If any application has more than one activity, one of them is made launcher activity.
- ✓ Launcher activity is launched when application is started.
- ✓ An activity is implemented as subclass of Activity class.
- ✓ You can create an activity as below

```
public class MainActivity extends Activity {  
  
}
```

## 2. Services

- ✓ A service is component that runs in background to perform long running operations or to perform work for remote processes.
- ✓ For example, A service may play music in the background while the user is using a different application. A service may upload file to server from the server while the user is using a different application.
- ✓ A service does not provide user interface. You can declare the service as below.

```
public class MyService extends Service {  
    }  
}
```



✓ Generally Android Service are of 2 types.

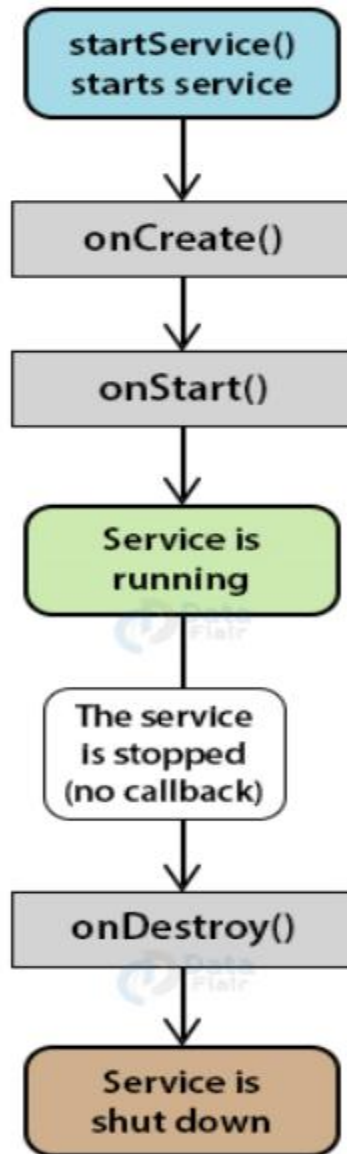
- **Started Service (Unbounded)**

This type of service is created and called by Android Activities. There is no 2 way communication between Android Activity and Service. The Activity just starts the service and does not care about the status of the service. The Service will finish it's work and automatically stops when finish it's job.

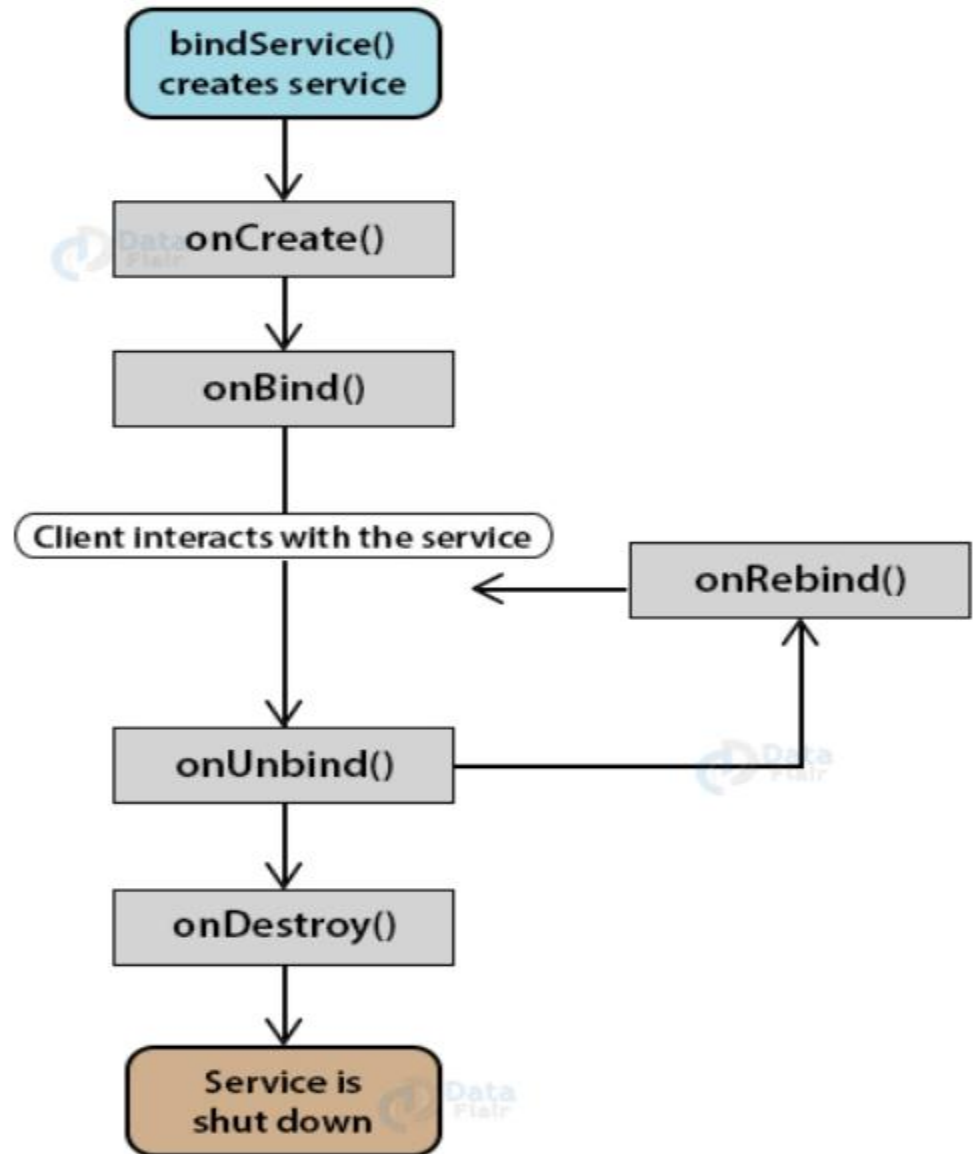
- **Bound Service (Bounded)**

This type of Android Service is for 2 way communication. Suppose an Android Activity has started a bounded service, then Activity can be notified about the status by the service.

# Life-Cycle of Android Services



UN Bounded Service



Bounded Services

### 3. Broadcast Receivers

- ✓ A broadcast receiver is a component that receive information, broadcasted by other applications or by the system, and take some actions accordingly.
- ✓ For example, An app can schedule an alarm to notify the user at any specified time.
- ✓ Another example is notify the user when battery is low.
- ✓ Although the user do not show user interface, it can create status bar notifications to alert the user to take a specific action.
- ✓ A broadcast receiver is implemented as subclass of BroadcastReceiver.

```
public class MyReceiver extends BroadcastReceiver {  
    public void onReceive(context,intent){ }  
}
```



## 4. Content Providers

- ✓ Content providers make the content of any file system, SQLite database, or on any other persistent storage, available to any other applications.
- ✓ That is we can use content providers to get a specific set of data in any application.
- ✓ Means it acts as bridge between the data and the application. you can also access many native databases using content providers.
- ✓ For example, you can access contacts using ContactManager. You must have proper permissions to access data of other applications.

- ✓ You can implement Content Providers by subclassing ContentProvider as below –

```
public class MyProvider extends ContentProvider {  
    public void onCreate(){}  
}
```

- ✓ Let's take an example: If you want to search a contact in your contact database (Like: name, number etc), then you can use Content Provider for this purpose.
- ✓ You can say Content provider is the pointer in your application which points to a specific database from other application.