

Services

Lesson 9



Contents

- Services for long tasks.
- IntentService



Services is an advanced topic

- Services are complex.
- Many ways of configuring a service.
- This lesson has introductory information only.
- Explore and learn for yourself if you want to use services.

Services for Long Tasks

What is a service?

A Service is an application component that can perform long-running operations in the background and does not provide a user interface.



What are services good for?

- Network transactions.
- Play music.
- Perform file I/O.
- Interact with a database.

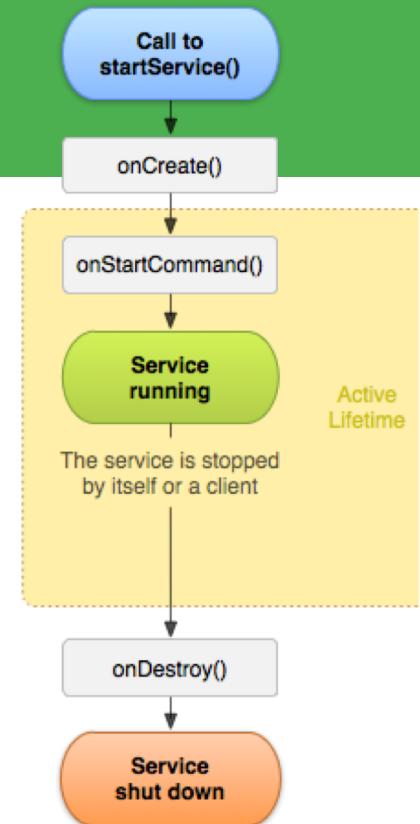


Characteristics of services

- Started with an Intent.
- Can stay running when user switches applications.
- Lifecycle—which you must manage.
- Other apps can use the service—manage permissions.
- Runs in the main thread of its hosting process.

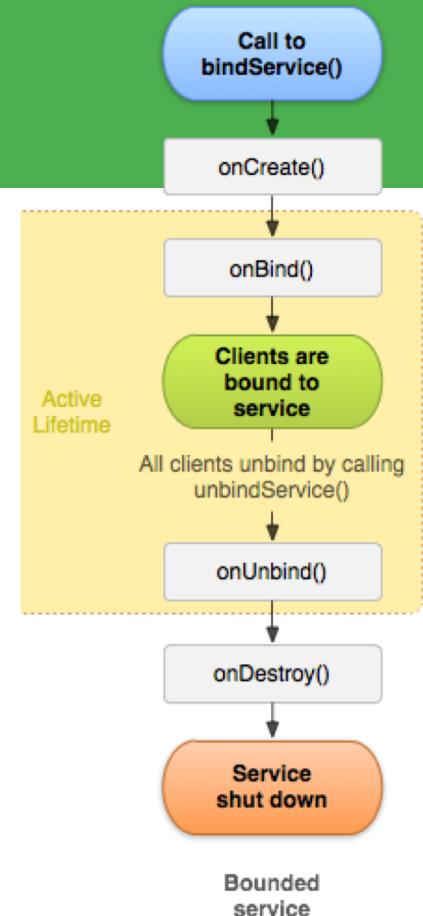
Forms of services: started

- Started with `startService()`
- Runs indefinitely until it stops itself
- Usually does not update the UI



Forms of services: bound

- Offers a client-server interface that allows components to interact with the service
- Clients send requests and get results
- Started with `bindService()`
- Ends when all clients unbind



Services and threads

Although services are separate from the UI, they still run on the main thread by default (except IntentService)

Offload CPU-intensive work to a separate thread within the service

Updating the app

If the service can't access the UI, how do you update the app to show the results?

Use a broadcast receiver!

Foreground services

Runs in the background but requires that the user is actively aware it exists—e.g. music player using music service

- Higher priority than background services since user will notice its absence—unlikely to be killed by the system
- Must provide a notification which the user cannot dismiss while the service is running

Background services limitations

- Starting from API 26, background app is not allowed to create a background service.
- A foreground app, can create and run both foreground and background services.
- When an app goes into the background, the system stops the app's background services.
- The `startService()` method now throws an [IllegalStateException](#) if an app is targeting API 26.
- These limitations don't affect foreground services or bound services.

Creating a service

- <service android:name=".ExampleService" />
- Manage permissions.
- Subclass IntentService or Service class.
- Implement lifecycle methods.
- Start service from Activity.
- Make sure service is stoppable.



Stopping a service

- A **started service** must manage its own lifecycle
- If not stopped, will keep running and consuming resources
- The service must stop itself by calling [stopSelf\(\)](#)
- Another component can stop it by calling [stopService\(\)](#)
- **Bound service** is destroyed when all clients unbound
- **IntentService** is destroyed after `onHandleIntent()` returns



IntentService

IntentService

- Simple service with simplified lifecycle
- Uses worker threads to fulfill requests
- Stops itself when done
- Ideal for one long task on a single background thread



IntentService Limitations

- Cannot interact with the UI
- Can only run one request at a time
- Cannot be interrupted

IntentService restrictions

- IntentService are subjected to the new restrictions on background services.
- For the apps targeting API 26, Android Support Library 26.0.0 introduces a new JobIntentService.
- JobIntentService provides the same functionality as IntentService but uses jobs instead of services.

IntentService Implementation

```
public class HelloIntentService extends IntentService {  
    public HelloIntentService() { super("HelloIntentService");}  
  
    @Override  
    protected void onHandleIntent(Intent intent) {  
        try {  
            // Do some work  
        } catch (InterruptedException e) {  
            Thread.currentThread().interrupt();  
        }  
    } // When this method returns, IntentService stops the service, as appropriate.  
}
```



Learn more

- [Services overview](#)
- [Background Execution Limits](#)



What's Next?

- Concept Chapter: [7.4 Services](#)
- No practical



END

