COMP30510 Mobile Application Development

Services & Alarms

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Outline

- Services
- Alarm Manger
- Which one to choose and why ?
- Service example
- IntentService
- Foreground Services
- Alarms Exact and Inexact
- Alarm example

Service

- An application component that can perform long-running operations in the background and does not provide a user interface
- Started manually via API, or via IPC
- Runs within the main thread of an application by default, so creating a new thread (with HandlerThread) or using AsyncTask() is often needed!

Alarm Manager

- Allows you to schedule your application to run at set point in the future.
- When activated it will call an intent that has been previously registered with it.
- Works even if your application is not running
- Alarms are now all inexact , but since you are using API 15 , you can set exact alarms.
- The time difference is normally only seconds if not less.

Do You Really Need a Service/Alarm ?

- Services run continuously, draining battery, so use sparingly!
- If you only need to perform something in a background while user interacts with your app, just use threads!
- Prefer using (Inexact) Alarms and Intent Receivers instead, if possible!
- The is no choice with later android API's from 19 (KitKat on) , to save battery life

Service Types

- Started
  - A service is "started" when an application component (such as an activity) starts it by calling **startService()**
- Bound
  - A service is "bound" when an application component binds to it by calling **bindService()**

Started Service

- Started by **startService()**
- Runs in background indefinitely until it stops itself with **selfStop()** or stopped by **stopService()**
- Separate from activity that started it
- Does not return any result to the caller
- Identified by implementing **onStartCommand()**

Bound Service

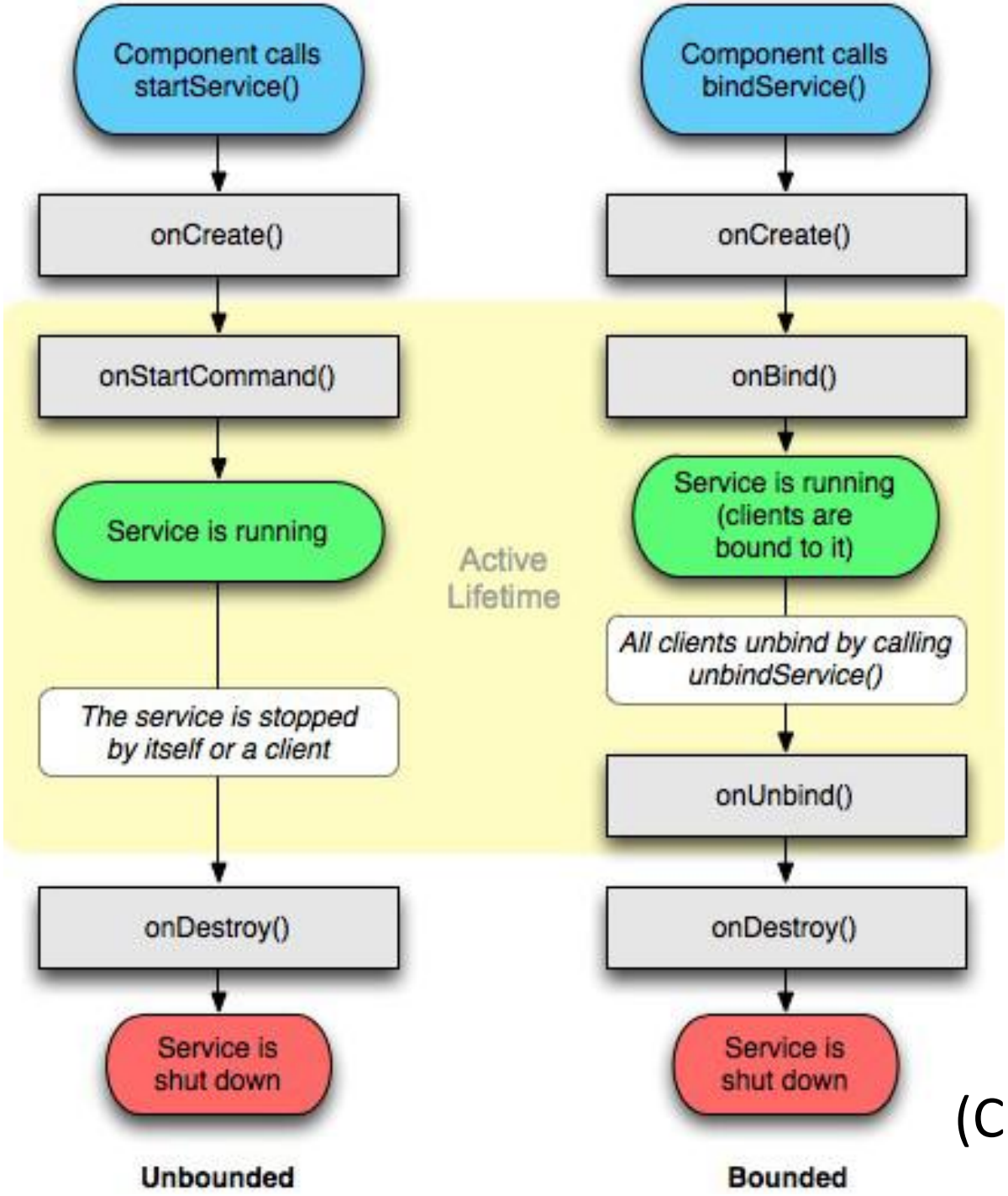
- Bound when called with bindService()
- Offers client-server interface allowing interaction, get requests, send results
- Identified by implementing onBind()
- Runs as long as another application component is bound to it (can be multiple). When all unbind, the service is destroyed

Services Cont'd

- Services can be both started and bound at the same time:
  - Implemented both **onStartCommand()** and **onBind()**
  - Requires both **serviceStop()** or **selfStop()** AND all app component to unbind to be destroyed
- By default service runs within the main thread of the application! So create threads or use AsyncTask

Service Methods

- **onCreate()**
- **onBind()**
- **onStartCommand()**
- **onDestroy()**



(C) android.com

Service Definition

<**service android:name=".OurService">**
<intentfilter>
<action android:name=
"ie.ucd.START_OUR_SERVICE" />
<category android:name=
"android.intent.category.DEFAULT" />
</intentfilter>
</service>

Service Example

```
public void onStartCommand(Intent i, int
flags, int startId)
{
    MediaPlayer p;
    super.onStartCommand(i, flags,
                                    startId);
    player = MediaPlayer.create(this,
                                    R.raw.test);
    player.start();
}
```

Service Example Cont'd

```
public void onDestroy()
{
    super.onDestroy();
    player.stop();
}
```

Service Example Cont'd

- startService(new Intent(this, "ie.ucd.START_OUR_SERVICE"));

- stopService(new Intent(this, "ie.ucd.START_OUR_SERVICE"));

IntentService

- Quick and easy alternative to a full service
- Does create a separate thread to execute all intents it receives
- Does not support multiple simultaneous requests (queues them instead)
- Implements onHandleIntent() and does the work there
- Dies after handling all intents it receives

Foreground Services

- You can mark a service as 'Foreground', telling the system your user is aware of this service and actively interacts with it
- Use 'startForeground()' and 'stopForeground()' to manage service state
- Foreground services aren't killed by the system, but require active notification in status bar

Alarm Manager

- Can be set to **setExact()** to set alarm at a specific time.
- Or to be more energy efficient it can be **set()** but this will inexact as its waiting for a time when the phone will check, worst case scenario could be up to the full length of the alarm , e.g. an hourly alarm could be off by nearly an hour.
- API 19 (KITKAT) alarm delivery is always inexact

Alarm Manager

- Android Developer example for setting an alarm in 60 seconds.

```
private AlarmManager alarmMgr;
private PendingIntent alarmIntent;
...
alarmMgr = (AlarmManager)context.getSystemService(Context.ALARM_SERVICE);
Intent intent = new Intent(context, AlarmReceiver.class);
alarmIntent = PendingIntent.getBroadcast(context, 0, intent, 0);

alarmMgr.set(AlarmManager.ELAPSED_REALTIME_WAKEUP,
        SystemClock.elapsedRealtime() +
        60 * 1000, alarmIntent);
```

- This will call the intent to be called, most alarms will trigger messages to the user in the form of toasts

Alarm Manger Cont'd

- If you need to setup or check for an alarm make sure its restarted at boot in case the phone has been switched off.
- Using an intent-filter and a broadcast receiver they can be setup after boot (*android.intent.action.BOOT_COMPLETED)*

Alarm Manger Example Manifest

```
<receiver
  android:name=".boot.RunOnBootToSetupAlarms">
<intent-filter>
 <action
  android:name="android.intent.action.BOOT_COMP
  LETED" />
 </intent-filter>  </receiver>
```

Further Alarm example

```
Intent intent2 = new Intent(context, SetUpNextAlarm.class);
 PendingIntent sender = PendingIntent.getBroadcast(context,  0, intent2, 0);

long everyHour=  3600000 ; // (an hour in milliseconds)
long firstTime=  3600000 ; // (an hour milliseconds)

AlarmManager am =(AlarmManager) context.getSystemService(Context.ALARM_SERVICE);


am.setInexcatRepeating(AlarmManager.ELAPSED_REALTIME_WAKEUP,
                                              firstTime, everyHour, sender);
```