Mobile Application Development Using BroadcastReceiver to set alarm to trigger refresh cache at regular intervals

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BroadcastReceiver

Learning objectives

- Detailed examination BootReceiver
- BootReceiver subclass of BroadcastReceiver
- BroadcastReceiver Android abstract class

BroadcastReceiver

Configuration & behaviour

- Receive intents sent by sendBroadcast()
- Receive intent sent on device boot
- Receiver element requires inclusion in manifest.
- Appropriate intent filter required in manifest receiver element.

BroadcastReceiver

Manifest

```
// Using device boot to trigger invocation of BootReceiver.onReceive
<manifest ...>
 <uses-permission android:name =
    "android.permission.RECEIVE_BOOT_COMPLETED"/>
 <application ...>
   <receiver android:name=".receivers.BootReceiver"
         android:exported="false">
    <intent-filter >
     <action android:name="android.intent.action.BOOT_COMPLETED"
    />
    </intent-filter>
   </receiver>
 </application>
</manifest>
```

BroadcastReceiver

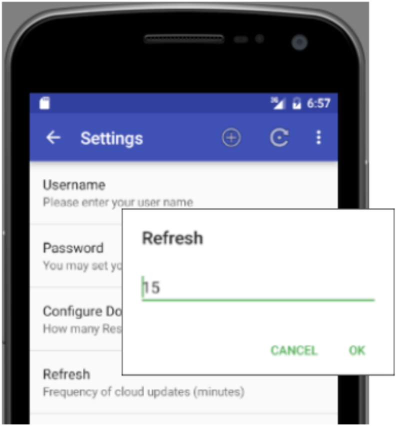
Manifest

```
//Using sendBroadcast() to invoke BroadcastReceiver.onReceive
<manifest . . .>
 <application . . .>
  <receiver android:name=".receivers.BootReceiver"
            android:exported="false">
   <intent-filter >
    <action android:name =
      "org.wit.myrent.receivers.SEND_BROADCAST"/>
   </intent-filter>
  </receiver>
 </application>
</manifest>
```

Settings

Obtain user-input refresh frequency

- User inputs refresh frequency in settings
- Units are minutes



Username
Please enter your user name

Password
You may set yo

Configure Do
How many Res

Refresh
Frequency of cloud updates (minutes)

Refresh

15

Settings

strings.xml

```
// Name preferences frequency key name stored in strings.xml file
<string name="refresh_interval_preference_key">
  refresh_interval
</string>
```

BroadcastReceiver

BootReceiver.onReceive

```
// Retrieve preferences key for refresh frequency
String key =
   context.getResources()
  .getString(R.string.refresh_interval_preference_key);
```

BroadcastReceiver

BootReceiver.onReceive

```
// Below, the variable value (units: minutes) is either default frequency
// or it is the frequency input by user in settings.
// first parameter is key obtained earlier
// second parameter is default to be used if getString fails
// to retrieve the user−input value from preferences.

String defaultFrequency =
   Long.toString(DEFAULT_INTERVAL/NUMBER_MILLIS_PER_MINUTE);
String value = prefs.getString(key, defaultFrequency);
```

BroadcastReceiver

BootReceiver.onReceive

```
// Use helper method NumUtil to validate value.
// If value is valid convert to millis and assign to variable interval
interval long interval = DEFAULT_INTERVAL; // units: millis
if (NumUtil.isPositiveNumber(value)) {
  // parse value & convert to milliseconds.
  // assign to long interval.
  interval =
    Long.parseLong(value) * NUMBER_MILLIS_PER_MINUTE;
}
```

BroadcastReceiver

BootReceiver.onReceive

```
// Set an arbitrary minimum interval value of a minute
// to avoid creating excess network traffic.

interval = interval < ONE_MINUTE ? ONE_MINUTE : interval;
```

BroadcastReceiver

BootReceiver.onReceive

```
// Prepare a PendingIntent with a view to triggering RefreshService

PendingIntent operation = PendingIntent.getService(
   context,
   REQUESTCODE,
   new Intent(context, RefreshService.class),
   PendingIntent.FLAG_UPDATE_CURRENT);
```

BroadcastReceiver

BootReceiver.onReceive

```
AlarmManager alarmManager =
 (AlarmManager) context.getSystemService(Context.ALARM_SERVICE);

//cancel any existing alarms with matching intent
alarmManager.cancel(operation);

// schedule alarm to trigger at approximately settings frequency
// note that param operation contains intent targeted to refresh service
alarmManager.setInexactRepeating(AlarmManager.RTC,
                                 System.currentTimeMillis(),
                                 interval,
                                 operation);
```

BroadcastReceiver

Summary

- BroadcastReceiver receives intents sent by sendBroadcast.
- Also may respond to device boot.
- Preferences setting provides desired refresh frequency.
- Permissions set in manifest.
- A service element required in manifest.
- BroadcastReceiver.onReceive retrieves refresh frequency.
- Failure to retrieve, results in use of default value.
- PendingIntent composed, targetted at refresh service.
- AlarmManager used to send intent at regular intervals.
- This has effect of triggering refresh service.
- This results in retrieving data from service.
- Local cache refreshed with this data.

References

Receivers

1. Official Documentation: BroadcastReceiver

http://bit.ly/2feyyKV [Accessed 2016-11-20]

2. Official Documentation: PendingIntent

http://bit.ly/2eUrTtN [Accessed 2016-11-20]

3. Official Documentation: AlarmManager

http://bit.ly/2fBMPlM [Accessed 2016-11-20]

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