

PROGRAMMING HANDHELD SYSTEMS

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THE BROADCASTRECEIVER CLASS

TODAY'S TOPICS

THE BROADCAST CLASS

REGISTRATION

BROADCAST

PROCESSING

BROADCASTRECEIVER

BASE CLASS FOR COMPONENTS THAT RECEIVE
AND REACT TO EVENTS

BROADCASTRECEIVER

BROADCASTRECEIVERS REGISTER TO RECEIVE
EVENTS IN WHICH THEY ARE INTERESTED

BROADCAST RECEIVER

WHEN EVENTS OCCUR THEY ARE
REPRESENTED AS INTENTS

THOSE INTENTS ARE THEN BROADCAST TO
THE SYSTEM

BROADCAST RECEIVER

ANDROID ROUTES THE INTENTS TO
BROADCASTRECEIVERS THAT HAVE
REGISTERED TO RECEIVE THEM

BROADCASTRECEIVERS RECEIVE THE INTENT
VIA A CALL TO `onReceive()`

TYPICAL USE CASE

REGISTER BROADCASTRECEIVERS

BROADCAST AN INTENT

ANDROID DELIVERS INTENT TO REGISTERED
RECIPIENTS BY CALLING THEIR `onReceive()`
METHOD

EVENT HANDLED IN `onReceive()`

REGISTERING FOR INTENTS

BROADCASTRECEIVERS CAN REGISTER IN TWO
WAYS

STATICALLY, IN ANDROIDMANIFEST.XML

DYNAMICALLY, BY CALLING A
registerReceiver() METHOD

STATIC REGISTRATION

PUT <receiver> AND <intent-filter> TAGS IN
ANDROIDMANIFEST.XML

<RECEIVER> FORMAT

<receiver

android:enabled=["true" | "false"]

android:exported=["true" | "false"]

android:icon="*drawable resource*"

android:label="*string resource*"

android:name="*string*"

android:permission="*string*"

android:process="*string*" >

...

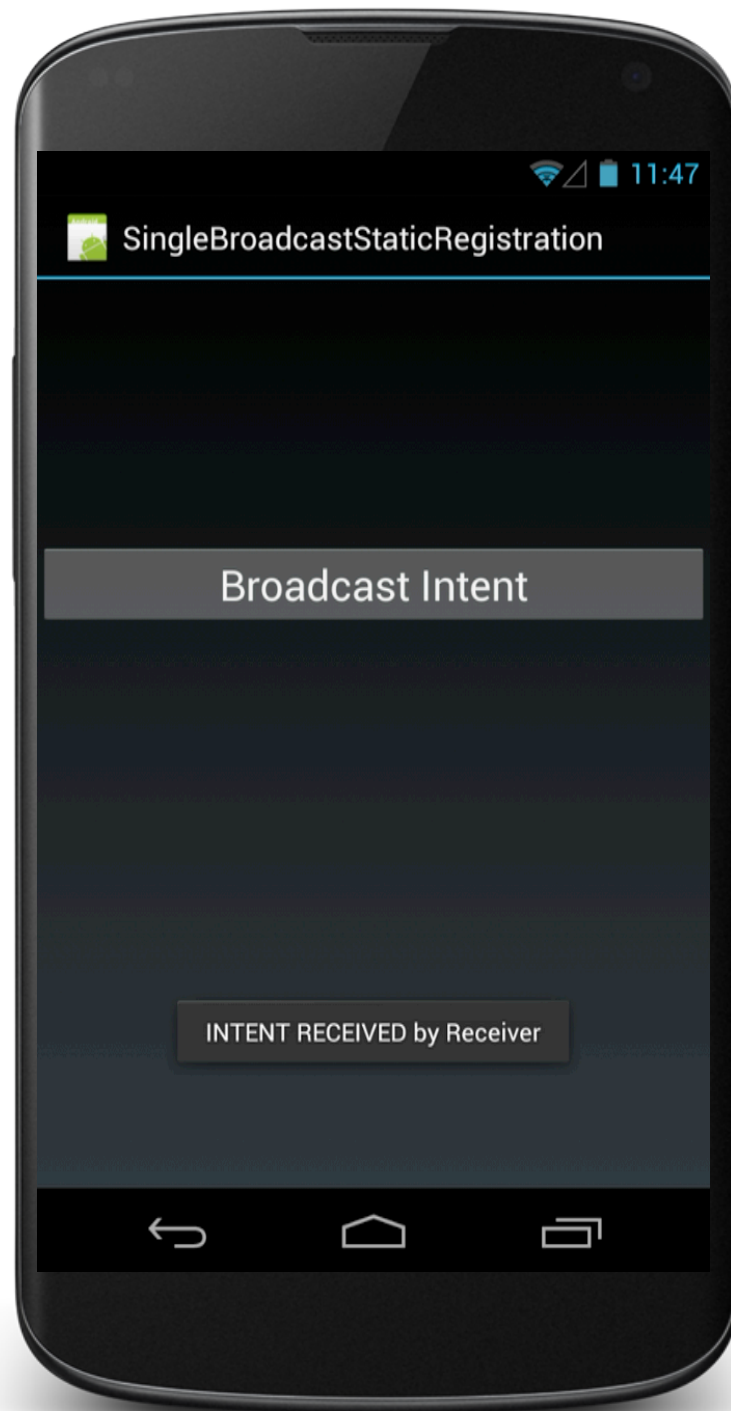
</receiver>

INTENT FILTER

SPECIFY <intent-filter> TAG WITHIN THE
<receiver>

STATIC REGISTRATION

RECEIVERS ARE REGISTERED WITH THE
SYSTEM AT BOOT TIME OR WHEN THEIR
APPLICATION PACKAGE IS ADDED AT RUNTIME



Demonstration of the
BcastRecSinBcastStatReg project in the
IDE

DYNAMIC REGISTRATION

CREATE AN INTENTFILTER

CREATE A BROADCASTRECEIVER

REGISTER BROADCASTRECEIVER USING
registerReceiver()

LOCALBROADCASTMANAGER

CONTEXT

CALL unregisterReceiver() TO
UNREGISTER BROADCASTRECEIVER

Demonstration of the
BcastRecSinBcastDynReg project in the
IDE

EVENT BROADCAST

SEVERAL BROADCAST METHODS SUPPORTED

NORMAL VS. ORDERED

NORMAL: PROCESSING ORDER UNDEFINED

ORDERED: SEQUENTIAL PROCESSING IN PRIORITY ORDER

STICKY VS. NON-STICKY

STICKY: STORE INTENT AFTER INITIAL BROADCAST

NON-STICKY: DISCARD INTENT AFTER INITIAL BROADCAST

WITH OR WITHOUT RECEIVER PERMISSIONS

SOME DEBUGGING TIPS

LOG EXTRA INTENT RESOLUTION INFORMATION

```
Intent.setFlag(FLAG_DEBUG_LOG_RESOLUTION)
```

LIST REGISTERED BROADCASTRECEIVERS

DYNAMICALLY REGISTERED

```
% adb shell dumpsys activity b
```

STATICALLY REGISTERED

```
% adb shell dumpsys package
```

EVENT DELIVERY

INTENTS DELIVERED BY CALLING `onReceive()`,
PASSING IN:

THE CONTEXT IN WHICH THE RECEIVER IS
RUNNING

THE INTENT THAT WAS BROADCAST

EVENT HANDLING IN onReceive()

HOSTING PROCESS HAS HIGH PRIORITY WHILE
onReceive() IS EXECUTING

EVENT HANDLING IN ONRECEIVE()

onReceive() RUNS ON THE MAIN THREAD, SO IT SHOULD BE SHORT-LIVED

IF EVENT HANDLING IS LENGTHY, CONSIDER STARTING A SERVICE, RATHER THAN PERFORMING COMPLETE OPERATION IN onReceive()

EVENT HANDLING IN ONRECEIVE()

RECEIVER IS NOT CONSIDERED VALID ONCE
onReceive() RETURNS

NORMALLY BROADCASTRECEIVERS CAN'T
START ASYNCHRONOUS OPERATIONS

E.G., SHOWING A DIALOG, STARTING AN ACTIVITY
VIA startActivityForResult()



ORDERED BROADCASTS

// send Intent to BroadcastReceivers in priority order

```
void sendOrderedBroadcast (Intent intent,  
                           String receiverPermission)
```

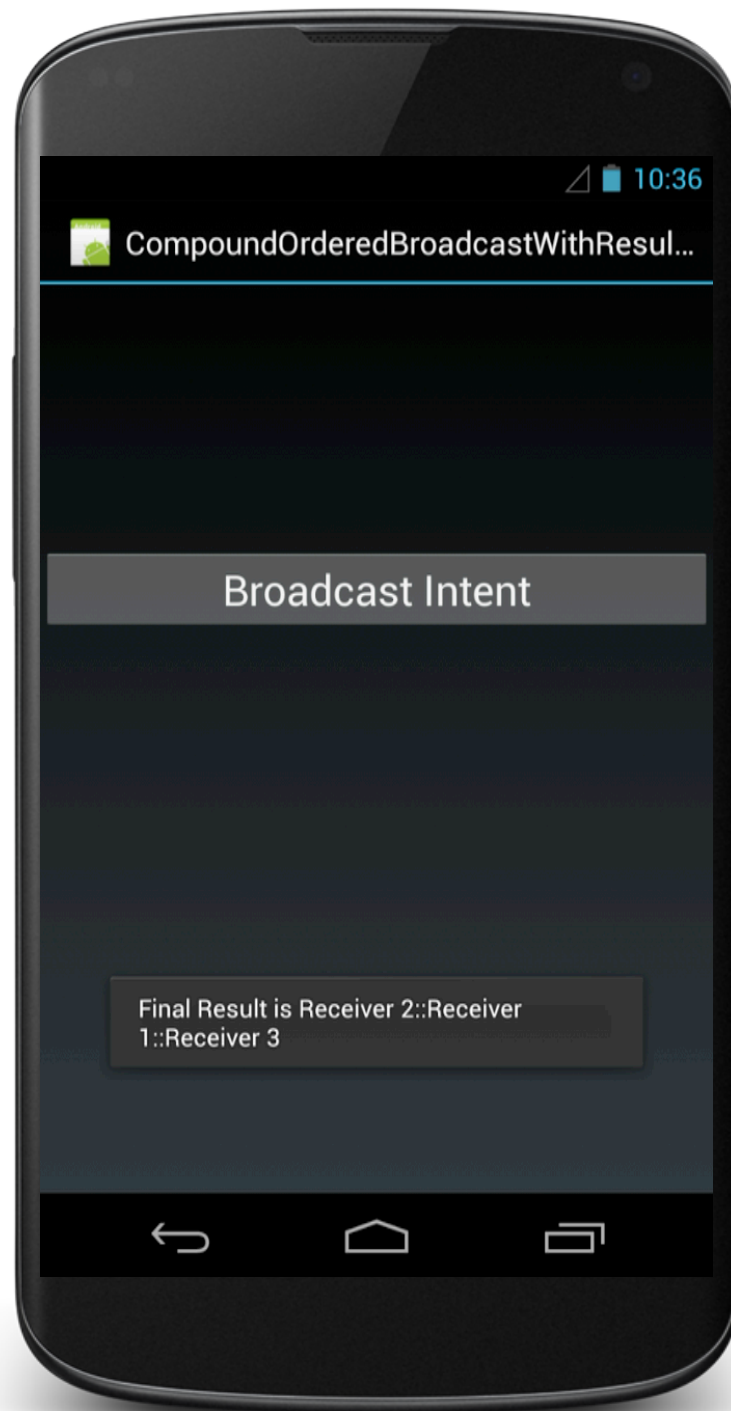
// send Intent to BroadcastReceivers in priority order

// includes multiple parameters for greater control

```
void sendOrderedBroadcast (Intent intent,  
                           String receiverPermission,  
                           BroadcastReceiver resultReceiver,  
                           Handler scheduler,  
                           int initialCode,  
                           String initialData,  
                           Bundle initialExtras)
```



Demonstration of the
BcastRecCompOrdBcast project in the
IDE



Demonstration of the
BcastRecCompOrdBcastWithResRec
project in the IDE

STICKY BROADCASTS

STICKY INTENTS ARE CACHED BY ANDROID

NEW INTENTS OVERWRITE OLDER INTENTS THEY
MATCH

WHEN BROADCASTRECEIVERS ARE
DYNAMICALLY REGISTERED

CACHED STICKY INTENTS MATCHING THE SPECIFIED
INTENTFILTER ARE BROADCAST TO THE
BROADCASTRECEIVER

ONE MATCHING STICKY INTENT IS RETURNED TO
THE CALLER

STICKY BROADCASTS

```
//public abstract class Context ...
```

```
// send sticky Intent to interested BroadcastReceivers
```

```
void sendStickyBroadcast (Intent intent)
```

```
// send sticky Intent to interested BroadcastReceivers in priority order
```

```
// sender can provide various parameters for greater control
```

```
void sendStickyOrderedBroadcast (Intent intent,  
                                BroadcastReceiver resultReceiver,  
                                Handler scheduler,  
                                int requestCode,  
                                String initialData,  
                                Bundle initialExtras)
```

BROADCASTER MUST HAVE BROADCAST_STICKY
PERMISSION TO SEND STICKY INTENTS

Demonstration of the BcastRecStickyInt project in the IDE

NEXT TIME

THREADS, ASYNCTASKS & HANDLERS