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CMSC436: Programming Handheld Systems

User Notification

Today’s Topics

Toast

Notification Area Notifications

User Notifications

Messages provided to the user outside of the normal UI

User Notifications

These include messages aimed at

User feedback

- Toasts
- Dialogs

Event notification

- Notification Area notifications

Toast

- Transitory messages that pop up on the current window
  - e.g., to inform user that an operation has completed successfully
- Automatically fade into & out of view
- No user interaction or response

Creating Toast Notifications

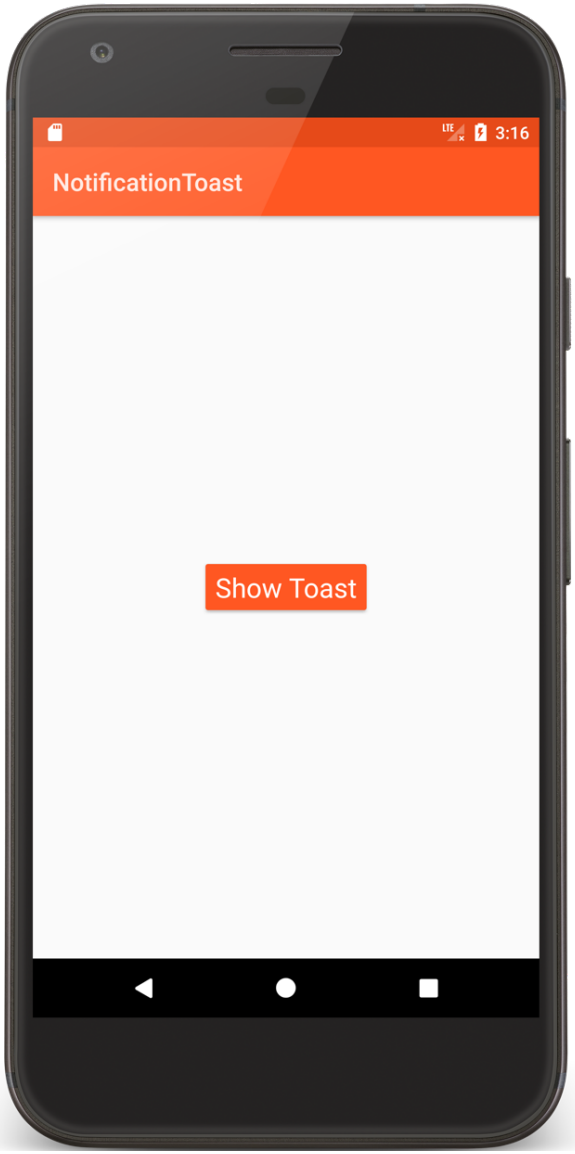
Instantiate a Toast object by calling

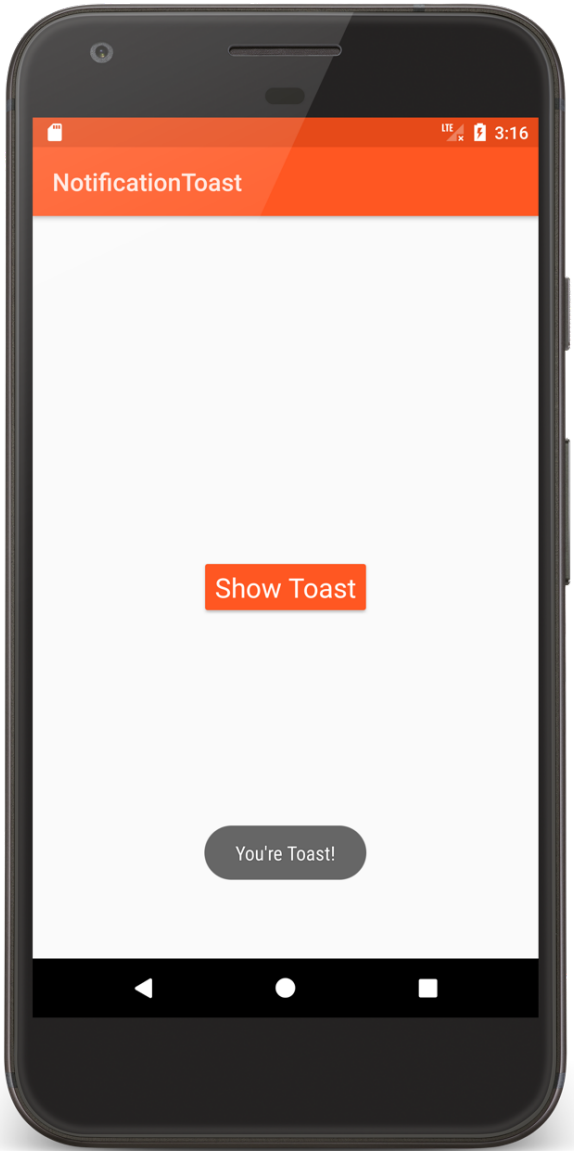
```
Toast.makeText(context, text, duration)
```

Show toast by calling

```
Toast.show()
```

Notification
Toast





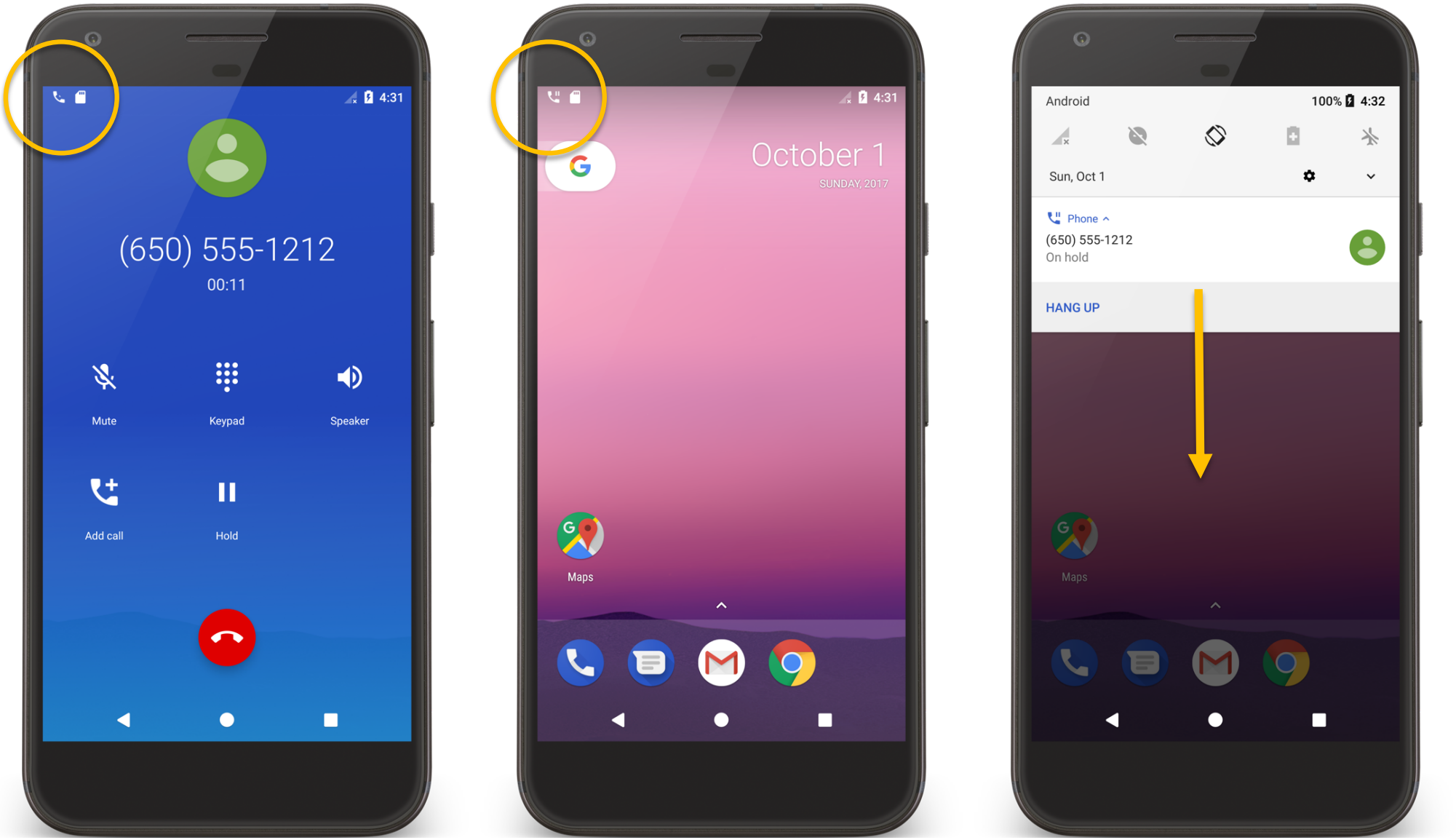
NotificationToastActivity.kt

```
class NotificationToastActivity : Activity() {
    public override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.main)

    }

    fun onClick(v: View) {
        Toast.makeText(applicationContext,
         getString(R.string.youre_toast_string), Toast.LENGTH_LONG).show()
    }
}
```

Notification Area Notifications

Android uses the notification area to alert users of important events

Also provides a notification drawer that users can pull down to see more detailed information about notifications


4:31
(650) 555-1212
00:11
Mute
Keypad
Speaker
Add call
Hold
4:31
October 1
SUNDAY, 2017
Maps
Android
100% 4:32
Sun, Oct 1
Phone
(650) 555-1212
On hold
HANG UP
Maps

Notification Manager

System Service that manages Notifications

- Can send & cancel notifications

Notification Architecture

Notification

- Title, detail, small icon

Notification Area

- Ticker text, small icon

Notification Drawer

- View
- Action

Required Notification Contents

A small icon, set by setSmallIcon()

A title, set by setContentTitle()

Detail text, set by setContentText()

A notification channel ID (On API level 26+)

Notification Channels

Settings associated with each notification channel

Channel characteristics include:

- Importance
- Sound
- Lights
- Vibration
- Show on lockscreen
- Override do not disturb

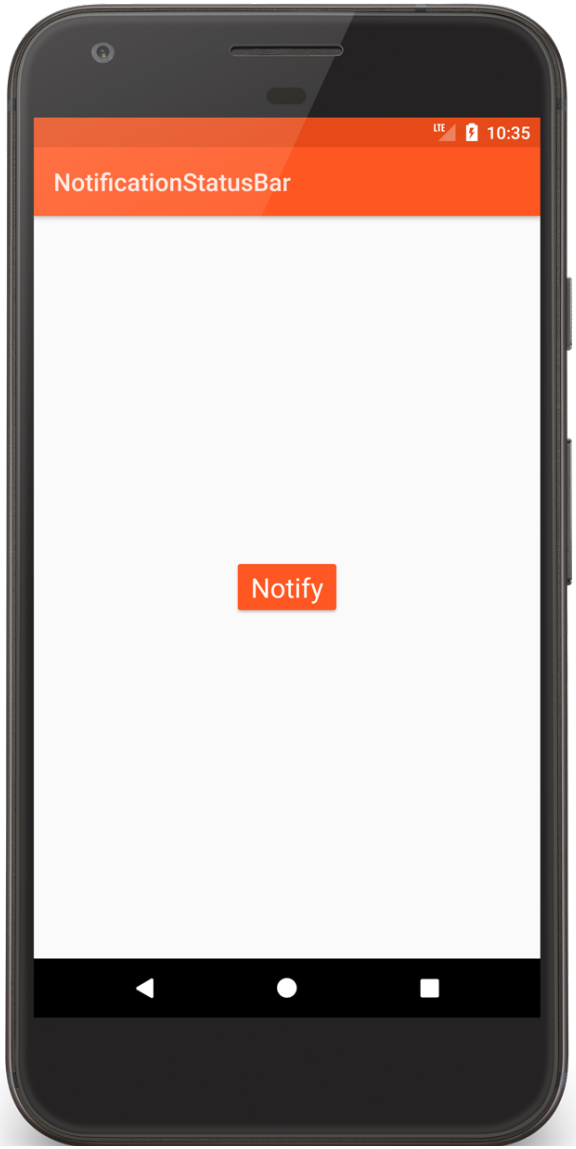
Creating a Notification Channel

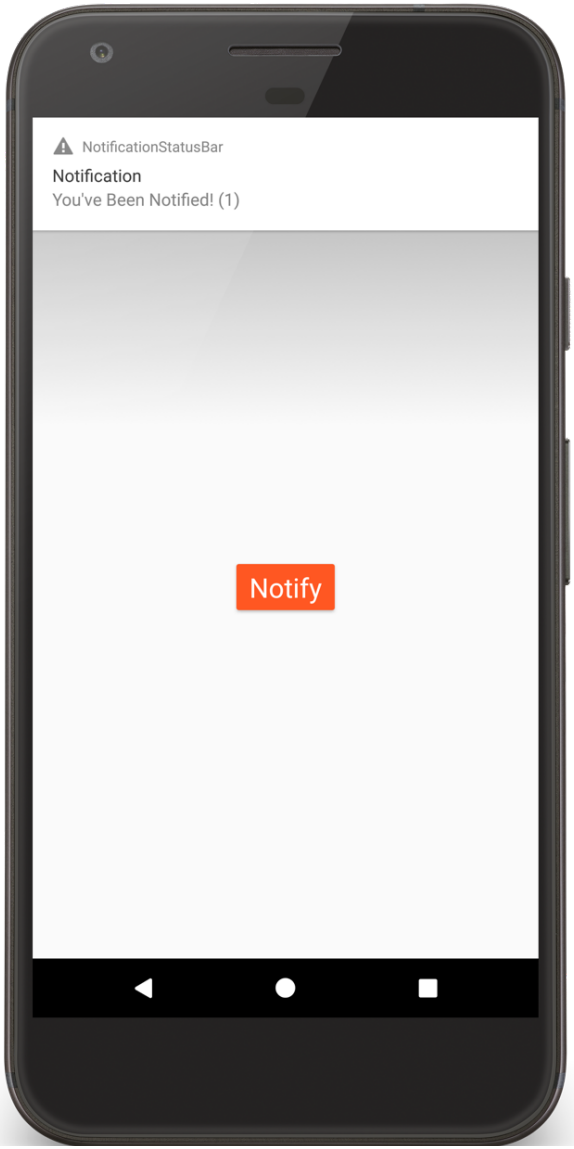
Construct a notification channel object with a package-unique ID

Configure the notification channel object

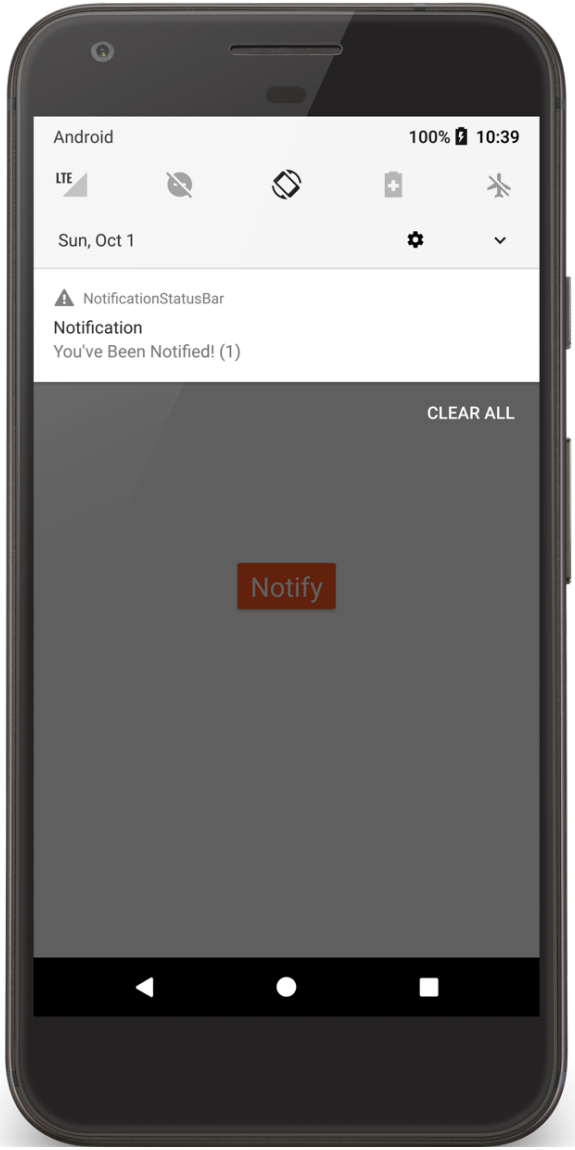
Submit the notification channel object to the notification manager

Notification
StatusBar





Notification
StatusBar



NotificationStatusBarActivity.kt

```
class NotificationStatusBarActivity : Activity() {
    companion object {
        // Notification ID to allow for future updates
        private const val MY_NOTIFICATION_ID = 1
        private const val KEY_COUNT = "key_count"
        private lateinit var mNotificationManager: NotificationManager
        private lateinit var mChannelID: String
        // Notification Text Elements
        private const val tickerText =
              "This is a Really, Really, Super Long Notification Message!"
        private const val contentTitle = "Notification"
        private const val contentText = "You've Been Notified!"
        private val mVibratePattern =
              longArrayOf(100, 200, 300, 400, 500, 400, 300, 200, 400)
        private lateinit var mSoundURI: Uri
    }
```

NotificationStatusBarActivity.kt

```
// Notification Count
private var mNotificationCount: Int = 0
public override fun onCreate(savedInstanceState: Bundle?) {
    …
  mNotificationManager =
   getSystemService(Context.NOTIFICATION_SERVICE) as NotificationManager
  createNotificationChannel()
}
private fun createNotificationChannel() {
    …
    val mChannel = NotificationChannel(mChannelID, name, importance)
    …
    mNotificationManager.createNotificationChannel(mChannel)
}
```

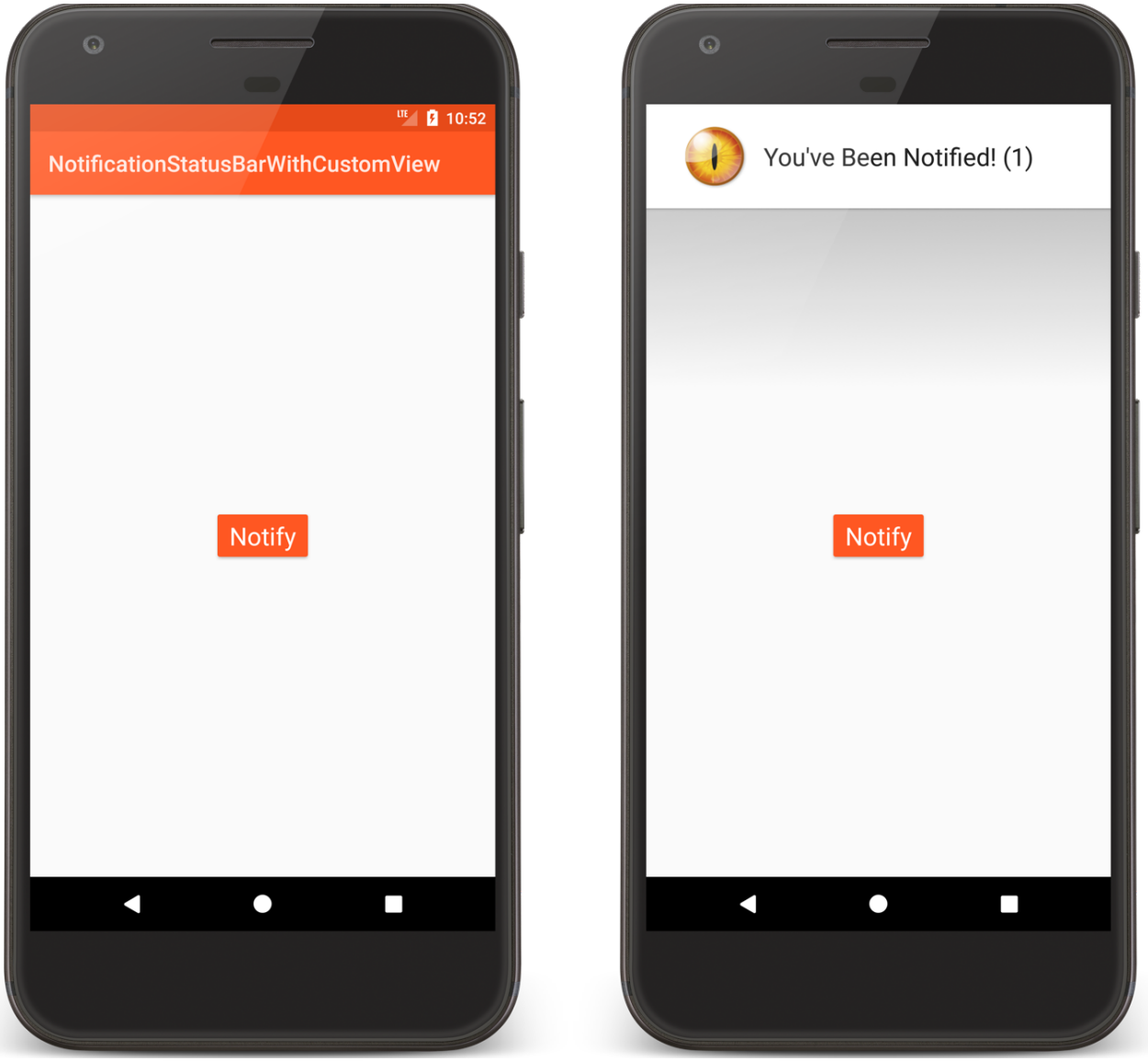
NotificationStatusBarActivity.kt

```
fun onClick(v: View) {
    // Define action Intent
    val mNotificationIntent = Intent(applicationContext,
        NotificationSubActivity::class.java).
             setFlags(Intent.FLAG_ACTIVITY_NEW_TASK)
    val mContentIntent = PendingIntent.getActivity(applicationContext,
             0,mNotificationIntent, PendingIntent.FLAG_UPDATE_CURRENT)
    …
```

NotificationStatusBarActivity.kt

```
        // Define the Notification's expanded message and Intent:
        val notificationBuilder = Notification.Builder(
            applicationContext, mChannelID)
            .setTicker(tickerText)
            .setSmallIcon(android.R.drawable.stat_sys_warning)
            .setAutoCancel(true)
            .setContentTitle(contentTitle)
            .setContentText("$contentText ( ${++mNotificationCount} )")
            .setContentIntent(mContentIntent)

        // Pass the Notification to the NotificationManager:
        mNotificationManager.notify(MY_NOTIFICATION_ID,
                                                notificationBuilder.build())
    }
```

Notification
StatusBar
WithCustomView



custom_notification.xml

```
<RelativeLayout …>
    <ImageView
        android:id="@+id/notification_image"
        android:layout_width="88dp"
        android:layout_height="88dp"
        android:layout_centerVertical="true"
        android:contentDescription="@string/eye_desc_string"
        android:src="@drawable/fire_eye_alien" />
    <TextView
        android:id="@+id/notification_text"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerVertical="true"
        android:layout_toEndOf="@id/notification_image"
        android:textAppearance=
                "@android:style/TextAppearance.Material.Large" />
</RelativeLayout>
```

NotificationStatusBarWithCustomViewActivity.kt

```
fun onClick(v: View) {
    // Define action Intent
    val notificationIntent = Intent(applicationContext,
        NotificationSubActivity::class.java).
         setFlags(Intent.FLAG_ACTIVITY_NEW_TASK)
    val contentIntent = PendingIntent.getActivity(applicationContext,
                  0, notificationIntent, PendingIntent.FLAG_UPDATE_CURRENT)
    val contentView =
         RemoteViews(packageName, R.layout.custom_notification)

    contentView.setTextViewText(R.id.notification_text,
                "$mContentText ( ${++mNotificationCount} )")
```

NotificationStatusBarWithCustomViewActivity.kt

```
    // Define the Notification's expanded message and Intent:
    val notificationBuilder = Notification.Builder(applicationContext,
         mChannelID)
        .setTicker(mTickerText)
        .setSmallIcon(android.R.drawable.stat_sys_warning)
        .setAutoCancel(true)
        .setContentIntent(contentIntent)
        .setCustomContentView(contentView)

    // Pass the Notification to the NotificationManager:
    mNotificationManager.notify(MY_NOTIFICATION_ID,
                                notificationBuilder.build())
}
```

Next Time

Firebase

Example Applications

NotificationToast

NotificationStatusBar

NotificationStatusBarWithCustomView