Scala on Android

The current state of affairs

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Build Tools

SBT ⇒ Android SDK Plugin

https://github.com/pfn/android-sdk-plugin

SBT ⇒ Android SDK Plugin

- Supports all Android SDK tasks
  - dex
  - ***typedResourcesGenerator***
  - ***proguard***
  - buildConfigGenerator
  - (+ 20... more)

SBT ⇒ Android SDK Plugin ⇒ typedResourcesGenerator

```
object TR {
  val title = TypedResource[TextView](R.id.title)

  object layout {
    val abc_screen_toolbar = TypedLayout[ActionBarOverlayLayout](R.layout.abc_screen_toolbar)
  }
}

class MyActivity extends TypedActivity {

  val titleTextView = findView(title) //titleTextView inferred as TextView, no casting needed

}
```

SBT ⇒ Android SDK Plugin ⇒ *proguard*

Size Matters

Scala byte code size reduced ~ (2.8M)

SBT ⇒ Android SDK Plugin

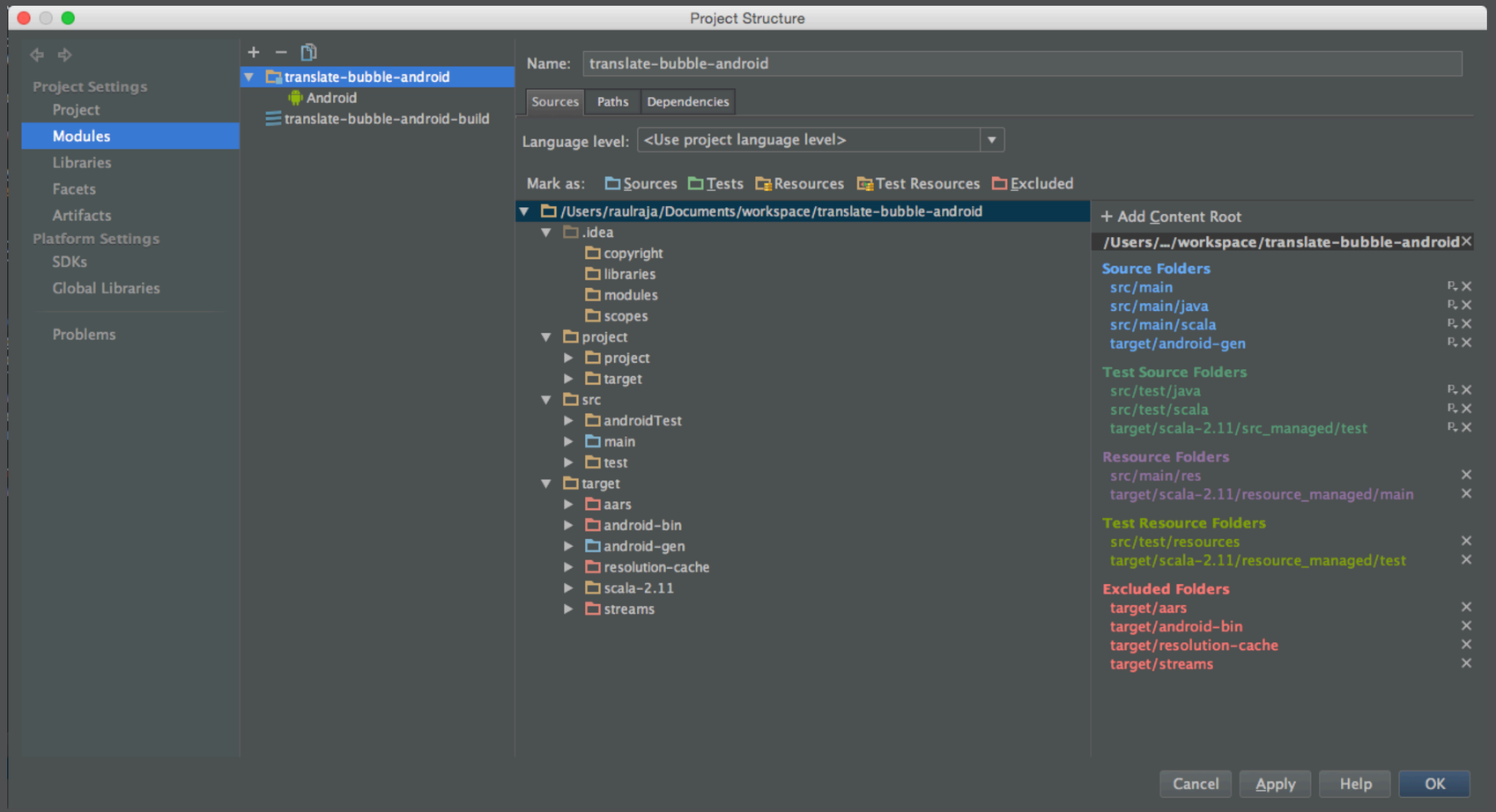
- ***https://github.com/pfn/android-sdk-plugin***
- Active
- Fast (incremental compilation and proguard caching)
- Proguard + MultiDexApplication integration *(Circumvents 65K method limit)*
- Supports *AAR*, *JAR* and *APK* artifact types

IDE Support

IntelliJ IDEA ⇒ *Syntax Highlighting*

```
17  package com.fortysevendeg.translatebubble.modules.notifications.impl
18
19  import android.app.{Notification, NotificationManager, PendingIntent}
20  import android.content.{Context, Intent}
21  import android.support.v4.app.NotificationCompat
22  import com.fortysevendeg.macroid.extras.AppContextProvider
23  import com.fortysevendeg.translatebubble.R
24  import com.fortysevendeg.translatebubble.modules.notifications._
25  import com.fortysevendeg.translatebubble.modules.persistent.PersistentServicesComponent
26  import com.fortysevendeg.translatebubble.service.Service
27  import com.fortysevendeg.translatebubble.ui.preferences.MainActivity
28
29  import scala.concurrent.ExecutionContext.Implicits.global
30  import scala.concurrent.Future
31
32  trait NotificationsServicesComponentImpl
33      extends NotificationsServicesComponent {
34
35    self : PersistentServicesComponent with AppContextProvider =>
36
37    lazy val notificationsServices = new NotificationsServicesImpl
38
39    class NotificationsServicesImpl
40        extends NotificationsServices {
```

IntelliJ IDEA ⇒ *Android + Scala + SBT*



IntelliJ IDEA

- Active
- Syntax Highlighting
- Code assistance
- ***Android Studio*** : Based on IntelliJ
  > Google says: If you have been using Eclipse with ADT, be aware that Android Studio is now the official IDE for Android

Libraries

Libraries ⇒ Scaloid ⇒ *Simplifying the Android SDK*

```
//plain vanilla scala
val button = new Button(context)
button.setText("Greet")
button.setOnClickListener(new OnClickListener() {
  def onClick(v: View) {
    Toast.makeText(context, "Hello!", Toast.LENGTH_SHORT).show()
  }
})
layout.addView(button)
```

Libraries ⇒ Scaloid ⇒ *Simplifying the Android SDK*

```
//with Scaloid
SButton("Greet", toast("Hello!"))
```

Libraries ⇒ Scaloid ⇒ *XML-less layouts*

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
        android:orientation="vertical" android:layout_width="match_parent"
        android:layout_height="wrap_content" android:padding="20dip">
    <TextView android:layout_width="match_parent"
            android:layout_height="wrap_content" android:text="Sign in"
            android:layout_marginBottom="25dip" android:textSize="24.5sp"/>
    <TextView android:layout_width="match_parent"
            android:layout_height="wrap_content" android:text="ID"/>
    <EditText android:layout_width="match_parent"
            android:layout_height="wrap_content" android:id="@+id/userId"/>
    <TextView android:layout_width="match_parent"
            android:layout_height="wrap_content" android:text="Password"/>
    <EditText android:layout_width="match_parent"
            android:layout_height="wrap_content" android:id="@+id/password"
            android:inputType="textPassword"/>
    <Button android:layout_width="match_parent"
            android:layout_height="wrap_content" android:id="@+id/signin"
            android:text="Sign in"/>
</LinearLayout>
```

Libraries ⇒ Scaloid ⇒ *XML-less layouts*

```
//with scaloid
new SVerticalLayout {
  STextView("Sign in").textSize(24.5 sp).<<.marginBottom(25 dip).>>
  STextView("ID")
  SEditText()
  STextView("Password")
  SEditText() inputType TEXT_PASSWORD
  SButton("Sign in")
}.padding(20 dip)
```

Libraries ⇒ Scaloid ⇒ *Futures & Async*

```
//plain scala
new AsyncTask[String, Void, String] {
  def doInBackground(params: Array[String]) = {
    doAJobTakeSomeTime(params)
  }

  override def onPostExecute(result: String) {
    alert("Done!", result)
  }
}.execute("param")
```

Libraries ⇒ Scaloid ⇒ *Futures & Async*

```
//scaloid
Future {
  val result = doAJobTakeSomeTime(params)
  runOnUiThread(alert("Done!", result))
}
```

Libraries ⇒ Macroid ⇒ *Functional UI with Macros*

```
import macroid._
import macroid.FullDsl._

class GreetingActivity extends Activity with Contexts[Activity] {
  override def onCreate(savedInstanceState: Bundle) = {
    super.onCreate(savedInstanceState)

    // the layout goes here
    setContentView {
      getUi {
        l[LinearLayout](
          w[Button],
          w[TextView]
        )
      }
    }
  }
}
```

Libraries ⇒ Macroid ⇒ *UI composition*

```
// ActivityContext is an Android Context obtained from an Activity
import macroid.ActivityContext
  ...
  def layout1(implicit ctx: ActivityContext) =
    l[LinearLayout](
      w[TextView]
    )

  def layout2(implicit ctx: ActivityContext) =
    l[FrameLayout](
      w[ProgressBar]
    )

  def layout3(implicit ctx: ActivityContext) =
    l[FrameLayout](
      layout1,
      layout2
    )
  ...
```

Libraries ⇒ Macroid ⇒ *Tweaks*

```
l[LinearLayout](
  // set button caption
  w[Button] <~ text("Click me"),

  // set text and hide for the time being
  w[TextView] <~ text("Hello!") <~ hide

  // set layout orientation
) <~ vertical
```

Libraries ⇒ Macroid ⇒ *Tweaks Composition*

```
// AppContext is an Android Context obtained from getApplicationContext
import macroid.AppContext
// More tweaks
import macroid.contrib.TextTweaks

def greeting(greeting: String)(implicit appCtx: AppContext) =
    TextTweaks.large +
    text(greeting) +
    hide
```

Libraries ⇒ Macroid ⇒ *Events*

```
button <~ On.click {
  ...
}
```

Libraries ⇒ Macroid ⇒ *Slots*

```
// create a slot
var greeting = slot[TextView]

l[LinearLayout](
  w[TextView] <~
    // wire the view to the slot
    wire(greeting) <~
    OurTweaks.greeting("Hello!"),
  w[Button] <~
    text("Click me") <~
    On.click {
      // use the slot elsewhere
      greeting <~ show
    }
) <~ vertical
```

Libraries ⇒ Macroid ⇒ *Contexts*

```
class MyActivity extends Activity with Contexts[Activity] {
  // implicit access to AppContext & ActivityContext stored as a weak reference
}

class MyFragment extends Fragment with Contexts[Fragment] {
  // implicit access to AppContext & ActivityContext stored as a weak reference
}
```

Libraries ⇒ Macroid ⇒ *Contexts*

```
class MyActivity extends Activity with Contexts[Activity] {
  // implicit access to AppContext & ActivityContext stored as a weak reference
}

class MyFragment extends Fragment with Contexts[Fragment] {
  // implicit access to AppContext & ActivityContext stored as a weak reference
}
```

No need to explicitly pass the context around!

Libraries ⇒ Macroid ⇒ *Snails*

```
val focusLoudly = Snail[View] { view ⇒
  view.setFocus()
  playSound
}
```

Libraries ⇒ Macroid ⇒ *Snails composition*

```
val wink = fadeIn ++ fadeOut
```

Libraries ⇒ Macroid ⇒ *Snails & Tweaks combined*

```
editText <~ text("foo") <~~ fadeIn <~ enable
```

Libraries ⇒ Macroid ⇒ *Easy workflows*

```
(myProgressBar <~~ fadeOut(400)) ~~
(myTextView <~~ blink) ~~
(myOtherTextView <~ text("'Scala by the SEA!"))
```

Libraries ⇒ Macroid ⇒ *Transformers*

```
linearLayout <~ Transformer {
  case t: TextView ⇒ t <~ text("foo")
  case i: ImageView ⇒ i <~ hide
}
```

Libraries ⇒ Macroid ⇒ *Adaptive (Media queries)*

```
object OurTweaks {
  def orient(implicit appCtx: AppContext) =
    landscape ? horizontal | vertical
}

...
// in layout
l[LinearLayout](
  ...
) <~ OurTweaks.orient
```

Libraries ⇒ Macroid ⇒ *Viewable*

Brings the power of Typeclasses to UI composition.

How to display ***A*** using ***W***.

```
libraryDependencies += aar("org.macroid" %% "macroid-viewable" % "2.0.0-M3")
```

```
trait Viewable[A, +W <: View]
```

Libraries ⇒ Macroid ⇒ *Viewable*

```
import macroid.viewable.Viewable

case class User(name: String)

def userViewable(
  implicit ctx: ActivityContext,
  appCtx: AppContext): Viewable[User, TextView] =
    Viewable[User] { user ⇒
      w[TextView] <~ TextTweaks.large <~ text(user.name)
    }
```

Libraries ⇒ Macroid ⇒ *Akka Fragments*

Handling Fragment events & messaging with Actors.

```
class MyActor extends FragmentActor[MyFragment] {
  def receive = receiveUi andThen {
    case MyMessage(x) ⇒ ...
    case MyOtherMessage ⇒ withUi(fragment ⇒ Ui {
      // do some cool ui stuff here
    })
    case FragmentActor.AttachUi(_) ⇒ ...
    case FragmentActor.DetachUi(_) ⇒ ...
  }
}
```

OS Apps ⇒ *Translate Bubble*

https://play.google.com/store/apps/details?id=com.fortysevendeg.translatebubble

https://github.com/47deg/translate-bubble-android

OS Apps ⇒ *Scala Days Official App*

https://play.google.com/store/apps/details?id=com.fortysevendeg.android.scaladays

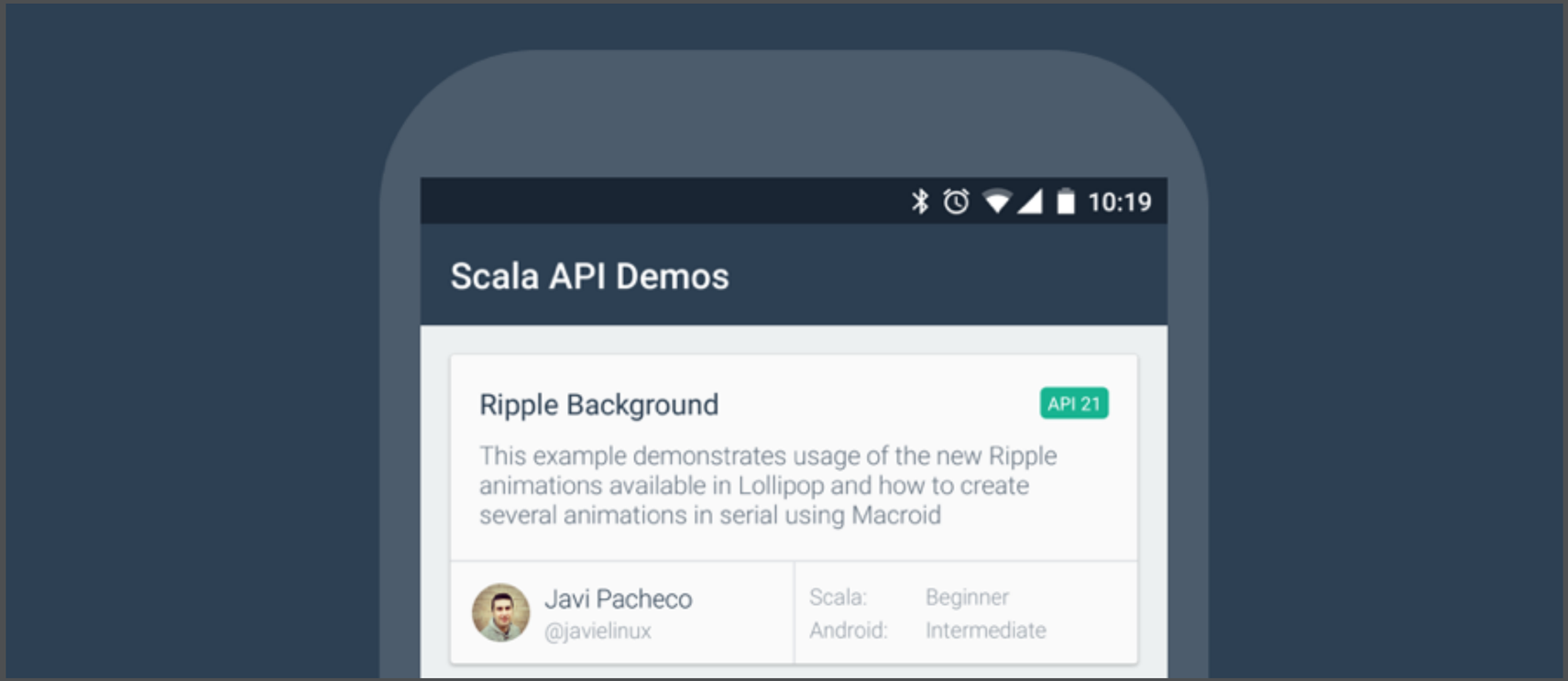
https://github.com/47deg/scala-days-android

(source code available on March 15th)

OS Apps ⇒ *Scala API Demos*

https://play.google.com/store/apps/details?id=com.fortysevendeg.scala.android

https://github.com/47deg/scala-android



Thank you

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