

MICROOH 麦可网

Android-从程序员到架构师之路

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<http://www.microoh.com>

F03_c

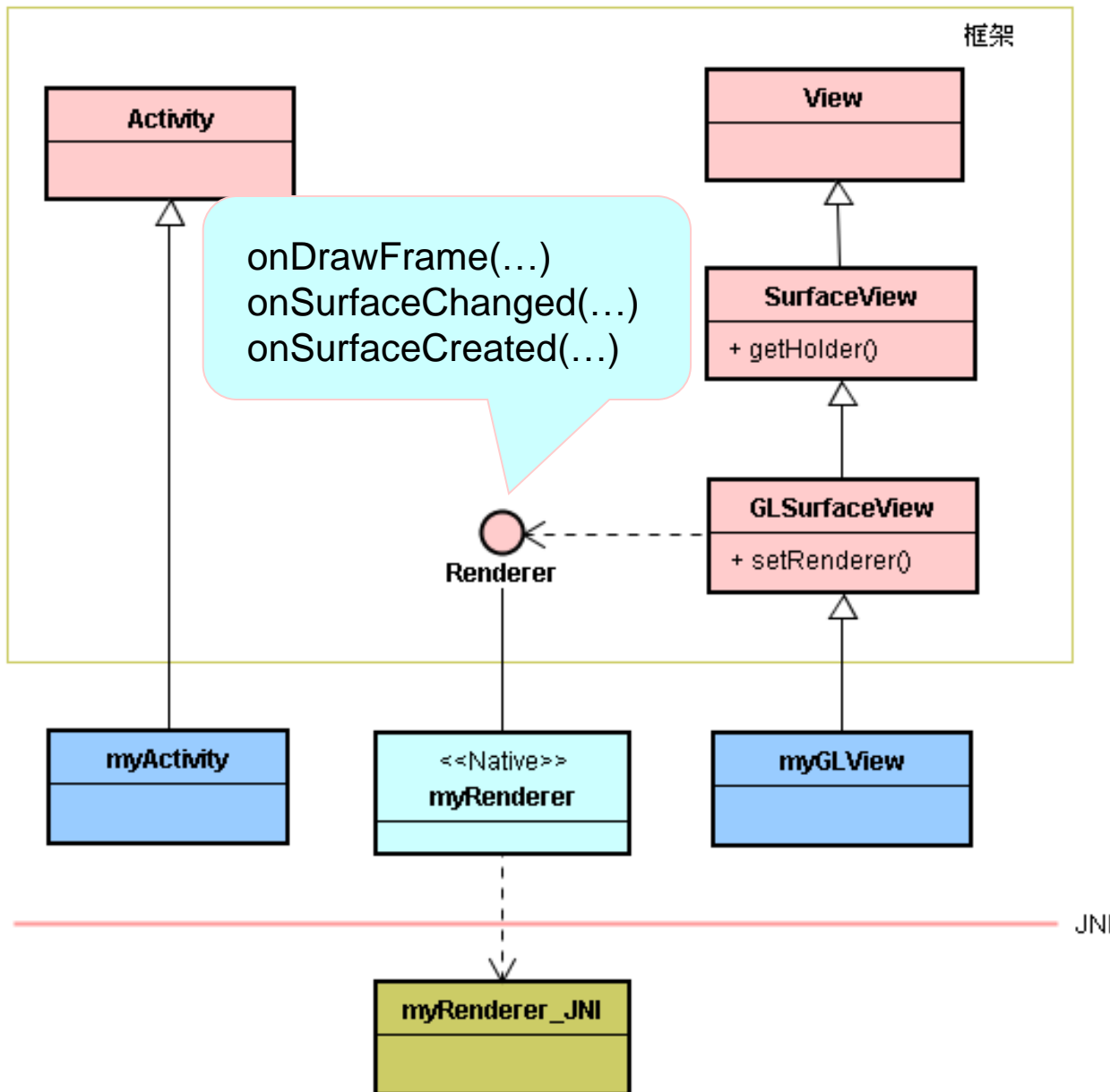
观摩：SurfaceView小框架 的特殊性设计(c)

By 高煥堂

3、范例：JNI + OpenGL ES C引擎

范例(一)

- 撰写<T>，实现Renderer特殊性接口，并定义Native函数，来与C/C++层的OpenGL引擎衔接。



```
class myRenderer implements GLSurfaceView.Renderer {  
    private static native void nativeInit();  
    private static native void nativeResize(int w, int h);  
    private static native void nativeRender();  
    private static native void nativeDone();  
    public void onSurfaceCreated(GL10 gl, EGLConfig config)  
        { nativeInit(); }  
    public void onSurfaceChanged(GL10 gl, int w, int h)  
        { nativeResize(w, h); }  
    public void onDrawFrame(GL10 gl)  
        { nativeRender(); }  
}
```

- 创建myRenderer对象，然后调用setRenderer()来把自己装配到GLSurfaceView里。

```
class myGLView extends GLSurfaceView {  
    myRenderer mRenderer;  
    public myGLView(Context context) {  
        super(context);  
        mRenderer = new myRenderer();  
        setRenderer(mRenderer);  
    }  
}
```


- 以C撰写Native函数的实现代码；做为myRenderer与OpenGL ESC引擎的衔接信道。

```
/* Java_com_example_MISOO_MyRenderer.h */  
// .....  
void  
Java_com_example_MISOO_MyRenderer_nativeInit( JNIEnv* env )  
    { appInit(); }  
void  
Java_com_example_MISOO_MyRenderer_nativeDone( JNIEnv* env )  
    { // free objects. }  
void  
Java_com_example_MISOO_MyRenderer_nativeRender( JNIEnv* env )  
    {   curTime = ...  
        appRender(curTime, sWindowWidth, sWindowHeight);  
    }
```

```
void appInit(){
    glEnable(GL_NORMALIZE);
    glEnable(GL_DEPTH_TEST);
    glDisable(GL_CULL_FACE);
    glShadeModel(GL_FLAT);
    glEnable(GL_LIGHTING);
    glEnable(GL_LIGHT0);
    glEnable(GL_LIGHT1);
    glEnable(GL_LIGHT2);
    glEnableClientState(GL_VERTEX_ARRAY);
    glEnableClientState(GL_COLOR_ARRAY);
}
// 其它函數
```

- myActivity创建myGLView的对象。

```
// myActivity.java
public class myActivity extends Activity {
    private GLSurfaceView mGLView;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        mGLView = new myGLView(this);
        setContentView(mGLView);
    }
    // .....
    static { System.loadLibrary("JniMyRenderer"); }
}
```

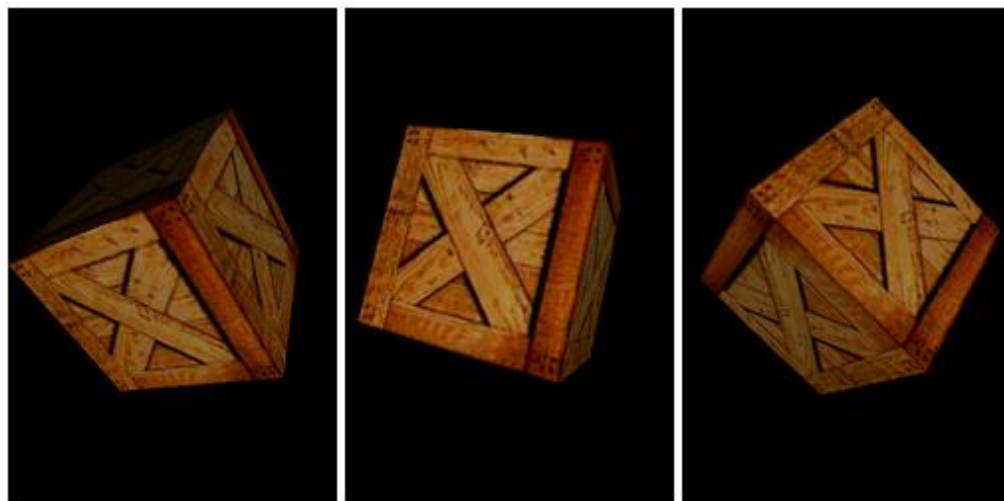
- setContentView()向WMS(和SurfaceFlinger)系統服務索取一個surface給GLSurfaceView。

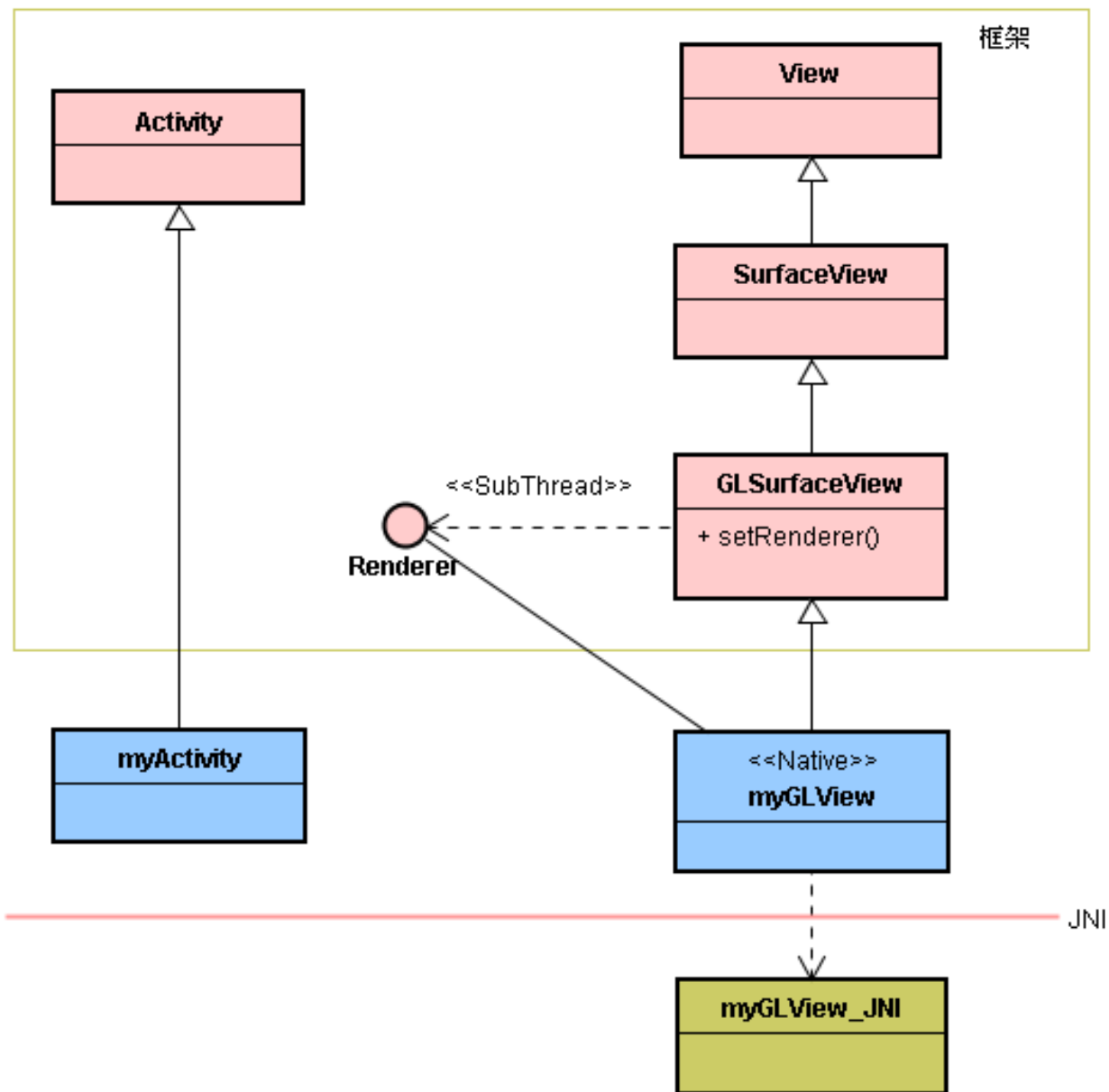
范例(二)

此范例摘自：

<http://www.gorglucks.com/android/android-ndk-cube-sample/>

此范例可绘出一个3D的Cube旋转图，如下：





- 撰写myGLView，实现Renderer特殊性接口，并定义Native函数，来与C/C++层的OpenGL引擎衔接。


```
// myGLView.java
// .....
public class myGLView extends GLSurfaceView
    implements Renderer {
    private Context context;
    public myGLView(Context context) {
        super(context);
        this.setRenderer(this);
        this.requestFocus();
        this.setFocusableInTouchMode(true);
        this.context = context;
    }
    public void onDrawFrame(GL10 gl) {
        nativeRender();
    }
    public void onSurfaceChanged(GL10 gl, int w, int h) {
        nativeResize(w, h);
    }
}
```

```
public void onDrawFrame(GL10 gl) {  
    nativeRender(); }  
public void onSurfaceChanged(GL10 gl, int w, int h) {  
    nativeResize(w, h); }  
public void onSurfaceCreated(GL10 gl, EGLConfig config) {  
    nativeInit();  
    nativePushTexture(pixels, bitmap.getWidth(),  
        bitmap.getHeight());  
}  
@Override public boolean onTouchEvent(MotionEvent event) {  
    if (event.getAction() == MotionEvent.ACTION_UP) {  
        nativePause();  
    }  
    return true;  
}
```

```
// Natives methods
```

```
private static native void nativeInit();
```

```
private static native void nativePause();
```

```
private static native void nativeResize(int w, int h);
```

```
private static native void nativeRender();
```

```
private static native void nativePushTexture(int[] pixels, int w,  
                                              int h);
```

```
}
```

- 以C撰写Native函数的实现代码；做为myRenderer与OpenGL ESC引擎的衔接信道。

```
// Java_com_gorglucks_myGLView.c */
```

```
// Init
```

```
void Java_com_gorglucks_myGLView_nativeInit( JNIEnv* env )  
{ // ..... }
```

```
// Window resize
```

```
void Java_com_gorglucks_myGLView_nativeResize(JNIEnv* env,  
        jobject thiz, jint w, jint h)  
{ // ..... }
```

```
// Pause/Resume
```

```
void Java_com_gorglucks_myGLView_nativePause(JNIEnv* env)  
{ // ..... }
```

```
// Render
```

```
void Java_com_gorglucks_myGLView_nativeRender(JNIEnv*  
                                                env)
```

```
{ // ..... }
```

```
// Create the texture
```

```
void Java_com_gorglucks_myGLView_nativePushTexture(JNIEnv*  
                                                    env, jobject thiz, jintArray arr, jint w, jint h)
```

```
{ // ..... }
```

- myActivity创建myGLView的对象。

```
// myActivity.java
// .....
public class myActivity extends Activity {
    GLSurfaceView GLView;
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        GLView = new myGLView(this);
        setContentView(GLView);
    }
    static { System.loadLibrary("cube"); }
}
```

- setContentView()向WMS(和SurfaceFlinger)系統服務索取一個surface給GLSurfaceView。

Thanks...



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