



Android Launcher分析

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大纲

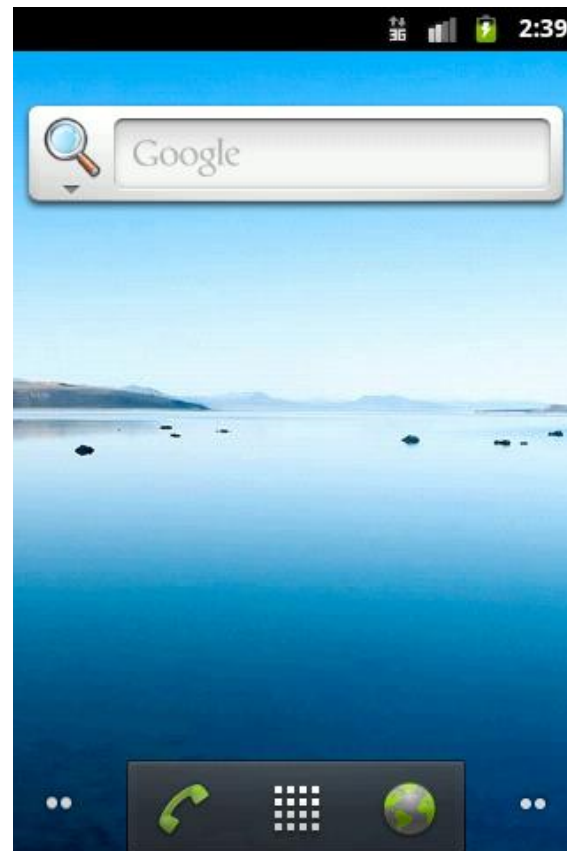


- } 1、如何使用应用成为launcher
- } 2、launcher需要具备哪些功能
- } 3、launcher UI层次结构
- } 4、launcher 优化
- } 6、launcher的数据存储
- } 6、常见问题



Launcher是什么

- } 1、launcher 即启动器，也就是home，一般叫做桌面
- } 2、launcher是一个应用程序



让应用成为Launcher



```
<activity
    android:name="com.android.launcher2.Launcher"
    android:launchMode="singleTask"
    android:clearTaskOnLaunch="true"
    android:stateNotNeeded="true"
    android:theme="@style/Theme"

    android:windowSoftInputMode="stateUnspecified|adjustPan">
    <intent-filter>
        <action android:name="android.intent.action.MAIN" />
        <category android:name="android.intent.category.HOME" />
        <!-- -->
        <category android:name="android.intent.category.LAUNCHER" />
        <!-- -->
        <category android:name="android.intent.category.DEFAULT" />
        <category android:name="android.intent.category.MONKEY"/>
    </intent-filter>
</activity>
```

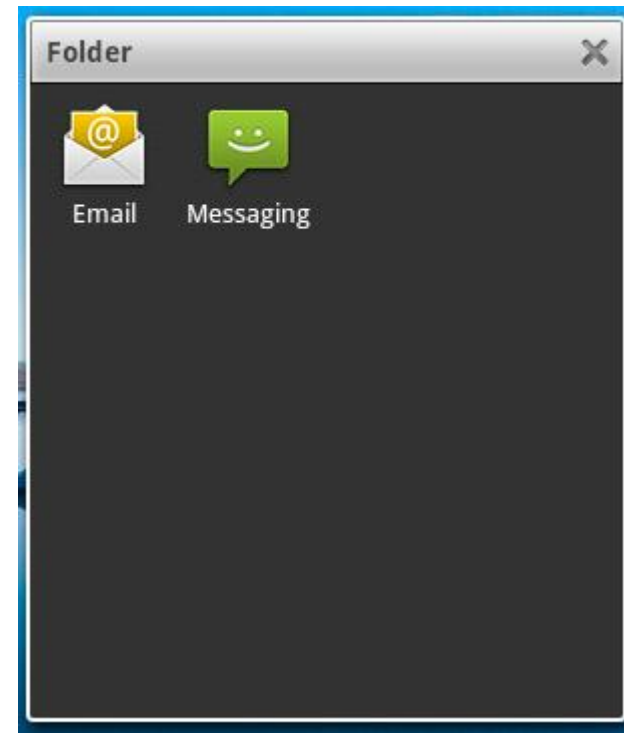
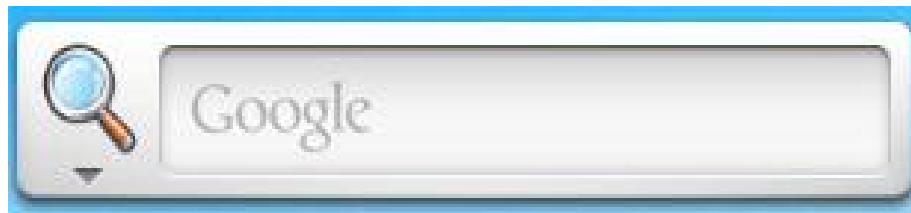
Launcher 应该具备的功能



1. 列出安装的应用程序
2. 启动应用程序
3. 显示窗口小部件
4. 显示壁纸
5. 书签
6. 文件夹
7.



Launcher 需要显示哪些元素



Launcher 如何显示应用程序图标

取得应用程序图标, 标题等



1. 使用 **PackageManager** 取得应用程序图标, 标题等数据

```
private void loadApps() {  
    Intent mainIntent = new Intent(Intent.ACTION_MAIN, null);  
    mainIntent.addCategory(Intent.CATEGORY_LAUNCHER);  
  
    mApps = getPackageManager().queryIntentActivities(mainIntent, 0);  
}  
  
ResolveInfo info = mApps.get(position);  
i.setImageDrawable(info.activityInfo.loadIcon(getPackageManager()));
```



Launcher 如何显示应用程序图标 绘制应用程序图标，标题



使用 TextView展示



Launcher 如何启动应用程序



```
void startActivitySafely(Intent intent, Object tag) {
    intent.addFlags(Intent.FLAG_ACTIVITY_NEW_TASK);
    try {
        startActivity(intent);
    } catch (ActivityNotFoundException e) {
        Toast.makeText(this, R.string.activity_not_found, Toast.LENGTH_SHORT).show();
        Log.e(TAG, "Unable to launch. tag=" + tag + " intent=" + intent, e);
    } catch (SecurityException e) {
        Toast.makeText(this, R.string.activity_not_found, Toast.LENGTH_SHORT).show();
        Log.e(TAG, "Launcher does not have the permission to launch " + intent +
            ". Make sure to create a MAIN intent-filter for the corresponding activity " +
            "or use the exported attribute for this activity. "
            + "tag="+ tag + " intent=" + intent, e);
    }
}
```

得到Widget数据1

选择窗口小部件



主屏幕提示



搜索



日历



模拟时钟



电量控制



相框



音乐

```
int appWidgetId = Launcher.this.mAppWidgetHost.allocateAppWidgetId();

Intent pickIntent = new Intent(AppWidgetManager.ACTION_APPWIDGET_PICK);
pickIntent.putExtra(AppWidgetManager.EXTRA_APPWIDGET_ID, appWidgetId);
// start the pick activity
startActivityForResult(pickIntent, REQUEST_PICK_APPWIDGET);
```

得到Widget数据2

```
@Override
protected void onActivityResult(int requestCode, int resultCode, Intent data) {
    if (resultCode == RESULT_OK && mAddItemCellInfo != null) {
        switch (requestCode) {
            case REQUEST_CREATE_LIVE_FOLDER:
                completeAddLiveFolder(data, mAddItemCellInfo);
                break;
            case REQUEST_PICK_APPWIDGET:
                addAppWidget(data);

                break;
            case REQUEST_CREATE_APPWIDGET:
                completeAddAppWidget(data, mAddItemCellInfo);
                break;
        }
    }
}
```

展示Widget



```
private void completeAddAppWidget(Intent data, CellLayout.CellInfo cellInfo) {
    Bundle extras = data.getExtras();
    int appWidgetId = extras.getInt(AppWidgetManager.EXTRA_APPWIDGET_ID, -1);
    AppWidgetProviderInfo appWidgetInfo = mAppWidgetManager.getAppWidgetInfo(appWidgetId);

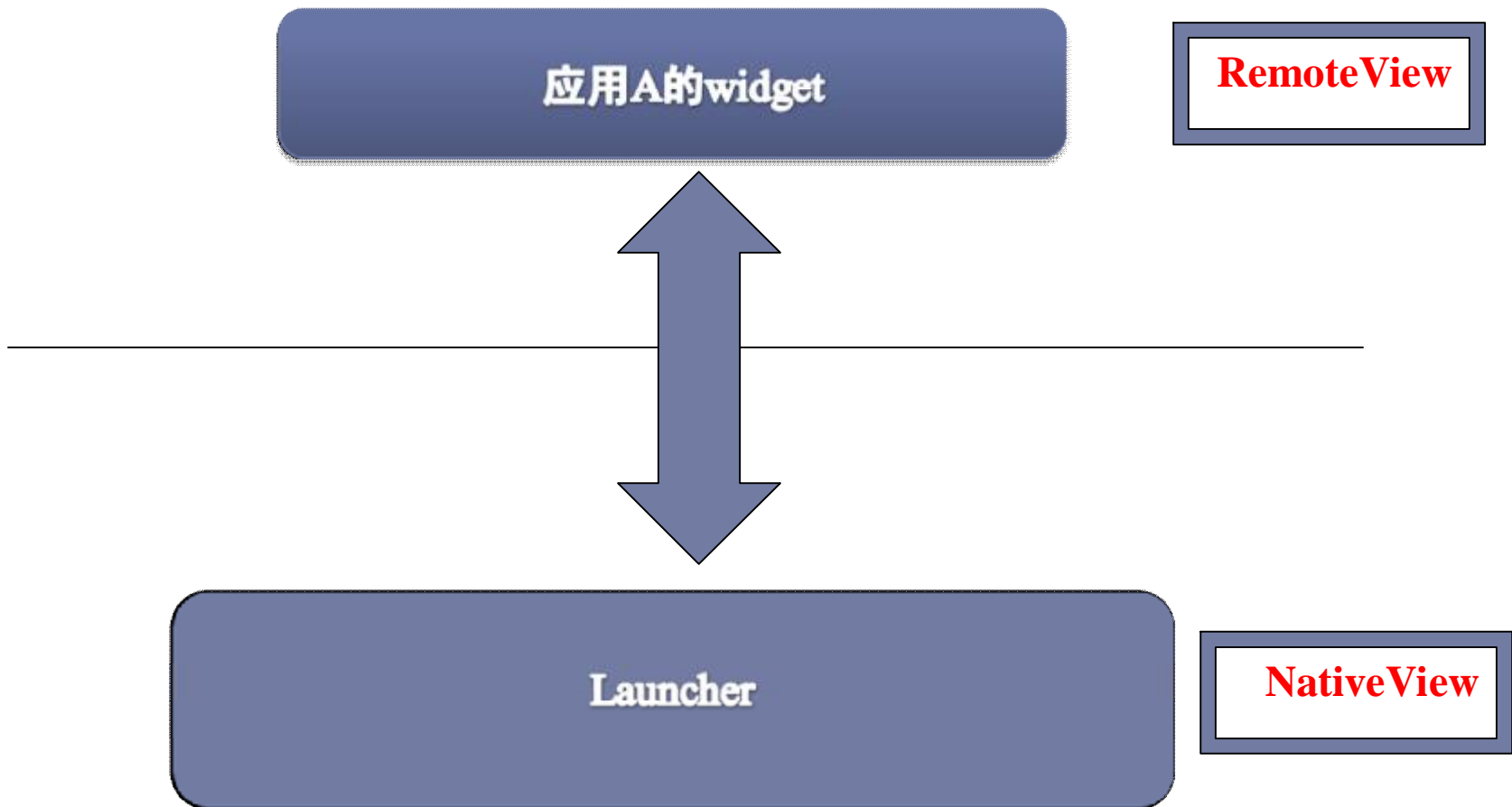
    LauncherModel.addItemToDatabase(this, launcherInfo,
        LauncherSettings.Favorites.CONTAINER_DESKTOP,
        mWorkspace.getCurrentScreen(), xy[0], xy[1], false);

    // Perform actual inflation because we're live
    launcherInfo.hostView = mAppWidgetHost.createView(this, appWidgetId, appWidgetInfo);

    launcherInfo.hostView.setAppWidget(appWidgetId, appWidgetInfo);
    launcherInfo.hostView.setTag(launcherInfo);

    mWorkspace.addInCurrentScreen(launcherInfo.hostView, xy[0], xy[1],
        launcherInfo.spanX, launcherInfo.spanY, isWorkspaceLocked());
}
```

Widget框架模型



```
public class RemoteViews implements Parcelable, Filter {
```

android.os.Parcelable

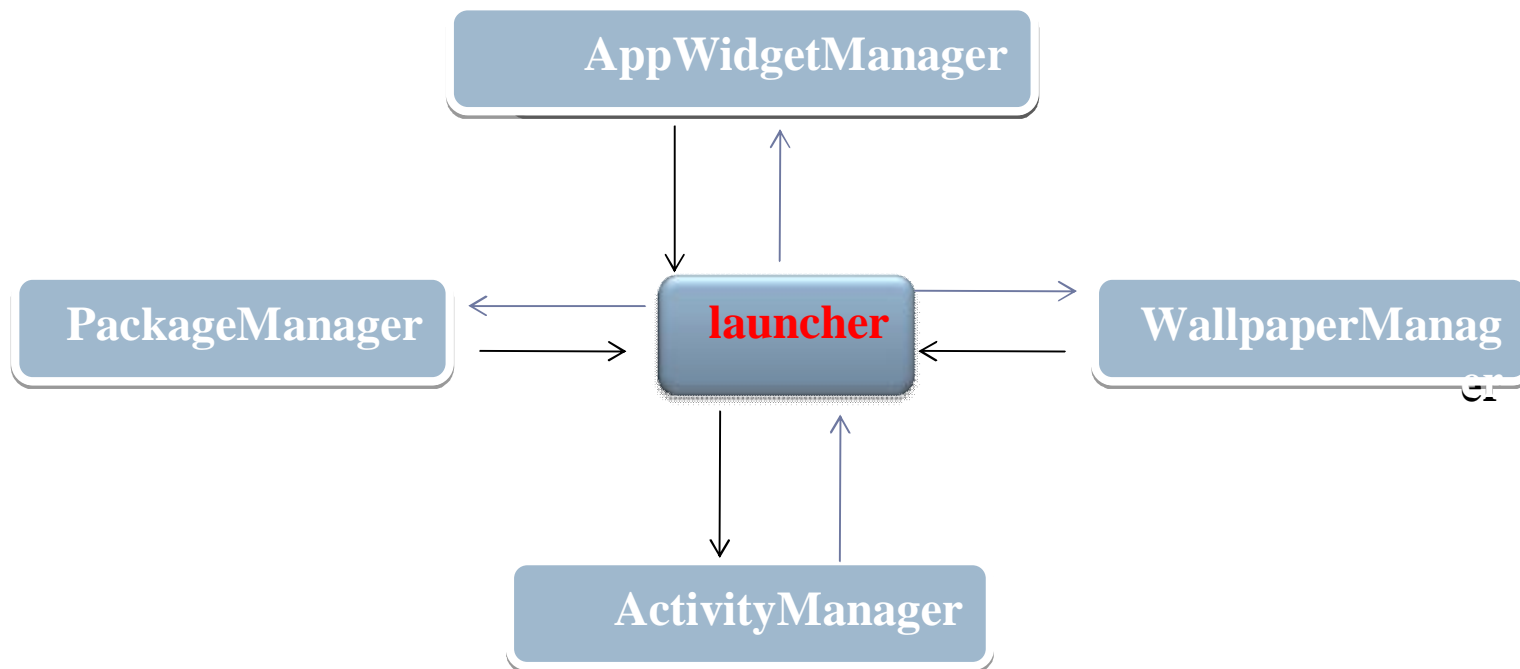
Interface for classes whose instances can be written to and restored from a [Parcel](#). Classes implementing the Parcelable interface must also have a static field called CREATOR, which is an object implementing the [Parcelable.Creator](#) interface.

A typical implementation of Parcelable is:

```
public class MyParcelable implements Parcelable {  
    private int mData;
```

```
/**  
 * Parcelable.Creator that instantiates RemoteViews objects  
 */  
public static final Parcelable.Creator<RemoteViews> CREATOR = new Parcelable.Creator<RemoteViews>() {  
    public RemoteViews createFromParcel(Parcel parcel) {  
        return new RemoteViews(parcel);  
    }  
  
    public RemoteViews[] newArray(int size) {  
        return new RemoteViews[size];  
    }  
};
```

Launcher 与系统manager的交互



请求



回应



墙纸的展示（通过theme在AndroidManifest.xml中配置）

```
<activity
    android:name="com.android.launcher2.Launcher"
    android:launchMode="singleTask"
    android:clearTaskOnLaunch="true"
    android:stateNotNeeded="true"
    android:theme="@style/Theme"
    android:screenOrientation="nosensor"
    android:windowSoftInputMode="stateUnspecified|adjustPan">
    <intent-filter>
        <action android:name="android.intent.action.MAIN" />
        <category android:name="android.intent.category.HOME" />
        <category android:name="android.intent.category.DEFAULT" />
        <category android:name="android.intent.category.MONKEY"/>
    </intent-filter>
</activity>

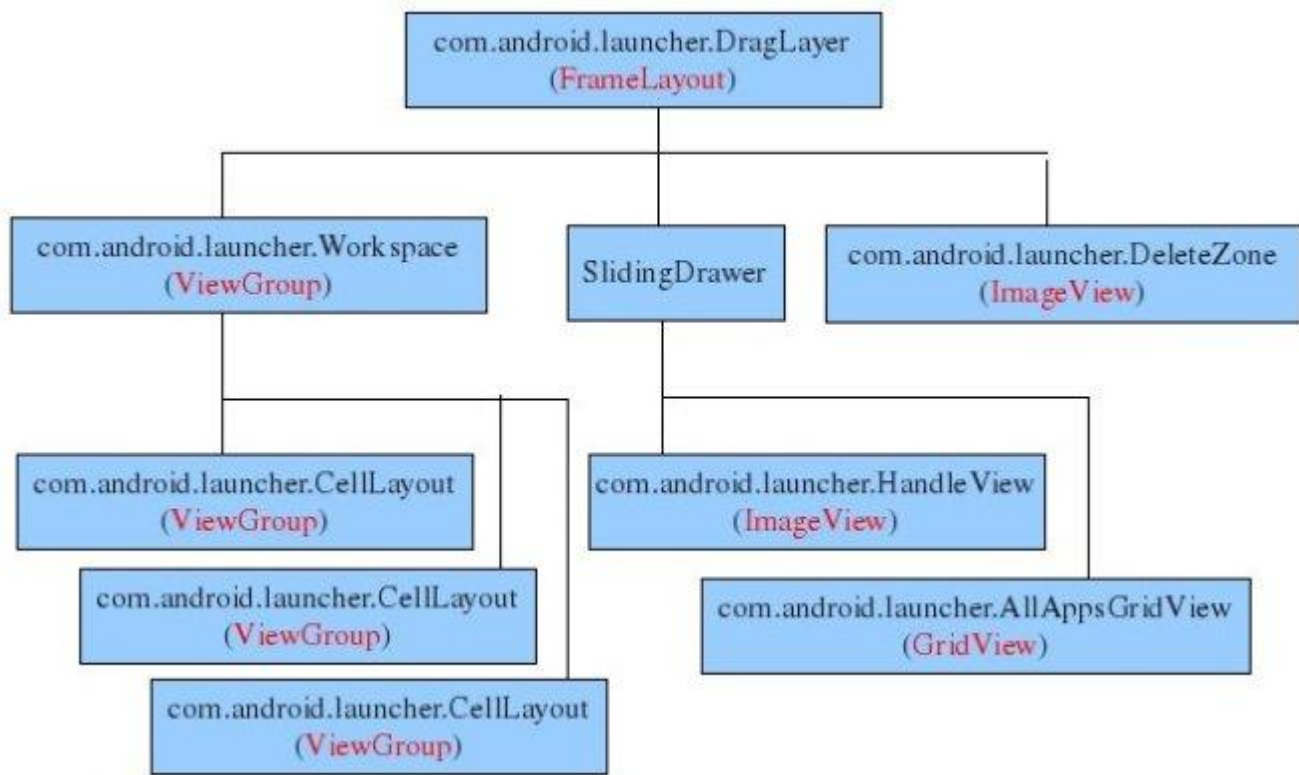
<resources>
    <style name="Theme" parent="android:Theme.Wallpaper">
        <item name="android:windowNoTitle">true</item>
    </style>
```

墙纸的展示（通过程序获取墙纸）

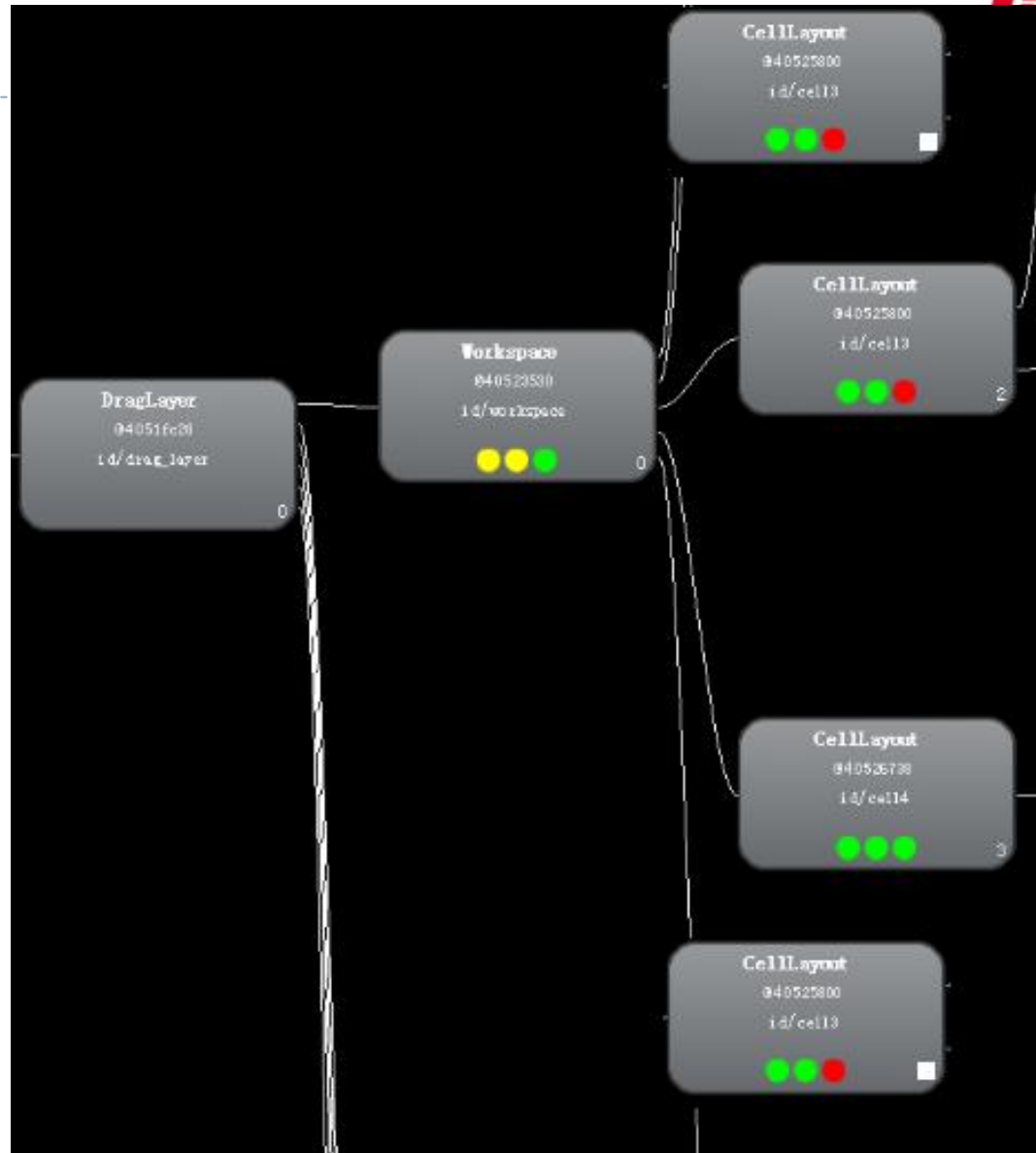
```
// Receives intents from other applications to change the wallpaper.  
private static class WallpaperIntentReceiver extends BroadcastReceiver {  
  
    @Override  
    public void onReceive(Context context, Intent intent) {  
  
        WallpaperManager wpm = (WallpaperManager)mApplication.getSystemService(WALLPAPER_SERVICE);  
        final Drawable drawable = wpm.getDrawable();  
    }  
}
```



Launcher UI 结构 android1.6

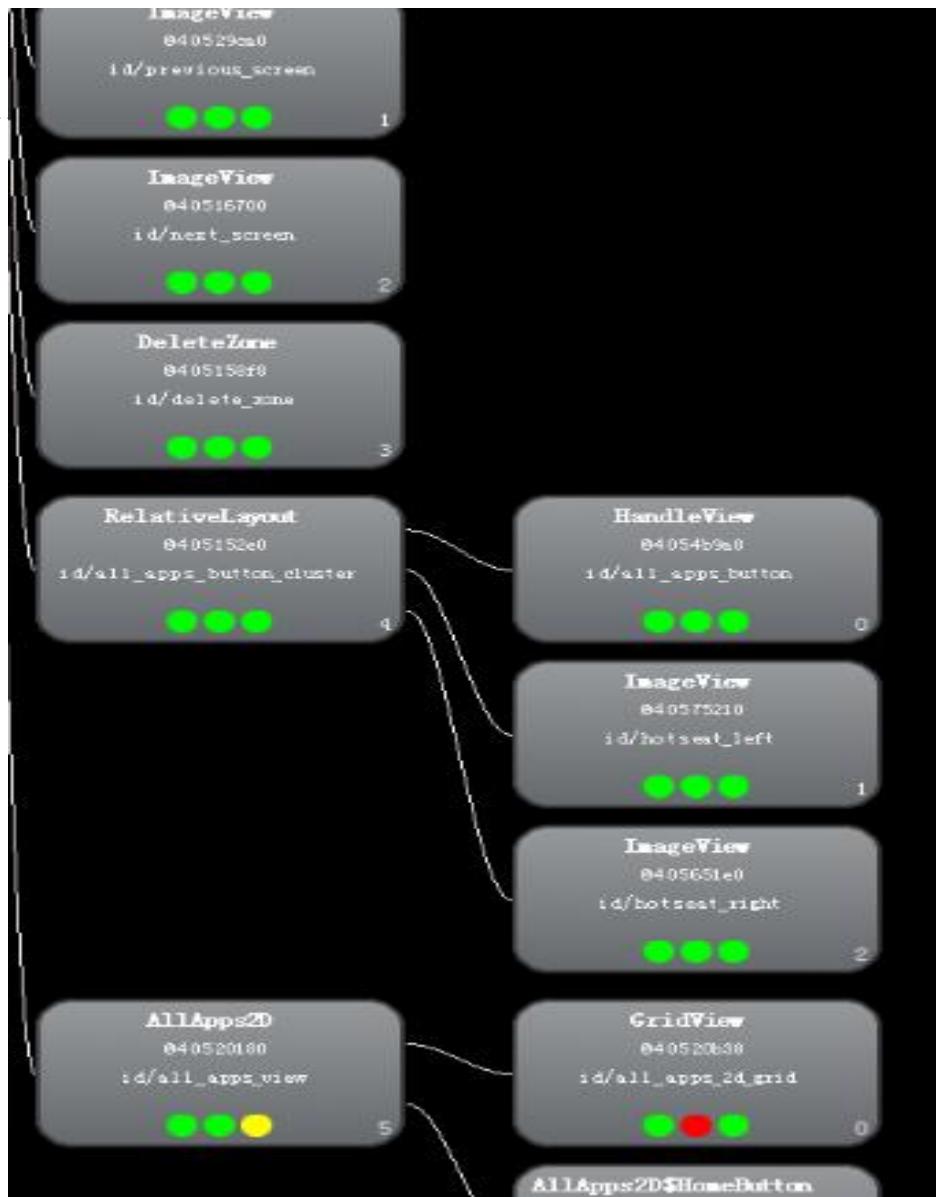


Launcher UI 结构 android2.1以后





Launcher UI 结构 android2.1以后



Launcher 优化






- } 1、TraceViewer 分析性能
- } 2、去掉动态壁纸
- } 3、窗口BackGround设置为NULL
- } 4、重写dispatchDraw
- } 5、裁剪掉窗口以外的部分
- } 6、创建RGB565的缓存

Launcher数据库

| _id | title | intent | container |
|---|----------------|---|-----------|
| Click here to define a filter | | | |
| 1 | <null> | <null> | -100 |
| 3 | <null> | <null> | -100 |
| 4 | Clock | #Intent;action=android.intent.action.MAIN;category=android.intent.category.LAUNCHER;launchFlags=0x10200000;component=com.android.deskclock/.DeskClock;end | -100 |
| 5 | Folder | <null> | -100 |
| 6 | Email | #Intent;action=android.intent.action.MAIN;category=android.intent.category.LAUNCHER;launchFlags=0x10200000;component=com.android.email/.activity.Welcome;end | 5 |
| 7 | Messaging | #Intent;action=android.intent.action.MAIN;category=android.intent.category.LAUNCHER;launchFlags=0x10200000;component=com.android.mms/.ui.ConversationList;end | 5 |
| 8 | Google | http://www.google.com/#Intent;action=android.intent.action.VIEW;S.com.android.browser.application_id=-376878250953528696;end | -100 |
| 9 | Wi-Fi settings | #Intent;action=android.intent.action.MAIN;category=com.android.settings.SHORTCUT;launchFlags=0x200000;component=com.android.settings/.wifi.WifiSettings;end | -100 |

Launcher数据库



| container | screen | cellX | cellY | spanX | spanY | itemType | appWidgetId | isShortcut | iconType | iconPackage | iconResource | icon | uri | displayMode |
|-------------------------------|--------|-------|-------|-------|-------|----------|-------------|------------|----------|----------------------|--|---|--------|-------------|
| Click here to define a filter | | | | | | | | | | | | | | |
| -100 | 2 | 0 | 0 | 4 | 1 | 4 | 1 | <null> | <null> | <null> | <null> | (null) | <null> | <null> |
| -100 | 3 | 0 | 0 | 4 | 1 | 4 | 3 | <null> | <null> | <null> | <null> | (null) | <null> | <null> |
| -100 | 2 | 1 | 2 | 1 | 1 | 0 | -1 | <null> | 0 | <null> | <null> |  | <null> | <null> |
| -100 | 1 | 1 | 2 | 1 | 1 | 2 | -1 | <null> | <null> | <null> | <null> | (null) | <null> | <null> |
| 5 | 0 | 0 | 0 | 1 | 1 | 0 | -1 | <null> | 0 | <null> | <null> | (null) | <null> | <null> |
| 5 | 0 | 0 | 0 | 1 | 1 | 0 | -1 | <null> | 0 | <null> | <null> | (null) | <null> | <null> |
| -100 | 1 | 2 | 0 | 1 | 1 | 1 | -1 | <null> | 0 | com.android.browser | com.android.browser:drawable/ic_launcher_shortcut_browser_bookmark |  | <null> | <null> |
| -100 | 1 | 1 | 0 | 1 | 1 | 1 | -1 | <null> | 0 | com.android.settings | com.android.settings:drawable/ic_launcher_settings |  | <null> | <null> |



Launcher常见问题



- } 1、桌面行列数
- } 2、ipad风格
- } 3、弹出应用列表动画



Android上优秀的开源Launcher



} ADW launcher

