



链滴

android 你了解多少 Application、Activity 和 Context 对象?

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<p>Context 的继承关系如下所示:

</p>

<p>所以, Android 中的 Context 数量 = Activity 的数量 + Service 的数量 + 1 (Application)</p>

<blockquote>

<p>Context 的用途比较广, 比如用来获取图片、字符串, 显式对话框等, 大部分情况下, 使用哪个 Context 都可以, 少数情况下只能使用特定的 Context. 比如启动 Activity 的时候, 要求传入 Activity Context, 因为 AMS 需要直到启动指定 Activity 的 Activity 的栈。一般情况下, 能使用 Application 的 Context 尽量使用它的, 因为它的生命周期更长。</p>

</blockquote>

<blockquote>

<p>Context 之间使用的是装饰者设计模式, 其中 Context 是一个抽象的类。ContextWrapper 内实际使用 ContextImpl 实现的, 因此所有的逻辑基本是在 ContextImpl 中实现的。然后对于 ContextThemeWrapper, 它在 ContextWrapper 的基础之上又进行了一层装饰, 就是与主题相关的东西。版的 Activity 启动中将 Activity 的各个回调执行的逻辑放在了各个 ClientTransactionItem 中, 比如: LaunchActivityItem 表示用来启动 Activity。最终执行逻辑的时候是调用它们的 execute() 方法并使传入的 ClientTransactionHandler 真正执行任务。而这里的 ClientTransactionHandler 实际上就是 ActivityThread, 所以它将调用到 Activity 的 <code>handleLaunchActivity()</code> 启动 Activity. 然后程序进入到 <code>performLaunchActivity()</code> 中。这个方法中会创建上面的 Application 和 Activity 对应的 Context: </p>

</blockquote>

```
<pre><code class="language-java highlight-chroma"><span class="highlight-line"><span class="highlight-cl"><span class="highlight-kd">private</span><span class="highlight-n">
    performLaunchActivity</span><span class="highlight-o">(</span><span class="highlight-n">ActivityClientRecord</span><span class="highlight-n">r</span><span class="highlight-o">,</span><span class="highlight-n">Intent</span><span class="highlight-n">
        customIntent</span><span class="highlight-o">)</span><span class="highlight-o">{</span></pre>
```

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</span></span><span class="highlight-line"><span class="highlight-cl"><span class="highlight-c1">    // ...</span></span></span></pre>
```

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</span></span><span class="highlight-line"><span class="highlight-cl"><span class="highlight-c1"><span class="highlight-c1"></span></span></span></pre>
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</span></span><span class="highlight-line"><span class="highlight-cl"><span class="highlight-c1"><span class="highlight-c1"></span></span></span></pre>
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</span></span><span class="highlight-line"><span class="highlight-cl"><span class="highlight-c1"><span class="highlight-c1"></span></span></span></pre>
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="highlight-c1">>// 创建新的 Activity
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span>         <span class="highlight-n">activity</span> <span class="h
ghlight-o">=</span> <span class="highlight-n">Instrumentation</span><span class="hi
hlight-o">.</span><span class="highlight-na">newActivity</span><span class="highlight-
"></span>
</span></span><span class="highlight-line"><span class="highlight-cl">         <span
class="highlight-n">cl</span><span class="highlight-o">,</span> <span class="highlight-n
">component</span><span class="highlight-o">.</span><span class="highlight-na">getCl
ssName</span><span class="highlight-o">(),</span> <span class="highlight-n">r</span></span>
span class="highlight-o">.</span><span class="highlight-na">intent</span><span class="h
ghlight-o">);</span>
</span></span><span class="highlight-line"><span class="highlight-cl">         <span clas
="highlight-c1">>// ...
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span>         <span class="highlight-o">}</span><span class="highlight-
">catch</span> <span class="highlight-o"></span><span class="highlight-n">Exception<
span> <span class="highlight-n">e</span><span class="highlight-o"></span> <span clas
="highlight-o">{</span>
</span></span><span class="highlight-line"><span class="highlight-cl">         <span clas
="highlight-c1">>// ... handle exception
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span>         <span class="highlight-o">}</span>
</span></span><span class="highlight-line"><span class="highlight-cl">
</span></span><span class="highlight-line"><span class="highlight-cl">         <span class=
highlight-k">try</span> <span class="highlight-o">{</span>
</span></span><span class="highlight-line"><span class="highlight-cl">         <span clas
="highlight-c1">>// 创建应用的 Application
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span>         <span class="highlight-n">Application</span> <span clas
="highlight-n">app</span> <span class="highlight-o">=</span> <span class="highlight-n
">r</span><span class="highlight-o">.</span><span class="highlight-na">packageInfo</s
an> <span class="highlight-o">.</span><span class="highlight-na">makeApplication</spa
> <span class="highlight-o"></span><span class="highlight-kc">>false</span><span class="h
highlight-o">,</span> <span class="highlight-n">Instrumentation</span><span class="h
ghlight-o">);</span>
</span></span><span class="highlight-line"><span class="highlight-cl">
</span></span><span class="highlight-line"><span class="highlight-cl">         <span clas
="highlight-k">if</span> <span class="highlight-o"></span><span class="highlight-n">a
ctivity</span> <span class="highlight-o">!=</span> <span class="highlight-kc">>null</span>
<span class="highlight-o">}</span><span class="highlight-o">{</span>
</span></span><span class="highlight-line"><span class="highlight-cl">         <span c
lass="highlight-n">CharSequence</span> <span class="highlight-n">title</span> <span cla
s="highlight-o">=</span> <span class="highlight-n">r</span><span class="highlight-o">
</span><span class="highlight-na">activityInfo</span><span class="highlight-o">.</span>
<span class="highlight-na">loadLabel</span><span class="highlight-o"></span><span cl
ss="highlight-n">appContext</span><span class="highlight-o">.</span><span class="high
light-na">getPackageManager</span><span class="highlight-o">());</span>
</span></span><span class="highlight-line"><span class="highlight-cl">         <span c
lass="highlight-c1">>// Activity 的配置
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span>         <span class="highlight-n">Configuration</span> <span
class="highlight-n">config</span> <span class="highlight-o">=</span> <span class="high
ght-k">new</span> <span class="highlight-n">Configuration</span><span class="highligh

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```

-o">(</span><span class="highlight-n">mCompatConfiguration</span><span class="highl
ght-o">);</span>
</span></span><span class="highlight-line"><span class="highlight-cl">           <span c
lass="highlight-k">if</span> <span class="highlight-o">(</span><span class="highlight-n"
r</span><span class="highlight-o">.</span><span class="highlight-na">overrideConfig</
span> <span class="highlight-o">!=</span> <span class="highlight-kc">>null</span><span c
lass="highlight-o">)</span> <span class="highlight-o">{</span></span>
</span></span><span class="highlight-line"><span class="highlight-cl">           <span
class="highlight-n">config</span><span class="highlight-o">.</span><span class="highli
ght-na">updateFrom</span><span class="highlight-o">(</span><span class="highlight-n">
</span><span class="highlight-o">.</span><span class="highlight-na">overrideConfig</s
an> <span class="highlight-o">);</span>
</span></span><span class="highlight-line"><span class="highlight-cl">           <span c
lass="highlight-o">}</span></span>
</span></span><span class="highlight-line"><span class="highlight-cl">           <span c
lass="highlight-c1">// 创建窗口
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span>           <span class="highlight-n">Window</span> <span clas
s="highlight-n">window</span> <span class="highlight-o">=</span> <span class="highlig
ht-kc">>null</span><span class="highlight-o">;</span>
</span></span><span class="highlight-line"><span class="highlight-cl">           <span c
lass="highlight-k">if</span> <span class="highlight-o">(</span><span class="highlight-n"
r</span><span class="highlight-o">.</span><span class="highlight-na">mPendingRemov
Window</span> <span class="highlight-o">!=</span> <span class="highlight-kc">>null</s
an> <span class="highlight-o">&amp;&amp;</span> <span class="highlight-n">r</span>
<span class="highlight-o">.</span><span class="highlight-na">mPreserveWindow</span><
span class="highlight-o">)</span> <span class="highlight-o">{</span></span>
</span></span><span class="highlight-line"><span class="highlight-cl">           <span
class="highlight-n">window</span> <span class="highlight-o">=</span> <span class="hi
hlight-n">r</span><span class="highlight-o">.</span><span class="highlight-na">mPendi
gRemoveWindow</span><span class="highlight-o">;</span>
</span></span><span class="highlight-line"><span class="highlight-cl">           <span
class="highlight-n">r</span><span class="highlight-o">.</span><span class="highlight-na
">mPendingRemoveWindow</span> <span class="highlight-o">=</span> <span class="high
light-kc">>null</span><span class="highlight-o">;</span>
</span></span><span class="highlight-line"><span class="highlight-cl">           <span
class="highlight-n">r</span><span class="highlight-o">.</span><span class="highlight-na
">mPendingRemoveWindowManager</span> <span class="highlight-o">=</span> <span cl
ass="highlight-kc">>null</span><span class="highlight-o">;</span>
</span></span><span class="highlight-line"><span class="highlight-cl">           <span c
lass="highlight-o">}</span></span>
</span></span><span class="highlight-line"><span class="highlight-cl">           <span c
lass="highlight-c1">// 关联 Activity 和 Context
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span>           <span class="highlight-n">appContext</span> <span cl
ass="highlight-o">.</span><span class="highlight-na">setOuterContext</span> <span class
"highlight-o">(</span><span class="highlight-n">activity</span><span class="highlight-o
">);</span>
</span></span><span class="highlight-line"><span class="highlight-cl">           <span c
lass="highlight-n">activity</span><span class="highlight-o">.</span><span class="highlig
ht-na">attach</span><span class="highlight-o">(</span><span class="highlight-n">appCo
text</span><span class="highlight-o">,</span> <span class="highlight-k">this</span><span c
lass="highlight-o">,</span> <span class="highlight-n">getInstrumentation</span><span
class="highlight-o">(),</span> <span class="highlight-n">r</span><span class="highligh

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-o">.</span><span class="highlight-na">token</span><span class="highlight-o">,</span>
</span></span><span class="highlight-line"><span class="highlight-cl">                <s
an class="highlight-n">r</span><span class="highlight-o">.</span><span class="highlight
na">ident</span><span class="highlight-o">,</span><span class="highlight
na">app</sp
n><span class="highlight-o">,</span><span class="highlight-n">r</span><span class="h
ghlight-o">.</span><span class="highlight-na">intent</span><span class="highlight-o">,<
/span><span class="highlight-n">r</span><span class="highlight-o">.</span><span clas
="highlight-na">activityInfo</span><span class="highlight-o">,</span><span class="highl
ght-n">title</span><span class="highlight-o">,</span><span class="highlight-n">r</spa
><span class="highlight-o">.</span><span class="highlight-na">parent</span><span clas
="highlight-o">,</span>
</span></span><span class="highlight-line"><span class="highlight-cl">                <s
an class="highlight-n">r</span><span class="highlight-o">.</span><span class="highlight
na">embeddedID</span><span class="highlight-o">,</span><span class="highlight-n">r
/span><span class="highlight-o">.</span><span class="highlight-na">lastNonConfiguratio
Instances</span><span class="highlight-o">,</span><span class="highlight-n">config</s
an><span class="highlight-o">,</span>
</span></span><span class="highlight-line"><span class="highlight-cl">                <s
an class="highlight-n">r</span><span class="highlight-o">.</span><span class="highlight
na">referrer</span><span class="highlight-o">,</span><span class="highlight-n">r</spa
><span class="highlight-o">.</span><span class="highlight-na">voiceInteractor</span><
pan class="highlight-o">,</span><span class="highlight-n">window</span><span class="
ighlight-o">,</span><span class="highlight-n">r</span><span class="highlight-o">.</sp
n><span class="highlight-na">configCallback</span><span class="highlight-o">);</span>
</span></span><span class="highlight-line"><span class="highlight-cl">                <span c
</span></span><span class="highlight-line"><span class="highlight-cl">                <span c
ass="highlight-c1">// ...
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span>                <span class="highlight-c1">// 设置 Activity 的主题
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span>                <span class="highlight-kt">int</span><span class="hi
hlight-n">theme</span><span class="highlight-o">=</span><span class="highlight-n">r
/span><span class="highlight-o">.</span><span class="highlight-na">activityInfo</span>
span class="highlight-o">.</span><span class="highlight-na">getThemeResource</span><
pan class="highlight-o">();</span>
</span></span><span class="highlight-line"><span class="highlight-cl">                <span c
ass="highlight-k">if</span><span class="highlight-o">(</span><span class="highlight-n"
theme</span><span class="highlight-o">!=</span><span class="highlight-mi">0</span>
<span class="highlight-o">)</span><span class="highlight-o">{</span>
</span></span><span class="highlight-line"><span class="highlight-cl">                <span
class="highlight-n">activity</span><span class="highlight-o">.</span><span class="highli
ht-na">setTheme</span><span class="highlight-o">(</span><span class="highlight-n">th
me</span><span class="highlight-o">);</span>
</span></span><span class="highlight-line"><span class="highlight-cl">                <span c
ass="highlight-o">}</span>
</span></span><span class="highlight-line"><span class="highlight-cl">                <span c
ass="highlight-c1">// 回调 Activity 的生命周期方法
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span>                <span class="highlight-n">activity</span><span class=
highlight-o">.</span><span class="highlight-na">mCalled</span><span class="highlight-
">=</span><span class="highlight-kc">>false</span><span class="highlight-o">);</span>
</span></span><span class="highlight-line"><span class="highlight-cl">                <span c

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ass="highlight-k">if</span> <span class="highlight-o"></span><span class="highlight-n"
r</span><span class="highlight-o">.</span><span class="highlight-na">isPersistable</spa
><span class="highlight-o">)</span> <span class="highlight-o">{</span>
</span></span><span class="highlight-line"><span class="highlight-cl">
class="highlight-n">mInstrumentation</span><span class="highlight-o">.</span><span cl
ss="highlight-na">callActivityOnCreate</span><span class="highlight-o"></span><span c
ass="highlight-n">activity</span><span class="highlight-o">,</span><span class="highlig
t-n">r</span><span class="highlight-o">.</span><span class="highlight-na">state</span
<span class="highlight-o">,</span><span class="highlight-n">r</span><span class="highl
ght-o">.</span><span class="highlight-na">persistentState</span><span class="highlight
o">};</span>
</span></span><span class="highlight-line"><span class="highlight-cl">
ass="highlight-o">}</span> <span class="highlight-k">else</span> <span class="highlight
o">{</span>
</span></span><span class="highlight-line"><span class="highlight-cl">
class="highlight-n">mInstrumentation</span><span class="highlight-o">.</span><span cl
ss="highlight-na">callActivityOnCreate</span><span class="highlight-o"></span><span c
ass="highlight-n">activity</span><span class="highlight-o">,</span><span class="highlig
t-n">r</span><span class="highlight-o">.</span><span class="highlight-na">state</span
<span class="highlight-o">};</span>
</span></span><span class="highlight-line"><span class="highlight-cl">
ass="highlight-o">}</span> <span class="highlight-cl">
</span></span><span class="highlight-line"><span class="highlight-cl">
ass="highlight-n">r</span><span class="highlight-o">.</span><span class="highlight-na"
activity</span> <span class="highlight-o">=</span> <span class="highlight-n">activity</s
an> <span class="highlight-o">};</span>
</span></span><span class="highlight-line"><span class="highlight-cl">
="highlight-o">}</span>
</span></span><span class="highlight-line"><span class="highlight-cl">
="highlight-n">r</span><span class="highlight-o">.</span><span class="highlight-na">se
State</span><span class="highlight-o"></span><span class="highlight-n">ON_CREATE</
pan> <span class="highlight-o">};</span>
</span></span><span class="highlight-line"><span class="highlight-cl">
="highlight-n">mActivities</span><span class="highlight-o">.</span><span class="highli
ht-na">put</span> <span class="highlight-o"></span><span class="highlight-n">r</span>
<span class="highlight-o">.</span><span class="highlight-na">token</span><span class=
highlight-o">,</span> <span class="highlight-n">r</span><span class="highlight-o">};</s
an>
</span></span><span class="highlight-line"><span class="highlight-cl">
highlight-o">}</span> <span class="highlight-k">catch</span> <span class="highlight-o">
</span><span class="highlight-n">SuperNotCalledException</span> <span class="highligh
-n">e</span><span class="highlight-o">)</span> <span class="highlight-o">{</span>
</span></span><span class="highlight-line"><span class="highlight-cl">
="highlight-k">throw</span> <span class="highlight-n">e</span><span class="highlight-
">};</span>
</span></span><span class="highlight-line"><span class="highlight-cl">
highlight-o">}</span> <span class="highlight-k">catch</span> <span class="highlight-o">
</span><span class="highlight-n">Exception</span> <span class="highlight-n">e</span>
span class="highlight-o">)</span> <span class="highlight-o">{</span>
</span></span><span class="highlight-line"><span class="highlight-cl">
="highlight-c1">>// ... handle exception
</span></span></span><span class="highlight-line"><span class="highlight-cl"> <span cla
s="highlight-c1"></span> <span class="highlight-o">}</span>
</span></span><span class="highlight-line"><span class="highlight-cl">

```

```

return;
}

public Application() {
    boolean forceDefaultAppClass = true;
    Instrumentation instrumentation = new Instrumentation();
    // ...
}

try {
    // 创建 Application 的 Context
    ContextImpl contextImpl = new ContextImpl(
        appContext,
        ContextImpl.this,
        createAppContext(),
        mActivityThread,
        app,
        mActivityThread,
        instrumentation,
        appClass,
        appContext);
    // 关联 Application 和 Context
    appContext.setOuterContext(app);
} catch (Exception e) {
    // ... handle exception
}

```

```
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span>    <span class="highlight-k">return</span> <span class="highl
ght-n">app</span><span class="highlight-o">;</span>
</span></span><span class="highlight-line"><span class="highlight-cl">  <span class="h
ghlight-o">}</span>
</span></span></code></pre>
```