



链滴

## 五、go-kit 微服务熔断机制

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<h3 id="介绍">介绍</h3>

<p><strong>go-kit</strong> 提供了三种熔断</p>

<p>1、<strong><a href="https://ld246.com/forward?goto=https%3A%2F%2Fgithub.com%Fsony%2Fgobreaker" target="\_blank" rel="nofollow ugc">gobreaker</a></strong></p>

<p>2、<strong><a href="https://ld246.com/forward?goto=https%3A%2F%2Fgithub.com%Fstreadway%2Fhandy" target="\_blank" rel="nofollow ugc">handy</a></strong></p>

<p>3、<strong><a href="https://ld246.com/forward?goto=https%3A%2F%2Fgithub.com%Fafex%2Fhystrix-go" target=" blank" rel="nofollow ugc">hystrix-go</a></strong></p>

<p>hystrix 在 java 中用的比较多，我们来介绍下 go-kit 中 hystrix 的使用方法</p>

<h3 id="go-kit的hystrix">go-kit 的 hystrix</h3>

<h4 id="Middleware的实现">Middleware 的实现</h4>

<p>1、Hystrix 返回 Middleware 此中间件会在原来的 endPoint 包一层 Hystrix 的 endPoint</p>

<p>2、hystrix 通过传入的 commanName 获取对应的 Hystrix 的设置，并设置 run 失败时运行的 fallback 函数为 nil</p>

<p>3、我们也可以自己实现 middleware 包装 endPoint</p>

```
<pre><code class="language-go highlight-chroma"><span class="highlight-line"><span cla
s="highlight-cl"><span class="highlight-kd">func</span> <span class="highlight-nf">Hystr
x</span> <span class="highlight-p">(</span><span class="highlight-nx">commandName<
span> <span class="highlight-kt">string</span> <span class="highlight-p">)</span> <span
class="highlight-nx">endPoint</span><span class="highlight-p">.</span><span class="hi
hlight-nx">Middleware</span> <span class="highlight-p">{</span>
```

```
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-k">return</span> <span class="highlight-kd">func</span><span class="highlight-
">(</span><span class="highlight-nx">next</span> <span class="highlight-nx">endPoint<
span> <span class="highlight-p">.</span><span class="highlight-nx">Endpoint</span><sp
n class="highlight-p">)</span> <span class="highlight-nx">endPoint</span><span class="
ighlight-p">.</span><span class="highlight-nx">Endpoint</span> <span class="highlight-
">{</span>
```

```
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
highlight-k">return</span> <span class="highlight-kd">func</span><span class="highlight
p">(</span><span class="highlight-nx">ctx</span> <span class="highlight-nx">context</
pan> <span class="highlight-p">.</span><span class="highlight-nx">Context</span><span
class="highlight-p">,</span> <span class="highlight-nx">request</span> <span class="hig
hlight-kd">interface</span><span class="highlight-p">{</span></span> <span class="highlight-p"
(</span><span class="highlight-nx">response</span> <span class="highlight-kd">interfac
</span><span class="highlight-p">}</span>,</span> <span class="highlight-nx">err</span> <sp
n class="highlight-kt">error</span><span class="highlight-p">)</span> <span class="highl
ght-p">{</span>
```

```
</span></span><span class="highlight-line"><span class="highlight-cl"> <span clas
="highlight-kd">var</span> <span class="highlight-nx">resp</span> <span class="highlig
t-kd">interface</span><span class="highlight-p">{</span></span>
```

```
</span></span><span class="highlight-line"><span class="highlight-cl"> <span clas
="highlight-k">if</span> <span class="highlight-nx">err</span> <span class="highlight-o
>:=</span> <span class="highlight-nx">hystrix</span><span class="highlight-p">.</span>
<span class="highlight-nf">Do</span><span class="highlight-p">(</span><span class="hi
hlight-nx">commandName</span><span class="highlight-p">,</span> <span class="highl
ght-kd">func</span><span class="highlight-p">()</span> <span class="highlight-p">(</s
an> <span class="highlight-nx">err</span> <span class="highlight-kt">error</span><span
lass="highlight-p">)</span> <span class="highlight-p">{</span>
```

```
</span></span><span class="highlight-line"><span class="highlight-cl"> <span c
ass="highlight-nx">resp</span><span class="highlight-p">,</span> <span class="highlight
nx">err</span> <span class="highlight-p">=</span><span class="highlight-nf">next</sp
n><span class="highlight-p">(</span><span class="highlight-nx">ctx</span><span class=
highlight-p">,</span> <span class="highlight-nx">request</span><span class="highlight-p
```

```

>)/span>
</span></span><span class="highlight-line"><span class="highlight-cl">      <span c
ass="highlight-k">return</span> <span class="highlight-nx">err</span>
</span></span><span class="highlight-line"><span class="highlight-cl">      <span clas
="highlight-p">},</span> <span class="highlight-kc">nil</span><span class="highligh
t-p">;</span> <span class="highlight-nx">err</span> <span class="highlight-o">!=</span> <s
an class="highlight-kc">nil</span> <span class="highlight-p">{</span>
</span></span><span class="highlight-line"><span class="highlight-cl">      <span c
ass="highlight-k">return</span> <span class="highlight-kc">nil</span><span class="highl
ght-p">,</span> <span class="highlight-nx">err</span>
</span></span><span class="highlight-line"><span class="highlight-cl">      <span clas
="highlight-p">}</span></span>
</span></span><span class="highlight-line"><span class="highlight-cl">      <span clas
="highlight-k">return</span> <span class="highlight-nx">resp</span><span class="highli
ht-p">,</span> <span class="highlight-kc">nil</span>
</span></span><span class="highlight-line"><span class="highlight-cl">      <span class=
highlight-p">}</span></span>
</span></span><span class="highlight-line"><span class="highlight-cl">      <span class="h
ghlight-p">}</span></span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="high
ight-p">}</span></span>
</span></span></code></pre>
<h4 id="客户端hystrix配置">客户端 hystrix 配置</h4>
<p>1、Timeout 【请求超时的时间】</p>
<p>2、ErrorPercentThreshold【允许出现的错误比例】</p>
<p>3、SleepWindow【熔断开启多久尝试发起一次请求】</p>
<p>4、MaxConcurrentRequests【允许的最大并发请求数】</p>
<p>5、RequestVolumeThreshold 【波动期内的最小请求数，默认波动期 10S】</p>
<pre><code class="language-go highlight-chroma"><span class="highlight-line"><span cla
s="highlight-cl"><span class="highlight-nx">commandName</span> <span> class="highligh
-o">:=</span> <span class="highlight-s">"my-endpoint"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"><span class="high
ight-nx">hystrix</span><span class="highlight-p">.</span><span class="highlight-nf">Co
figureCommand</span><span class="highlight-p">(</span><span class="highlight-nx">c
mmandName</span><span class="highlight-p">,</span><span class="highlight-nx">hystr
x</span><span class="highlight-p">.</span><span class="highlight-nx">CommandConfig
</span><span class="highlight-p">{</span>
</span></span><span class="highlight-line"><span class="highlight-cl">  <span class="h
ghlight-nx">Timeout</span><span class="highlight-p">:</span><span class="highli
ght-mi">1000</span> <span class="highlight-o">*</span> <span class="highlight-mi">
0</span><span class="highlight-p">,</span>
</span></span><span class="highlight-line"><span class="highlight-cl">  <span class="h
ghlight-nx">ErrorPercentThreshold</span><span class="highlight-p">:</span><span clas
="highlight-mi">1</span><span class="highlight-p">,</span>
</span></span><span class="highlight-line"><span class="highlight-cl">  <span class="h
ghlight-nx">SleepWindow</span><span class="highlight-p">:</span><span class="highli
ght-mi">10000</span><span class="highlight-p">,</span>
</span></span><span class="highlight-line"><span class="highlight-cl">  <span class="h
ghlight-nx">MaxConcurrentRequests</span><span class="highlight-p">:</span><span cl
ss="highlight-mi">1000</span><span class="highlight-p">,</span>
</span></span><span class="highlight-line"><span class="highlight-cl">  <span class="h
ghlight-nx">RequestVolumeThreshold</span><span class="highlight-p">:</span><span cl
ss="highlight-mi">5</span><span class="highlight-p">,</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="high

```

```

ight-p">}}</span>
</span></span></code></pre>
<p>增加熔断中间件的包装</p>
<pre><code class="language-go highlight-chroma"><span class="highlight-line"><span cla
s="highlight-cl"><span class="highlight-nx">breakerMw</span> <span class="highlight-o"
:=</span> <span class="highlight-nx">circuitbreaker</span><span class="highlight-p">.</
pan><span class="highlight-nf">Hystrix</span><span class="highlight-p">(</span><span
lass="highlight-nx">commandName</span><span class="highlight-p">)</span>
</span></span><span class="highlight-line"><span class="highlight-cl"><span class="high
ight-c1">// 增加熔断中间件
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span><span class="highlight-nx">reqEndPoint</span> <span class="hi
hlight-p">=</span> <span class="highlight-nf">breakerMw</span><span class="highlight
p">(</span><span class="highlight-nx">reqEndPoint</span><span class="highlight-p">)</
pan>
</span></span></code></pre>
<h4 id="完整代码">完整代码</h4>
<p>1、 关闭微服务的 service</p>
<p>2、 在之前我们的客户端代码增加熔断配置</p>
<p>3、 增加循环请求代码</p>
<pre><code class="language-go highlight-chroma"><span class="highlight-line"><span cla
s="highlight-cl"><span class="highlight-kn">package</span> <span class="highlight-nx">
ain</span>
</span></span><span class="highlight-line"><span class="highlight-cl">
</span></span><span class="highlight-line"><span class="highlight-cl"><span class="high
ight-kn">import</span> <span class="highlight-p">(</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-s">"context"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-s">"fmt"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-s">"github.com/afex/hystrix-go/hystrix"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-s">"github.com/go-kit/kit/circuitbreaker"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-s">"github.com/go-kit/kit/endpoint"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-s">"github.com/go-kit/kit/log"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-s">"github.com/go-kit/kit/sd"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-s">"github.com/go-kit/kit/sd/etcdrv3"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-s">"github.com/go-kit/kit/sd/lb"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-s">"google.golang.org/grpc"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-s">"grpc-test/pb"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-s">"io"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-s">"time"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"><span class="high
ight-p">)</span></span>

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</span></span><span class="highlight-line"><span class="highlight-cl">
</span></span><span class="highlight-line"><span class="highlight-cl"><span class="high
ight-kd">func</span> <span class="highlight-nf">main</span><span class="highlight-p">(
</span> <span class="highlight-p">{</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-nx">commandName</span> <span class="highlight-o">:=</span> <span class="hi
hlight-s">"my-endpoint"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-nx">hystrix</span><span class="highlight-p">.</span><span class="highlight-nf"
ConfigureCommand</span><span class="highlight-p">(</span><span class="highlight-nx
">commandName</span><span class="highlight-p">,</span> <span class="highlight-nx"
">ystrix</span><span class="highlight-p">.</span><span class="highlight-nx">CommandCo
fig</span><span class="highlight-p">{</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class=
highlight-nx">Timeout</span><span class="highlight-p">:</span> <span class="h
ghlight-mi">1000</span> <span class="highlight-o">*</span> <span class="highlight-mi"
30</span><span class="highlight-p">,</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class=
highlight-nx">ErrorPercentThreshold</span><span class="highlight-p">:</span> <span cla
s="highlight-mi">1</span><span class="highlight-p">,</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class=
highlight-nx">SleepWindow</span><span class="highlight-p">:</span> <span class
"highlight-mi">10000</span><span class="highlight-p">,</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class=
highlight-nx">MaxConcurrentRequests</span><span class="highlight-p">:</span> <span c
ass="highlight-mi">1000</span><span class="highlight-p">,</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class=
highlight-nx">RequestVolumeThreshold</span><span class="highlight-p">:</span> <span
lass="highlight-mi">5</span><span class="highlight-p">,</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-p">})</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-nx">breakerMw</span> <span class="highlight-o">:=</span> <span class="highli
ht-nx">circuitbreaker</span><span class="highlight-p">.</span><span class="highlight-nf"
">Hystrix</span><span class="highlight-p">(</span><span class="highlight-nx">command
ame</span><span class="highlight-p">)</span>
</span></span><span class="highlight-line"><span class="highlight-cl">
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-kd">var</span> <span class="highlight-p">(</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class=
highlight-c1">//注册中心地址
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span> <span class="highlight-nx">etcdServer</span> <span class=
highlight-p">=</span> <span class="highlight-s">"127.0.0.1:2379"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class=
highlight-c1">//监听的服务前缀
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span> <span class="highlight-nx">prefix</span> <span class="high
ight-p">=</span> <span class="highlight-s">"/services/book/"</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class=
highlight-nx">ctx</span> <span class="highlight-p">=</span> <span class="highlight-nx"
">context</span><span class="highlight-p">.</span><span class="highlight-nf">Backgrou
nd</span><span class="highlight-p">()</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
```

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highlight-p">)/span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-nx">options</span> <span class="highlight-o">:=</span> <span class="highligh
x">etcdv3</span><span class="highlight-p">.</span><span class="highlight-nx">ClientOpt
ons</span><span class="highlight-p">}</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class=
highlight-nx">DialTimeout</span><span class="highlight-p">:</span><span class="highl
ght-nx">time</span><span class="highlight-p">.</span><span class="highlight-nx">Seco
d</span><span class="highlight-o">*</span> <span class="highlight-mi">3</span><span class=
"highlight-p">,</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class=
highlight-nx">DialKeepAlive</span><span class="highlight-p">:</span><span class="highl
ght-nx">time</span><span class="highlight-p">.</span><span class="highlight-nx">Seco
d</span><span class="highlight-o">*</span> <span class="highlight-mi">3</span><span class=
"highlight-p">,</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-p">}</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-c1">//连接注册中心
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span> <span class="highlight-nx">client</span><span class="highlig
t-p">,</span> <span class="highlight-nx">err</span> <span class="highlight-o">:=</span>
<span class="highlight-nx">etcdv3</span><span class="highlight-p">.</span><span class=
"highlight-nf">NewClient</span><span class="highlight-p">(</span><span class="highli
ht-nx">ctx</span><span class="highlight-p">,</span><span class="highlight-p">[]</span>
<span class="highlight-kt">string</span><span class="highlight-p">}</span><span class=
highlight-nx">etcdServer</span><span class="highlight-p">},</span> <span class="highlig
t-nx">options</span><span class="highlight-p">)</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-k">if</span> <span class="highlight-nx">err</span> <span class="highlight-o">!=
</span> <span class="highlight-kc">nil</span> <span class="highlight-p">}</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class=
highlight-nb">panic</span><span class="highlight-p">(</span><span class="highlight-nx
>err</span><span class="highlight-p">)</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-p">}</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-nx">logger</span> <span class="highlight-o">:=</span> <span class="highlight-n
">log</span><span class="highlight-p">.</span><span class="highlight-nf">NewNopLog
er</span><span class="highlight-p">()</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-c1">//创建实例管理器,此管理器会Watch监听etc中prefix的目录变化更新缓存的服务实例
据
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span> <span class="highlight-nx">instancer</span><span class="highl
ght-p">,</span> <span class="highlight-nx">err</span> <span class="highlight-o">:=</s
an> <span class="highlight-nx">etcdv3</span><span class="highlight-p">.</span><span c
ass="highlight-nf">NewInstancer</span><span class="highlight-p">(</span><span class="
ighlight-nx">client</span><span class="highlight-p">,</span> <span class="highlight-nx"
prefix</span><span class="highlight-p">,</span> <span class="highlight-nx">logger</spa
><span class="highlight-p">)</span>
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-k">if</span> <span class="highlight-nx">err</span> <span class="highlight-o">!=
</span> <span class="highlight-kc">nil</span> <span class="highlight-p">}</span>
```

```

</span></span><span class="highlight-line"><span class="highlight-cl">    <span class="highlight-nb">panic</span><span class="highlight-p">(</span><span class="highlight-nx">err</span><span class="highlight-p">)</span></span></span><span class="highlight-line"><span class="highlight-cl">    <span class="highlight-p">}</span></span></span><span class="highlight-line"><span class="highlight-cl">    <span class="highlight-c1">>//创建端点管理器, 此管理器根据Factory和监听的到实例创建endPoint并订阅instance的变化动态更新Factory创建的endPoint
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span class="highlight-c1"></span><span class="highlight-nx">endpointer</span><span class="highlight-o">:=</span><span class="highlight-nx">sd</span><span class="highlight-p">.</span><span class="highlight-nf">NewEndpointer</span><span class="highlight-p">(</span><span class="highlight-nx">instancer</span><span class="highlight-p">,</span><span class="highlight-nx">reqFactory</span><span class="highlight-p">,</span><span class="highlight-nx">logger</span><span class="highlight-p">)</span></span></span><span class="highlight-line"><span class="highlight-cl">    <span class="highlight-c1">>//创建负载均衡器
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span class="highlight-c1"></span><span class="highlight-nx">balancer</span><span class="highlight-o">:=</span><span class="highlight-nx">lb</span><span class="highlight-p">.</span><span class="highlight-nf">NewRoundRobin</span><span class="highlight-p">(</span><span class="highlight-nx">endpointer</span><span class="highlight-p">)</span></span></span><span class="highlight-line"><span class="highlight-cl">
</span></span></span><span class="highlight-line"><span class="highlight-cl">    <span class="highlight-cm">/**
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span class="highlight-cm">    我们可以通过负载均衡器直接获取请求的endPoint, 发起请求
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span class="highlight-cm">    reqEndPoint_ := balancer.Endpoint()
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span class="highlight-cm">    */</span></span></span><span class="highlight-line"><span class="highlight-cl">    <span class="highlight-cm">/**
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span class="highlight-cm">    也可以通过retry定义尝试次数进行请求
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span class="highlight-cm">    */</span></span></span><span class="highlight-line"><span class="highlight-cl">    <span class="highlight-nx">reqEndPoint</span><span class="highlight-o">:=</span><span class="highlight-nx">lb</span><span class="highlight-p">.</span><span class="highlight-nf">Retry</span><span class="highlight-p">(</span><span class="highlight-mi">3</span><span class="highlight-p">,</span><span class="highlight-mi">100</span><span class="highlight-o"></span><span class="highlight-nx">time</span><span class="highlight-p">.</span><span class="highlight-nx">Second</span><span class="highlight-p">,</span><span class="highlight-nx">balancer</span><span class="highlight-p">)</span></span></span><span class="highlight-line"><span class="highlight-cl">
</span></span></span><span class="highlight-line"><span class="highlight-cl">    <span class="highlight-c1">>//增加熔断中间件
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span class="highlight-c1"></span><span class="highlight-nx">reqEndPoint</span><span class="highlight-p">=</span><span class="highlight-nf">breakerMw</span><span class="highlight-p">(</span><span class="highlight-nx">reqEndPoint</span><span class="highlight-p">
</span></span></span><span class="highlight-line"><span class="highlight-cl">    <span class="highlight-cm">/**

```

highlight-c1">//现在我们可以通过 endPoint 发起请求了

```
</span></span></span><span class="highlight-line"><span class="highlight-cl"><span cla
s="highlight-c1"></span> <span class="highlight-nx">req</span> <span class="highlight
o">:=</span> <span class="highlight-kd">struct</span><span class="highlight-p">{</s
an>
```

```
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-k">for</span> <span class="highlight-nx">i</span> <span class="highlight-o">:=<
span> <span class="highlight-mi">1</span><span class="highlight-p">;</span> <span cla
s="highlight-nx">i</span> <span class="highlight-o">&lt;=</span> <span class="highlight
mi">20</span><span class="highlight-p">;</span> <span class="highlight-nx">i</span><
pan class="highlight-o">++</span> <span class="highlight-p">{</span>
```

```
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class=
highlight-k">if</span> <span class="highlight-nx">_</span><span class="highlight-p">,</
pan> <span class="highlight-nx">err</span> <span class="highlight-p">=</span> <span c
ass="highlight-nf">reqEndPoint</span><span class="highlight-p">(</span><span class="h
ghlight-nx">ctx</span><span class="highlight-p">,</span> <span class="highlight-nx">re
</span><span class="highlight-p">);</span> <span class="highlight-nx">err</span> <span
class="highlight-o">!</span><span class="highlight-kc">nil</span> <span class="highli
ht-p">{</span>
```

```
</span></span><span class="highlight-line"><span class="highlight-cl"> <span clas
="highlight-nx">fmt</span><span class="highlight-p">.</span><span class="highlight-nf"
Println</span><span class="highlight-p">(</span><span class="highlight-s">"当前时间: "</
pan><span class="highlight-p">,</span> <span class="highlight-nx">time</span><span cl
ss="highlight-p">.</span><span class="highlight-nf">Now</span><span class="highlight-
">().</span><span class="highlight-nf">Format</span><span class="highlight-p">(</span>
<span class="highlight-s">"2006-01-02 15:04:05.99" </span><span class="highlight-p">))</
pan>
```

```
</span></span><span class="highlight-line"><span class="highlight-cl"> <span clas
="highlight-nx">fmt</span><span class="highlight-p">.</span><span class="highlight-nf"
Println</span><span class="highlight-p">(</span><span class="highlight-nx">err</span>
span class="highlight-p">)</span>
```

```
</span></span><span class="highlight-line"><span class="highlight-cl"> <span clas
="highlight-nx">time</span><span class="highlight-p">.</span><span class="highlight-nf"
>sleep</span><span class="highlight-p">(</span><span class="highlight-mi">1</span> <
pan class="highlight-o">*</span> <span class="highlight-nx">time</span><span class="hi
hlight-p">.</span><span class="highlight-nx">Second</span><span class="highlight-p">)<
/span>
```

```
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class=
highlight-p">}</span></span>
```

```
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="h
ghlight-p">}</span></span>
```

```
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="high
ight-p">}</span></span>
```

```
</span></span><span class="highlight-line"><span class="highlight-cl">
</span></span><span class="highlight-line"><span class="highlight-cl"> <span class="high
ight-c1">// 通过传入的 实例地址 创建对应的请求endPoint
```

```
</span></span></span><span class="highlight-line"><span class="highlight-cl"> <span cla
s="highlight-c1"></span><span class="highlight-kd">func</span> <span class="highlight-
f">reqFactory</span><span class="highlight-p">(</span><span class="highlight-nx">insta
nceAddr</span> <span class="highlight-kt">string</span><span class="highlight-p">)</sp
n> <span class="highlight-p">(</span><span class="highlight-nx">endpoint</span><span class="
highlight-p">.</span><span class="highlight-nx">Endpoint</span><span class="hi
hlight-p">,</span> <span class="highlight-nx">io</span><span class="highlight-p">.</sp
n><span class="highlight-nx">Closer</span><span class="highlight-p">,</span> <span cla
```



```
s="highlight-kt">error</span> <span class="highlight-p"></span> <span class="highlight-
">{</span>
</span></span> <span class="highlight-line"> <span class="highlight-cl"> <span class="h
ghlight-k">return</span> <span class="highlight-kd">func</span><span class="highlight-
">(</span><span class="highlight-nx">ctx</span> <span class="highlight-nx">context</s
an> <span class="highlight-p">.</span><span class="highlight-nx">Context</span> <span c
ass="highlight-p">,</span> <span class="highlight-nx">request</span> <span class="highl
ght-kd">interface</span><span class="highlight-p">{}</span> <span class="highlight-p">
</span><span class="highlight-kd">interface</span><span class="highlight-p">{}</span>
<span class="highlight-kt">error</span><span class="highlight-p"></span> <span class=
highlight-p">{</span>
</span></span> <span class="highlight-line"> <span class="highlight-cl"> <span class=
highlight-nx">fmt</span> <span class="highlight-p">.</span><span class="highlight-nf">P
rintln</span> <span class="highlight-p">(</span><span class="highlight-s">"请求服务: "</s
an> <span class="highlight-p">,</span> <span class="highlight-nx">instanceAddr</span><
pan class="highlight-p">,</span> <span class="highlight-s">"当前时间: "</span><span clas
="highlight-p">,</span> <span class="highlight-nx">time</span><span class="highlight-p
">.</span><span class="highlight-nf">Now</span><span class="highlight-p">().</span><s
an class="highlight-nf">Format</span> <span class="highlight-p">(</span><span class="hi
hlight-s">"2006-01-02 15:04:05.99"</span><span class="highlight-p">))</span>
</span></span> <span class="highlight-line"> <span class="highlight-cl"> <span class=
highlight-nx">conn</span><span class="highlight-p">,</span> <span class="highlight-nx"
err</span> <span class="highlight-o">:=</span> <span class="highlight-nx">grpc</span>
span class="highlight-p">.</span><span class="highlight-nf">Dial</span> <span class="hi
hlight-p">(</span><span class="highlight-nx">instanceAddr</span><span class="highlight
p">,</span> <span class="highlight-nx">grpc</span><span class="highlight-p">.</span>
span class="highlight-nf">WithInsecure</span><span class="highlight-p">())</span>
</span></span> <span class="highlight-line"> <span class="highlight-cl"> <span class=
highlight-k">if</span> <span class="highlight-nx">err</span> <span class="highlight-o">
=</span> <span class="highlight-kc">nil</span> <span class="highlight-p">{</span>
</span></span> <span class="highlight-line"> <span class="highlight-cl"> <span clas
="highlight-nx">fmt</span> <span class="highlight-p">.</span><span class="highlight-nf"
Println</span> <span class="highlight-p">(</span><span class="highlight-nx">err</span>
span class="highlight-p">)</span>
</span></span> <span class="highlight-line"> <span class="highlight-cl"> <span clas
="highlight-nb">panic</span> <span class="highlight-p">(</span><span class="highlight-s
">"connect error"</span><span class="highlight-p">)</span>
</span></span> <span class="highlight-line"> <span class="highlight-cl"> <span class=
highlight-p">}</span></span>
</span></span> <span class="highlight-line"> <span class="highlight-cl"> <span class=
highlight-k">defer</span> <span class="highlight-nx">conn</span> <span class="highlight
p">.</span><span class="highlight-nf">Close</span><span class="highlight-p">()</span>
</span></span> <span class="highlight-line"> <span class="highlight-cl"> <span class=
highlight-nx">bookClient</span> <span class="highlight-o">:=</span> <span class="highl
ght-nx">book</span> <span class="highlight-p">.</span><span class="highlight-nf">New
ookServiceClient</span> <span class="highlight-p">(</span><span class="highlight-nx">c
nn</span><span class="highlight-p">)</span>
</span></span> <span class="highlight-line"> <span class="highlight-cl"> <span class=
highlight-nx">bi</span> <span class="highlight-p">,</span> <span class="highlight-nx">er
</span> <span class="highlight-o">:=</span> <span class="highlight-nx">bookClient</sp
n> <span class="highlight-p">.</span><span class="highlight-nf">GetBookInfo</span><sp
n class="highlight-p">(</span><span class="highlight-nx">context</span><span class="hi
hlight-p">.</span><span class="highlight-nf">Background</span><span class="highlight-
">(),</span> <span class="highlight-o">&amp;</span><span class="highlight-nx">book</
```

```

pan> <span class="highlight-p">.</span> <span class="highlight-nx">BookInfoParams</spa
> <span class="highlight-p">{</span> <span class="highlight-nx">BookId</span> <span clas
="highlight-p">:</span> <span class="highlight-mi">1</span> <span class="highlight-p">}
</span>
</span> <span class="highlight-line"> <span class="highlight-cl"> <span class=
highlight-nx">fmt</span> <span class="highlight-p">.</span> <span class="highlight-nf">P
intln</span> <span class="highlight-p">(</span> <span class="highlight-nx">bi</span> <span sp
n class="highlight-p">)</span>
</span> <span class="highlight-line"> <span class="highlight-cl"> <span class=
highlight-nx">fmt</span> <span class="highlight-p">.</span> <span class="highlight-nf">P
intln</span> <span class="highlight-p">(</span> <span class="highlight-s">"
" </span>
span class="highlight-p">,</span> <span class="highlight-s">"获取书籍详情"</span> <span
lass="highlight-p">)</span>
</span> <span class="highlight-line"> <span class="highlight-cl"> <span class=
highlight-nx">fmt</span> <span class="highlight-p">.</span> <span class="highlight-nf">P
intln</span> <span class="highlight-p">(</span> <span class="highlight-s">"
" </span>
span class="highlight-p">,</span> <span class="highlight-s">"bookId: 1"</span> <span cla
s="highlight-p">,</span> <span class="highlight-s">"=&gt;"</span> <span class="highlig
t-p">,</span> <span class="highlight-s">"bookName:"</span> <span class="highlight-p">,<
/span> <span class="highlight-nx">bi</span> <span class="highlight-p">.</span> <span cla
s="highlight-nx">BookName</span> <span class="highlight-p">)</span>
</span> <span class="highlight-line"> <span class="highlight-cl"> <span class=
highlight-k">return</span> <span class="highlight-kc">nil</span> <span class="highlight-
">,</span> <span class="highlight-kc">nil</span>
</span> <span class="highlight-line"> <span class="highlight-cl"> <span class="h
ghlight-p">},</span> <span class="highlight-kc">nil</span> <span class="highlight-p">,</
pan> <span class="highlight-kc">nil</span>
</span> <span class="highlight-line"> <span class="highlight-cl"> <span class="high
ight-p">}</span>
</span> </span> </code> </pre>
<h4 id="输出记录">输出记录</h4>
<pre> <code class="highlight-chroma"> <span class="highlight-line"> <span class="highlight
cl">当前时间: 2018-05-02 16:10:19.71
</span> <span class="highlight-line"> <span class="highlight-cl">no endpoints avai
able (previously: no endpoints available; no endpoints available)
</span> <span class="highlight-line"> <span class="highlight-cl">当前时间: 2018-05
02 16:10:20.71
</span> <span class="highlight-line"> <span class="highlight-cl">no endpoints avai
able (previously: no endpoints available; no endpoints available)
</span> <span class="highlight-line"> <span class="highlight-cl">当前时间: 2018-05
02 16:10:21.71
</span> <span class="highlight-line"> <span class="highlight-cl">no endpoints avai
able (previously: no endpoints available; no endpoints available)
</span> <span class="highlight-line"> <span class="highlight-cl">当前时间: 2018-05
02 16:10:22.71
</span> <span class="highlight-line"> <span class="highlight-cl">no endpoints avai
able (previously: no endpoints available; no endpoints available)
</span> <span class="highlight-line"> <span class="highlight-cl">当前时间: 2018-05
02 16:10:23.71
</span> <span class="highlight-line"> <span class="highlight-cl">no endpoints avai
able (previously: no endpoints available; no endpoints available)
</span> <span class="highlight-line"> <span class="highlight-cl">2018/05/02 16:10:
4 hystrix-go: opening circuit my-endpoint
</span> <span class="highlight-line"> <span class="highlight-cl">当前时间: 2018-05

```

02 16:10:24.71  
</span></span><span class="highlight-line"><span class="highlight-cl">hystrix: circuit op  
n  
</span></span><span class="highlight-line"><span class="highlight-cl">当前时间: 2018-05  
02 16:10:25.71  
</span></span><span class="highlight-line"><span class="highlight-cl">hystrix: circuit op  
n  
</span></span><span class="highlight-line"><span class="highlight-cl">当前时间: 2018-05  
02 16:10:26.71  
</span></span><span class="highlight-line"><span class="highlight-cl">hystrix: circuit op  
n  
</span></span><span class="highlight-line"><span class="highlight-cl">当前时间: 2018-05  
02 16:10:27.71  
</span></span><span class="highlight-line"><span class="highlight-cl">hystrix: circuit op  
n  
</span></span><span class="highlight-line"><span class="highlight-cl">当前时间: 2018-05  
02 16:10:28.71  
</span></span><span class="highlight-line"><span class="highlight-cl">hystrix: circuit op  
n  
</span></span><span class="highlight-line"><span class="highlight-cl">当前时间: 2018-05  
02 16:10:29.71  
</span></span><span class="highlight-line"><span class="highlight-cl">hystrix: circuit op  
n  
</span></span><span class="highlight-line"><span class="highlight-cl">当前时间: 2018-05  
02 16:10:30.71  
</span></span><span class="highlight-line"><span class="highlight-cl">hystrix: circuit op  
n  
</span></span><span class="highlight-line"><span class="highlight-cl">当前时间: 2018-05  
02 16:10:31.71  
</span></span><span class="highlight-line"><span class="highlight-cl">hystrix: circuit op  
n  
</span></span><span class="highlight-line"><span class="highlight-cl">当前时间: 2018-05  
02 16:10:32.71  
</span></span><span class="highlight-line"><span class="highlight-cl">hystrix: circuit op  
n  
</span></span><span class="highlight-line"><span class="highlight-cl">当前时间: 2018-05  
02 16:10:33.71  
</span></span><span class="highlight-line"><span class="highlight-cl">hystrix: circuit op  
n  
</span></span><span class="highlight-line"><span class="highlight-cl">当前时间: 2018-05  
02 16:10:34.71  
</span></span><span class="highlight-line"><span class="highlight-cl">no endpoints avai  
able (previously: no endpoints available; no endpoints available)  
</span></span><span class="highlight-line"><span class="highlight-cl">2018/05/02 16:10:  
4 hystrix-go: allowing single test to possibly close circuit my-endpoint  
</span></span><span class="highlight-line"><span class="highlight-cl">当前时间: 2018-05  
02 16:10:35.71  
</span></span><span class="highlight-line"><span class="highlight-cl">hystrix: circuit op  
n  
</span></span><span class="highlight-line"><span class="highlight-cl">当前时间: 2018-05  
02 16:10:36.71  
</span></span><span class="highlight-line"><span class="highlight-cl">hystrix: circuit op  
n  
</span></span><span class="highlight-line"><span class="highlight-cl">当前时间: 2018-05

02 16:10:37.71

```
</span></span><span class="highlight-line"><span class="highlight-cl">hystrix: circuit op  
n
```

```
</span></span><span class="highlight-line"><span class="highlight-cl">当前时间: 2018-05  
02 16:10:38.71
```

```
</span></span><span class="highlight-line"><span class="highlight-cl">hystrix: circuit op  
n
```

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

```
</span></span><span class="highlight-line"><span class="highlight-cl">Process finished w  
th exit code 0
```

```
</span></span></code></pre>
```

<p>通过上面的输出记录可以验证我们的配置: </p>

<p>1、 前 5 条波动期内的错误, 没有触发 circuit 开启</p>

<p>2、 circuit 开启后请求熔断生效</p>

<p>3、 circuit 开启 10S 后, SleepWindow 测试发起请求设置生效</p>