谈谈 Web 那些事

Spring MVC 实践

编写第一个 Spring MVC Controller

认识 Spring MVC

DispatcherServlet

- Controller
- xxxResolver
  - ViewResolver
  - HandlerExceptionResolver
  - MultipartResolver
- HandlerMapping

Spring MVC 中的常用注解

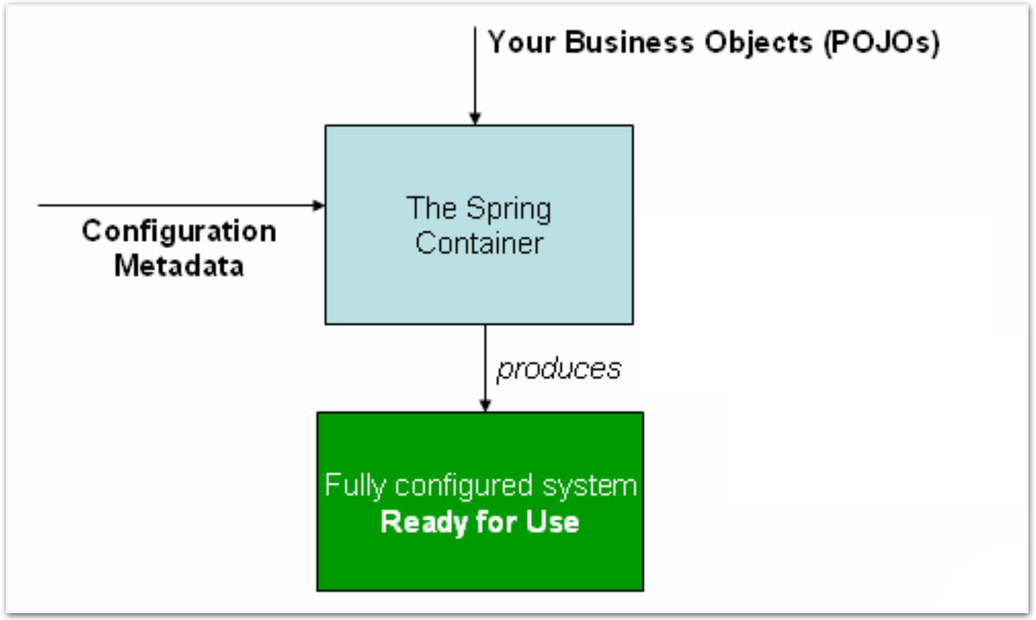
- @Controller
  - @RestController
- @RequestMapping
  - @GetMapping / @PostMapping
  - @PutMapping / @DeleteMapping
- @RequestBody / @ResponseBody / @ResponseStatus

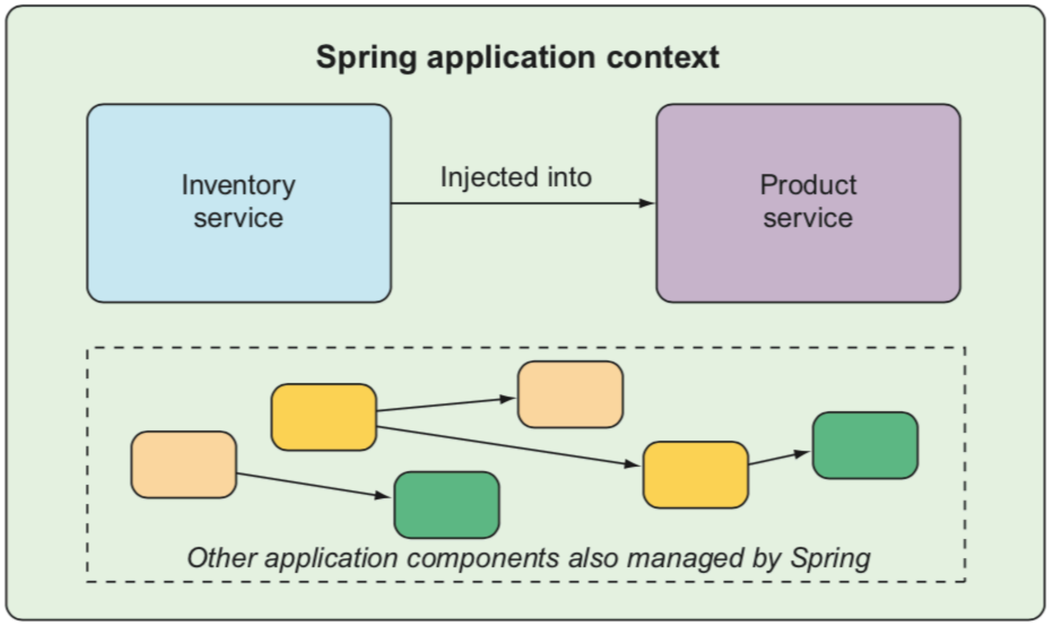
“Talk is cheap, show me the code.”

Chapter 6 / simple-controller-demo

理解 Spring 的应用上下文

Spring 的应用程序上下文



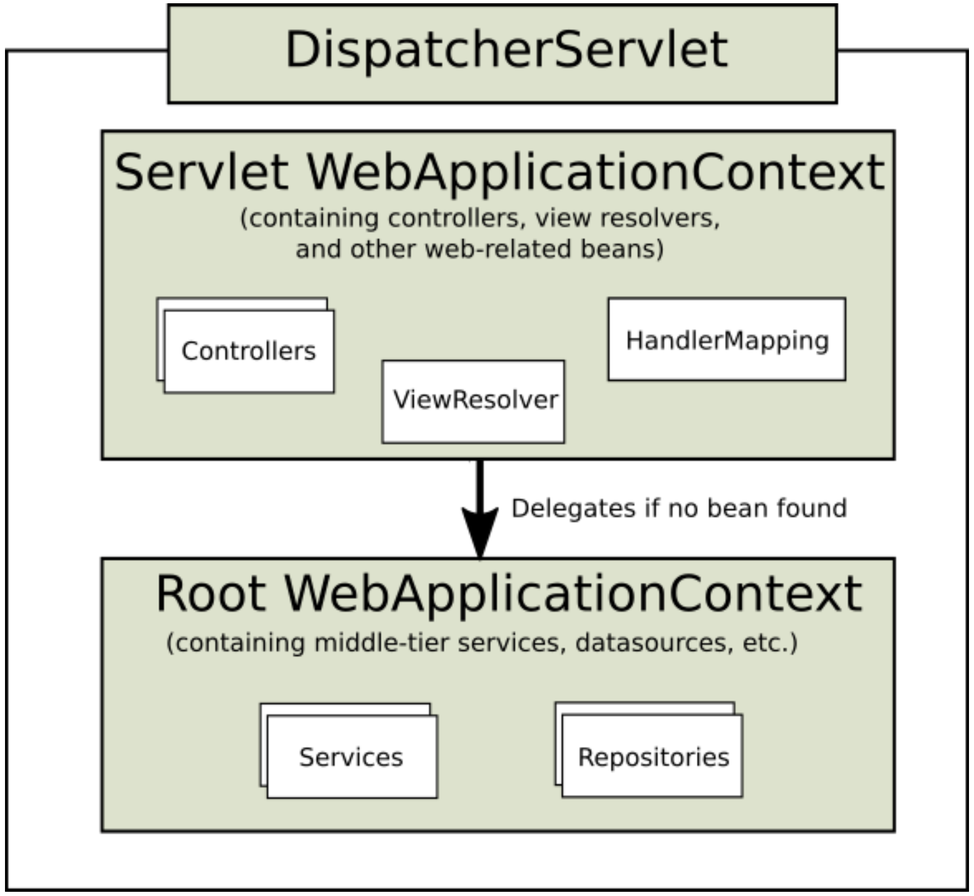


Spring 的应用程序上下文

关于上下文常用的接口及其实现

- BeanFactory
  - DefaultListableBeanFactory
- ApplicationContext
  - ClassPathXmlApplicationContext
  - FileSystemXmlApplicationContext
  - AnnotationConfigApplicationContext
- WebApplicationContext

Web 上下文层次


DispatcherServlet
Servlet WebApplicationContext
(containing controllers, view resolvers,
and other web-related beans)
Controllers
ViewResolver
HandlerMapping
Delegates if no bean found
Root WebApplicationContext
(containing middle-tier services, datasources, etc.)
Services
Repositories

Web 上下文层次

```xml
<web-app>

    <listener>
        <listener-class>org.springframework.web.context.ContextLoaderListener</listener-
class>
    </listener>

    <context-param>
        <param-name>contextConfigLocation</param-name>
        <param-value>/WEB-INF/app-context.xml</param-value>
    </context-param>

    <servlet>
        <servlet-name>app</servlet-name>
        <servlet-class>org.springframework.web.servlet.DispatcherServlet</servlet-class>
        <init-param>
            <param-name>contextConfigLocation</param-name>
            <param-value></param-value>
        </init-param>
        <load-on-startup>1</load-on-startup>
    </servlet>

    <servlet-mapping>
        <servlet-name>app</servlet-name>
        <url-pattern>/app/*</url-pattern>
    </servlet-mapping>

</web-app>
```

```java
public class MyWebAppInitializer extends
AbstractAnnotationConfigDispatcherServletInitializer {

    @Override
    protected Class<?>[] getRootConfigClasses() {
        return new Class<?>[] { RootConfig.class };
    }

    @Override
    protected Class<?>[] getServletConfigClasses() {
        return new Class<?>[] { App1Config.class };
    }

    @Override
    protected String[] getServletMappings() {
        return new String[] { "/app1/*" };
    }
}
```

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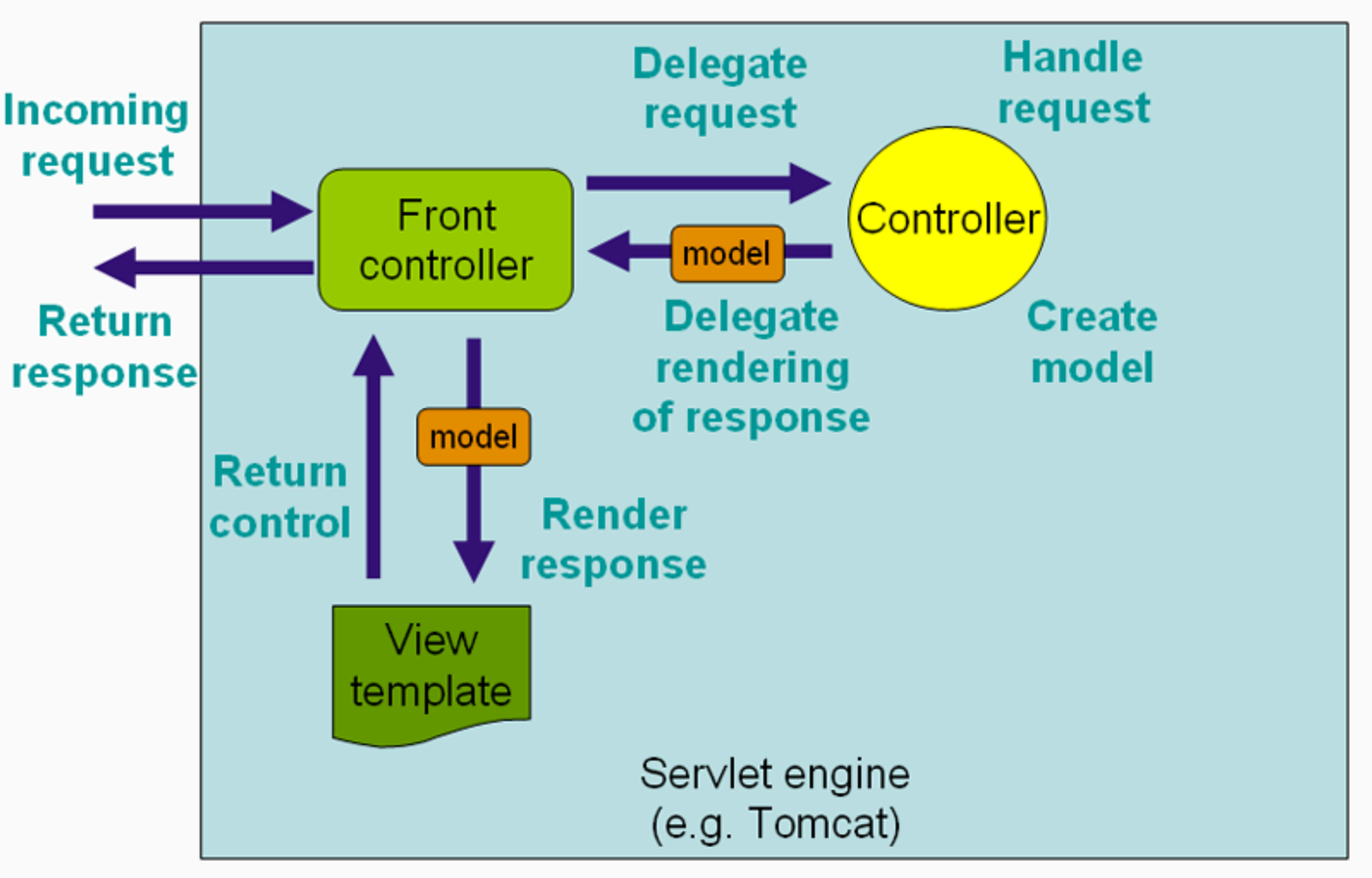
Spring MVC 中的各种机制

请求处理

Spring MVC 的请求处理流程



一个请求的大致处理流程

绑定一些 Attribute

- WebApplicationContext / LocaleResolver / ThemeResolver

处理 Multipart

- 如果是，则将请求转为 MultipartHttpServletRequest

Handler 处理

- 如果找到对应 Handler，执行 Controller 及前后置处理器逻辑

处理返回的 Model ，呈现视图

如何定义处理方法

定义映射关系

@Controller

@RequestMapping

- path / method 指定映射路径与方法
- params / headers 限定映射范围
- consumes / produces 限定请求与响应格式

一些快捷方式

- @RestController
- @GetMapping / @PostMapping / @PutMapping / @DeleteMapping / @PatchMapping

定义处理方法

- @RequestBody / @ResponseBody / @ResponseStatus
- @PathVariable / @RequestParam / @RequestHeader
- HttpEntity / ResponseEntity

定义处理方法

详细参数

- https://docs.spring.io/spring/docs/5.1.5.RELEASE/spring-framework-reference/web.html#mvc-ann-arguments

详细返回

- https://docs.spring.io/spring/docs/5.1.5.RELEASE/spring-framework-reference/web.html#mvc-ann-return-types

方法示例

```
@PostMapping(path = "/", consumes = MediaType.APPLICATION_JSON_VALUE,
        produces = MediaType.APPLICATION_JSON_UTF8_VALUE)
@ResponseStatus(HttpStatus.CREATED)
public CoffeeOrder create(@RequestBody NewOrderRequest newOrder) {
    log.info("Receive new Order {}", newOrder);
    Coffee[] coffeeList = coffeeService.getCoffeeByName(newOrder.getItems())
            .toArray(new Coffee[] {});
    return orderService.createOrder(newOrder.getCustomer(), coffeeList);
}
```

方法示例

```
@RequestMapping(path = "/{id}", method = RequestMethod.GET,
        produces = MediaType.APPLICATION_JSON_UTF8_VALUE)
@ResponseBody
public Coffee getById(@PathVariable Long id) {
    Coffee coffee = coffeeService.getCoffee(id);
    return coffee;
}

@GetMapping(path = "/", params = "name")
@ResponseBody
public Coffee getByName(@RequestParam String name) {
    return coffeeService.getCoffee(name);
}
```

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Chapter 6 / complex-controller-demo

定义类型转换

自己实现 WebMvcConfigurer

- Spring Boot 在 WebMvcAutoConfiguration 中实现了一个
- 添加自定义的 Converter
- 添加自定义的 Formatter

定义校验

- 通过 Validator 对绑定结果进行校验
  - Hibernate Validator
- `@Valid` 注解
- `BindingResult`

Multipart 上传

- 配置 MultipartResolver
  - Spring Boot 自动配置 MultipartAutoConfiguration
- 支持类型 multipart/form-data
- MultipartFile 类型

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Chapter 6 / more-complex-controller-demo

Spring MVC 中的各种机制

视图处理

视图解析的实现基础

ViewResolver 与 View 接口

- AbstractCachingViewResolver
- UrlBasedViewResolver
- FreeMarkerViewResolver
- ContentNegotiatingViewResolver
- InternalResourceViewResolver

DispatcherServlet 中的视图解析逻辑

- initStrategies()
  - initViewResolvers() 初始化了对应 ViewResolver
- doDispatch()
  - processDispatchResult()
    - 没有返回视图的话，尝试 RequestToViewNameTranslator
    - resolveViewName() 解析 View 对象

DispatcherServlet 中的视图解析逻辑

使用 @ResponseBody 的情况

- 在 HandlerAdapter.handle() 的中完成了 Response 输出
  - RequestMappingHandlerAdapter.invokeHandlerMethod()
    - HandlerMethodReturnValueHandlerComposite.handleReturnValue()
      - RequestResponseBodyMethodProcessor.handleReturnValue()

重定向

两种不同的重定向前缀

- `redirect:`
- `forward:`

Spring MVC 中的常用视图

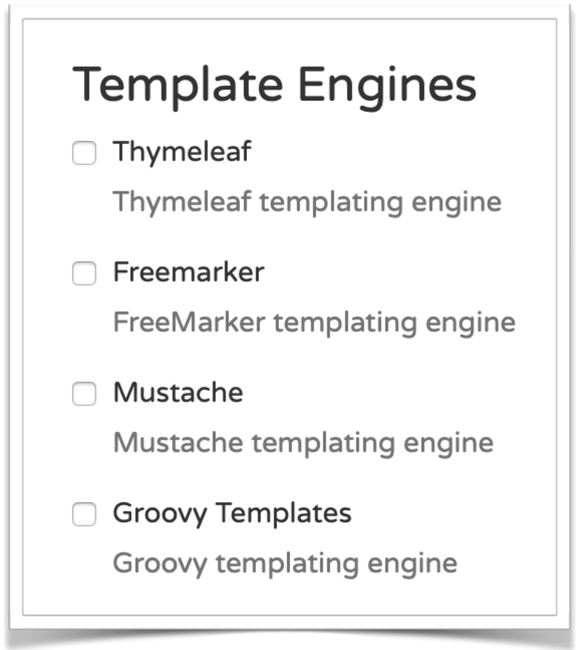
Spring MVC 支持的视图

支持的视图列表

- https://docs.spring.io/spring/docs/5.1.5.RELEASE/spring-framework-reference/web.html#mvc-view

- Jackson-based JSON / XML

- Thymeleaf & FreeMarker



配置 MessageConverter

- 通过 WebMvcConfigurer 的 configureMessageConverters()
  - Spring Boot 自动查找 HttpMessageConverters 进行注册

```
public class WebConfiguration implements WebMvcConfigurer {

    @Override
    public void configureMessageConverters(List<HttpMessageConverter<?>> converters) {
        Jackson2ObjectMapperBuilder builder = new Jackson2ObjectMapperBuilder()
                .indentOutput(true)
                .dateFormat(new SimpleDateFormat("yyyy-MM-dd"))
                .modulesToInstall(new ParameterNamesModule());
        converters.add(new MappingJackson2HttpMessageConverter(builder.build()));
        converters.add(new
MappingJackson2XmlHttpMessageConverter(builder.createXmlMapper(true).build()));
    }
}
```

Spring Boot 对 Jackson 的支持

- `JacksonAutoConfiguration`
  - Spring Boot 通过 `@JsonComponent` 注册 JSON 序列化组件
  - `Jackson2ObjectMapperBuilderCustomizer`
- `JacksonHttpMessageConvertersConfiguration`
  - 增加 jackson-dataformat-xml 以支持 XML 序列化

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Chapter 6 / json-view-demo

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“Thymeleaf is a modern server-side Java template engine for both web and standalone environments.”

– *https://www.thymeleaf.org/*

使用 Thymeleaf

添加 Thymeleaf 依赖

- org.springframework.boot:spring-boot-starter-thymeleaf

Spring Boot 的自动配置

- `ThymeleafAutoConfiguration`
  - `ThymeleafViewResolver`

Thymeleaf 的一些默认配置

- spring.thymeleaf.cache=true
- spring.thymeleaf.check-template=true
- spring.thymeleaf.check-template-location=true
- spring.thymeleaf.enabled=true
- spring.thymeleaf.encoding=UTF-8
- spring.thymeleaf.mode=HTML
- spring.thymeleaf.servlet.content-type=text/html
- spring.thymeleaf.prefix=classpath:/templates/
- spring.thymeleaf.suffix=.html

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Chapter 6 / thymeleaf-view-demo

静态资源与缓存

Spring Boot 中的静态资源配置

核心逻辑

- `WebMvcConfigurer.addResourceHandlers()`

常用配置

- spring.mvc.static-path-pattern=/**
- spring.resources.static-locations=classpath:/META-INF/resources/,classpath:/resources/,classpath:/static/,classpath:/public/

Spring Boot 中的缓存配置

常用配置（默认时间单位都是秒）

- `ResourceProperties.Cache`
- spring.resources.cache.cachecontrol.max-age=时间
- spring.resources.cache.cachecontrol.no-cache=true/false
- spring.resources.cache.cachecontrol.s-max-age=时间

Controller 中手工设置缓存

```
@GetMapping("/book/{id}")
public ResponseEntity<Book> showBook(@PathVariable Long id) {

    Book book = findBook(id);
    String version = book.getVersion();

    return ResponseEntity
            .ok()
            .cacheControl(CacheControl.maxAge(30, TimeUnit.DAYS))
            .eTag(version) // lastModified is also available
            .body(book);
}
```

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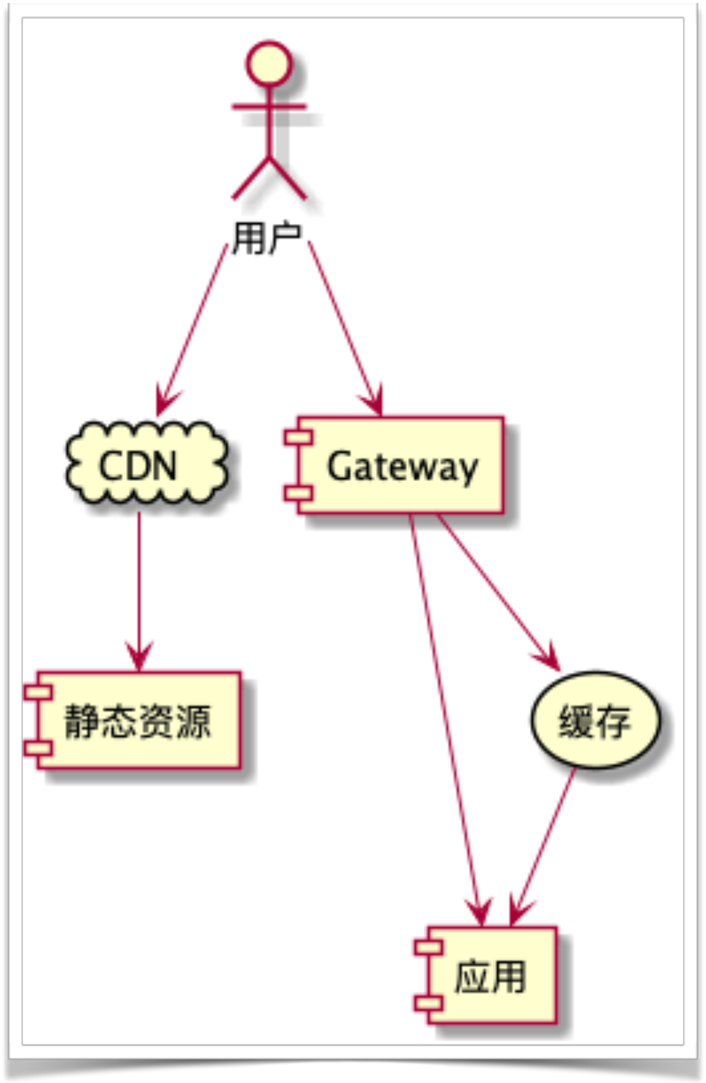
Chapter 6 / cache-demo

建议的资源访问方式



了解 Spring MVC 的切入点

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Spring MVC 中的各种机制

异常处理

SpringBucks 进度小结

本章小结

- Project Reactor 的基本用法
- 如何通过 Reactive 的方式访问 NoSQL
- 如何通过 Reactive 的方式访问 RDBMS
- Spring AOP 的基本概念
- 监控 DAO 层的简单方案

SpringBucks 进度小结

- 通过 Reactive 的方式来保存数据与操作缓存