Validation

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C3: Protected

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Icons Used

Questions

Tools

Hands on Exercise

Coding Standards

Test Your Understanding

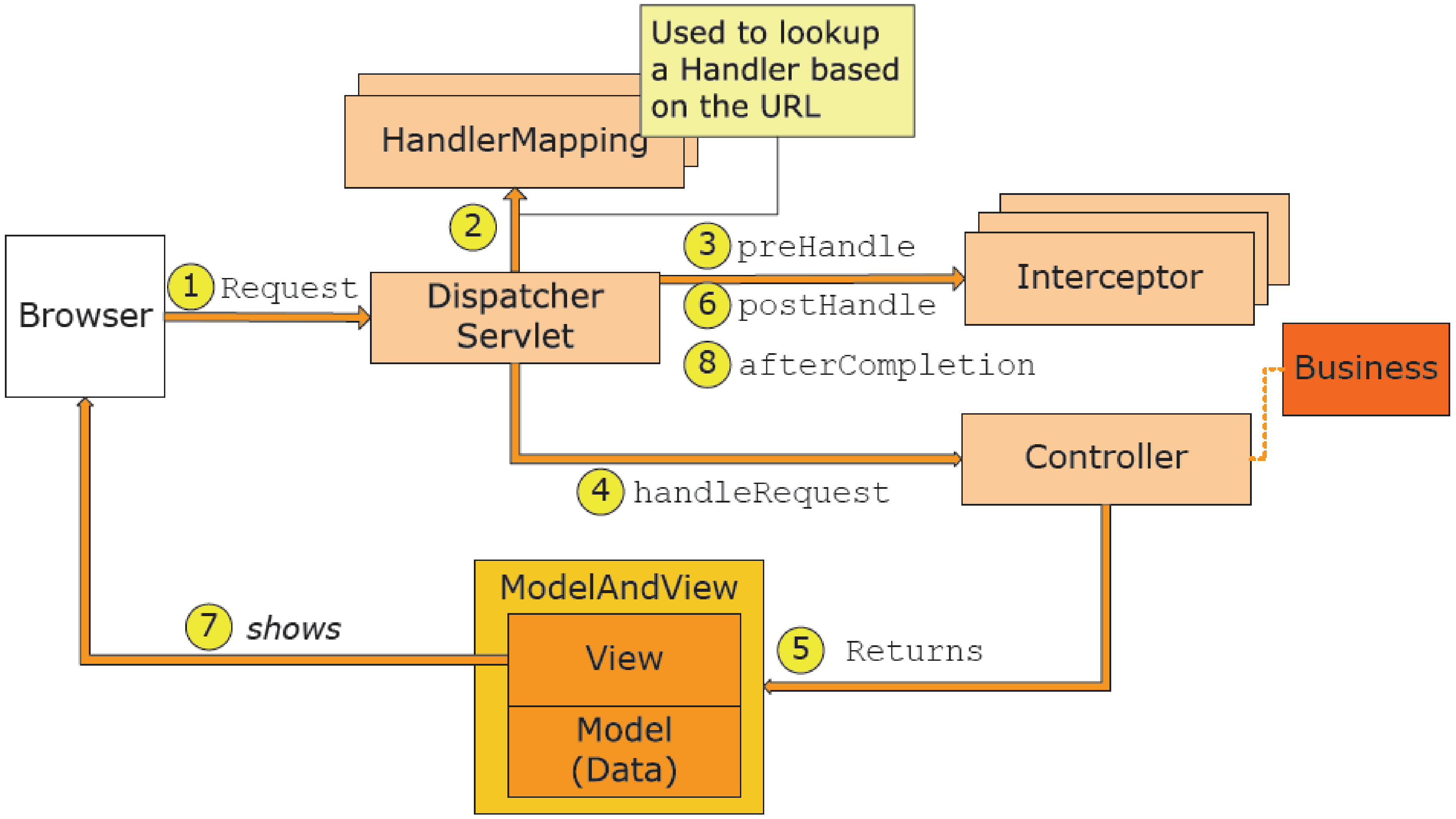
Reference

Demonstration

A Welcome Break

Contacts

Review of Architecture



Validation: Overview

- Introduction:
  - Command Objects that have been populated can be validated and report back errors when validation fails.
  - Spring offers its own validation infrastructure as an add-on to core Spring.
  - Spring 3 introduces several enhancements to its validation support.
    - First, the JSR-303 Bean Validation API is now fully supported.
    - Second, when used programmatically, Spring's DataBinder can now validate objects as well as bind to them.
    - Third, Spring MVC now has support for declaratively validating @Controller inputs.

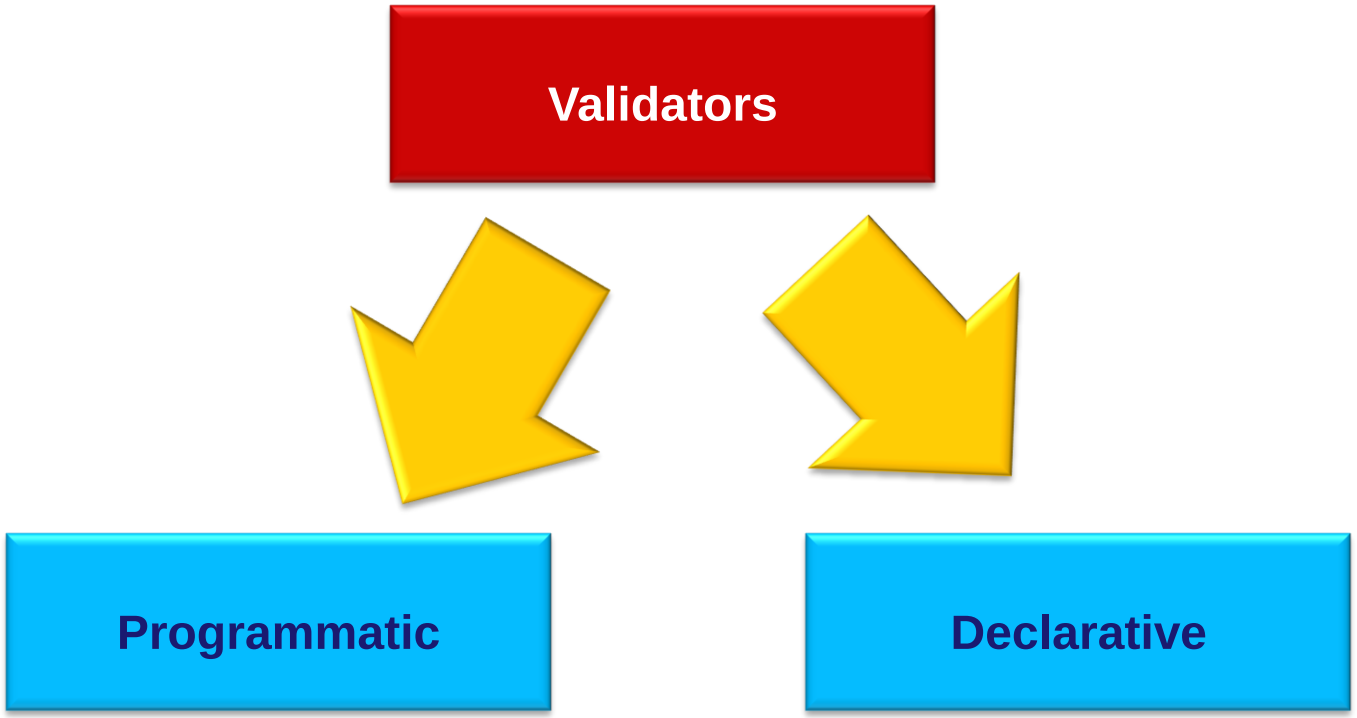
Validation: Objectives

- **Objective:**

After completing this chapter you will be able to:

- Write programmatic validators
- Write declarative validators

Types of Validators



Programmatic Validators

```
public interface Validator{
        public boolean supports(Class cl);
        public void validate(Object target, Errors errors);
}
```

Validates the given object

Can this validator validate instances of the supplied class?

Validator Interface

- One (the primary) or more validator objects can be registered
  - Has two methods that need to be implemented

```
public interface Validator {
  /**
  * Return whether or not this object can validate objects
  * of the given class.
  */
  boolean supports(Class clazz);
  /**
  * Validate an object, which must be of a class for which
  * the supports() method returned true.
  * @param obj Populated object to validate
  * @param errors Errors object we're building. May contain
  * errors for this field relating to types.
  */
  void validate(Object obj, Errors errors);
}
```

Validator- A Sample

```
public class PersonValidator implements Validator {
/** * This Validator validates just Person instances */
      public boolean supports(Class clazz) {
      return Person.class.equals(clazz);
}
public void validate(Object obj, Errors e) {
      ValidationUtils.rejectIfEmpty(e, "name", "name.empty");
      Person p = (Person) obj;
       if (p.getAge() < 0) {
                e.rejectValue("age", "negativevalue");
      }
      else
      if (p.getAge() > 110) {
                 e.rejectValue("age", "too.darn.old");
     }
}
}
```

Reusing Validators

```
public class CustomerValidator implements Validator {
    private final Validator addressValidator;

    public CustomerValidator(Validator addressValidator) {
    if (addressValidator == null) {
            throw new IllegalArgumentException("The supplied [Validator] is required
    and must not be null.");
    }
    If (!addressValidator.supports(Address.class)){
             throw new IllegalArgumentException( "The supplied [Validator] must
    support the validation of [Address] instances.");
    }
            this.addressValidator = addressValidator;
 }
```

Reusing Validators (Contd.)

```
/** * This Validator validates Customer instances, and any subclasses of Customer too */
public boolean supports(Class clazz) {
    return Customer.class.isAssignableFrom(clazz);
}
public void validate(Object target, Errors errors) {
    ValidationUtils.rejectIfEmptyOrWhitespace(errors, "firstName", "field.required");
    ValidationUtils.rejectIfEmptyOrWhitespace(errors, "surname", "field.required");
    Customer customer = (Customer) target;
     try {
            errors.pushNestedPath("address");
            ValidationUtils.invokeValidator(this.addressValidator,
                                                   customer.getAddress(), errors);
}
finally {
    errors.popNestedPath(); } } }
```

Controller with Validator

```
<bean id=“logonValidator” c lass=“test.web.validation.LogonValidation”/>
<bean id="logonValidator" class="test.web.LogonValidator"/>
<bean id="logonForm" class="test.web.LogonFormController">
   <property name="sessionForm"><value>true</value></property>
   <property name="commandName"> <value>credentials</value> </property>
   <property name="commandClass"> <value>Credentials</value> </property>
   <property name="validator"><ref bean="logonValidator"/></property>
   <property name="formView"><value>logon.jsp</value></property>
   <property name="successView"><value>sucess.jsp</value></property>
</bean>
```

Adding Validation - Example

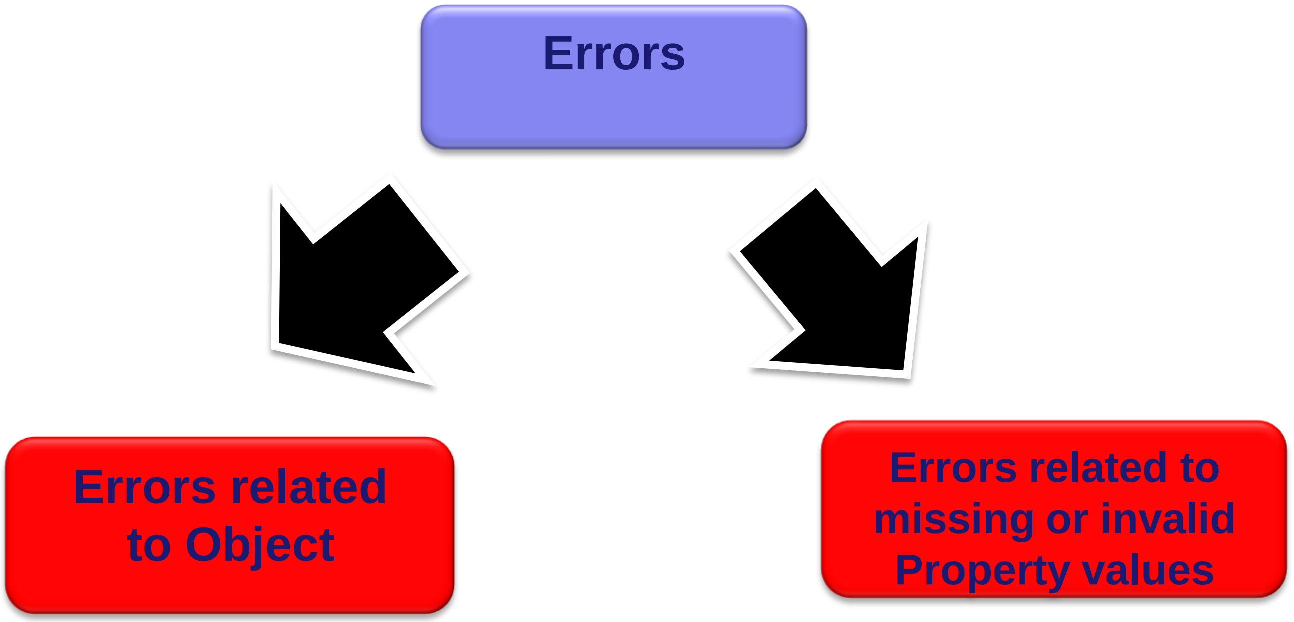
```
public class RegistrationValidator implements Validator {
  private final static Date MINBIRTHDATE;
  static {
    Calendar c = Calendar.getInstance();
    c.add(Calendar.YEAR,-14);
   MINBIRTHDATE = c.getTime();
  }
  public boolean supports(Class aClass) {
    return aClass.isAssignableFrom(RegistrationDetails.class);
  }
  public void validate(Object object, Errors errors) {
    RegistrationDetails details = (RegistrationDetails) object;
    Date date = details.getBirthdate();
    if (date!=null && date.after(MINBIRTHDATE)){
      errors.rejectValue("birthdate","tooyoung",
      "You have to be 14 years or older to register");
    }
    String username = details.getUsername();
    if ((username == null) || (username.length()==0)){
      errors.rejectValue("username","required","username is required");
    }
  }
}
```

Adding Validation - Example

❖ Registering the `Validator`

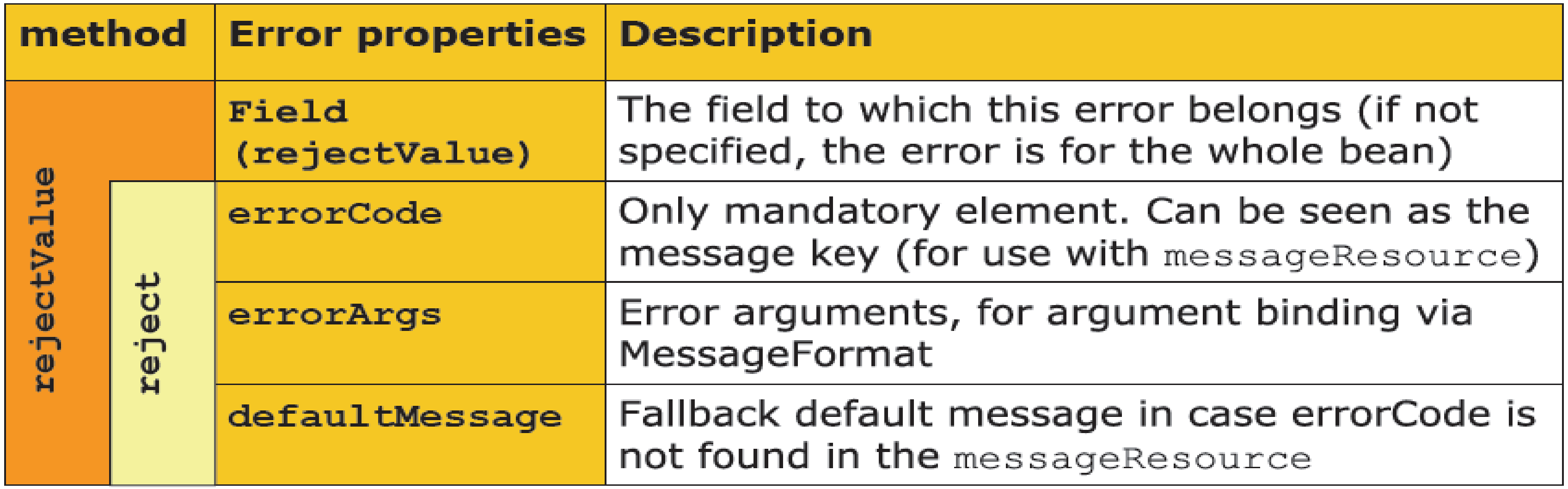
```
<bean id="registrationController"
      class="demos..SimpleRegistrationController">
  ...
  <property name="validators">
    <list>
      <bean class="demos..RegistrationValidator"/>
    </list>
  </property>
</bean>
```

Errors Interface



Adding Validation (Contd.)

❖ The Errors:



method		Error properties	Description
rejectValue		**Field (rejectValue)**	The field to which this error belongs (if not specified, the error is for the whole bean)
	reject	**errorCode**	Only mandatory element. Can be seen as the message key (for use with `messageResource`)
		errorArgs	Error arguments, for argument binding via MessageFormat
		defaultMessage	Fallback default message in case errorCode is not found in the `messageResource`

reject() method

Public void reject(String errorCode);

Public void reject(String errorCode, String defaultMessage);

Public void reject(String errorCode, Object[] errorArugments, String defaultMessage);

Note: Rejecting an object as a whole is called a global error, because though no specific property value is invalid, the form values cannot be processed. An example could be a customer who is underage.

rejectValue() method

```
public void rejectValue(String propertyName, String errorCode);
public void rejectValue(String propertyName, String errorCode,
                String defaultMessage);
public void rejectValue(String propertyName, String errorCode,
                                 Object[] errorArguments,
                                 String  defaultMessage);
```

Note: Rejecting a property value is called field error

Global errors typically appear on the top of a form in the view, while field errors typically appear next to the input fields they are related to.

Declarative Validator

- Support for declarative validation with JSR-303 (Bean Validation) annotations.
- Fortunately, you only need to add a single line of configuration to Spring xml configuration to flip on all of the annotation-driven features you'll need from Spring MVC:

```
<mvc:annotation-driven/>
```

- Along with many other Spring 3 features, The <mvc:annotation-driven> also registers JSR-303 validation support.

JSR-303 Bean Validation API

- JSR-303 standardizes validation constraint declaration and metadata for the Java platform.
- Using this API, you annotate domain model properties with declarative validation constraints and the runtime enforces them.
- There are a number of built-in constraints you can take advantage of such as @NotNull, @Size(Min=,Max=), @Pattern
- You may also define your own custom constraints.

Declarative Validation example

- JSR-303 allows you to define declarative validation constraints against such properties.

```
public class PersonForm {
@NotNull
@Size(max=64)
private String name;

@Min(0)
private int age;
}
```

When an instance of this class is validated by a JSR-303 Validator, these constraints will be enforced.

Configure Spring as JSR-303 Validator

- The hibernate Validator is the default reference implementation for JSR -303.
- Spring provides full support for the JSR-303 Bean Validation API. This includes convenient support for bootstrapping a JSR-303 implementation as a Spring bean.
- Use the LocalValidatorFactoryBean to configure a default JSR-303 Validator as a Spring bean:

```
<bean id="validator"
class="org.springframework.validation.beanvalidation.LocalValidatorFactoryBean"/>
```

Injecting a Validator

- LocalValidatorFactoryBean implements both javax.validation.ValidatorFactory and javax.validation.Validator, as well as Spring's org.springframework.validation.Validator.
- Inject a reference to javax.validation.Validator if you prefer to work with the JSR-303 API directly:

```
import javax.validation.Validator;
@Service
public class MyService  {
@Autowired
private Validator validator;
```

- Inject a reference to org.springframework.validation.Validator if your bean requires the Spring Validation API:

```
import org.springframework.validation.Validator;
@Service
public class MyService  {
@Autowired
private Validator validator;
}
```

Configuring Custom Constraints

- Each JSR-303 validation constraint consists of two parts.
- First, a @Constraint annotation that declares the constraint and its configurable properties.
- Second, an implementation of the javax.validation.ConstraintValidator interface that implements the constraint's behavior.
- To associate a declaration with an implementation, each @Constraint annotation references a corresponding ValidationConstraint implementation class.
- At runtime, a ConstraintValidatorFactory instantiates the referenced implementation when the constraint annotation is encountered in your domain model.

Configuring Custom Constraints (Contd.)

```
@Target({ElementType.METHOD, ElementType.FIELD})
@Retention(RetentionPolicy.RUNTIME)
@Constraint(validatedBy=MyConstraintValidator.class)
public @interface MyConstraint {
}
```

declares the constraint and properties

```
import javax.validation.ConstraintValidator;
public class MyConstraintValidator implements ConstraintValidator  {
    @Autowired;
    private Foo aDependency;
    ...
}
```

Implements the ConstraintValidator interface that implements the constraint's behavior

Configuring a DataBinder

- Since Spring 3, a DataBinder instance can be configured with a Validator.
- Once configured, the Validator may be invoked by calling binder.validate(). Any validation Errors are automatically added to the binder's BindingResult.
- Binding and validation errors can be trapped and introspected by declaring a BindingResult parameter (see the example later).
- BindingResult’s getFieldError() method can be used to access those field errors in UI Form. Or JSP tag <sf:errors> can render field validation errors.

@Controller Input Validation

- To trigger validation of a @Controller input, simply annotate the input argument as @Valid.
- Spring MVC will validate a @Valid object after binding so-long as an appropriate Validator has been configured.

```
@Controller
public class MyController  {

      @RequestMapping("/foo", method=RequestMethod.POST)
      public String processFoo(@Valid Foo foo, BindingResult bindingResult)  {
            if(bindingResult.hasErrors()) {
                        return “error_edit";
            }
            //logic for processing Foo
      }
}
```

@Controller Input Validation (Contd.)

- The @Valid annotation is the first line of defense against faulty form input.
- Should anything go wrong while validating the Foo object, the validation error will be carried to the processFoo() method via the BindingResult that's passed in on the second parameter.
- If the BindingResult's hasErrors() method returns true, then that means that validation failed.
- In that case, the method will return error_edit as the view name to display the form again so that the user can correct any validation errors.

Advantages of Validators

- Validators are pluggable
- They can be injected into Controllers that call the business logic. The Spring MVC has the ability to automatically validate @Controller inputs
- Validators handle the first-level validation that more fine-grained, supports i18n, and fully integrated with the presentation layer through Errors interface.

Validation

Time for a Break !

Validation

- Questions from participants

Test Your Understanding

1. Spring supports only Programmatic validations. Say try or false.
2. What is the minimum Spring configuration required to configure a JSR-303-backed Validator with Spring MVC.

Validation: Summary

- Validator and Errors interfaces form the backbone for validation.
- Spring provides full Support for declarative validation with JSR-303 (Bean Validation) annotations.

Validation: Source

- http://docs.jboss.org/hibernate/validator/4.2/reference/en-US/html_single/#example-constraint-validator
- http://static.springsource.org/spring/docs/3.0.x/spring-framework-reference/html/validation.html#validation-beanvalidation

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