

# Apache Struts: An MVC Framework

## Lecture 3: Validating Input

Core Servlets & JSP book: [www.coreservlets.com](http://www.coreservlets.com)  
 More Servlets & JSP book: [www.moreservlets.com](http://www.moreservlets.com)  
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## Overview

- Distinguishing manual validation from automatic validation
- Distinguishing client-side validation from server-side validation
- Using automatic validation
  - Declare application-wide properties file
  - Add messages to properties file
  - Turn on the automatic validator
  - Put validation rules in validation.xml
  - Put <html:errors/> in input page
  - Enable JavaScript validation

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## Manual Validation

- Option 1: Use standard Struts framework
  - Return custom conditions from form
  - Map certain conditions back to the input form
  - Embed the messages in the form bean
- Option 2: Use the Struts validate method
  - Insert <html:errors/> in input form

```
public ActionErrors validate(ActionMapping mapping,
    HttpServletRequest request) {
    ActionErrors errors = super.validate(mapping, request);
    if (errors == null) errors = new ActionErrors();
    if (someField == null || someField.trim().equals("")) {
        errors.add("someField",
            new ActionError("errors.someField"));
    }
    return errors;
}
```

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## Manual vs. Automatic Validation

- Manual validation
  - Most flexible
  - Repeats same logic many times
  - Runs on server only if you use existing framework
  - Tedious
  - Embedded in Java code
    - Which violates Struts strategy of having as much as possible in editable XML files
- Automatic validation
  - Consolidates validation code
  - Lets you use standard validation rules
  - Runs on server; can optionally also run on client
  - Described by XML files

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## Client-Side vs. Server-Side Validation

- Client-side validation
  - JavaScript code verifies format of fields
  - Dialog box warns users of illegal values
  - Submission blocked if invalid
  - Pro:
    - Fast
  - Cons:
    - Can be deliberately or accidentally bypassed
    - Cannot do validation that requires much application logic
- Server-side validation
  - Java code on server verifies format of fields
  - Form is redisplayed (with warnings) if illegal values
  - You *must* do this regardless of whether you do client-side validation or not!

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## Using Automatic Validation

1. Declare application-wide properties file
  - Use message-resources in struts-config.xml. Eg:
    - <message-resources parameter="resources.application" null="false" />
    - Refers to WEB-INF/classes/resources/application.properties
2. Add messages to properties file
  - Eg: inputForm.firstName=First name
3. Turn on the automatic validator
  - Use plug-in in struts-config.xml. Eg:
 

```
<plug-in
    className="org.apache.struts.validator.ValidatorPlugIn">
    <set-property property="pathnames"
    value="/WEB-INF/validator-rules.xml,
    /WEB-INF/validation.xml"/>
</plug-in>
```

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## Using Automatic Validation (Continued)

### 4. Put validation rules in validation.xml

```
- Eg:  
<formset>  
  <form name="orderFormBean">  
    <field property="firstName"  
      depends="required">  
      <arg0 key="inputForm.firstName"/>  
    </field>  
  </form>  
...  
</formset>
```

### 5. Put <html:errors/> in input page

- Edit properties file to customize form of error message

### 6. Enable JavaScript validation

- Add <html:javascript/> anywhere in form  
- Add onsubmit="return validateBeanName(this);" to  
html:form

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## Using Automatic Validation: Example (Goal)

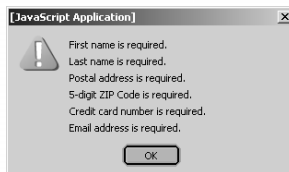


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## Using Automatic Validation: Example (Goal)

### • JavaScript validation enabled



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## Using Automatic Validation: Example (Goal)

### • JavaScript validation disabled



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## Using Automatic Validation: Example (Goal)



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## Implementing the Example (Background)

```
<form-beans>  
  <form-bean name="orderFormBean"  
    type="coreservlets.OrderFormBean"/>  
</form-beans>  
  
<action-mappings>  
  <action path="/actions/order"  
    type="coreservlets.Order"  
    name="orderFormBean"  
    scope="session"  
    input="/forms/order-form.jsp">  
    <forward name="success"  
      path="/WEB-INF/results/order-confirmation.jsp"/>  
  </action>  
</action-mappings>
```

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## Implementing the Example (Background)

```
package coreservlets;

import javax.servlet.http.*;
import org.apache.struts.action.*;

public class Order extends Action {
    public ActionForward execute(ActionMapping mapping,
        ActionForm form,
        HttpServletRequest request,
        HttpServletResponse response)
        throws Exception {
        return(mapping.findForward("success"));
    }
}
```

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## Step 1: Declare Application-wide Properties File

- In `struts-config.xml` (below `action-mappings`):
  - `<message-resources parameter="resources.application"/>`
  - Refers to `WEB-INF/classes/resources/application.properties`

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## Step 2: Add Messages to Properties File

- `WEB-INF/classes/resources/application.properties`

```
# -- Custom messages for this application --
inputForm.firstName=First name
inputForm.lastName=Last name
inputForm.address=Postal address
inputForm.zipCode=5-digit ZIP Code
inputForm.creditCardNumber=Credit card number
inputForm.email=Email address
# -- standard errors --
errors.header=<FONT COLOR=RED><UL>
errors.prefix=<LI>
errors.suffix=</LI>
errors.footer=</UL></FONT>
# -- validator --
...
errors.required={0} is required.
errors.email={0} is an invalid e-mail address.
```

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## Step 3: Turn on the Automatic Validator

- At bottom of `struts-config.xml`:

```
<plug-in className="org.apache.struts.validator.ValidatorPlugIn">
<set-property
property="pathnames"
value="/WEB-INF/validator-rules.xml,/WEB-INF/validation.xml"/>
</plug-in>
```

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## Step 4: Put Validation Rules in validation.xml

- `<form-validation>` and `<formset>`
  - Main enclosing elements
- `<form name="beanName">`
  - Matches form-bean name from `struts-config.xml`
- `<field property="firstName" depends="required">`
  - Matches HTML form property name
- `depends="required"`
  - Matches name of predefined validator rule
    - `required`: must be non-empty
    - `mask`: must match a given regular expression
    - `email`: must be an email address
    - `creditCard`: must be a legal credit card number
      - (Use 41111111111111 for testing)
- `<arg0 key="property.subname"/>`
  - Replaces `{0}` in error message from properties file

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## Step 4: Put Validation Rules in validation.xml

```
<form-validation>
  <formset>
    <form name="orderFormBean">
      <field property="firstName"
        depends="required">
        <arg0 key="inputForm.firstName"/>
      </field>
      ...
      <field property="zipCode"
        depends="required,mask">
        <arg0 key="inputForm.zipCode"/>
        <arg1 key="inputForm.zipCode"/>
        <var>
          <var-name>mask</var-name>
          <var-value>^\d{5}\d*$</var-value>
        </var>
      </field>
    </form>
  </formset>
</form-validation>
```

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## Steps 5 & 6: Output `<html:errors/>` and Enable JavaScript validation

```
...
<%@ taglib uri="/WEB-INF/struts-html.tld" prefix="html" %>
<html:errors/>
<html:form action="/actions/order"
  onsubmit="return validateOrderFormBean(this);">
  First name: <html:text property="firstName"/><BR>
  Last name: <html:text property="lastName"/><BR>
  Mailing address: <html:text property="address"/><BR>
  ZIP Code: <html:text property="zipCode"/><BR>
  Credit Card Number:
  <html:text property="creditCardNumber"/><BR>
  Email address for confirmation:
  <html:text property="email"/><BR>
  <html:submit value="Order Now!"/>
</html:form>
<html:javascript formName="orderFormBean"/>
...
```

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## Other Validator Capabilities

- **More predefined validators**
  - required
  - mask
  - range
  - maxLength
  - minLength
  - integer, float, double, long, short, byte
  - date
  - creditCard
  - email
- **Rolling your own pluggable validators**
  - For example, one field may depend on another
  - You can assign both server-side and client-side code
  - Declare validators in validator-rules.xml

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## Summary

- Declare application-wide properties file
- Add messages to properties file
- Turn on the automatic validator
- Put validation rules in validation.xml
- Put `<html:errors/>` in input page
- Enable JavaScript validation

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## Questions?

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