CSE 510
Web Data Engineering

The Struts 2 Framework

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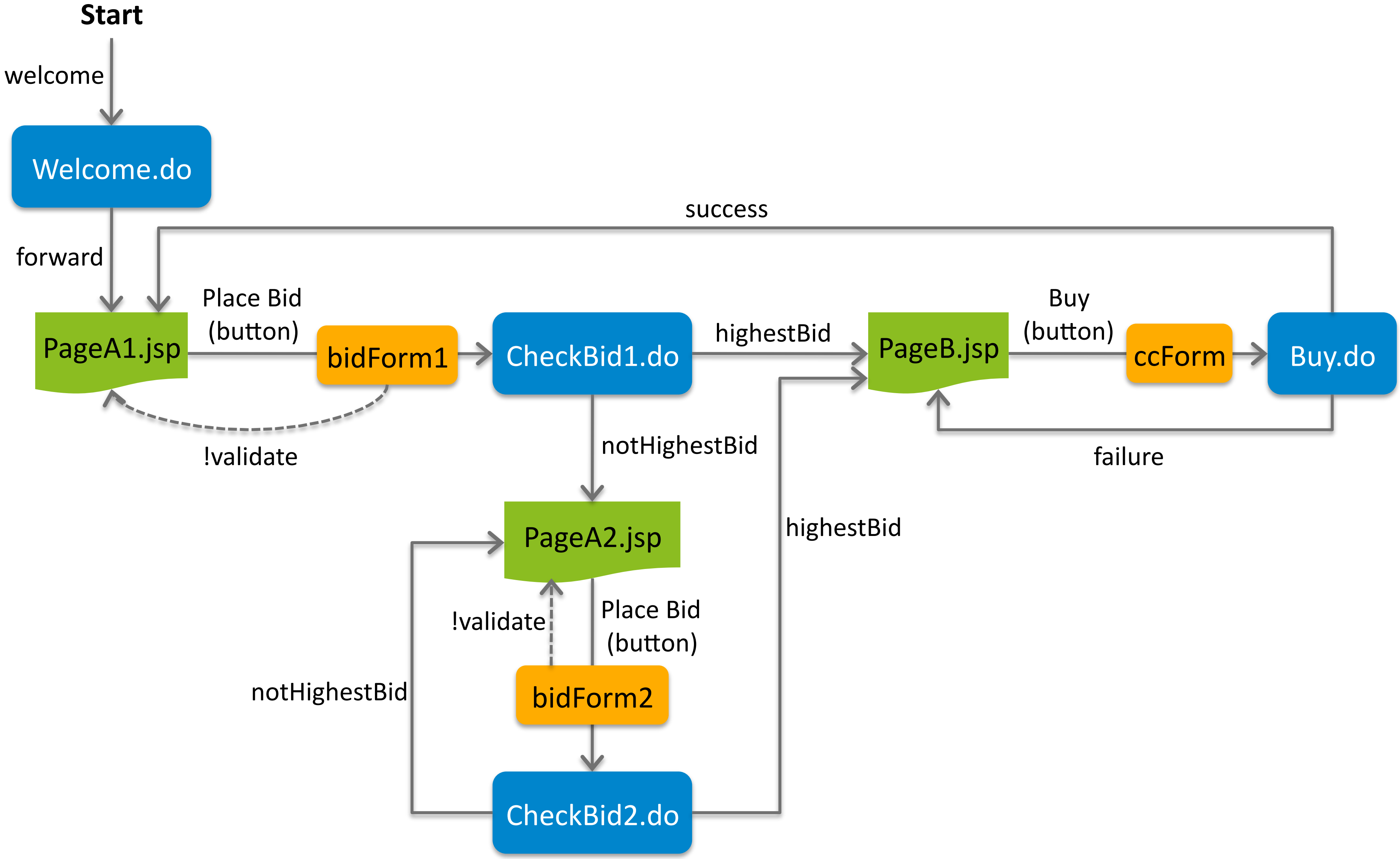
What's The Difference?

- A new framework that implements the MVC
  - It is said to be simpler for development

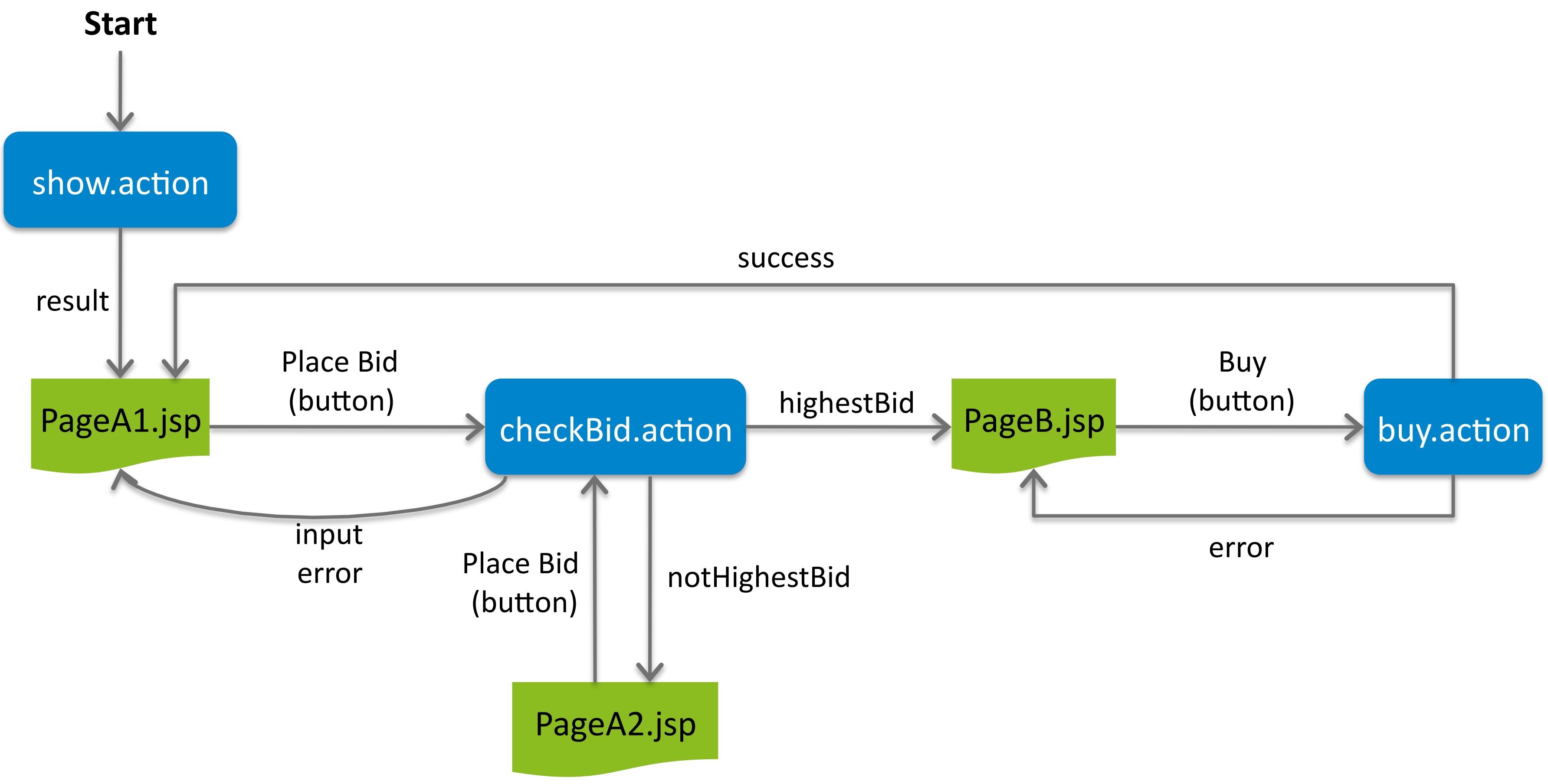
Features:

- **Action**: implements an **`Action`** interface along with other interfaces, or extends the **`ActionSupport`** class
- **Validation**: through XWork validation framework
- **Action Execution**: different lifecycles

Auction MVC Workflow – Struts 1



Auction MVC Workflow – Struts 2



How To Migrate From Struts 1

Deploy **StrutsPrepareAndExecuteFilter**

web.xml

```
<filter>
   <filter-name>struts2</filter-name>
   <filter-class>
org.apache.struts2.dispatcher.ng.filter.StrutsPrepareAndExecuteFilter
   </filter-class>
</filter>

<filter-mapping>
   <filter-name>struts2</filter-name>
   <url-pattern>/*</url-pattern>
</filter-mapping>
```

How To Migrate From Struts 1 (cont'd)

Deploy **StrutsPrepareAndExecuteFilter**

- A filter is a lightweight servlet that doesn't generate a response, instead it executes in addition to the normal request handling process
- Struts2 filter does not have a parameter that defines the names of the configuration files
- The default configuration file for Struts2 is **struts.xml** and needs to be on the classpath of the web application

How To Migrate From Struts 1 (cont'd)

- Rewrite the workflow configuration file
  - The logic itself is very similar to Struts 1

struts.xml

```
<action name="buy" class="app.actions.Buy">
  <result name="success">/pages/PageA1.jsp</result>
  <result name="error">/pages/PageB.jsp</result>
</action>
```

- By default, the extension is **.action** instead of **.do**
  - Defined in the `default.properties` file (within the Struts2 JAR file) as the `struts.action.extension` property

How To Migrate From Struts 1 (cont'd)

- Rewrite the workflow configuration file
  - The logic itself is very similar to Struts 1

struts.xml

```
<action name="checkBid" class="app.actions.CheckBid">
   <result name="input">/pages/PageA1.jsp</result>
   <result name="error">/pages/PageA1.jsp</result>
   <result name="highestBid">/pages/PageB.jsp</result>
   <result name="notHighestBid">/pages/PageA2.jsp</result>
</action>
```

How To Migrate From Struts 1 (cont'd)

- Rewrite the action
  - For the Action, there is no ActionForm bound to it anymore
  - Instead, Action itself contains the form data

```
public class Buy extends ActionSupport {

  private String cardNum = null;
  // setter and getter for the variable

  public String execute() {...}
}
```

How To Migrate From Struts 1 (cont’d)

- Rewrite JSP pages
  - Struts 2 uses new taglibs
  - Provides better support for client-side programming (Ajax, JavaScript)
  - Conceptually, they are the same as Struts 1

```
<%@ taglib prefix="s" uri="/struts-tags"%>
<s:form action="checkBid" method="POST">
  <s:actionerror />
  <s:textfield name="itemID" label="Item ID"/>
  <s:textfield name="bidPrice" label="Bid"/>
  <s:submit value="Place Bid" align="center"/>
</s:form>
```

Form Validation

- Static validation
  - Write the configuration in a XML file

CheckBid-validation.xml

```
<validators>
  <field name="itemID">
     <field-validator type="requiredstring">
           <param name="trim">true</param>
           <message>Item ID is required</message>
     </field-validator>
  </field>
</validators>
```

Form Validation (cont'd)

- Dynamic Validation
  - Action implements **Validateable** interface

```
public class Buy extends ActionSupport implements
  Validateable {
  ...
  public void validate() {
      if (...) { addActionError("..."); }
  }
}
```

Objects In Session/Request Scope

- In many cases, you need to access objects across pages
  - Example: Pre-populate form with values
- Trivial in Struts 1, as you can save a FormBean in session or request
- In Struts 2, there is no FormBean concept
- **Solution:** Action implements the **ModelDriven** interface, and overrides the **getModel()** method
- When a form that is bound to the action is rendered, getModel() will be called automatically to obtain the bean object

Objects In Session/Request Scope (cont’d)

```
public class MyAction implements ModelDriven, ServletRequestAware {
   private HttpSession session;
   private HttpServletRequest request;
   private FormBean bean; // objects defined by me
   public void setServletRequest(HttpServletRequest request) {
      this.request = request;
      this.session = this.getSession();
   }
   public FormBean getModel() {
      bean = (FormBean) session.getAttribute(FormBean.NAME);
      if (bean == null) {
         bean = new FormBean();
         bean.setAttribute(FormBean.NAME, bean);
      }
      return bean;
   }
   public static class FormBean {  // setter getter  }
}
```