



Struts Roadmap

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Agenda

- What is Struts?
- What does Struts do for me?
- How does Struts work?
- Where did Struts originate?
- What is the future of Struts?
- What are the latest features?





Agenda *(Continued)*

- What extensions are available?
- Should I choose Struts?
- Where can I find additional information?
- Demo



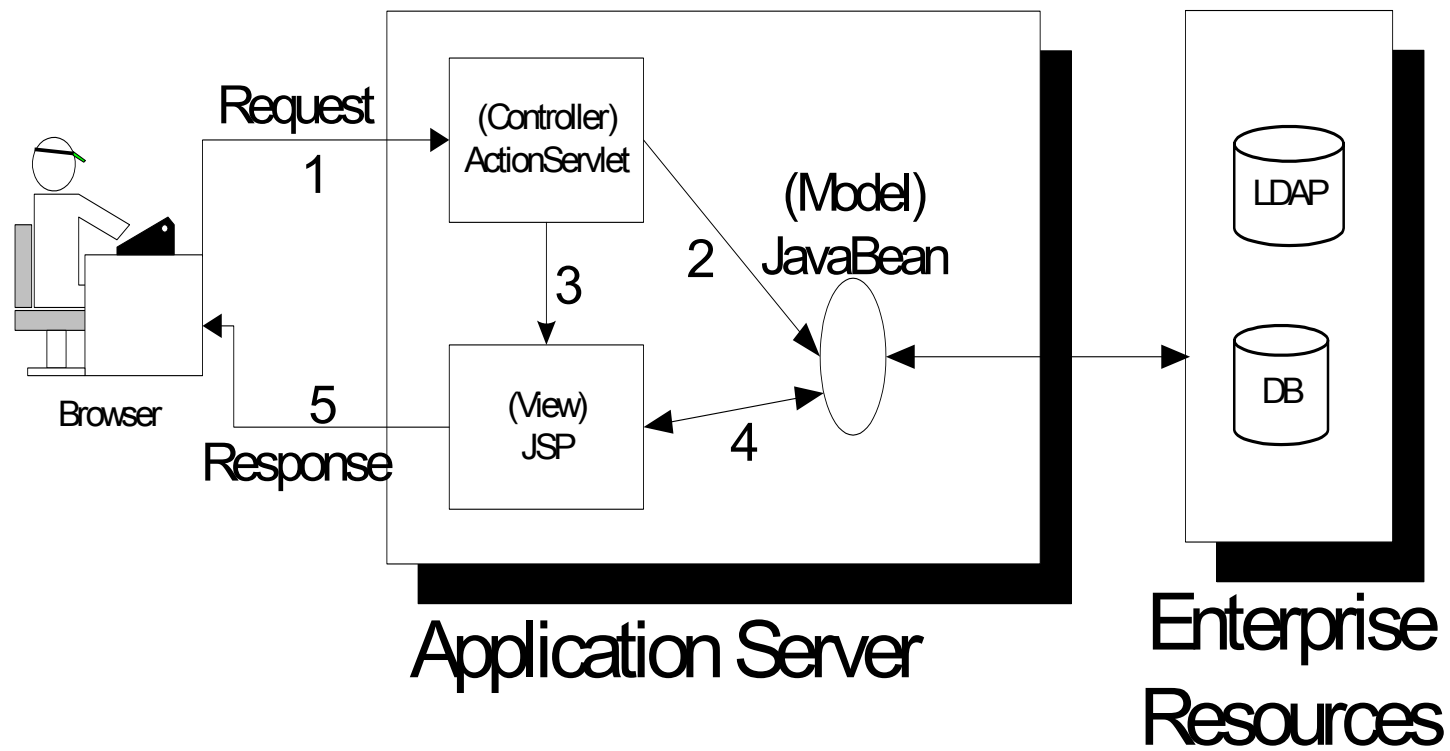


What Is Struts?

- The official site:
 - <http://struts.apache.org>
- An open source framework for building Java web applications.
- Encourages application architectures based on Model 2 (a variation of MVC)



Model 2





Core Technology

- Core based on:
 - Java Servlets
 - JavaBeans
 - Resource Bundles
 - XML
 - Open source technologies like Jakarta-Commons





What Does Struts Do for Me?

- Struts provides a framework to collect input from a user, direct that input to server-side code, and forward to output page(s).
- Solves common problems found by “the community” while building enterprise web applications.





Compelling Features

- Validation – a very robust XML based validation framework is built into Struts.
- Security – you can add role based security.
- Internationalization (i18n) – built in support using Java resource bundles





How Does Struts Work?

- It uses a deployment descriptor very similar to servlets.
 - struts-config.xml vs. web.xml
- Struts “processes” HTTP requests using a handful of components configured in the struts-config.xml file.





Basic Steps

- User fills in form & clicks “submit”
- HttpRequest is sent to the ActionServlet
- ActionServlet delegates processing to the RequestProcessor
- RequestProcessor loads form values into an ActionForm
- RequestProcessor sends ActionForm to Action





Basic Steps *(Continued)*

- Action implements Business Logic as the execute() method
- Business Logic performs application specific instructions
- CRUD operations, Workflow, Email, LDAP, Legacy Integration, *etc.*
- Action saves any Model data as JavaBeans to appropriate Scope





Basic Steps *(Continued)*

- Action returns ActionForward to RequestProcessor
- RequestProcessor forwards / includes / redirects to appropriate View defined in the ActionMapping
- View “renders” presentation including any Model data stored in JavaBeans or MessageResources to provide i18n.





Sample Config File

```
<struts-config>
  <form-beans>
    <form-bean name="logonForm" type="app.LogonForm"/>
  </form-beans>
  <action-mappings>
    <action path="/Welcome" forward="/pages/Welcome.jsp"/>
    <action path="/Logon" forward="/pages/Logon.jsp"/>
    <action path="/LogonSubmit"
      type="app.LogonAction" name="logonForm"
      validate="true" input="/Logon.do">
      <forward name="success" path="/Welcome.do"/>
      <forward name="failure" path="/Logon.do"/>
    </action>
  </action-mappings>
  <message-resources parameter="resources.application"/>
</struts-config>
```





ActionServlet

- Responsibility:
 - Boot strap configuration upon init().
- Config:
 - <struts-config>
- API:
 - This class is provided.



RequestProcessor

- Responsibility:
 - Handles all processing of Request/Response lifecycle.
- Config:
 - `<controller processorClass="" />`
- API:
 - This class is provided, but if default behavior is not suitable then subclass:
`org.apache.struts.action.RequestProcessor`
 - Override any of the process methods required





ActionMapping (aka ActionConfig)

- Responsibility:

- Contains configuration information that relates the path, form-bean, and action together along with other basic instructions. This is the primary “instruction set” for the controller.

- Config:

- `<action path="" name="" type=""/>`

- API:

- This class is provided, but to include additional information you can subclass



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`org.apache.struts.action.ActionMapping`



Action Form

- **Responsibility:**
 - Holds all information from the client, typically HTML form data. Perform validation of client input.
- **Config:**
 - Uses an associated ActionFormBean (aka FormBeanConfig) for configuration:
 - `<form-bean name="" type=""/>`
- **API:**
 - Subclass (or use one of the DynaForm classes)
`org.apache.struts.action.ActionForm`
 - Override `reset()` and `validate()` methods.





Action

- **Responsibility:**
 - This is the binding layer to business logic. Should also store any JavaBeans required by view.
- **Config:**
 - Associated to a path and form-bean, and configured using the ActionMapping
- **API:**
 - Subclass `org.apache.struts.action.Action`
Override the `execute()` method.





ActionForward (*aka* ForwardConfig)

- Responsibility:
 - Typically contains the location of a JSP, tile definition, or other view component.
- Config:
 - `<forward name="" path=""/>`
- API:
 - This class is provided.





ActionMessage

- Responsibility:
 - Constructs a message string from the resource bundle.
- Config:
 - `<message-resources parameter="" />`
- API:
 - This class is provided.





Where Did Struts Originate?

- Initial releases 0.5 (May 2000) – 1.0 (Mar 2001)\ul style="list-style-type: none;"> - Implemented core Model2 concept
 - Action perform()
 - FormBean validate()
 - ActionMapping path="xxx.do"
 - ActionForward path="nextStep.jsp"
 - Struts Taglibs
- Donated to the Apache foundation by Sun's Chief Web Architect, Craig McClanahan





1.1 Release

- Struts 1.1 (Aug 2003)
 - Expanded Core Features
 - Tiles
 - Plugins
 - Module Support
 - Validation
 - Explore interoperability with emerging standards
 - EL
 - JSTL
 - JSF





Latest Release

- **Struts 1.2.4 (Sep 2004)**
 - Remove deprecations from 1.0 to 1.1, and prior
 - Building greater stability and feature integration
 - Further module integration
 - Further support EL and JSTL
 - **New Features**
 - Wildcard mappings
 - DigestingPlugIn
 - MappingDispatchAction
 - Migrate build from Ant to Maven



What Is the Future of Struts?

- With so many emerging standards, the future of Struts is still unclear.
- The current thinking is to begin 2 main branches for ongoing development:
 - 1.x series – Servlet 2.2 / JSP 1.1
 - 2.x series – Servlet 2.4 / JSP 2.0





Development Release

- **Struts 1.2.5** (Oct. 17, 2004)
 - Continuing to correct bugs and cleanup codebase.
 - Migrated to Subversion
 - Website updates
 - Any new enhancements will most likely be in the 1.3.x series.





Future Release

- Struts 1.3 (late 2004, 2005)
 - Use jakarta-commons Resources
 - Separate into multiple builds
 - * core, apps, el, faces, site, taglib
 - * flow, scripting (new)
 - Allow configuration extends="" in all other elements (similar to tiles)
 - Move core to "Struts Chain" Request Processor
 - Complete Maven migration





Future Release

- **Struts 1.4** (2005, 2006)
 - Review approach to RequestProcessor
 - Consider ActionContext
 - Enhanced support for newer servlet and jsp specs.
 - Consider adding support for Porlets by specifying an alternate Request Processor catalog





Future Release

- **Struts 2.0** (late 2005, 2006)
 - Enhanced support for using Struts in large team environments.
 - Provide broad enhancements using Servlet 2.4 and JSP 2.0 platforms
 - Comprehensive unit test coverage for all core features
 - Transparent support for a portlet environment (JSR 168), with minimal-to-no changes in your business logic and pages.



Future Release *(Continued)*

- **Struts 2.0** *(Continued)*
 - Direct support for JSTL/JSF taglibs and the JSF API
 - Enhanced support for other presentation layers, such as XLST
 - Enhanced support for scriptable Actions, using technologies like BSF or Jelly





What Are the Latest Features?

- There are several features in ongoing development.
 - Struts EL
 - Struts Faces
 - CoRe – Chain of Responsibility Request Processor
 - Commons Resources





Struts EL

- This is a port of the Struts taglib to JSTL.
 - Any new development should focus on using this taglib.





Bean EL taglib

- All struts bean tags that provided behavior not present in JSTL have been ported.
- Use JSTL tags
 - c:set, EL
 - Replaces: cookie, define, header, parameter
 - c:import
 - Replaces: include
 - c:out
 - Replaces: write





Logic EL taglib

- All struts logic tags that provided behavior not present in JSTL have been ported.
- Use JSTL tags
 - c:if, c:when, EL
 - Replaces: empty, equal, greaterEqual, greaterThan, lessEqual, lessThan, notEmpty, notEqual





HTML EL Taglib

- All Struts HTML tags have been ported.





Tiles EL Taglib

- As of Struts 1.2.1 the tiles taglib has been ported to JSTL





Struts – Faces

- This is an integration library to explore methods of integrating Struts with JSF.
 - Note: At the time of this writing, this library is not current. If possible, I will include more current information and potentially an example during the week of my presentation.





Jakarta Commons – Chain of Responsibility

- A new commons library to support the “Chain of Responsibility” design pattern.
- A CoRe Request Processor is being built using this new library.

<http://cvs.apache.org/viewcvs.cgi/jakarta-struts/contrib/struts-chain/README.txt>





Jakarta Commons Resources

- Allows you greater flexibility in managing resource bundles.
 - Store message resources in other formats in database.





What Extensions Are Available?

- SSL Ext
- Spring Framework
- Xdoclet
- AppFuse





Extensions? *(Continued)*

- BSF
- Cocoon
- ControlFlow
- Doc





Struts SSL Ext

- This extension allows you to define transmission protocol behavior.
 - *i.e.*, which Actions require HTTPS protocol.
- Extends:
 - ActionConfig, RequestProcessor, Plugin
 - `<html:link>` and `<html:form>`

<http://struts.apache.org/faqs/ssl.html>

<http://sslext.sourceforge.net/>



Spring Framework Extensions

- IoC and AOP
 - Allows concentration on business logic development, and separates logging, auditing, ...
 - <http://www.springframework.org>
- Struts package: `org.springframework.web.struts`
 - ContextLoaderPlugin
 - DelegatingRequestProcessor
 - ActionSupport, DispatchActionSupport
 - ActionServletAwareProcessor
- Made the “Struts Spring Plugin” extension obsolete.



XDoclet Extensions

- Component Code Generation
 - Uses @javadoc attributes to provide code generation capabilities.
 - <http://xdoclet.sourceforge.net/tags/apache-tags.html>
- Examples
 - @struts.action
 - @struts.form
 - @struts.validation





AppFuse Extension

- Starter application that includes integration with Hibernate, DBUnit, Cactus, Log4j, and Struts
 - <http://raibledesigns.com/wiki/Wiki.jsp?page=AppFuse>





Bean Scripting Framework Ext.

- Using the Jakarta BSF framework allows struts Action classes to be written in a scripting framework
 - Perl
 - Python
 - Ruby
 - JavaScript
 - BeanShell
 - VBScript (?)



Cocoon Extensions

- Allows you to leverage the presentation power of the Cocoon framework.
- Struts ActionForwards are passed to Cocoon to be rendered as XML Pipelines.
 - See <http://cocoon.apache.org> for more details.

<http://struts.sourceforge.net/struts-cocoon/index.html>





Struts Flow

- Port of Cocoon's ControlFlow concept.
 - Allows complex workflow using "continuations-capable" JavaScript.

<http://struts.sourceforge.net/struts-flow/index.html>



Struts Doc

- An Ant task to generate javadoc like documentation from the Struts config file.

<http://struts.sourceforge.net/strutsdoc/index.html>





JAAS Techniques

- There is no definite JAAS resource at this time for Struts.
- Potential sources of further information:
 - <http://www.mooreds.com/jaas.html>
 - <http://www.javaworld.com/javaforums/showflat.php?Cat=2&Board=JavaSecurity&Number=2500&page=0&view=collapsed&sb=5&o=&fpart=1>
 - <http://sourceforge.net/projects/jguard>





Should I Choose Struts?

- Large community of support
- Stable and mature technology
- Don't take Risk alone
- For a more in-depth analysis:
 - http://www.scioworks.net/devnews/articles/struts_adoption_issues



Where Can I Find Additional Information?

- <http://struts.apache.org>
 - Source code, binary distribution, UserGuide, Developer Guide, FAQ, Roadmap
 - Warning: Not always very current!
- <http://wiki.apache.org/struts/>
 - Help wanted, NewFAQs, ShortTermPlans, Whiteboard, ReleasePlans, IdeaJar
 - Resources
 - Books, articles, tools, training, weblinks
 - Typically much more current.
- <http://struts.sourceforge.net>
 - Extensions and examples



Questions

Are there any questions?





Thank you for coming!

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