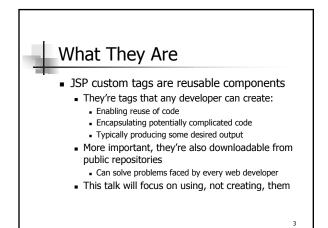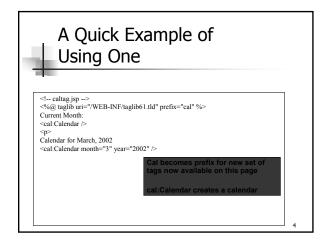# Incorporating JSP Custom Tags Into Your Web Apps
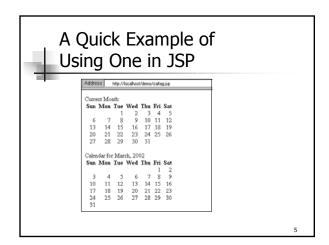
Charles Arehart
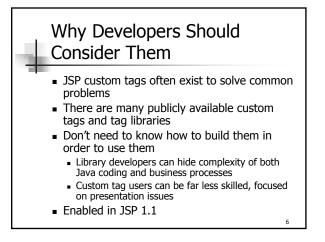Founder/CTO, Systemanage
Laurel MD

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Topics

- Why They Can Be Useful
- 5 Steps to Using Them
- Finding Custom Tag Libraries
- The JSP Standard Tag Library (JSTL)
- Where to Learn More

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What They Are

- JSP custom tags are reusable components
  - They're tags that any developer can create:
    - Enabling reuse of code
    - Encapsulating potentially complicated code
    - Typically producing some desired output
  - More important, they're also downloadable from public repositories
    - Can solve problems faced by every web developer
  - This talk will focus on using, not creating, them

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A Quick Example of Using One

```
<!-- caltag.jsp -->
<%@ taglib uri="/WEB-INF/taglib61.tld" prefix="cal" %>
Current Month:
<cal:Calendar />
<p>
Calendar for March, 2002
<cal:Calendar month="3" year="2002" />
```

Cal becomes prefix for new set of tags now available on this page

cal:Calendar creates a calendar

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A Quick Example of Using One in JSP

| Address | http://localhost/demo/caltag.jsp |

Current Month:

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Calendar for March, 2002

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

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Why Developers Should Consider Them

- JSP custom tags often exist to solve common problems
- There are many publicly available custom tags and tag libraries
- Don't need to know how to build them in order to use them
  - Library developers can hide complexity of both Java coding and business processes
  - Custom tag users can be far less skilled, focused on presentation issues
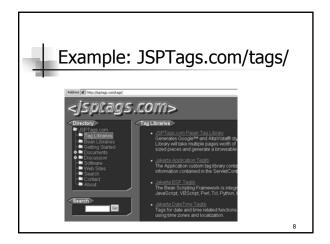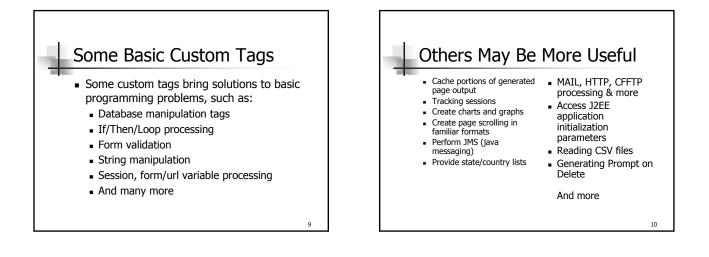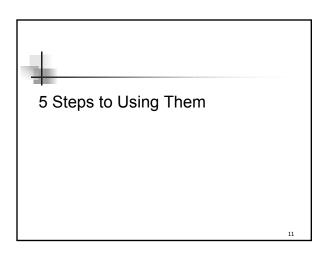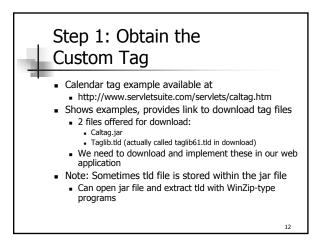- Enabled in JSP 1.1

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Resources for Finding Such Custom Tags

- Many resources exist for finding publicly available custom tags
  - Most are free
  - Some are offered commercially
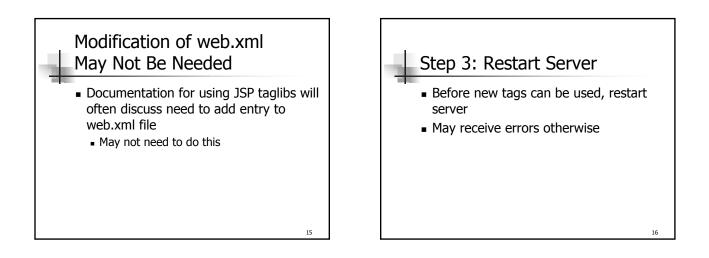- One example is jsptags.com
  - There are many others, shown later

Example: JSPTags.com/tags/

Some Basic Custom Tags

- Some custom tags bring solutions to basic programming problems, such as:
  - Database manipulation tags
  - If/Then/Loop processing
  - Form validation
  - String manipulation
  - Session, form/url variable processing
  - And many more

Others May Be More Useful

- Cache portions of generated page output
- Tracking sessions
- Create charts and graphs
- Create page scrolling in familiar formats
- Perform JMS (java messaging)
- Provide state/country lists

- MAIL, HTTP, CFFTP processing & more
- Access J2EE application initialization parameters
- Reading CSV files
- Generating Prompt on Delete

And more

5 Steps to Using Them

Step 1: Obtain the Custom Tag

- Calendar tag example available at
  - http://www.servletsuite.com/servlets/caltag.htm
- Shows examples, provides link to download tag files
  - 2 files offered for download:
    - Caltag.jar
    - Taglib.tld (actually called taglib61.tld in download)
  - We need to download and implement these in our web application
- Note: Sometimes tld file is stored within the jar file
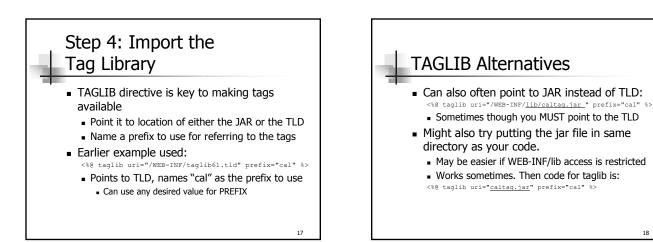 - Can open jar file and extract tld with WinZip-type programs

Understanding.tld Files

- TLD – Tag Library Descriptor format
  - Describes JSP custom tags and their use
- Don't really need to open or even understand these files to use them
  - Just know where to put them in our web application directories
  - And how to use them in our templates

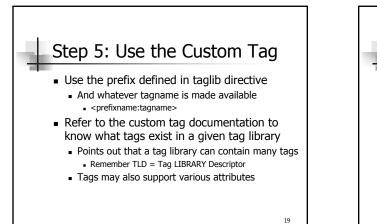13

Step 2: Place Them in Web Application Directories

- Place .tld files in WEB-INF/
- Place .jar files in WEB-INF/lib
- Have Admin do this for you if dirs are restricted
- Place code that calls custom tag in any typical JSP dir
- Resulting possible file structure:
  - wwwroot
    - wwwroot/demo/cal.jsp
    - wwwroot/WEB-INF/taglib61.tld
    - wwwroot/WEB-INF/lib/caltag.jar

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Modification of web.xml May Not Be Needed

- Documentation for using JSP taglibs will often discuss need to add entry to web.xml file
  - May not need to do this

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Step 3: Restart Server

- Before new tags can be used, restart server
- May receive errors otherwise

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Step 4: Import the Tag Library

- TAGLIB directive is key to making tags available
  - Point it to location of either the JAR or the TLD
  - Name a prefix to use for referring to the tags
- Earlier example used:
  `<%@ taglib uri="/WEB-INF/taglib61.tld" prefix="cal" %>`
  - Points to TLD, names "cal" as the prefix to use
    - Can use any desired value for PREFIX

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TAGLIB Alternatives

- Can also often point to JAR instead of TLD:
  `<%@ taglib uri="/WEB-INF/lib/caltag.jar " prefix="cal" %>`
  - Sometimes though you MUST point to the TLD
- Might also try putting the jar file in same directory as your code.
  - May be easier if WEB-INF/lib access is restricted
  - Works sometimes. Then code for taglib is:
  `<%@ taglib uri="caltag.jar" prefix="cal" %>`

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Step 5: Use the Custom Tag

- Use the prefix defined in taglib directive
  - And whatever tagname is made available
    - <prefixname:tagname>
- Refer to the custom tag documentation to know what tags exist in a given tag library
  - Points out that a tag library can contain many tags
    - Remember TLD = Tag LIBRARY Descriptor
  - Tags may also support various attributes

"Cal" Tag Library Offers Multiple Tags

- We used only the basic cal:Calendar tag
  - There are also other tags for this tag library, as documented at the taglib web site
  - For instance, option available to create a link on the calendar for a given day, with setLink tag and its day attribute

```
<cal:Calendar month="3" year="2002">
  <cal:setLink
  day="5">http://www.abc.com</cal:setLink>
  <cal:setLink
  day="15">http://www.def.com/</cal:setLink>
</cal:Calendar>
```

  - That's all there is to it!

Finding Custom Tag Libraries

Several JSP Custom Tag Portals

- Some free, some commercial
  - jsptags.com
  - servletsuite.com/jsp.htm
  - jspin.com/home/tags
  - aewnet.com/root/webdev/jsp/jsptaglibs/
  - javashareware.com/CFScripts/jservlets.cfm
  - dotjonline.com
  - opensymphony.com
  - Jspsmart.com
  - javaskyline.com/dev.html

Some Useful Tags in the ColdJava Suite

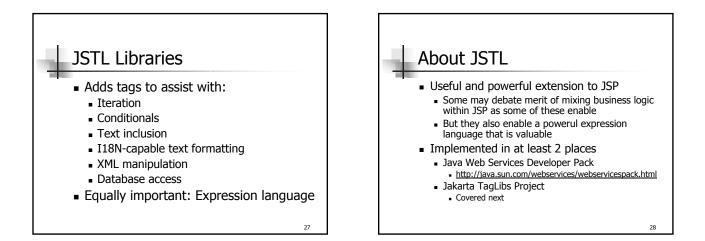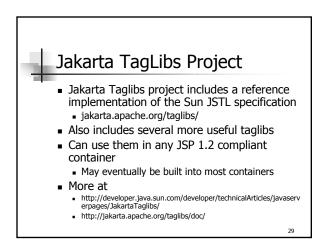| Title	Description	Filename
Button	create HTML buttons with confirmation dialog	Buttag
Cache	supports dynamic caching of generated output	Cachetag
Calendar	create calendars	Caltag
Country	create country select lists	Cntrtag
Delay	delay execution in page	Delaytag

More info on each at http://coldjava.hypermart.net/servlets/[filename].htm

Some Useful Tags in the ColdJava Suite (cont.)

Title	Description	Filename
Sessions Counter	calculate a number of active sessions	Livetag
Sessions Stats	collects statistics for sessions (how many sessions are active, what was the peak value for active sessions, total counter for sessions, minimal, maximal and average life time for sessions)	Sesslist
Smarttag	parses own body converting hyperlinks and mailtos	Smarttag

More info on each at http://coldjava.hypermart.net/servlets/[filename].htm

Other Tags in Various Taglibs

- Clickstream
  - show the current users on your site, and where they've been in detail
  - http://www.opensymphony.com/clickstream/
- Pager
  - generate Google and AltaVista style search result navigators
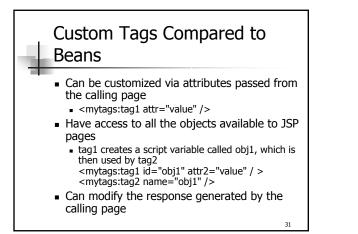 - http://jsptags.com/tags/navigation/pager/

JSP Standard Tag Library

- JSTL: effort to create standardized custom tags
  - Many jsp/servlet containers (and some of those previous sites) were creating their own solutions to common programming needs
  - See
    - java.sun.com/products/jsp/jstl
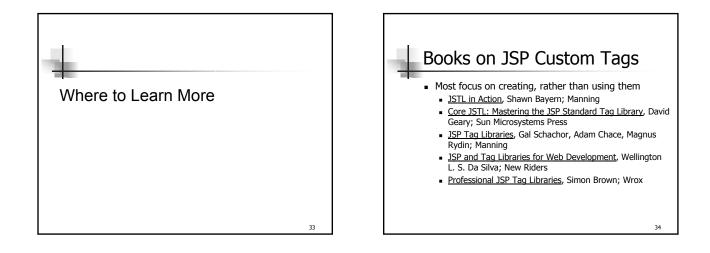   - JSR 52 (http://jcp.org/jsr/detail/052.jsp)

JSTL Libraries

- Adds tags to assist with:
  - Iteration
  - Conditionals
  - Text inclusion
  - I18N-capable text formatting
  - XML manipulation
  - Database access
- Equally important: Expression language

About JSTL

- Useful and powerful extension to JSP
  - Some may debate merit of mixing business logic within JSP as some of these enable
  - But they also enable a powerul expression language that is valuable
- Implemented in at least 2 places
  - Java Web Services Developer Pack
    - http://java.sun.com/webservices/webservicespack.html
  - Jakarta TagLibs Project
    - Covered next

Jakarta TagLibs Project

- Jakarta Taglibs project includes a reference implementation of the Sun JSTL specification
  - jakarta.apache.org/taglibs/
- Also includes several more useful taglibs
- Can use them in any JSP 1.2 compliant container
  - May eventually be built into most containers
- More at
  - http://developer.java.sun.com/developer/technicalArticles/javaserverpages/JakartaTaglibs/
  - http://jakarta.apache.org/taglibs/doc/

Some Interesting (Non-Standard) Jakarata Taglibs

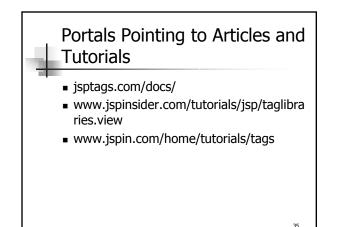|	
Application Taglib	used to access information contained in the ServletContext for a web application.
Cache Taglib	lets you cache fragments of your JSP pages.
IO Taglib	perform HTTP GETs or PUT operations and to make XML-RPC and SOAP requests.
JMS Taglib	perform a variety of JMS related operations such as sending and receiving messages
Mailer Taglib	used to send email
Scrape Taglib	scrape or extract content from web documents
XSL Taglib	for transforming XML input sources with XSL stylesheets
Xtags Taglib	lets you navigate, process and style XML documents with XSLT and XPath

Custom Tags Compared to Beans

- Can be customized via attributes passed from the calling page
  - `<mytags:tag1 attr="value" />`
- Have access to all the objects available to JSP pages
  - tag1 creates a script variable called obj1, which is then used by tag2
    `<mytags:tag1 id="obj1" attr2="value" / >`
    `<mytags:tag2 name="obj1" />`
- Can modify the response generated by the calling page

Custom Tags Compared to Beans (cont.)
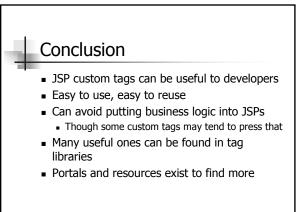
- Can communicate with one another
  - Can create and initialize a JavaBeans component, create a variable that refers to that bean in one tag, and then use that bean in another tag
- Can be nested within one another
  `<mytags:outerTag>`
  `<mytags:innerTag />`
  `</mytags:outerTag>`

Where to Learn More

Books on JSP Custom Tags

- Most focus on creating, rather than using them
  - JSTL in Action, Shawn Bayern; Manning
  - Core JSTL: Mastering the JSP Standard Tag Library, David Geary; Sun Microsystems Press
  - JSP Tag Libraries, Gal Schachor, Adam Chace, Magnus Rydin; Manning
  - JSP and Tag Libraries for Web Development, Wellington L. S. Da Silva; New Riders
  - Professional JSP Tag Libraries, Simon Brown; Wrox

Portals Pointing to Articles and Tutorials

- jsptags.com/docs/
- www.jspinsider.com/tutorials/jsp/taglibraries.view
- www.jspin.com/home/tutorials/tags

Conclusion

- JSP custom tags can be useful to developers
- Easy to use, easy to reuse
- Can avoid putting business logic into JSPs
  - Though some custom tags may tend to press that
- Many useful ones can be found in tag libraries
- Portals and resources exist to find more

Contact Info

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