CF and JSP/Servlets

Developed originally by Robi Sen

For the CF UnderGround II Seminar, Apr 2001

Edited and enhanced by Charlie Arehart
(Robi had an emergency and couldn't make it)

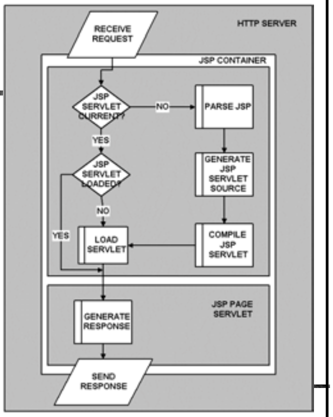
Topics Covered

- Overview JSP/Servlets
- Comparison of CF and JSP Tags
  - Variables
  - Application Scope
  - Conditional Processing
  - Reusing Common Code
  - Sessions
  - Database Access
- JSP/Servlet Engine, Tool Vendors
- Leveraging Java in CF Today
- Learning More

What are they?

- JSP/Java Servlets
  - Servlets
    - Comparable to CGI/ISAPI/NSAPI programming, in Java vs Perl
      - Java class that dynamically extends the function of a Web Server
      - Handle HTTP requests and generate HTTP responses
  - JSP
    - Tag-based scripting and page-template interface to Java development, a la CF
      - High level abstraction language to servlet standard

Server Process for JSP

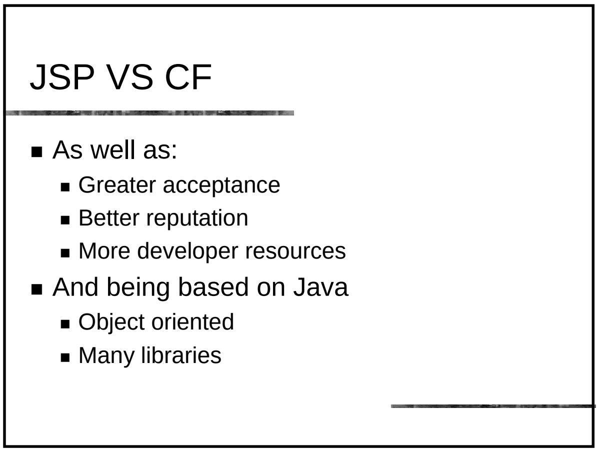


What CF has over JSP

- ColdFusion offers:
  - Faster learning curve
  - More features in language out of the box
    - (i.e. cftransaction, cfhttp, cfftp, cached queries, queries of queries)
  - Greater abstraction, high productivity
  - Greater maturity as web application

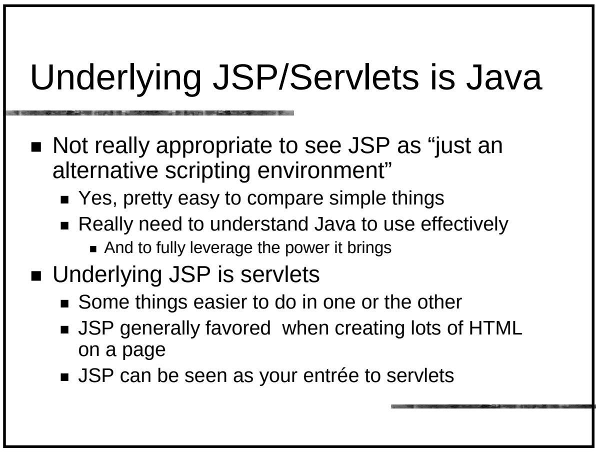
What JSP over CF

- JSP offers:
  - Platform Agnostic(Write Once Run Anywhere)
  - Scalability and Robustness
  - Performance and power
  - Access to Enterprise Technologies
  - Manageability
  - Standardization
  - Massive adoption and developer community



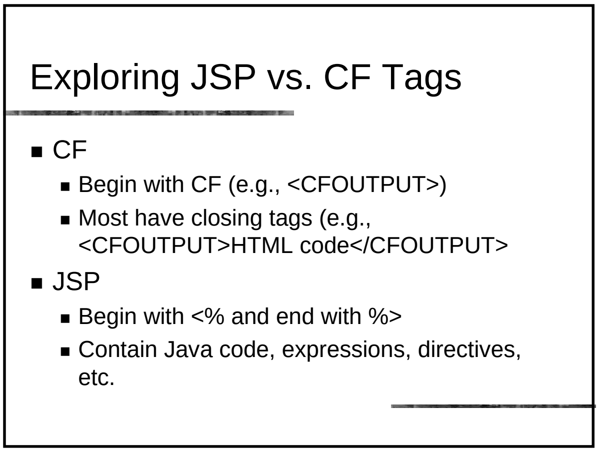
JSP VS CF

- As well as:
  - Greater acceptance
  - Better reputation
  - More developer resources
- And being based on Java
  - Object oriented
  - Many libraries



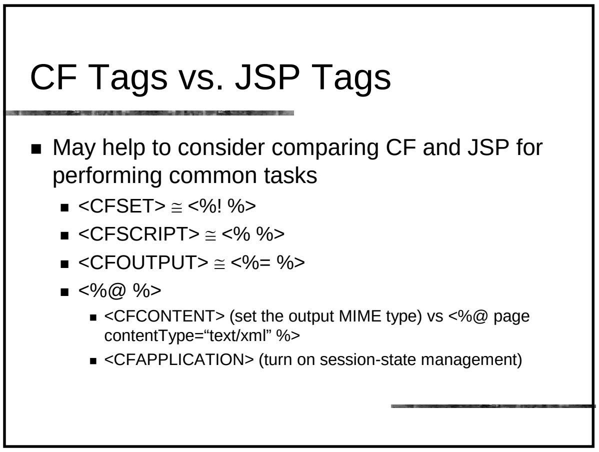
Underlying JSP/Servlets is Java

- Not really appropriate to see JSP as “just an alternative scripting environment”
  - Yes, pretty easy to compare simple things
  - Really need to understand Java to use effectively
    - And to fully leverage the power it brings
- Underlying JSP is servlets
  - Some things easier to do in one or the other
  - JSP generally favored when creating lots of HTML on a page
  - JSP can be seen as your entrée to servlets



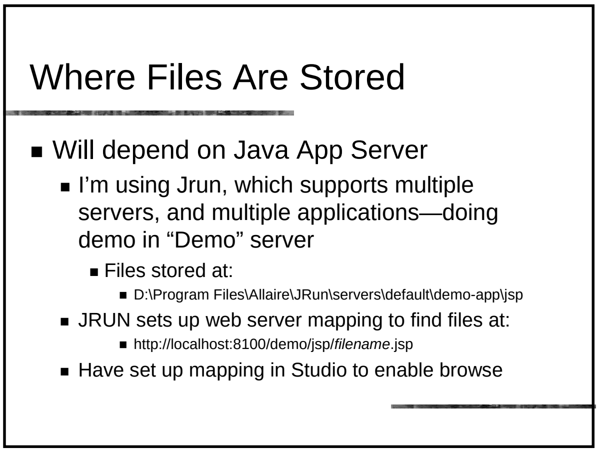
Exploring JSP vs. CF Tags

- CF
  - Begin with CF (e.g., <CFOUTPUT>)
  - Most have closing tags (e.g., <CFOUTPUT>HTML code</CFOUTPUT>
- JSP
  - Begin with <% and end with %>
  - Contain Java code, expressions, directives, etc.



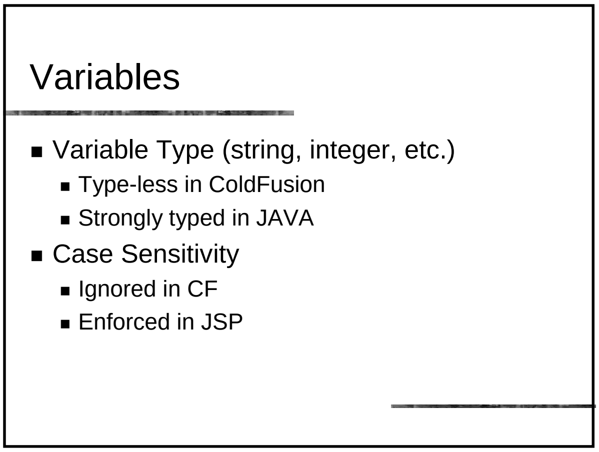
CF Tags vs. JSP Tags

- May help to consider comparing CF and JSP for performing common tasks
  - <CFSET> ≅ <%! %>
  - <CFSCRIPT> ≅ <% %>
  - <CFOUTPUT> ≅ <%= %>
  - <%@ %>
    - <CFCONTENT> (set the output MIME type) vs <%@ page contentType="text/xml" %>
    - <CFAPPLICATION> (turn on session-state management)



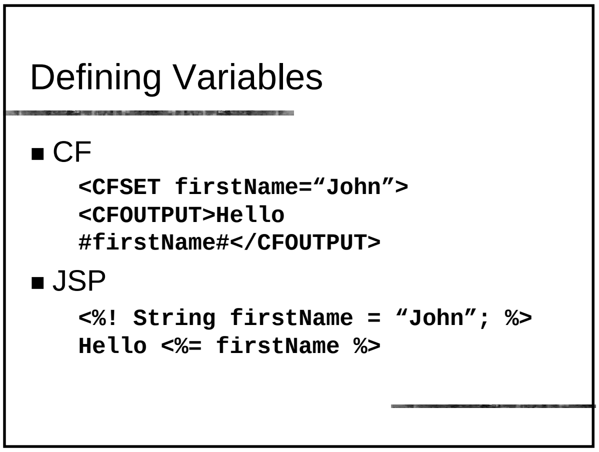
Where Files Are Stored

- Will depend on Java App Server
  - I'm using Jrun, which supports multiple servers, and multiple applications—doing demo in "Demo" server
    - Files stored at:
      - D:\Program Files\Allaire\JRun\servers\default\demo-app\jsp
  - JRUN sets up web server mapping to find files at:
      - http://localhost:8100/demo/jsp/*filename*.jsp
  - Have set up mapping in Studio to enable browse



Variables

- Variable Type (string, integer, etc.)
  - Type-less in ColdFusion
  - Strongly typed in JAVA
- Case Sensitivity
  - Ignored in CF
  - Enforced in JSP



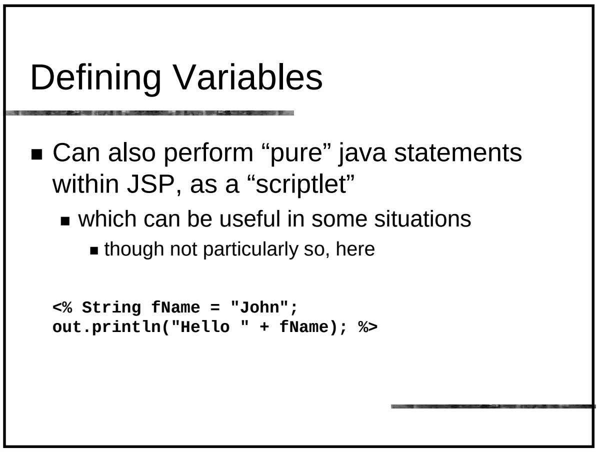
Defining Variables

- CF

```
<CFSET firstName=“John”>
<CFOUTPUT>Hello
#firstName#</CFOUTPUT>
```

- JSP

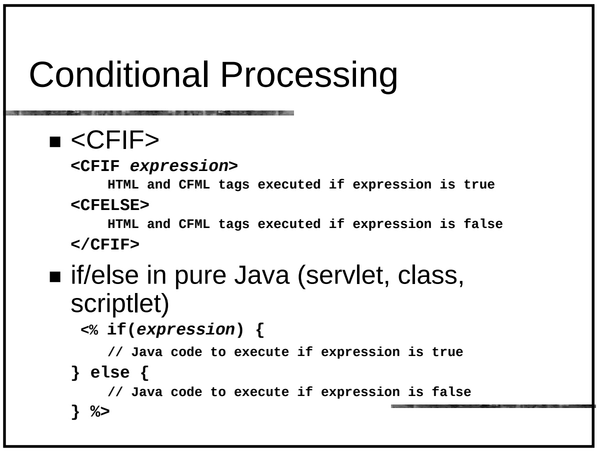
```
<%! String firstName = “John”; %>
Hello <%= firstName %>
```



Defining Variables

- Can also perform “pure” java statements within JSP, as a “scriptlet”
  - which can be useful in some situations
    - though not particularly so, here

```
<% String fName = "John";
out.println("Hello " + fName); %>
```



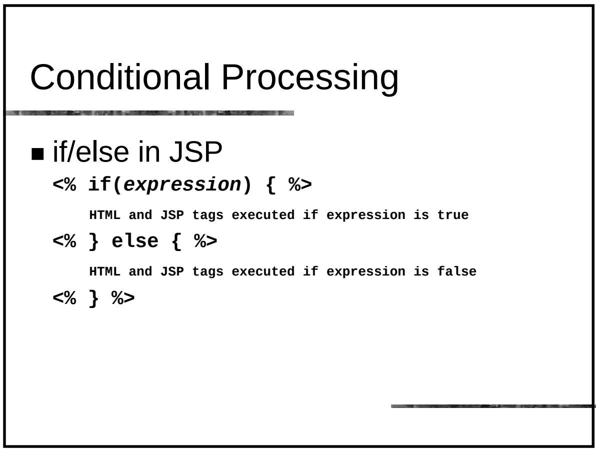
Conditional Processing

- <CFIF>

```
<CFIF expression>
    HTML and CFML tags executed if expression is true
<CFELSE>
    HTML and CFML tags executed if expression is false
</CFIF>
```

- if/else in pure Java (servlet, class, scriptlet)

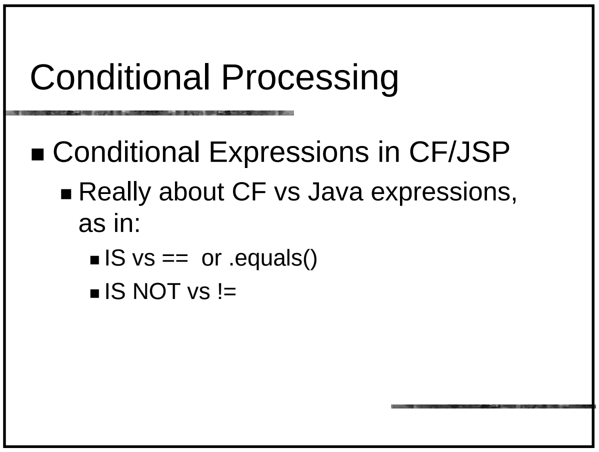
```
 <% if(expression) {
    // Java code to execute if expression is true
} else {
    // Java code to execute if expression is false
} %>
```



Conditional Processing

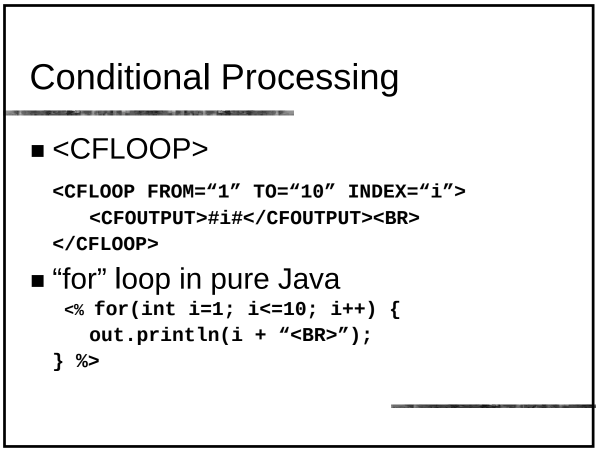
- if/else in JSP

```
<% if(expression) { %>
    HTML and JSP tags executed if expression is true
<% } else { %>
    HTML and JSP tags executed if expression is false
<% } %>
```



Conditional Processing

- Conditional Expressions in CF/JSP
  - Really about CF vs Java expressions, as in:
    - IS vs == or .equals()
    - IS NOT vs !=



Conditional Processing

- <CFLOOP>

```
<CFLOOP FROM="1" TO="10" INDEX="i">
   <CFOUTPUT>#i#</CFOUTPUT><BR>
</CFLOOP>
```

- "for" loop in pure Java

```
 <% for(int i=1; i<=10; i++) {
   out.println(i + "<BR>");
} %>
```

Conditional Processing

- “for” loop in JSP

```
<% for(int i=1; i<=10; i++) { %>
    <%= i %><BR>
<% } %>
```

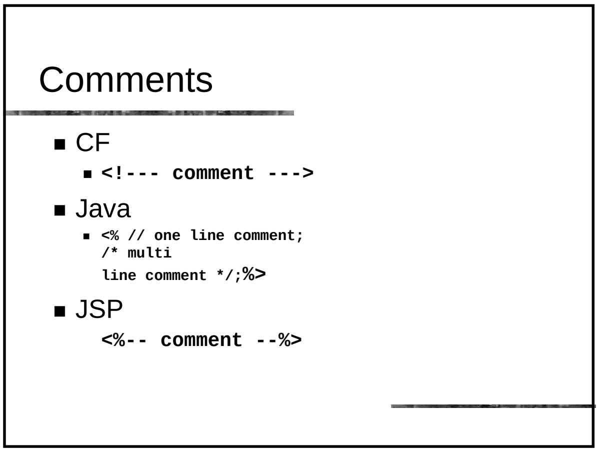
Reusing Common Code

- CF
  - `<CFINCLUDE TEMPLATE=“/Templates/header.cfm”>`
- JSP
  - `<%@ include file = "path" ... %>`
- **or**
  - `<jsp:include page=“/Templates/header.jsp”/>`
  - **More like CF custom tag call**
    - **Goes to other page, executes, and returns**
    - **Passes request object to called page**

Redirection

- CF
  - `<CFLOCATION URL=“/Forms/demo.cfm”>`
- Java
  - `<% RequestDispatcher aDispatcher = request.getRequestDispatcher(“/Templates/header.jsp”);`
  - `aDispatcher.include(request, response); %>`
- JSP

```
<jsp:forward page="/Forms/demo.cfm" />
```

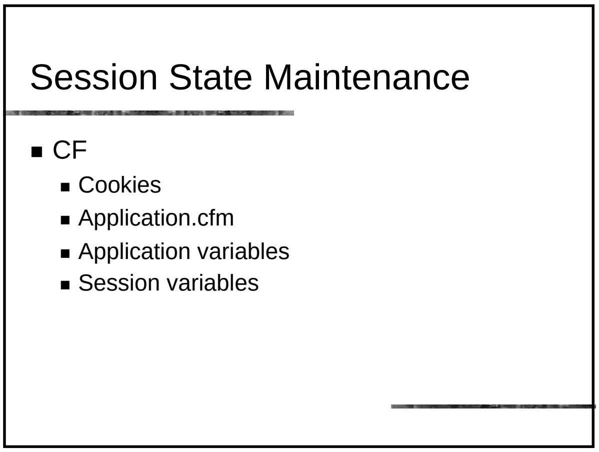


Comments

- CF
  - `<!--- comment --->`
- Java

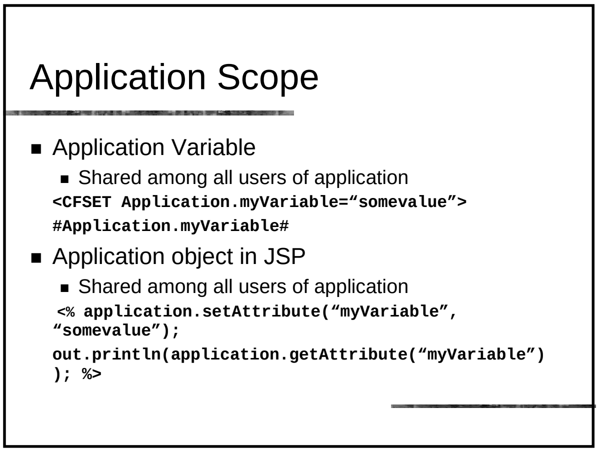
  -
    ```
    <% // one line comment;
    /* multi
    line comment */;%>
    ```
- JSP

  ```
  <%-- comment --%>
  ```



Session State Maintenance

- CF
  - Cookies
  - Application.cfm
  - Application variables
  - Session variables



Application Scope

- Application Variable
  - Shared among all users of application

```
<CFSET Application.myVariable="somevalue">
#Application.myVariable#
```

- Application object in JSP
  - Shared among all users of application

```
<% application.setAttribute("myVariable",
"somevalue");
out.println(application.getAttribute("myVariable")
); %>
```

Application Scope

- ServletContext object
  - Shared among all users of servlet

```
<%
  getServletContext().setAttribute(“myVar
  iable”, “somevalue”);
getServletContext().getAttribute(“myVaria
  ble”); %>
```

Session State Maintenance

- CF “session.” variables

```
<cfset session.name = “john doe”>
```

- Servlet HttpSession object

```
<% HttpSession aSession = request.getSession();
aSession.setAttribute(“name”, “John Doe”); %>
```

- JSP session object is an instance of the HttpSession object.

```
<% session.setAttribute(“name”, “John Doe”);%>
```

Database Access

- ODBC
  - Standard database access method
  - Inserts a middle layer (driver) between the database and the application
- JDBC (Java Database Connectivity)
  - Based on ODBC
  - Allows access to any tabular data source from the Java programming language

Database Access: In CF

- Use CF Administrator to set the DataSource
- Query the database using <CFQUERY>

```
<CFSET variables.anID = 2>
<CFQUERY NAME="myquery"
DATASOURCE="mydatabase">
select firstname, lastname from mytable
where id = #variables.anID#</CFQUERY>
```

- Accessing the data from the ResultSet

```
#myquery.firstname#
#myquery.lastname#
```

Database Access: In CF

- Displaying the ResultSet
  - One Row

```
<CFOUTPUT>
The name is #myquery.firstname#
#myquery.lastname#
</CFOUTPUT>
```

  - Many Rows

```
<CFOUTPUT QUERY="myquery">
The name is #myquery.firstname#
#myquery.lastname#
</CFOUTPUT>
```

Database Access: In Java

- Set the DataSource using a GUI tool (e.g., Jrun Mgt Console)
  - In "default server"
  - Edit "jdbc data sources"
  - Click edit to create a new one
  - If already defined on server in odbc
    - Enter its name, in "name" (ie, cfexamples)
    - Enter sun.jdbc.odbc.JdbcOdbcDriver for "driver"
    - Enter "jdbc:odbc:cfexamples" for url
    - Enter any other needed info (userid, password)
  - "Update", then "test"

Database Access: In Java

- In page, import needed libraries

```
<%@ page import="java.sql.*, javax.sql.*,
javax.naming.*" %>
```

- Obtain a reference to the DataSource using JNDI

```
<% InitialContext aContext = new
  InitialContext();
DataSource myDataSource = (DataSource)
  aContext.lookup(“java:comp/env/jdbc/cfexampl
  es”);%>
```

Database Access: In Java

- Call the DataSource method getConnection() to establish a connection

```
Connection con =
  myDataSource.getConnection();
```

Database Access: In Java

- Create/Prepare the Statement

```
PreparedStatement aStatement =
 con.prepareStatement(“select firstname,
 lastname from cfexamples where empid = ?”);
 aStatement.setInt(1, 2);
```

- Sets the first parameter (?) to the value 2
  - Finds empid=2

Database Access: In Java

- Execute the query using the Statement object's method executeQuery() method or the CallableStatement object's execute() method.

```
ResultSet rs = aStatement.executeQuery();
```

- Accessing the data from the ResultSet

```
rs.getString(1);
rs.getString(2);
```

Displaying ResultSet: Scriptlets

- One Row

```
if(rs.next()) {
      out.println("Hello " +
rs.getString(1) +
                                    " " +
rs.getString(2));
}
```

- Many Rows

```
while(rs.next()) {
      out.println("Hello " +
rs.getString(1) +
                            " " +
rs.getString(2));
}
```

Displaying ResultSet: JSP

- One Row

```
<% if(rs.next()) { %>
    Hello <%= rs.getString(1); %>
        <%= rs.getString(2); %>
<% } %>
```

- Many Rows

```
<% while(rs.next()) { %>
    Hello <%= rs.getString(1); %>
        <%= rs.getString(2); %>
<% } %>
```

More topics to learn

- Java
  - Language, libraries, data types
  - Concepts like classes, methods, packages, public/private/protected/"friendly", static/final, much more
- J2EE
  - JDBC, Enterprise Java Beans, JINI, JNDI, JMS, etc.
- JSP
  - JSP Custom Tags
  - JSP Page Directives
  - Error Handling …

More topics to learn

- SQL in scripts vs EJB
- Servlets/JSP
  - Request/response objects, headers, response codes
- Integrating servlets and JSP's
  - Battle line among supporters of each
  - Best used in tandem, where each best fits
- And much more

Learning More

- Excellent documentation with Jrun
- Several books
  - Core Servlets and JSP, Marty Hall
  - Professional JSP, Wrox Press
  - Pure JSP, James Goodwill
  - Java Server Pages Application Development, Scott Stirling, Ben Forta, et al
  - And others
- Thinking in Java, Bruce Eckel
  - eckelobjects.com

Learning More

- Several CFDJ Articles
  - Java For Cfers, Ben Forta
    - 3 parts, starting November 2000
  - ColdFusion & Java: A Cold Cup o' Joe, Guy Rish
    - 9 parts, starting in Jan 2001
- Also see Java Developer's Journal

JSP/Servlet Engine Providers

- Allaire Jrun
  - 3 person developer edition available free!
  - Can install on same server as CF Server
- IBM WebSphere
- BEA WebLogic
- Apache/TomCat
- others

Java Editing Tools

- Jrun Studio
  - CF Studio also supports JSP
- Kawa
- Others, from competing JSP engine providers

CF 6.0 AKA NEO

- CF, as we know it
  - But on top of a Java, rather than C++ platform
  - Basically transparent to CF developers
- Strength of JAVA, ease of CF
  - Backwards compatibility
  - Scalability built on a leading container (JRUN)
- May be made available on other Java Server vendor platforms (IBM, BEA, etc.)
  - Still being debated by Allaire, I understand

Leveraging Java in CF Today

- CFSERVLET
- CFOBJECT
- Java Custom Tags
- TagServlet (from n-ary.com)
- “wolf in sheep’s clothing” trick
  - How to look like you’re converting your CF code to use JSP when you’re really not ☺

Times Up!

- Hope you enjoyed the session
- Send questions to:
  - Charlie Arehart
  - Carehart@systemanage.com