



Going From CF to Java

(moving between the two)

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Agenda

- **Considering Java as an Alternative**
- **Integrating CF and Java Today**
- **Future Integration Possibilities for CF'ers**
- **JRun and Java Application Servers**
- **Software Needed**
- **Learning More**
- **Q & A**

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Audience

- **Intended primarily for those with:**
 - ColdFusion experience
 - Aware of Java and its value to application developers
 - Though perhaps no java experience
- **Anyone interested in:**
 - Learning about Java integrating ColdFusion & Java
 - Extending ColdFusion capabilities via Java

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Our Goal

- **Goals**

- Put Java in perspective for CF developers
- Get a flavor for opportunities, challenges
- Suggest ways to integrate the two today
- Muse on where the future may lead for us
- Point to resources for learning more

Who Am I?

- **A programmer by trade, trainer at heart**

- with nearly 20 years IT experience
 - 4 years ColdFusion, 1 year server-side Java
- Monthly contributor to ColdFusion Developer Journal, bi-monthly column beginning soon in Java Developer Journal
- Speaker at user groups, conferences worldwide
- Macromedia Certified Advanced Developer/Instructor

- **Best practices, performance tuning consultant**

- Contract mentor to development teams

Considering Java as an Alternative

- **Java: it's here & it's big**

- **May have been feeling pull**

- May have been able to “fight” getting into it
- Time has come to face the truth
 - A large market is demanding Enterprise java solutions
 - Also, many tools coming out on the market, built in Java

- **Our focus is on server-side java**

- Not client-side

- **Microsoft's pulling JVM out of Future Windows Operating Environments**

- Is it a threat to Java's future?
 - May have more effect on client side
 - Not that big a deal for server-side developers

Considering Java as an Alternative

- **Not really about caving in**
 - Learning how and when to best leverage Java as a CF developer
 - Not about leaving CF for Java
 - More about how to best marry the two
 - Getting easier all the time
- **Not even necessarily about learning java**
 - Just when and how to integrate java tools
 - Though certainly, to do much, will need to learn java
- **Free to get started**
 - Most platform tools are free, for developer level deployment

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Why Bother?

- **Benefits for current projects**
 - Leveraging java library functions for features
 - Accessing existing apps/modules within enterprise
 - Whether written in java (as classes, EJB's, Servlets)
 - Or made available by way of it (CORBA)
 - Creating new classes to extend functionality
- **Benefits as a professional developer or development firm**
 - Many tools available, written in java
 - Saves you having to build yourself
 - May be packaged for use with JSP/Servlets
 - Can easily figure out how to convert for use in CF

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What Can Java Give Us?

- **Among the things Java can offer CF developers include:**
 - Stronger string manipulation
 - XML manipulation
 - Networking
 - Compression
 - Encryption
 - Graphics generation
 - Image creation and manipulation
 - PDF creation and formatting
- **Enterprise integration**

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Macromedia Tag Gallery

- **Macromedia Tag Gallery and Sun site offer downloadable examples of such things**
 - Separate “java” link on left in taggallery
 - 41 things based on search of “java” at taggallery
 - Search criteria used
 - java not applet not “java script” not “no java” not “java tree”
 - ignore applets, other extraneous things, not relevant to this topic
 - Examples:
 - CFX_zipbrowser
 - CFX_html2pdf

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Going Outside of CF Entirely

- **Entire other discussion possible about leaving CF entirely**
 - Java Servlets
 - JavaServer Pages
 - Enterprise JavaBeans
 - And more
- **Will discuss this more later**
 - Focus for now is on integrating CF and Java

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Integrating CF and Java Today

- **CFOBJECT for Java**
 - Used to call upon java classes available on the same server running CF
 - leverage java language
 - access existing tools, business objects, including EJB's
- **CFX_ Java Custom tags**
 - Used to call upon Java classes on same server
 - leverage CF integration within the Java class (accessing/updating CF variables, queries, etc.)
 - call existing CFX_ tags in Macromedia Taggallery
- **CFServlet**
 - Used to integrate with Servlets on same or other server
 - Either obtaining the output of the servlet
 - pass data to/from servlet

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Ways To Use Java

- **To call existing things**
 - Native Java language offering richer environment
 - Classes, Servlets, CFX_custom tags you or someone else has built
 - Can be a class that produces a result (like a subroutine)
 - Or perhaps a JavaBean
 - Or one whose methods, properties you manipulate within CF
 - Tools that have java API
 - Such as charting tools, PDF creation tools, etc.
 - may choose to use API rather than some custom tag
 - Or ...

Ways To Use Java

- **To call existing things (cont.)**
 - EJB's
 - Those built within company to support applications
 - Tools that have EJB interfaces
 - (NetCharts EJB, for example)
- **Or to create any of these new, for your apps**

Installation Support for Java Integration

- **To leverage CFOBJECT for Java and CFX**
 - you must have 4.5.1 of ColdFusion
 - Must have Java Runtime Environment 1.2
 - Must configure CF server Admin to setup classpath and other parameters
 - Critical points are
 - JVM path: where JVM is installed (and jvm's name)
 - Classpath: where your classes will be stored
 - CFX_jar path: where cfx.jar used by CFX's will be stored

Installation Support for Java Integration

- See “A Cold Cup O’ Joe” Part 1
 - Jan 01 CFDJ
 - Great discussion of setup issues, challenges
- See later slide “Software Needed”
 - how to obtain software, versions, etc.

CFOBJECT for Java

- New support in 4.5 for CFOBJECT Type=“Java”
 - Also createobject() function for use in CFSCRIPT
 - `<cfscript>`
 - `classref = createobject("java","classname");`
 - `classref.methodname(parameter);`
 - `</cfscript>`
- Allows call to java objects
 - Either native java language objects or custom ones
 - Just need to know methods and attributes

Calling Java for Extended Functionality

- If there’s something Java can do, call it
- Example:

```
<!-- // Create a java.util.GregorianCalendar Object // -->
<CFOBJECT ACTION="CREATE" TYPE="Java" CLASS="java.util.GregorianCalendar"
NAME="myCalendar">

<!-- Default Constructor is being called implicitly -->
<!-- Check if 2001 is a leap-year -->
<CFSET is2001LeapYear = myCalendar.isLeapYear(2001)>

<!-- Retrieve current date -->
<CFSET theYear = myCalendar.get(myCalendar.YEAR)>
<CFSET theMonth = myCalendar.get(myCalendar.MONTH) + 1>
<CFSET theDay = myCalendar.get(myCalendar.DATE)>

<cfoutput>
<html>
<body>
Is 2001 a leap-year? <b>#is2001LeapYear#</b>
<p>
Today is the <b>#theMonth# / #theDay# / #theYear#</b>
</body>
</html>
</cfoutput>
```

Extending with Java (cont)

- **Notice that that involved no compilation of any java classes**
 - Was leveraging java language from within CF
- **See also call _javacalendar.cfm**
 - Converted from code offered in a java book
 - Just need to see how to convert to CFOBJECT
 - invoke methods like functions
 - Get/set properties like normal variable use
- **Can only really benefit if you understand Java**
 - More to the point, know the various capabilities of the language libraries
 - See <http://java.sun.com/j2se/1.3/docs/API/index.html>
 - For online documentation of libraries

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Calling a Class to Execute Some Tool

- **Many tools now provided as java classes**
- **May be able to call upon them from within CF**
 - With no java coding, per se, required
 - An example: PopChart from corda.com
 - Java-based dynamic server-side charts
 - Relatively inexpensive,
 - also supports CF w/out Java (using URL's to pass data)
- **Just need to see how to call as CFOBJECT**
 - Must set classpath in CF admin to wherever that code is stored; restart CF server

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Calling a Java Class You Build

- **Can treat the opportunity like a subroutine, calling a java class you've created**
 - May provide business rule functionality
- **Need to build and compile the java class**
 - Put it somewhere in the defined classpath, or modify the classpath, as defined in the CF admin
 - Need to know how to write java
 - More in a moment
- **When creating own Java classes, beware:**
 - Must restart CF server after recompile of any class instantiated via CFOBJECT (or change of classpath)
 - Fixed in CF5 with new dynamic class load path

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Building Java Classes

- **To build your own classes, need to know how to write java**
 - More than just learning language
 - On simple level, must also learn how to create java code
 - Various issues such as class name, case sensitivity
 - Class compiled via javac
 - » How to invoke compiler
 - On larger level, should learn java language
 - object-oriented programming, inheritance, polymorphism
 - Packages, interfaces, inner classes, etc.
 - many concepts foreign to procedural programmers
 - Plenty of good books on Java
 - More on “reading list” later

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Some Challenges

- **For more complex uses**
 - Need to understand calling an object’s default constructor or overloaded constructors
 - Does not currently support overload by attribute datatype
 - Available javacast function to control type passed to java
 - “Cold Cup O’ Joe” Part 3 discusses much of this
 - April 01 CFDJ
 - Release 5 adds new GetException() function
 - To manage java exceptions from CFOBJECT more effectively

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CFX_ Java Custom Tags

- **Similar to calling upon objects**
 - Class can read/manipulate CF elements
 - Variables, queries
 - See simple example
 - Can also pass it attributes
 - Processed with request.getAttribute in class
 - See simple example
- **Must be registered in the CF administrator**
 - Then called as <cfx_objectname>
 - See call_cfx_hellocoldfusion.cfm
- **May hear of old way of doing this, CFX_J**
- **Often a CFX will perform better than CFOBJECT**
 - Though some have experience to suggest opposite

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Java CFX Interface

- **3 steps: compile, define in admin, call**
 - In CF5, no longer need to restart server when changed
- **Several available methods, attributes for developing java Custom Tags**
 - Query interface
 - Request Interface
 - Response Interface
- **See “Developing Web Apps” for details**
 - Chapter 18

JRun and Java Application Servers

- **JRun is a Java Application Server**
 - And a very well respected one, at that
 - Reasonably priced, free developer edition
- **Others include**
 - IBM Websphere
 - BEA Weblogic
 - Apache TomCat
- **Enables execution of Java Server Pages, Servlets**
 - JRUN also includes features to run EJBs, and more
- **JSP's ease entry into Java world**

Why Consider JSP/Servlets?

- **Lots more clients clamoring for JSP/Servlets than CF**
 - Still plenty of market for CF, just larger for JSP/Servlets
- **“Learn once/Run Anywhere”**
 - Skills learned in working with JRun migrate for the most part to other java application servers
 - IBM Websphere, BEA WebLogic, Apache TomCat
- **What can JSP/Servlets do that CF can't?**
 - On a simple-to-intermediate level, not much
 - More the integration possibilities
 - But now, knowing how CF can integrate Java, not as critical
 - Choose the best platform for each task

Integrating CF and JRUN: CFServlet

- **Only works with JRun**
- **Allows call to servlet running under JRun**
 - Also allows sharing of data between them
- **May hear of old way of doing this: CF_Servlet**

EJB's

- **Enterprise Java Beans**
 - EJB's run in an EJB container (JRun is one such)
 - Provide substantial functionality for managing distributed computing
- **Can be called from within CF via CFOBJECT**
 - Demonstrated in Macromedia "Developing Applications with JRun", chapter 42
- **Some tools now available as EJB's**
 - NetCharts EJB from visualmining.com

Future integration possibilities for CF'ers

- **ColdFusion 6, a.k.a Neo**
 - Changing CF from running on a C++ platform to running on a Java platform
 - Does NOT propose to change CF developers into Java developers
 - CF templates will run unchanged
 - Under the cover, will be turned into Java Servlets
 - Will further open integration possibilities
 - More important for Macromedia
 - Allows them to leverage the Java platform
 - And many features that they currently must build from scratch to make CF as powerful as it is

TagServlet from n-ary.com

- **Can process a file of CFML on a java server**
 - Has more limited tag support than Neo proposes
 - Is improving
- **Currently in beta, will eventually be sold**
- **Called TagFusion for a time**

Software Needed

- **To do any java integration, need Java Runtime Engine on server**
 - Can obtain free from javasoft.com
- **To run JRun or do JSP/servlet integration, will need a Java application server**
 - Macromedia offers free 3 person developer edition
 - Will need Java 2 EE (J2EE) SDK on top of that
 - Available on install, also free from javasoft.com
 - Other java app servers from IBM, BEA (beasys.com), Apache Tomcat (apache.org)

Software Needed (cont.)

- **To do EJB integration, need EJB server**
 - JRun Enterprise provides that, as do other products
- **ColdFusion 4.5 +**
 - added java custom tags and CFObject support for java
- **Pre 4.5**
 - Cfx_j custom tag
 - Cf_servlet custom tag

A Reading List

- **Macromedia JRUN documentation**
 - Even without java experience, they make using understanding JSPs/servlets rather easy
- **Java Developers Journal magazine**
- **JavaServer Pages Application Development**
 - Ben Forta and company
 - Doesn't presume java knowledge
- **Beginning Java Objects**
 - Great book for fundamentals of java/objects/design
- **Other good J2EE Books**
 - Core Servlets and JSP
 - Professional Java Server Programming (J2EE Ed.)
 - Enterprise JavaBeans
- **Other good foundational Java books**
 - Core Java2; Beginning Java2; Thinking in Java

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Beware of Some Books

- **Servlet/JSP books teach to java developers**
 - Focus more on showing them how to do web application development (stateless programming, passing data from URL's and forms, etc.)
 - Presume that reader already knows Java
 - Java Server Pages App Dev (Forta) presumes no java
- **Java books often focus too much on client-side Java (applets, Swing)**
 - Not as relevant to us interested in server-side java
 - But important to consider for their core java content

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Learning More

- **Many CFDJ articles**
 - Especially current 8 part "Cold Cup O' Joe" series by Guy Rish
 - Matching ColdFusion with Server-side Java, by Christian Schneider
 - 3 part "Java for CF'ers" series by Ben Forta
 - 6 part "Online Ticket Store" series by Ajit Sagar
 - 4 parts of which were in Java Dev. Journal
- **Macromedia documentation**
 - CFObject, CFX_ custom tags, CFServlet
 - Language Reference and "Developing Web Apps"
 - Administering CF (for admin setup)

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Learning More

- **Excellent Macromedia JRun documentation**
 - Download the Macromedia JRun 3-user demo
 - No time expiration
- **Macromedia now offering several Java classes**
 - Java for Web Developers (3 day)
 - FastTrack to JSP (2 day)
 - Also coming soon, Building J2EE Apps
 - These all replace former 'Servlets, Java and JSP' class
- **I'm planning a class on Integrating CF & Java**
 - Will expand on many of today's topics, walkthroughs, tips & tricks, more substantial applications
 - See last slide for contact info

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Topics Covered Further in My Forthcoming Class

- **My class would cover more, and w/ walkthrus**
 - Actual tools for integrating CF/Java
 - Setting up the environment/challenges
 - Solving nasty classpath problems, compile tricks
 - Some Java programming fundamentals
 - Finding, leveraging other libraries, classes
 - Trying different database integration alternatives
 - Integration with more products/services
 - XML/XSL, PDF, Graphing engines, Servlets etc.
 - Converting Java, Servlet code to CFOBJECT/CFX
- ...

* Topics are tentative and subject to change

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Topics Covered Further in My Forthcoming Class (cont.)

- Performance implications of calling objects
- Integrating with EJB's
 - For distributed computing, database calls, more tools
- Comparing Java to other object-oriented CF approaches (Spectra, FuseBox, CFOjects)
- More about Neo, tagservlet
- And more

* Topics are tentative and subject to change

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For Further Questions

- **For follow-up questions**
 - Or more information on Java or ColdFusion consulting, training, or presentations
- **Please contact:**
 - Charlie Arehart, CTO, Systemanage
 - carehart@systemanage.com
 - (voice) 301 604 8399
 - <http://www.systemanage.com>
- **Available for training, mentoring, short-term consulting (1-5 days):**
 - All manner of CF topics, beginner-adv
 - Maximizing developer productivity
 - Best practices, performance tuning
 - J2EE (JSP/Servlets/EJBs), Integrating CF/Java
 - Database design, Int/Adv SQL topics
 - Testing, Graphing, Source Code Control, and more
 - Wireless applications

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