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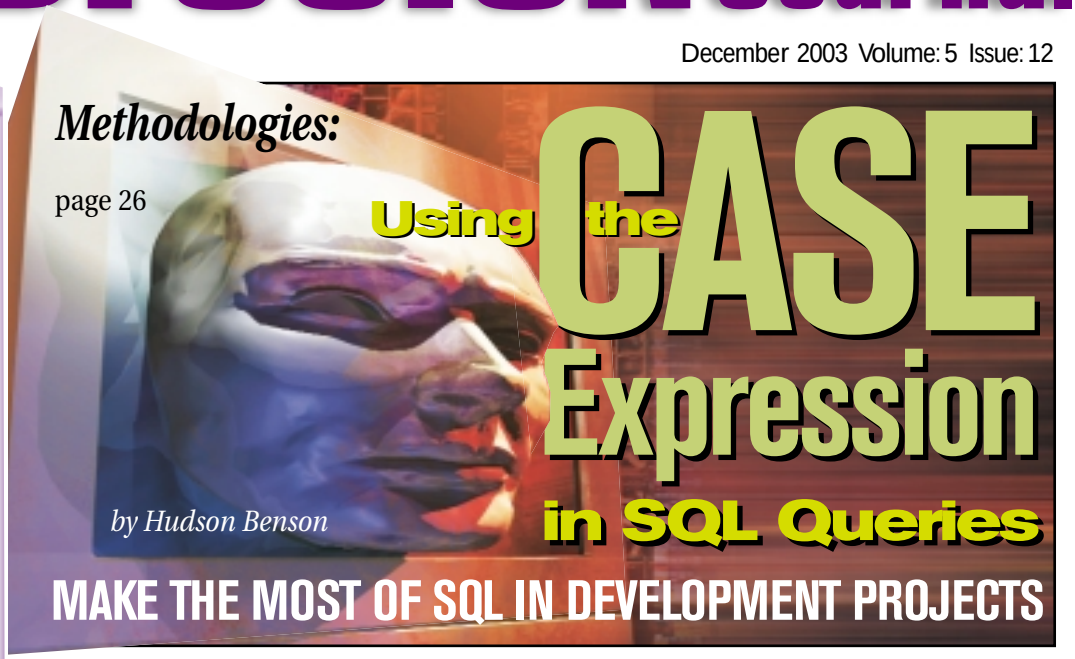

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by Hudson Benson

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editorial

editor-in-chief
Robert Diamond robert@sys-con.com
technical editors
Raymond Camden raymond@sys-con.com
Simon Horwith simon@sys-con.com
executive editor
Jamie Matusow jamie@sys-con.com
editor
Nancy Valentine nancy@sys-con.com
associate editors
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Jean Cassidy jean@sys-con.com
Jennifer Van Winckel jennifer@sys-con.com

production

production consultant
Jim Morgan jim@sys-con.com
art director
Alex Botero alex@sys-con.com
associate art directors
Louis F. Cuffari louis@sys-con.com
Richard Silverberg richards@sys-con.com
Tami Beatty tami@sys-con.com

contributors to this issue

Hudson Benson, Raymond Camden, Sandra Clark, Hal Helms, Curtis Hermann, Simon Horwith, Eric Jansson, Jeremy Lyon, Randy Smith

editorial offices

SYS-CON MEDIA
135 CHESTNUT RIDGE RD., MONTVALE, NJ 07645
TELEPHONE: 201 802-3000 **FAX:** 201 782-9638
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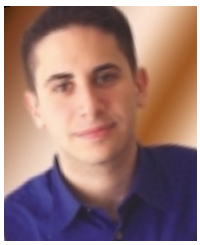
Another Year, Another Exciting Macromedia Developer Conference...

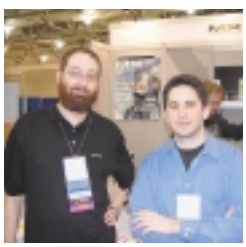


By Robert Diamond

I'm writing this month's editorial from MAX, the 2003 Macromedia conference in Salt Lake City. The conference has undergone both name and location changes over the past few years, but one key thing remains the same and that's the overall level of excitement of Macromedia's developer community. By many reports, attendance is up from last year's show, and if traffic to our booth is any indication, it certainly seems true. It's a fantastic sign in an economic year that has those who are simply breaking even jumping for joy.

It's been a product-filled year for Macromedia. Most interesting to us at ***CFDJ*** was obviously the release of CFMX 6.1, along with Studio MX 2004. On the publication front this year, not only have we received great feedback on *CFDJ*, but we launched ***MX Developer's Journal***, of which the premier edition debuted here at MAX. As I've said in the past, *CFDJ* isn't going anywhere, but if you'd like to learn even more about ColdFusion and the rest of Macromedia's product line every month, there's now a place: www.sys-con.com/mx.

Al Ramadan and Rob Diamond before the keynote at MAX



Ben Forta and Rob Diamond at the CFDJ/MXDJ booth at MAX

Macromedia's push here at the conference is once again the rich digital user experience that combines the fields of design and development (and naturally their complete line of software as well).

At the opening keynote, Al Ramadan, executive vice president of marketing at Macromedia, introduced Norm Meyrowitz, Macromedia's president of products, who mastered the rest of the ceremonies. Norm, in his 11th year at Macromedia, spoke of being astounded – as we too at *CFDJ* often are – by the amazing applications being created with MM software.

Back to the fields of design versus development – that's something that Macromedia sees as a blurring distinction, which is evidenced by the 2004 product line. You can now write code to make beautiful Flash applications, and if you're in Flash and want to connect to a CF or other Web service, it's now just a few non-code clicks away. That's exciting for me, as well as many other developers who would probably never in a million years optimally use Flash timelines, but we can certainly code.

Impressive examples were then shown by the product managers for each bit of the MX product line ranging from Flash to Dreamweaver, showing some of the premier crop of interactive Web development that's been done in MX 2004, and highlighting some of the new Studio MX product features.

Also taking the stage, to talk about "ColdFusion MX and Beyond," was Ben Forta, Macromedia's senior technical evangelist and a *CFDJ* regular since issue one. Known for spilling the beans about future CF releases at past Macromedia events, Ben didn't disappoint, once again providing lots of good CF news.

First, ColdFusion sales are up this year which is good news for the life of the product –

—continued on page 11

About the Author

Robert Diamond is vice president of information systems for SYS-CON Media, and editor-in-chief of **ColdFusion Developer's Journal.** *Named one of the "Top thirty magazine industry executives under the age of 30" in* Folio *magazine's November 2000 issue, Robert holds a BS degree in information management and technology from the School of Information Studies at Syracuse University. Visit his blog at* www.robertdiamond.com.

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president & ceo
Fuat Kircaali fuat@sys-con.com

vp, business development
Grisha Davida grisha@sys-con.com
group publisher
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Alan Williamson alan@sys-con.com

advertising
senior vp, sales & marketing
Carmen Gonzalez carmen@sys-con.com
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Alisa Catalano alisa@sys-con.com
associate sales managers
Carrie Gebert carrieg@sys-con.com
Kristin Kuhnle kristin@sys-con.com
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sys-con events
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Grisha Davida grisha@sys-con.com
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customer relations
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Shelia Dickerson shelia@sys-con.com
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sys-con.com
vp, information systems
Robert Diamond robert@sys-con.com

web designers
Stephen Kilmurray stephen@sys-con.com
Christopher Croce chris@sys-con.com
online editor
Lin Goetz lin@sys-con.com

accounting
financial analyst
Joan LaRose joan@sys-con.com
accounts receivable
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Tales from the List

Macromedia takes its vision to MAXimum heights

I am writing this month's column while sitting next to my wife Ayesha aboard Virgin Atlantic Flight 22 from Washington Dulles to London Heathrow, on my way home from attending Macromedia's MAX conference in Salt Lake City. In this month's column I will summarize my impression of what Macromedia's announcements and ambiance at the conference might mean for developers today and in the near future.

By Simon Horwith

I'll begin by discussing the venue, since prior to the conference it was the topic of much controversy. I am happy to report that Salt Lake City was not only more beautiful than I anticipated, but more fun as well. Macromedia did an excellent job keeping us busy not only during conference hours but in after-hours social functions as well. Contrary to some preconference popular belief, it is entirely legal to drink and to have a good time in the state of Utah.

Macromedia made many interesting announcements at MAX: the official announcement of the availability of Central and the Central SDK; the announcement of "Flex" (formerly codenamed "Royale") and the first public demonstrations of the new technology; and a sneak peek at the next version of ColdFusion, currently code-named "Blackstone," to name a few.

Central is not entirely new – many of us have been using Central applications for several months now, but Macromedia showed us many we'd never seen before. Kevin Lynch (Macromedia CTO and director of the Central initiative) showed the audience just how productive Central applications can be. This included a presentation by AOL in which they announced an instant messenger SDK/API to allow the integration of AOL IM functionality within Central applications.

I can tell you that if I were primarily a Flash developer I'd make myself familiar with the nuances of building Central applications ASAP. Its ability to function on- and offline as well as the ease of installing and distributing Central applications makes it the ideal development platform for Flash developers who are looking to achieve the kind of functionality generally reserved for traditional client/server desktop applications.

Flex, in a nutshell, is a J2EE application that parses XML (I believe it's "MXML" to be exact) and generates SWF files based on the XML. We saw several demos of how a Flash front-end and back-end functionality can be created with just a few tags that define the user interface and the consumption of some Web services. This is significant for three main reasons. First, it allows people who do not know Flash to create rich Internet applications – particularly more "traditional" developers. Second, not only does Flex create Flash front ends, but it creates front ends that have the "Halo" look and feel. (Halo, if you don't know, is all about Macromedia's vision of how all applications should look and feel. Applications built with Halo are more usable for end users as well as more aesthetically pleasing. So far

—continued on next page

About the Author

Simon Horwith is co-technical editor of **CFDJ**, *and chief technology officer of eTRILOGY Ltd., a software development company based in London, England. Simon has been using ColdFusion since version 1.5 and is a member of Team Macromedia. He is a Macromedia Certified Advanced ColdFusion and Flash developer and is a Macromedia Certified instructor. In addition to administering the CFDJ List mail list and presenting at CFUGs and conferences around the world, he has also been a contributing author of several books and technical papers.*
simon@horwith.com

Macromedia has been pretty quiet about Halo but they are beginning to incorporate it into all of their products.) Getting back to Flex, the third reason it is significant is that, from an architectural point of view, it makes more sense in an enterprise application to define RIA interfaces with XML.

This XML can be static or can be dynamically generated with an application server like ColdFusion. This is much more flexible than having to compile .swf files for all of your RIA front ends. It is also easier for non-Flash developers to do. I would not be surprised to find Flex become the method of choice for the development of RIA front ends on the Web and, because it requires no knowledge of Flash, it could have a very significant impact on how ColdFusion developers build their applications. Most likely, its success is going to depend on its pricing model – without a doubt, it is a very cool technology.

The third major announcement was a sneak peek at the next version of ColdFusion – codenamed "Blackstone" ("goth" developers at MAX must have loved the name). I won't talk about the new features, mostly because it's still too early to say which of these features will be in the next version and which will not. I will say that it's clear that Macromedia intends to give developers more control and new tools so that they may have more control over the output that their pages generate. In addition, Ben Forta mentioned that they're looking into ways to allow developers to package and distribute their applications without revealing the source.

I mention these possible new features because I see them having a significant impact on the community. Obviously, if we are able to compile our CFML applications into a binary file of some sort, thus hiding all of the actual source code (the way most traditional programming languages work), this will allow developers to distribute applications without fear that they'll never be financially compensated, that the code will be changed against their will, or that the inner workings of their application will be exposed.

This is significant in so many contexts. If developers are able to control output in terms of file format (Flash, PDF, etc.), pagination, etc., I see more developers taking responsibility for the creation and look and feel of the front end. Whether or not this is a good thing remains to be seen – certainly it will require that developers spend more time thinking about how they should be organizing their code. As I mentioned, nobody knows what will make it into the next release of ColdFusion, so we'll just have to wait on that one.

Community Involvement

Now that I've talked a bit about the announcements, I'll talk about the conference itself. I spoke with a lot of the attendees and this year, more than any other, they seemed to really feel that the topics and presenters were fantastic. This is good news. The more advanced topics seemed a little more advanced, there were topics covering a wider range of products than ever before, and all in all it seemed there was something for everyone.

Speaking of the wide range of products as well as topics covered, not only were there (not surprisingly) many Flash and RIA session topics, but Macromedia released two RIA applications for attendees prior to the conference. The release of the MAX Central application and the Intro Flash Application (visit macromedia.com for more information about these apps) was one of two things that Macromedia did at MAX that I feel were very important. The release of these two apps showed Macromedia "putting its money where its mouth is," and showing us all just how effective RIAs can be. Yes, Macromedia, experience does matter.

The second extremely important thing that Macromedia did at MAX was to have presence. Never before have I witnessed more Macromedia product developers in one place, let alone interacting with the community. The ColdFusion Application Server, Flash, Central, and Dreamweaver product developers were there in full force. They were not only mingling with the crowd and having a good time, but were also asking us questions about how we feel about the current products and what we'd like to see in future versions… *and they were listening to what we had to say*. This, to me, was the absolute best part of MAX and the thing that Macromedia did better than anything else at the conference. By the way, it's worth mentioning that very senior folks like Kevin Lynch and product managers were also very visible and interested in speaking with us – it was just terrific!

Given all of the heavy dialogue between the community and the Macromedia product developers, I feel that certain truths were discovered. The product development teams now have a much better idea of how we developers feel about our products and what we'd like to see in the future, and the community (for the first time in a while) feels more involved in helping to shape the products we use. In listening to the folks at Macromedia as well as the conference attendees, one other thing has become evident to me. Given the onslaught of new products and versions, as well as the growing number of ColdFusion developers, it appears that there is a lot of confusion about how we should be building our applications. The overall feeling that Macromedia employees had on this topic is that it is their job to create the tools and that it is the responsibility of the development community to define the best ways in which to use them. I couldn't agree with this more.

Time to Define CF Standards

I would like to take a moment to announce that I feel the time has come for the ColdFusion development community to organize themselves a bit and follow the examples of the Java and J2EE communities (among others) and define standards. Not just best practices, but actual specifications and agreed-upon standards for achieving common functionality within CFML applications. MAX made this need clear to me and so I am launching www.cfstandards.org. The goal of cfstandards will be to recognize common tasks and functionality and create flexible modules for achieving these results. I am in the process of speaking with several top developers about contributing their time to the project and encourage anyone interested to contact me. It will take a while to get the ball rolling, but within a year we could begin to see standard methods of achieving functionality across all CFMX applications. Everything on the site will be developed and distributed free of charge, will be open source, and will continuously be reviewed and refined. You'll hear more about this project in the very near future.

Finally, I would like to thank everyone at Macromedia who helped with MAX. It was a huge success and this success was a direct result of your individual and combined efforts. The community thanks you and we all look forward to next year's conference… wherever it may be.

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FLiPping the Software Development Process

...and giving clients what they want

In the past, I've written in broad terms about FLiP, the Fusebox Lifecycle Process, a methodology for delivering successful software projects that work (despite its name) with any – or no – software framework. In this article, I want to "drill down" on one aspect of FLiP and see how it is used in practice.

By Hal Helms

A central tenet of FLiP's philosophy is the recognition that users really can't tell us what they want until they see it. If that sounds paradoxical, consider how often you've delivered a project you've worked long and hard on, only to hear the most dangerous words that can come out of a client's mouth: "You know what would be nice…"

What comes next is a litany of client wishes and needs, followed by the sound of the developer muttering, "Why didn't they tell me this before I built it?" The reason clients don't tell us what they want is that they can't. They have no vocabulary to even think in those terms. Attempts to remedy this using such things as flowcharts and UML diagrams are mostly unsuccessful; clients simply don't think in such structured ways. Instead, they react to what they see, leading to the familiar "you know what would be nice" recitation of wants.

As frustrating as this seems, it can be argued that it's really good news as it provides us with the opportunity – if we accept it – to act not merely as coders, but as developers. Coders are charged with taking requirements and turning them into machine-interpretable programs. Developers are asked to guide the client from the vague stages of "requirements gathering" through deployment. The two have quite different scopes of responsibilities and are paid accordingly.

Back to the paradox: clients can't tell us what they want until they see it, yet we can't build what clients want until we know what we're building. Is it any wonder that the success rate for custom software is so low?

There is a solution to this puzzle, and it's a surprisingly low-tech one. The answer hinges on the fact that to customers, the user interface is the application. They just assume that all that "back-end stuff" will work correctly. (If that seems hopelessly naïve, Alan Cooper, the user interface guru, asks when was the last time you insisted that a new phone you were considering purchasing be plugged in so you could check for a dial tone?) Naïve or not, it offers a way out of the maze: we can provide users with the application – in prototype form.

We often think of a prototype as consisting of nothing more than a few representative pages with, perhaps, some greeking and generic images filling the pages. But a prototype in the FLiP sense is much more like a movie set: its value depends on it being unmistakable for the real thing. Prototypes bridge the language gap between developers and clients by giving us a common referent. We can begin with even vague requirements and depend on an iterative prototype process to help the clients (and us) discover the real job requirements.

In other articles I've discussed how this prototyping/design/requirements process works. In this article, though, I want to start from the point in the development process where we have a fully developed prototype. What then? How do we translate this into something that can be built?

Let's begin by looking at a prototype page. By this point in the process, the client and architect have signed off on the prototype – the client saying, in effect, "Everything you have shown me is just the way I want it, and there is nothing that you have not shown me that I'm expecting," and the architect also indicating that everything needed (content, information, etc.) has been provided. Figure 1 shows what a prototype page might look like.

It's time to move to the architecting stage of the process. From the prototype we need to determine two things: requests that can be made of the application and incoming and/or outgoing variables.

Figure 1: A page from the signed-off prototype

For this, I normally use different-colored highlighters. In this article, though, I've outlined the requests that can be made of the application with rectangular boxes while using ovoid boxes to indicate variables. Figure 2 shows the same prototype page where the process of "marking up" has begun.

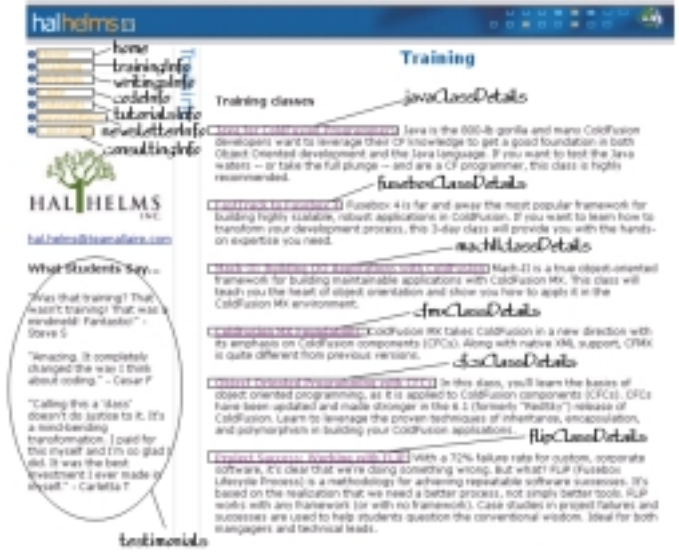

Figure 2: The marked-up prototype page

If you're using the Mach-II framework (www.mach-ii.com), the requests (javaClassDetails, fuseboxClassDetails, etc.) correspond exactly with Mach-II events. If you're using the Fusebox framework (www.fusebox.org), the requests almost correspond with fuseactions. I say "almost" because a well-formed fuseaction involves both a circuit and a request. In this case, no circuits have been provided. (Even if you're not using any framework, you'll almost certainly have the concept of requests to the application.)

The next phase in the FLiP process is the creation of a schematic diagram. One of the elements of FLiP is the specification of how code should be documented through the use of a fusedoc. While fusedocs provide unit-level documentation (and actually are a form of program-definition language), schematics provide a higher-level representation of the system.

While you can create a schematic with pen and paper, software tools make the process more efficient. At this point in the architectural process, we are still finding our way and tools that allow us to rapidly try out ideas are welcome. One of the best tools I've found for this is known as a mind-mapping diagrammer. Think of it as a visual outliner. Using a mind-mapping tool, I can quickly incorporate the requests identified on the prototype mark-up (see Figure 3).

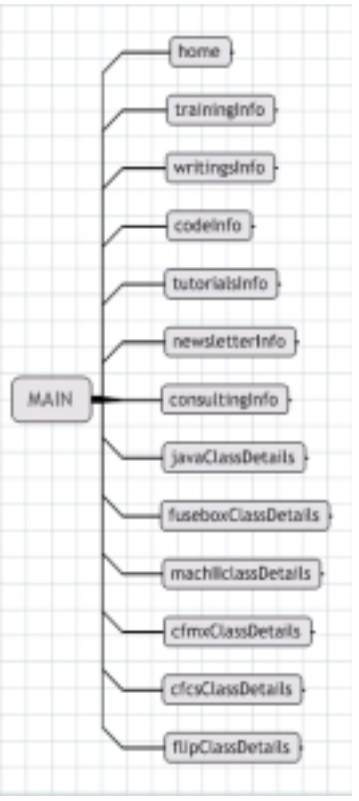

Figure 3: Preliminary schematic

Editorial —*continued from page 5*

and the state of the industry for us developers. Additionally in the "positive signs column" Ben has spent some heavy time on Google as of late, and proudly reported that there are now 10 million additional indexed CFML pages in Google than there were a year ago. Also Google-ing the U.S. government's public-facing Web sites, the number one technology now in use is ColdFusion. ASP/ASP.NET and JSPs run a distant second and third in those rankings.

So what's next in the world of ColdFusion? Ben gave the audience a glimpse of what's been codenamed "Blackstone," the next version of ColdFusion. Now that the platform is in place with CFMX 6/6.1, this next as-of-yet undated release is based totally on user feedback as to what developers are looking for.

Key themes are:

- ***Reporting and printed output:*** Making RAD more rapid, and simpler ways to create compelling and sophisticated user interfaces
- ***Productivity:*** Radical new productivity gains targeted toward both new and existing developers
- ***Deployment:*** New ways to deploy applications including the often-requested source-code protection

The keynote concluded with David Mendels, senior vice president, Macromedia, who spoke on expanding the MX universe. He spoke about Macromedia Flex (previously codenamed Royale), which is a presentation-level server that sits on top of J2EE, CF, and – in the future – .NET servers designed for creating rich application front ends.

More on this coming up in future issues of *CFDJ*!

In many frameworks (including Fusebox), the responsibilities for requests are divided among a series of smaller components. For our purposes, let's assume we're using the Fusebox framework. The next step is to determine which components (circuits in Fusebox parlance) we'll want. One effective method for getting a "first cut" at this is to look for the nouns in the requests. These form a sort of "candidate pool" for circuits. From there, we can exercise our judgment to decide which circuits are the best.

For this application, I've picked out the following nouns as potential circuits: home, training, writings, code, tutorials, newsletter, and consulting. Why nothing for the various class details? I've decided those requests should be handled by the training circuit. Figure 4 provides the mind map with the circuits added in and the requests moved to indicate to which circuits they belong.

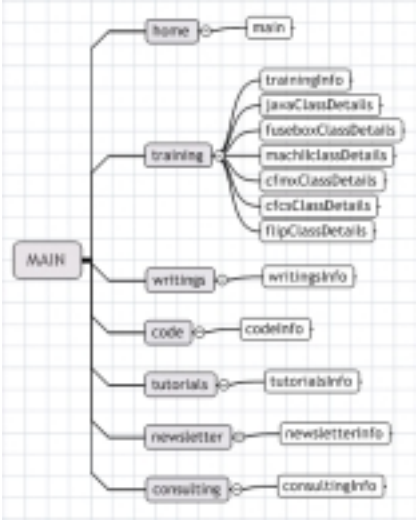

Figure 4: Mind map with added circuits

With each page of the marked-up prototype incorporated into the schematic, the closer I am to a complete identification of components and requests. Using a mind-mapping tool allows me to easily make changes to my developing architecture. Once the broad strokes are filled in, I can determine the individual bits of code needed to fulfill a request (fuses if using the Fusebox framework) and the incoming/outgoing variables needed for the code pieces. Figure 5 provides a snapshot that shows the fuses needed to fulfill the request, training.trainingInfo. Note the use of the "Comments" section to detail incoming and/or outgoing variables.

FLiP is a powerful, proven method for repeatedly producing successful software projects that give clients what they want while providing developers with the information they need. Some wag once defined insanity as "doing the same thing over and over while expecting different results." Prototypes and schematics are different tools, integral to the FLiP process, for producing different results. For information on attending a two-day class on FLiP, see http://halhelms.com/index.cfm?fuseaction=training.flipDetails.

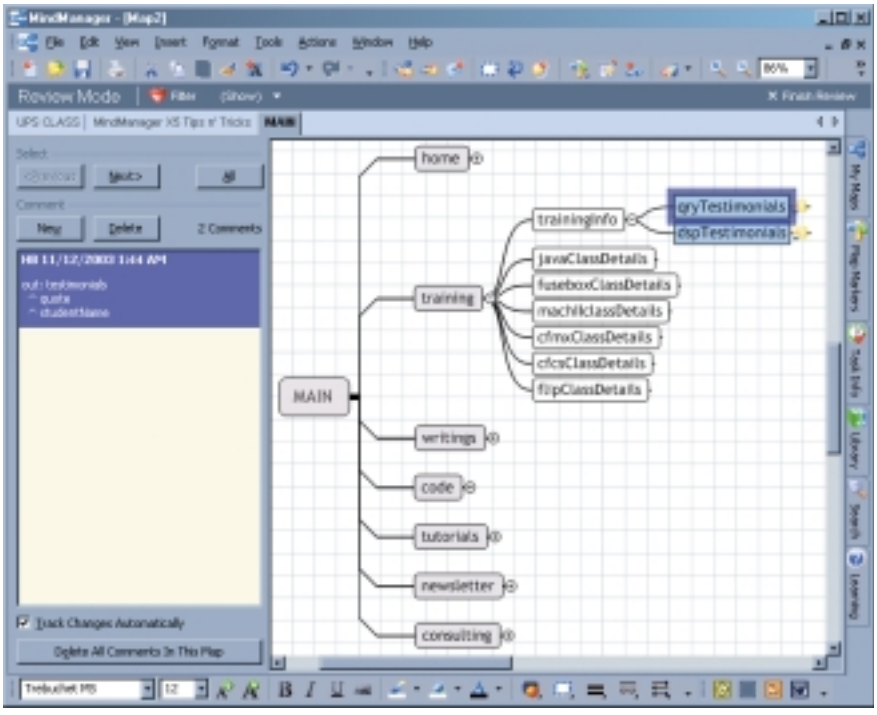

Figure 5: Fuses needed for training.traininginfo request

When completed, the schematic can be printed or plotted. Some mind-map tools can export the information in outline or XML format while some tools can export directly to Microsoft Office.

What mind-mapping tools are available? There are a number to choose from, with different feature sets and costs. The one I've used here is called MindManager from mindjet.com. Other products include Visual Mind from http://visual-mind.com, MindMapper from http://mindmapper.com, and FreeMind (a free product) from http://freemind.sourceforge.net.

About the Author

Hal Helms (www.halhelms.com) is a Team Macromedia member who provides both on-site and remote training in ColdFusion, Java, and Fusebox. Hal is cofounder of the Mach-II project. hal.helms@teamallaire.com

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Integrate Standards-Based Testing into Your CF App Development Process

Open standards are great, but what about testing them?

By Eric Jansson

Anyone who has ever tested dynamically generated Web application interfaces against HTML standards knows how time-consuming and boring it can be to do this manually.

Commonly, Web designers and testers will use an online validator like the W3C HTML validator at www.w3c.org/validator, which takes the URL of an HTML file, or the uploaded HTML file itself, as its input, and returns a report of any markup issues. The problem – and what makes the process time-consuming – lies in submitting these HTML files to the validator.

Source code that generates HTML – a stew of HTML, scripting tags, and code blocks – won't validate by itself. We can, of course, remove the scripting tags and other code to validate the "raw" HTML in the file before any dynamic content is added at runtime, but this misses the point. We want to validate the whole enchilada – both the HTML markup in the source file and the HTML added at runtime.

So why not just submit application URLs to the validator? Since most sophisticated Web apps save state between HTTP requests (via cookies, the session, or other mechanism) and often require authentication, this strategy too is doomed: the W3C validation service does not act as a single, unified client, and cannot maintain state or authentication tokens.

Given this situation, a common process in standards-testing Web apps is to save these dynamically generated user interfaces to disk as HTML files, and then manually validate those files. This works, but is time-consuming as it takes a lot of "View source" and "Save to disk..." operations in the Web browser, followed by a lot of cutting and pasting of URLs into the validation service's HTML form. This slow, uninspiring work is not why anyone I know ever chose a career in Web application development.

This article offers a solution in the form of a ColdFusion custom tag that will enable app developers and testers to validate dynamic interfaces at runtime with a single click of a button. Not only does this save time over manual submission, it also allows you to quickly and easily test different configurations of the same HTML page. I developed this code as part of a project for the company ExploreLearning, which develops interactive activities and simulations for secondary and higher education. They retain the copyright to the code, but have released it for others to try out and use.

Stepping Back: Why Validate Your HTML?

Before looking at the code, let's review what HTML validation does for our development efforts and why it is an important part of a Web application quality-assurance process. Here are some of the major reasons:

- ***Valid HTML helps ensure that browsers will properly display content in past and future versions:*** Every Web app developer knows the frustration of finding that an older, renegade browser displays an interface improperly. Sometimes these are not standards issues, but standards-compliant HTML will help to ensure that browsers can successfully parse and build a valid DOM out of your HTML code, and this goes for future browsers too.
- ***Interfaces are more likely to be accessible if valid, since other user devices will also expect standards-compliant markup:*** As such, it allows people with disabilities a better chance of being able to access the information. There may also be legal issues involved, as many organizations and institutions have an explicit mission to deliver their information via the Web without discriminating against any population. Sandra Clark's articles "A Case for Accessibility" (*CFDJ*, Vol. 5, issue 9), "Determining Accessibility" (*CFDJ*, Vol. 5, issue 10), and "Putting It All Together with Fusebox 4" (in this issue), offer an insightful look at these issues and what they mean to Web development.
- ***Valid HTML helps ensure consistency and may make application maintenance easier:*** Clean code now breeds clean code later. This is a simple quality-assurance test for your application's user interfaces that can help ensure that HTML markup code is properly structured.
- ***It can encourage Web developers to reform older habits:*** I'm referring here to the growing popularity of using CSS in HTML interfaces to handle layout, instead of relying on HTML <table> tags and similar mechanisms. Programmers and Web developers will find that tableless HTML validates easier, since it relies less on tags to determine placement of interface elements, and therefore allows markup to express content semantics, not content presentation. The resulting HTML code is simpler, easier to follow, and can be rearranged more easily.

Developing the Tag

On to developing the custom ColdFusion tag. The basic problem is that we have a dynamic resource that we need to make static, as validation services typically accept only static resources. But there are some other requirements as well: it must be easy and convenient for QA testers and developers to perform

validations and receive feedback, and it must work easily with any ColdFusion script.

So the first steps will be to intercept an HTTP request, recreate that request, and write the results to disk. With the HTML saved to disk and now a static file, we offer the user the option of submitting that saved HTML file to the validator. Since the same script effectively calls itself using this model, we need to prevent that second request from generating another request and so on, recursing until ColdFusion figures out that something is amiss. To avoid this, we will flag this second request, letting the custom ColdFusion tag know not to generate another request. The whole process looks like this:

Intercept an incoming HTTP request, and:

- If the request is flagged, leave it alone
- If the request is not flagged:
  - Replicate the HTTP request (using <cfhttp> tag) and add a flag to prevent that request from also being intercepted
  - Gather the HTTP response in a CF variable (also using <cfhttp> tag)
  - Write the HTTP response to a file
  - Read in (or include) this file in the HTTP response
  - Add a button to allow the user to request validation of the static file

As the actual code for the tag is not that long, we will go through the tag code in order. First, we declare a few constants at the top of our custom tag:

```
<cfset FLAG_PARAM_NAME = "PAGE_VALIDATOR_PASSTHRU">
<cfset FILE_EXT = ".validate.html">
<cfset VALIDATION_URL = "http://validator.w3.org/check?uri=">
```

FLAG_PARAM_NAME will be the name of our flag parameter, while FILE_EXT will be a file extension we will add when writing the HTML code to disk. The VALIDATION_URL is the URL of the validation service. We parameterize this URL in case the W3C webmaster moves the validator, or in case we want to use a different validator (more on this later).

Next comes the code block that surrounds all tag code captures with the overall if-logic of our tag:

```
<cfif NOT IsDefined("FORM." & #FLAG_PARAM_NAME #) AND NOT
IsDefined("URL."  & #FLAG_PARAM_NAME #)  >
   <!--- capture this request --->
```

Here we check for the existence of the flag parameter. If this flag is not present, we then need to capture and prepare the HTTP request for validation. If the flag is present, we let the HTTP request sail by, untouched. Note that the FLAG_PARAM_NAME we use should never be used by our application.

Now we need to work a little CGI magic to capture some information about the location of the present request on the server. This work will allow us to do two things: (1) figure out where on the disk to write the HTML file, and (2) figure out the URL corresponding to that file, so we can submit it.

```
<!--- generate the fileName and scriptPath --->
<cfset filename = Reverse(#CGI.SCRIPT_NAME#) >
<cfset filename = Left(fileName, Find("/",fileName) - 1) >
<cfset fileName = Reverse(fileName) >
<cfset filename = fileName & #FILE_EXT# >

<cfset scriptPath = Reverse(#CGI.SCRIPT_NAME#) >
<cfset scriptPath = Mid(scriptPath,Find("/",scriptPath), Len(scriptPath) -
Find("/",scriptPath) + 1) >
<cfset scriptPath = Reverse(scriptPath) >
```

Both of these use the CGI variable SCRIPT_NAME as a starting point. The SCRIPT_NAME is the path from the server root to the ColdFusion script currently being executed. It might look something like: "/some_app/some_dir/some_script.cfm".

To create fileName, we strip off everything before the final "/" and add our FILE_EXT (to avoid overwriting the current ColdFusion file). scriptPath, by contrast, includes everything before the final "/". We use the ColdFusion function Reverse() to simplify the process of searching for the final "/", since if we reverse CGI.SCRIPT_NAME, the final slash is always the first slash. The above code would produce these variable assignments with the path above:

filePath some_script.cfm.validate.cfm

scriptPath some_app/some_dir/

Now we need to make a new request to this URL, capture it, and write it to disk. In ColdFusion what would be a complicated maneuver in most other Web languages becomes mundane: all we have to do is use the <cfhttp> tag to do all three of these. First, we start the tag:

```
<cfhttp url=
"http://#CGI.SERVER_NAME#:#CGI.SERVER_PORT##CGI.SCRIPT_NAME"
port = "#CGI.SERVER_PORT#"
method = "#CGI.REQUEST_METHOD#"
path = "#GetDirectoryFromPath(GetTemplatePath())#"
file = #fileName#
resolveURL = "yes"
throwOnError = "yes"
redirect = "no"
timeout = "30">
```

We are using some new CGI variables here. Back is our friend CGI.SCRIPT_NAME, but now accompanied by CGI.SERVER_NAME, CGI.SERVER_PORT, and CGI.REQUEST_METHOD. These represent the name of the server, the port the HTTP request is being sent to, and the HTTP method (either GET or POST) respectively. We use them to create an exact duplicate of the present HTTP request (more info on these CGI variables is available in the ColdFusion documentation).

We use the file attribute to request that the <cfhttp> tag write the results to a file with the fileName we generated above. We also use the redirect attribute to output the saved HTML to the current request. Understand why the <cfhttp> tag is one of my favorite ColdFusion features? This would take many lines of code in most other Web-development environments.

Next, we need to reconstruct the parameters of this request, which we do by iterating through the HTTP GET and POST collections and encoding them in <cfhttpparam>s:

```
<!--- grab POST/FORM parameters --->
```

```
<cfloop collection=#FORM# item="name">
   <cfhttpparam name=#name#
          type="FormField"
          value=#StructFind(FORM, name)#>
</cfloop>

<!--- grab GET/URL parameters --->
<cfloop collection=#URL# item="name">
   <cfhttpparam name=#name#
          type="URL"
          value=#StructFind(URL, name)#>
</cfloop>
```

Now – and this is important – we add our flag parameter. If we forget to add this, our tag will keep catching HTTP requests and making new ones until ColdFusion puts a stop to it.

```
<cfhttpparam name="#FLAG_PARAM_NAME#"
type="URL"
value="TRUE">
```

...and we close our <cfhttp> tag...

```
</cfhttp>
```

Finally, we drop a button on the page to allow the submission of this static file to the W3C validation service. Here's where we finally use the scriptPath parameter we calculated above, which will help us point to the new file we wrote to disk:

```
<cfoutput>
   <a href =
"#VALIDATION_URL#http://#CGI.SERVER_NAME#:#CGI.SERVER_PORT##scriptPath#
#fileName#" target="validationWin" onclick ="window.open(this.href,
this.target, 'scrollbars=yes, resizable=yes, menubar=yes, titlebar=yes,
location=yes, width=700, height=600,'); return true">validate</a>
</cfoutput>
```

This code writes out an HTML link labeled "validate". When the user clicks this button, the static resource is submitted to the validator in a separate window, and the results are displayed to the user. To drop the tag into a page, all we do is include a <cf_PageValidator> tag in the source file. Be careful to place this tag at the top of the page before any other scripting logic, however.

And that's all. As our testers and developers navigate through the Web application, they will see "validate" buttons at the top of each tagged ColdFusion file. By clicking this button, they can get instant feedback on issues with HTML markup. Not only does this procedure save lots of manual work, it allows developers to easily test different configurations of resources, because, after all, Web applications are dynamic resources.

Taking It to the Next Level

We could automate our HTML standards testing even more aggressively however. Note that by using the <cfhttp> tag again at the end of the tag when we write our HTML validate link, we could automatically submit our static HTML file to the W3C validation service and save the results to a file where they could be reviewed later. But we can do even better than that: the W3C validator offers a number of options for customizing the output of a validation. One of them, the "output" parameter, can be used to request the results as XML.

Using this technique – a second <cfhttp> request and the "output" parameter – we could request validations, parse the returned XML file, and write the validation messages and errors to a database where they could be saved, searched, and have reports generated on them. This system could be integrated with an existing bug database, such that normal testing automatically generates requests to resolve problems with HTML standards compliance. I leave this work to the reader or the ColdFusion community, as there is not sufficient space to embark on that process here.

Validation: Not Just for HTML Compliance Anymore...

Before closing, I want to return to the issue of Web accessibility. Ensuring that our applications produce valid HTML is a big step in ensuring that not only Web browsers, but also other devices can access this content. But valid HTML does not automatically mean that the content also meets accessibility standards. To further assist us in designing accessible Web interfaces, there are validators that will report on accessibility issues in HTML files, pointing out common problems, such as ensuring that HTML <table> cells can be read in order, that images and other resources are properly identified with descriptions, and that the pages avoid tags that can create accessibility problems, just to name a few. Generally, these services check against existing community guidelines such as the W3C's Web Content Accessibility Guidelines and U.S. Section 508 Guidelines.

Our validator tag can easily be configured to access these services as well, opening up the door to stronger accessibility testing as well. By merely altering the VALIDATION_URL constant declared at the top of the tag or by adding a second link, we can submit the static resource to any of these online services. For those wishing to explore this option, I have included the names and URLs of a couple of accessibility validators below. Enjoy.

Resources

- W3C MarkUp Validation Service: http://validator.w3.org/
- Bobby (accessibility validator): http://bobby.watchfire.com/bobby/html/en/index.jsp
- Cyntia Says Portal (accessibility validator): www.cynthiasays.com/

About the Author

Eric Jansson is a freelance software consultant working in the field of educational technology and Web application development. He has published on a variety of technologies including Flash, .NET, and databases.

ehjansson@hotmail.com

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Introducing
Macromedia MX 2004.

www.macromedia.com/go/2004

MX to iSeries Demystified

A world-class database platform paired up with a world-class Web application server

By Jeremy Lyon

In this article, I'll show you how to connect ColdFusion MX to an IBM iSeries (formerly AS/400) DB2 database. I'll describe your connectivity options and give you configuration examples.

While attending an iSeries conference a couple of years ago, I had the opportunity to talk with an IBM DB2 engineer. I still remember the blank look on his face when I explained that I use ColdFusion to access his database. In his defense, I've enlightened more than a few Macromedians as to what an iSeries is and what it does. Thank heaven for standards and thank the heavens again for Macromedia's and IBM's adherence to them.

There are several ways to get to DB2 data on the iSeries. We'll concentrate on ODBC and JDBC. Platform examples will include ColdFusion MX 6.1 on Windows 2000 Server and JRun/ColdFusion MX 6.1 on Apple OSX 10.1.5.

Windows 2000 Server

ODBC Configuration Step by Step Installation

To make ODBC work, you need Client Access for iSeries installed on the ColdFusion Server. Client Access for iSeries is a licensed program and is available on the media distributed with the operating system. ODBC is an option provided with the Client Access tools suite. For security reasons it's best to perform a selective setup and choose only the options you will need (see Figure 1).

In the iSeries world, a software patch is known as a PTF or Program Temporary Fix. I cannot stress enough how important these are. Make sure that you download and apply the latest iSeries Client Access PTFs.

Creating a System DSN for ODBC

Create a system DSN with the Windows ODBC Administrator using the iSeries Access ODBC driver. I won't cover all the settings, but I'll point out a few that will make it work better with MX Studio and Server.

Server Tab

Naming convention differences: It's best to use SQL naming instead of system or *SYS. SQL naming uses dotted notation when separating libraries and files. *SYS uses the less-common forward slash mark.

Library list: This is where you set the libraries that this ODBC connection will use to find data. While explicit paths will work in your SQL statements, the libraries will not show up in the Studio MX available libraries list for the data source.

Performance Tab

Use blocking with fetch of one row: Use this option when your application iterates through small blocks of sequential records.

Enable lazy close support: This option prevents unnecessary opening and closing of connections.

Create a ColdFusion Data Source

Open your ColdFusion server administration screen and create a new data source. The type will be ODBC Socket and the name will be the name you gave to the System DSN. Supply a profile and password, verify the data source, and you should be ready to go.

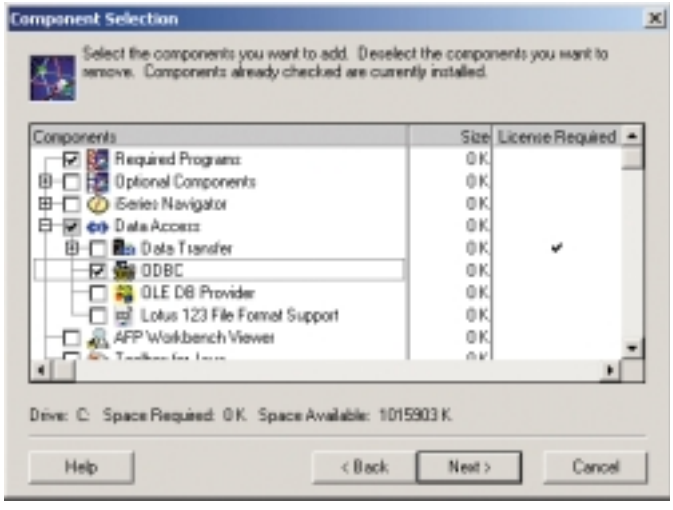

Figure 1: iSeries Access for Windows ODBC client configuration

Diagnostics/Troubleshooting

This is where ODBC has bragging rights over JDBC on the iSeries. The ODBC facilities for troubleshooting application performance and connectivity are as comprehensive as they are easy to use. You can access these tools from the Windows 2000 ODBC configuration panel.

Windows 2000 Server

JDBC Configuration Step by Step

IBM provides three JDBC drivers for the iSeries: the Native JDBC driver, the JT400 or IBM Java Toolbox driver, and JTOpen, the open source driver. The native driver, while faster than the others, will only run on the iSeries JVM.

What is the IBM Toolbox for Java? What is JTOpen? What are the differences? The answer is very little. The IBM Toolbox for Java is the polished, refined older brother of JTOpen.

JTOpen is the bleeding-edge open source version of the toolbox. It includes contributions from the open source community along with the newest fixes and enhancements from IBM. JTOpen is covered by the IBM Public License. Perhaps the most significant difference between the two is how the products are supported. JTOpen's support is provided through an online forum whereas the Toolbox is supported through traditional IBM software support channels.

The Toolbox formally known as the "IBM Toolbox for Java" is the licensed version of JTOpen. It's shipped with the iSeries as part of the base operating system and can be referenced by its licensed program code 5722JC1 or 5769JC1 for OS/400 versions prior to V5R1.

IBM Toolbox for Java and JTOpen Installation

- See www-1.ibm.com/servers/eserver/iseries/toolbox/faq.htm#faqG and http://publib.boulder.ibm.com/iseries/v5r1/ic2924/index.htm?info/rzahh/rzahnm04.htm for system requirements.

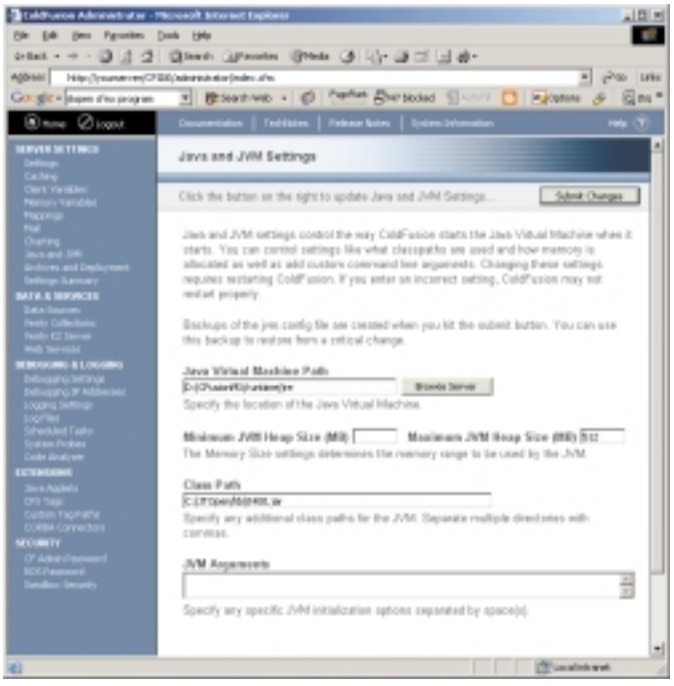

Figure 2: MX classpath configuration

- Use iSeries Operations Navigator to locate the Java Toolkit folder on the iSeries. You can find it in the QIBM/ProdData/HTTP/Public/jt400/ IFS folder. If it's not installed, have your system administrator install the licensed program 5722JC1 (V5Rx) or 5769JC1 (V4Rx).

  or

- Download the latest JTOpen from www-1.ibm.com/servers/eserver/iseries/toolbox/downloads.htm.
- Create a folder on your ColdFusion MX Server. To minimize the classpath length I put one in the root and called it C:\JT400 or C:\JTOpen.
- Copy the contents of QIBM/ProdData/HTTP/Public/jt400/ or extract the JTOpen zip file into your new folder.
- Using the ColdFusion administrator, navigate to Java and JVM Settings and put C:/JT400/lib/jt400.jar or C:/JTOpen/lib/jt400.jar into the classpath box. If you have multiple classpaths, separate them with a comma (see Figure 2).
- Stop and restart the ColdFusion MX Application Server service.
- Under "Data & Services" on the left navigation bar, click Data Sources. In the "Add Data Source" area, give your data source a name, then choose the other driver type and click Add (see Figure 3).

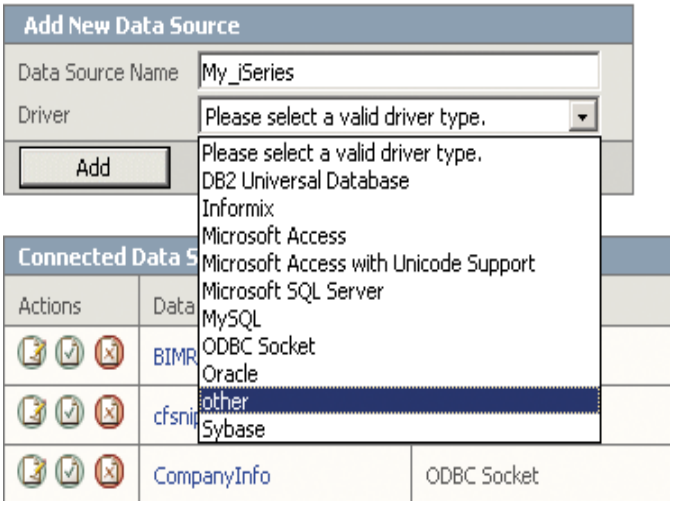

Figure 3: MX data source configuration

- CF Data Source Name = My_iSeries
- JDBC URL = as jdbc:as400://[iSeries server name or address]/[Database Name];prompt=false; You can verify the name by entering the WRKRDBDIRE command on the iSeries. Don't forget the prompt=false. This prevents the iSeries from sending a profile/password dialog box to the ColdFusion server in the event of an invalid profile/password. Without it, the ColdFusion server could hang.
- Driver Class = com.ibm.as400.access.AS400JDBCDriver
- Driver Name = Optional
- Username = Optional. You can always append this information later in your application. I use a username and password during setup and remove it when I know it works.
- Password=Optional
- Description=Optional

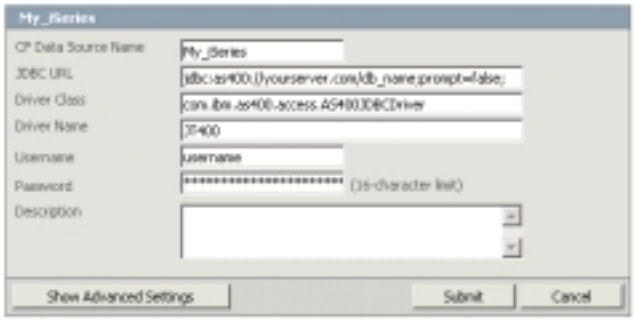

Figure 4: JDBC configuration

ColdFusion is now connected to the iSeries (see Figure 4).

Apple OSX

JDBC Configuration Step by Step

The most intriguing capability for Web developers may be OS X's built-in support for Java. OS X ships with Java2 Standard Edition (J2SE), allowing developers a native environment to deploy their Java applications.

Connecting to the AS400 from JRun and ColdFusion

- Open the JRun Management Console (JMC) from your browser. Click on the default server link in the "Welcome to Macromedia JRun 4" window.
- Add a classpath to the JTOpen.jar file you installed into the root level of the hard drive. Click on *Settings*, then *JVM Settings*. In the Java VM Settings window, go to the Classpaths for Java VM area, and click the Browse button next to the New Classpath text field. Navigate to the */JTOpen4/lib/jt400.jar* file and click Open. The classpath will appear in the "New Classpath" text field. Click Add, then Update at the bottom of the window.
- Open the ColdFusion MX Administrator.
- Under Data & Services on the left navigation bar, click *Data Sources*. In the Add Data Source area, give your data source a name, then choose the *other* driver type and click Add.
- In the Add window, enter the JDBC URL as *jdbc:as400://[iSeries server name* or *address]/[Database Name];prompt=false*
- The Driver Class is *com.ibm.as400.access.AS400JDBCDriver*. The Driver Name field is optional. Enter your AS400 username and password, and a brief description of the data source. Click Submit. You can verify that the data source is connected to the database in the Data Sources window by clicking the checkmark icon next to the data source name.
- ColdFusion is now connected to the AS400.

"ODBC and JDBC are just the tip of the iceberg when it comes to integrating ColdFusion with the iSeries"

Performance Tips & Additional Settings

Now that you have a basic connection to the iSeries, it's time to do some performance tuning. While researching this article I performed countless query tests against various driver and server settings. I quickly realized that comprehensive performance tuning was well beyond the scope of this article. I've included links to IBM documentation at the end of the article.

- ***Avoid using "Select *":*** ODBC and JDBC will perform unnecessary field-level processing if you use only a few fields.
- ***Use connection pooling:*** The instantiation of a new connection will result in a noticeable performance hit even on the fastest of systems. New connections to a fast iSeries took an average of 350ms to establish without connection pooling turned on.
- ***Install the latest patches from IBM and Macromedia:*** Not only do they fix problems, they add functionality and performance. Both companies have a good track record when it comes to fixes.
- ***Take advantage of DB2's stored procedures:*** You can call them directly from SQL.

```
<cfquery name="myQuery" datasource="my_iSeries">
   { library.program('parm') }
</cfquery>
```

I'm not a DBA and I don't know all that much about packaging in DB2, but if you do and want to use it here's how to set it up:

```
jdbc:as400://[iSeries server name or address]/[Database
Name];prompt=false;libraries=*libl,mylib;extended dynamic=true;pack-
age=mypackage;package library=mylib;package cache=true;
```

Modifying the block size and enabling data compression may also improve performance depending on your workload.

```
as jdbc:as400://[iSeries server name or address]/[Database
Name];prompt=false;libraries=*libl,mylib;block size=512;data compres-
sion=true;
```

Conclusion

The Java Toolkit comes with literally hundreds of Java classes that you can access using the <cfobject> tag. The simple call in Listing 1 gets disk space information.

What a combination! A world-class database platform paired up with a world-class Web application server. Thanks to standards, ODBC and JDBC are just the tip of the iceberg when it comes to integrating ColdFusion with the iSeries.

Acknowledgment

I'd like to thank my coworker and Apple guru Robert Haddan. He configured, tested, and documented the configuration process on OS X.

Additional iSeries Resources

- ***Troubleshooting ODBC:*** http://publib.boulder.ibm.com/iseries/v5r2/ic2924/index.htm?info/rzaii/rzaiiodbc22.HTM
- ***Performance Tuning ODBC:*** http://publib.boulder.ibm.com/iseries/v5r2/ic2924/info/rzaik/rzaikodbcperfconsd.htm
- ***JDBC Properties:*** http://publib.boulder.ibm.com/iseries/v5r2/ic2924/index.htm?info/rzahh/javadoc/JDBCProperties.html
- ***Troubleshooting JDBC:*** www-1.ibm.com/servers/eserver/iseries/toolbox/troubleshooting.htm#RecordLevelAccess
- ***Performance Tuning JDBC:*** http://publib.boulder.ibm.com/iseries/v5r2/ic2924/info/rzaha/jdbcperf.htm

About the Author

Jeremy Lyon is the eGovernment Coordinator for the Oregon Department of Revenue. Jeremy has over 15 years of administration and programming experience utilizing systems ranging from the Timex Sinclair 1000 to the Cray XMP supercomputer.

lyonj@comcast.net

Listing 1

```
<!--- Get auxiliary storage pool size example --->
<!--- connection information --->
<cfset myiSeries = JavaCast("string","my_iSeries.com")>
<cfset user = JavaCast("string","my_username")>
<cfset passwd = JavaCast("string","my_password")>

<!--- create the iSeries/AS400 object  --->
<cfobject action="create" type="java"
class="com.ibm.as400.access.AS400" name="iseries">

<!--- create the system status object --->
<cfobject action="create" type="java"
class="com.ibm.as400.access.SystemStatus" name="status">

<!--- call the Java contructors --->
<cfset iseries.init(myiSeries, user, passwd)>
<cfset status.init(iseries)>

<!--- call the Java class --->
<cfset ASP_size = (status.getTotalAuxiliaryStorage()/1000)>

<!--- disconnect --->
<cfset iseries.disconnectService(iseries.command)>

<cfoutput>#ASP_size# GB</cfoutput>
```

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Accessibility: Putting It All Together with Fusebox 4

Fusebox 4 and Web standards go hand in hand, creating an accessible site with minimal headaches

By Sandra Clark

In the last three articles in this series, I've spent a lot of time on everything but ColdFusion. Separating content from presentation by using Web standards makes accessibility much easier. Using ColdFusion and Fusebox 4 to do this makes it even easier.

One of the basic tenets of Fusebox has always been to separate out business logic from display logic. This has been done by designating specific types of files (called fuses) to hold different types of logic. Historically, the following have been used:

- Query fuses (qry_fusename) holds code that returns a recordset
- Action fuses (act_fusename) holds code that runs business logic
- Display fuses (dsp_fusename) holds the actual code that displays to the user

Web standards takes the idea of display one step further, by separating out the content (HTML and actual information) from the way it's presented (cascading style sheets [CSS]). The concepts of separation in Fusebox 4 go hand in hand with the concepts of separation in Web standards.

Fusebox 4 and Content Variables

Fusebox 4 includes the capability of calling multiple fuseactions within another fuseaction using the Fusebox 4 XML command <do />. Calling the <do /> command also includes the ability to "stuff" any output for display into a variable of your choice rather than outputting it at the moment of creation. This attribute of the <do /> command, "contentvariable," opens up a world where Web standards become easy.

Imagine a portal system where you want to create menus, and pull in news, articles of interest, and other items. The code for each item can become complex. By separating out each item as fuseactions, we simplify the task by breaking it down to simpler components. (*Note:* In the sample code here, I'll show only the calls to the display since this article is focused on the layouts.)

Fusebox 4 uses the concept of circuits (in our case, directory structures) and fuseactions (calls to grouped sets of individual scripts or fuses). Each circuit will contain a circuit controller which is called circuit.xml. In this controller, the Fusebox 4 XML language is the language used. (The fuses will be the code that contains our ColdFusion and XHTML.)

In our sample portal, the call to the home page would be a fuseaction called welcome in the home circuit (or in Fusebox 4 jargon, home.welcome). The circuit itself is displayed in Listing 1. You'll notice in this listing that the fuseactions being called within the main fuseaction all contain a call placing the information into a content variable (i.e., <do action="vhmain.menu" contentvariable="content.menu" /> places the output which results from the call to the menu in the view HTML main circuit [vhmain] into a content variable called "content.menu"). The fuseaction called in our sample "includes" the actual display fuse as seen in Listing 2. The information contained in the dsp_menu fuse would be very simple XHTML as found in Listing 3.

Displaying All the Content Variables

To display the content variables, we add another type of fuse to the Fusebox 4 toolbox. A layout fuse (lay_fusename) as shown in Listing 5 will contain the actual presentational code, including calls to cascading style sheets. Notice there are no tables used; the presentation is styled using CSS. Also notice how simple the page is. It really consists of only the actual XHTML code needed for the layout and the content variables placed specifically where necessary. Changing a layout page is simple since you are truly working with the layout as a whole, instead of trying to work around your content as well. Layouts should be their own circuits and be called as a fuseaction via the <do /> command as in Listing 4.

Layout files can be called at the end of a fuseaction with the ability to change layouts on a fuseaction basis. They can be called per circuit by making use of Fusebox 4's <postfuseaction></postfuseaction> call in the circuit.xml or they can be called for an entire application by being placed in the <globalfuseaction><postfuseaction> area in the fusebox.xml file. How you choose to place your layouts depends entirely on you.

Can't I Do It with Just ColdFusion?

You can accomplish the same thing in ColdFusion using the <cfsavecontent> tag (in CF5 or CFMX) or the custom tag <cf_bodycontent>, written by Steve Nelson for older versions. In each case you would wrap all the output between the tags and save it and then have your layout at the end of your .cfm file, possibly via a <cfinclude>. However, one of the benefits to using the Fusebox framework is that a lot of the grunt work is already done for you.

How About Netscape 4?

Netscape 4.x was first introduced in December 1996. As such it is not a Web standards–compliant browser. In fact, the latest statistics from browser news (www.upsdell.com/BrowserNews/stat.htm) and other sources show Netscape 4 as having a less than 2% rate of usage at this time. So how come we still have to consider them?

Netscape 4 Standardization

Many United States federal agencies are still standardized on Netscape 4, a browser that was introduced in December 1996. One of the by-products of this is that most agencies still rely on producing Web sites and applications using the nested table layout because that's what works on their computers. It's hard to design a tableless site for a client who can't see it. Viewed in this way, the U.S. government might be considered one of the largest stumbling blocks on the road to accessibility.

Speech Browsers and Screen Readers Cannot Easily Be Detected As Such

The other obstacle to implementing Web standards in this environment is that many speech browsers, such as IBM Home Page Reader, use Internet Explorer as an underlying browser. A screen reader will use whatever browser the user has available. Because of this, it's impossible to use a browser detection script to definitively say that a particular user is "viewing" a page using assistive technology. So how do we solve this conundrum?

One of the tenets of Section 508 is:

1194.22(k) A text-only page, with equivalent information or functionality shall be provided with the provisions of these standards, when compliance cannot be accomplished in any other way.

I propose a new accessibility rule:

When designing pages that shall be accessible, a reasonable alternative shall be made when a browser that does not support Web standards is encountered. The content of a non–Web standards page shall be updated whenever the primary page changes.

In other words, I propose that we code our pages to Web standards (including positioning) and that we treat outmoded browsers like Netscape 4 as the alternative. Since browser detection scripts can easily determine Netscape 4, it's a reasonable use of resources.

Separate and Equal

To make our pages separate and truly equal, all that's necessary is to direct our content variables to a tabled layout when Netscape 4 is encountered. The actual changes to the existing Fusebox 4 code are truly minimal. These changes involve creating a tabled layout for each of our standard layout pages, a style sheet that works with Netscape and implements a browser sniffer as a preprocess plug-in.

A browser sniffer is code that determines what type of browser is currently accessing our site. There are several browser sniffers available. I tend to use a free one found on the Macromedia Exchange called AEBrowser. Since Fusebox 4 does not contain the ability to call a custom tag within its XML language, I need to place the actual custom tag call to the browser sniffer in a fuse or a Fusebox 4 plug-in and use it that way.

I call the plug-in, which I have named "sniffer" in Fusebox 4's preprocess phase. This phase executes before any calls to any fuseactions take place.

```
<plugins>
   <phase name="preProcess">
         <plugin name="sniffer" template="sniffer.cfm" />
</phase>
</plugins>
```

The plug-in itself must sit in the plug-in subdirectory. All sniffer.cfm contains is a call to the custom tag via cfmodule.

```
<cfmodule template="cf_aebrowser.cfm">
```

This sniffer creates a structure called browser.

Everything else in our system works in exactly the same way until we call the layout fuseaction <do action="layouts.portal" />, as shown in Listing 6. The call to the portal layout uses Fusebox 4's conditional statement to determine if our user is coming in via Netscape 4. If so, it calls a tabled layout, otherwise it calls the standards layout. The tabled layout will call its own style sheet specifically designed for Netscape 4, as well as streaming the *exact same content* into a tabled layout as shown in Listing 7.

Conclusion

Accessibility is an issue that has been made harder than it actually is because of our reliance on outdated coding techniques. By using Web standards and Fusebox 4 in addition to the guidelines in the Web Accessibility Initiative (WAI) and Section 508, we not only conform to the law (when applicable), but also to the goal of making out Web pages and applications available to all parties – not just those who are able-bodied.

For more examples of Fusebox 4 and layouts using Web standards, see the Fusebox 4 example code at my site www.shayna.com.

—See code listings on next page

About the Author

Sandra Clark, a Macromedia Certified Advanced ColdFusion developer, is a senior software developer with the Constella Group in Bethesda, Maryland. She has contributed material to the ColdFusion 5.0 Certified Developers Study Guide *published by Syngress Media/Osborne McGraw Hill and is an author on* Discovering Fusebox 4, *by Techspedition, Inc. She has also spoken at various User Groups and ColdFusion user conferences around the country.*
slclark@shayna.com

Listing 1: Main fuseaction calling other fuseactions

```
<circuit access="public">
   <fuseaction name="home">
      <do action="vhmain.welcome" contentvariable="content.welcome" />
      <do action="info.new" contentvariable="content.info" />
      <do action="faq.list" contentvariable="content.faq" />
      <do action="specials.display" contentvariable="content.special" />
      <do action="news.new" contentvariable="content.news" />
      <do action="vhmain.contact" contentvariable="content.contact" />
      <do action="vhmain.menu" contentvariable="content.menu" />
      <do action="vhmain.sitenav" contentvariable="content.textlinks" />
      <do action="vhmain.bobby" contentvariable="content.bobby" />
   </fuseaction>
</circuit>
```

Listing 2: Menu Fuseaction

```
<circuit access="internal">
   <fuseaction name="menu">
      <include template="dsp_menu.cfm" />
   </fuseaction>
</circuit>
```

Listing 3: Contents of dsp_menu.cfm

```
<span class="menuheading">Menu</span>
<a class="menu" href="calendar.html">Training</a>
<a class="menu" href="forms.html">
   Forms &amp;amp; Procedures</a>
<a class="menu" href="accommodation.html">
   Accessibility Drawings and Plans</a>
<span class="menuheading">Links</span>
<a class="menu" href="acomlinks.htm">
   Reasonable Accommodation Links</a>
<a class="menu" href="access.html">
   Accessibility Links</a>
<a class="menu" href="employment.html">
   Employment Links</a>
<a class="menu" href="recreational.html">
   Recreational Links</a>
```

Listing 4: Layout circuit

```
<circuit access="internal">
   <fuseaction name="portal">
      <include template="lay_top.cfm" />
   </fuseaction>
</circuit>
```

Listing 5: Web standards layout for portal page

```
<!doctype html public
"-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html lang="en">
<head>
<title> Home Page</title>
<meta http-equiv="Content-Type"
      content="text/html; charset=iso-8859-1" />
<style type="text/css" media="screen">
      @import url("assets/mstrstyle.css");
</style>
</head>
<body>
      <div id="header">
            <a href="">
            <img src="assets/spacer.gif"
                  alt="Link Site" width="494" height="65"
                  border="0" align="left" /></a></div>
      <div id="divider"></div>
<cfoutput>
      <div id="divider"></div>
      <div id="main">
             <div id="welcome">#content.welcome#</div>
            <div id="info">#content.info#</div>
            <div id="faq">#content.faq#</div>
            <div id="special">#content.special#</div>
            <div id="contact">#content.contact#</div>
      </div>
      <div id="leftcol"></div>
      <div id="navcol">
            <div id="nav">#content.menu#</div>
            <div id="news">#content.news#</div>
      </div>
      <div id="footer">
            <div id="textlinks">#content.textlinks#</div>
            <div id="bobby">#content.bobby#</div>
      </div>
      </cfoutput>
</body>
</html>
```

Listing 6: Determining layout by browser type

```
<circuit access="internal">
   <fuseaction name="portal">
      <if condition="browser.isNavigator is true AND browser.majorversion
LT 6">
         <true>
            <include template="layout_table.cfm" />
         </true>
         <false>
            <include template="lay_top.cfm" />
         </false>
      </if>

   </fuseaction>
</circuit>
```

Listing 7: Netscape 4 gets the tabled layout

```
<!DOCTYPE html PUBLIC
"-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
    <title>Home Page</title>
<meta http-equiv="Refresh" />
<meta http-equiv="Content-Type" content="text/html;
   charset=iso-8859-1" />
<link href="assets/table_style.css" type="text/css"
   rel="stylesheet" />
</head>
<body  topmargin="0" leftmargin="0"
```

```
      marginwidth="0" marginheight="0">
<cfoutput>
<table height="586" cellpadding="2" width="592"
   border="0" >
<tr>
   <td class="header" width="592" colspan="3">
      <map name="FPMap0" id="FP">
         <area shape="rect" alt="Web Site"
         coords="437,7,492,24" href="" /></map>
         <img height="65" alt=" Office"
           src="assets/banner.jpg" usemap="##FP"
           width="494" border="0" />
</td></tr>
<tr>
<td class="divider" width="592"
      colspan="3" height="1">
          <img height="2" alt="Dividing Line"
          src="assets/line.gif" width="600"
          align="middle" /></td></tr>
<tr>
   <td class="leftCol" valign="top"
      width="15"  height="489"
      rowspan="6"> </td>
   <td class="welcome" valign="top" width="577"
      colspan="2" height="48">#content.welcome#
   </td></tr>
<tr>
   <td class="navCol" valign="top"
      width="121" height="303" rowspan="3">
      #content.menu#
      #content.news#
   </td>
   <td class="info" valign="top" width="456"
      height="92">#content.info#
   </td></tr>
<tr>
   <td valign="top" width="386" height="69">
      #content.faq#</td></tr>
<tr>
<td valign="top" width="386" height="98"
      class="special">
      #content.special#</td></tr>
<tr>
   <td class="contact" valign="top" align="left"
      width="577" colspan="2" height="38
      #content.contact#</td></tr>
<tr>
   <td class="textLinks" valign="top"
      align="left" width="577" colspan="2"
      height="34">#content.textlinks#</td></tr>
<tr>
   <td colspan="3" class="Bobby">
      <a href="http://www.cast.org/">
      <img src="assets/approved32.gif"
      alt="These Pages are Bobby Approved"
      width="131" height="40" border="0"></a>
</td></tr></table>
</cfoutput>
</body>
</html>
```

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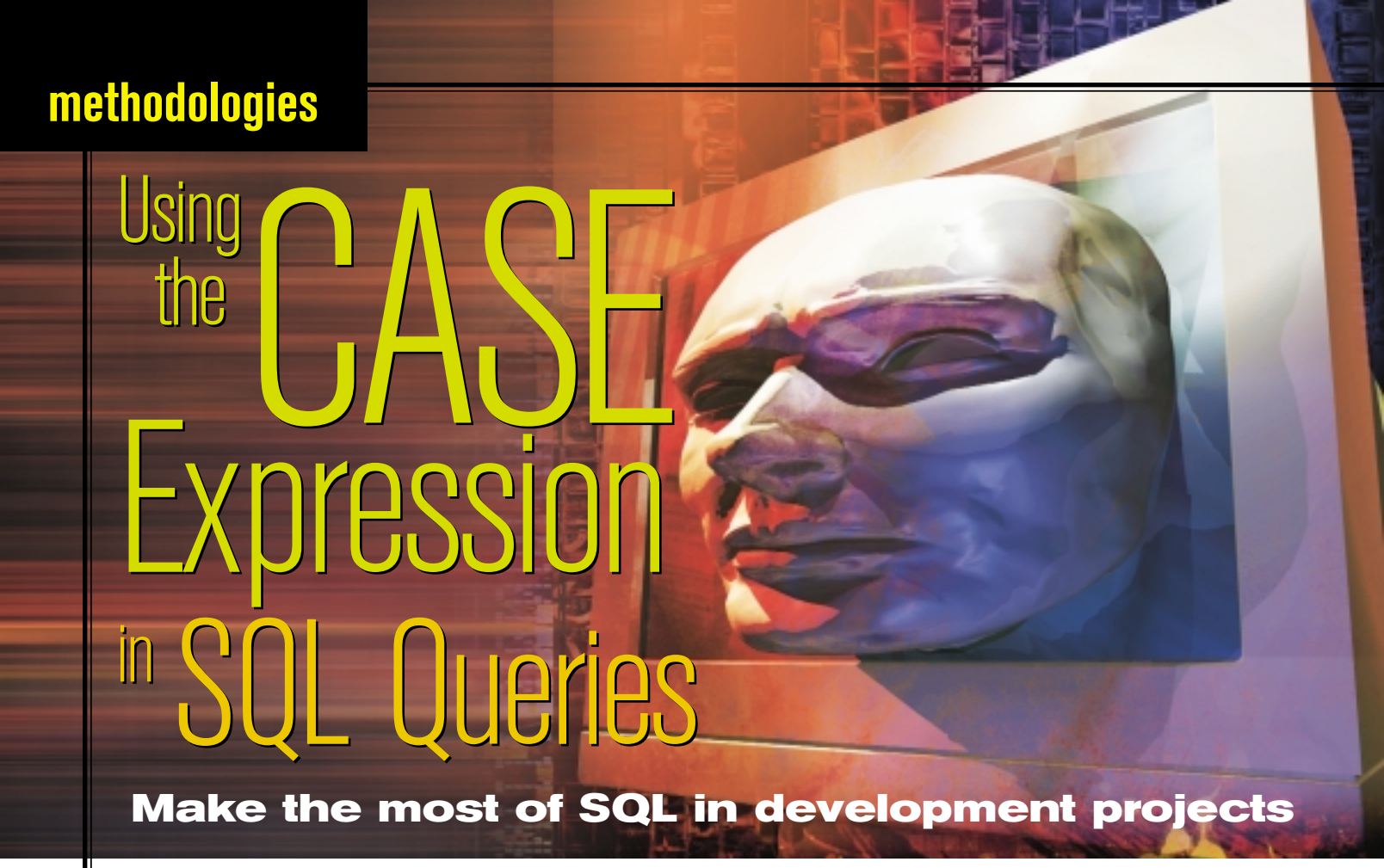

Using the CASE Expression in SQL Queries

Make the most of SQL in development projects

By Hudson Benson

The DBMS (database management system) is often faster at performing calculations like summing up or averaging the values in a column of numbers than, for instance, the application server. However, there are many cases in which performing the same calculation on all of the data in a column will not provide the correct result.

This article will show you how to use the CASE expression in SQL queries to more flexibly perform aggregate calculations and set values based on a logical statement.

An example of the need to apply the CASE expression in an aggregate function is an online shopping cart with several item-specific options that, depending on the options chosen, change the way an item's price is added to the cart and, therefore, the final total price of the order. I will discuss a shopping cart for an online store that requires variable pricing within four option areas. The price calculation of the final order will vary depending on the setting of each option.

The example store sells items including artwork, books, gifts, events, and memberships. It's a dynamic store allowing administrators to add and delete categories, subcategories, and items. One item can exist in as many categories as the administrator would like. Individual items within a category may be subject to different pricing options. With these requirements, the programmer does not know what categories and subcategories will exist in the store in the future or under what category or pricing options an item will be placed. Therefore, options must be set at the item level and be available for administrators to set and change.

Requirements for the example store include the ability of administrators to choose options in these four areas:

1. ***Sale price:*** Individual items may or may not be on sale. The database table contains a column for regular price and sale price and an additional flag column named SaleItem, allowing the administrator simply to change the SaleItem setting rather than change the value for regular price each time the item goes on sale.
2. ***Shipping:*** Shipping cost is calculated based on the shopping cart total. However, administrators can select certain items such as memberships so that they do not carry a shipping charge.
3. ***Member and employee discount:*** The organization has members and employees who are entitled to different discounts on purchases from the store. However, some items do not qualify for discounting under any circumstance.
4. ***Sales taxes:*** Some items are taxed and some are not. For example, tax law does not require sales tax on memberships.

Overview of the SUM Function

Programmers often use the SUM() aggregate function to total the numbers contained in a database column. For instance, in a shopping cart, you might use the sum function as follows:

```
SELECT Name, SUM(Price) as Total
FROM Item
WHERE ItemID=#SomeValue#
```

The database will return rows of records, each containing the Name of the item and the sum total of the values found in the Price column for the records selected. Each row will contain the same value for Total. If no columns are selected, the query will return one row with the value of Total.

Based on the discussion above, simply totaling the prices in the Price column will not work for this shopping cart. For example, if the customer chooses an item that's on sale, the price in the SalePrice column must be used for that item. You might choose to solve this problem with CFML as follows:

```
<CFSET SumPrice=0>
<CFLOOP QUERY="GetCartItems">
<CFIF SaleItem is 1>
<CFSET SumPrice=SumPrice+(Quantity*SalePrice)>
<CFELSE>
<CFSET SumPrice=SumPrice+(Quantity*Price)>
</CFIF>
</CFLOOP>
```

This solution does not rely on SQL to total the item prices. Instead, the application loops through all of the items selected and adds them up in a CFLOOP loop. However, SQL does provide an elegant way to perform the same calculation using the SUM aggregate function in combination with the CASE expression. The total price of the items, taking into account those that are on sale, is included in the returned table using this method.

Overview of the CASE Expression

The CASE expression, introduced in SQL-92, provides the programmer with the ability to choose one of multiple values based on a logical expression. The value added to the item total of our shopping cart using the SUM() aggregate function is the value in the Price column for an item that is not on sale and the value in the SalePrice column for an item that is on sale. The CASE expression is supported by SQL Server, MySQL, PostgreSQL, and Oracle beginning with Oracle8*i*.

The SQL query to total the price of the items, taking into account those that are on sale, looks like:

```
SELECT
SUM(CASE WHEN SaleItem=1 THEN SalePrice ELSE Price END)
FROM Item
as TotalPrice
WHERE Item.CartID=#SomeValue#
```

In the query above, the item is evaluated to see if SaleItem is 1. If it is, the SalePrice column is used for that item in calculating the total price. If not, the Price column is used.

Database Tables

The critical database tables for our cart include Item, Cart, CartItems, Tax, Discount, and Shipping.

The important columns in each table are:

1. ***Item:*** ItemID (primary key), Price, SalePrice, SaleItem (1 or 0), Shipping (1 or 0), Discount (1 or 0), Tax (1 or 0)
2. ***Cart:*** CartID (primary key)
3. ***CartItems:*** CartItemID(primary key), CartID, ItemID, Quantity
4. ***Tax:*** Pct, Gov
5. ***Discount:*** DiscountID (primary key), Name, Pct
6. ***Shipping:*** MinTotal, MaxTotal, ShipCost

The columns SaleItem, Shipping, Discount, and Tax, in the Item table, are switches used to turn each of the item pricing options on and off. For instance, if SaleItem is 1, then the product will be priced at the sale price. Of course, there are a number of other columns in the Item table that contain the content required to display the item.

The Cart table stores keys to identify carts and to find items in a cart. A Cart record is created when a customer adds his first item to a cart. The CartID is stored to allow for the retrieval of cart items after the cart session has expired.

The CartItems table allows for the joining of the cart with the items in the cart. It also stores the quantity of the item to be included in the cart.

The Tax table stores the abbreviated names and the percent sales tax for each government requiring the addition of tax.

The Discount table stores the names of member or employee discounts and their respective discount percentage.

The Shipping table stores min/max ranges of item totals and the corresponding shipping charge to be applied to the order based on the order total falling between or being equal to the min and/or max total.

Shopping Cart Calculation Example

Before summing the cart for the customer prior to final checkout using the SUM() aggregate function and CASE expression, information necessary for the calculation of the cart total is retrieved from the database as follows.

First, get the discount percentage based on the member type (individual, student, etc.) or employee status selected by the customer in the checkout form. Optionally, if a member and/or employee database exists, you can verify the member type or employee status from the employee or member records.

```
<CFQUERY NAME="GetDiscount" DATASOURCE="#Application.Datasource#">
   SELECT Name, Pct
   FROM Discount
   WHERE DiscountID='#Form.DiscountID#'
</CFQUERY>
```

Next, get the sales tax based on the state to which the order will be shipped. The customer has provided a "bill to" address and, optionally, a "ship to" address. Sales tax is based on the "ship to" state. If the "bill to" address is the same as the "ship to" address, the customer completes only the "bill to" address form. At this point, check to see if the form field Form.sState (the "ship to" state) is not available or is null. If either is true we use Form.State (the "bill to" state) to calculate sales taxes because the "ship to" address and the "bill to" address are the same. If both are false, use the "ship to" state.

```
<CFIF Not IsDefined('Form.sState') or Form.sState is "">
<CFSET ShippingState=Form.State>
<CFELSE>
<CFSET ShippingState=Form.sState>
</CFIF>
<CFQUERY NAME="GetSalesTaxes" DATASOURCE="#Application.Datasource#">
   SELECT Pct
```

```
            FROM Tax
   WHERE Gov = '#ShippingState#'
</CFQUERY>
```

Finally, check to see if sales tax applies. If there are no sales tax records for the state to which the order will be shipped, GetSalesTaxes.RecordCount will be 0 and sales tax will not be added.

```
<CFIF GetSalesTaxes.RecordCount gte 1 and GetSalesTaxes.Pct is not "">
<CFSET TaxRate=GetSalesTaxes.Pct>
<CFELSE>
<CFSET TaxRate=0>
</CFIF>
```

Now it is known what discount to apply and what percentage of the total price of the taxable items will be added to the bill for sales tax. The real work using the CASE expression can begin.

Elsewhere in the application when the customer places his or her first item into the cart, Session.Cart is created and set to a unique value generated by the CreateUUID() function. Because records in the CartItems table contain the field CartID that is set to a value equal to Session.Cart as items are added to the cart by the shopper, using Session.Cart directly in the query GetCartItems detailed below works as long as Session.Cart exists.

However, Session.Cart is deleted after final checkout to end the cart session. In order to re-use the following code to process orders after the cart session is over and Session.Cart no longer exists, or to extend the life of the cart beyond the existence of Session.Cart if desired, create CartSumCartID and use it in the GetCartItems query in place of Session.Cart. This allows the value of CartSumCartID to be set using a database record instead of Session.Cart (e.g., the value in the CartID field in the Cart table described in the Database Tables section above). For now, just set CartSumCartID to Session.Cart because in this example the query GetCartItems is being used prior to final checkout.

```
<CFSET CartSumCartID=Session.Cart>
```

The query at the heart of the shopping cart is as follows:

<!---begin query to retrieve the cart items and the shopping cart totals needed to generate the cart final total--->

```
<CFQUERY NAME="GetCartItems" DATASOURCE="#Application.Datasource#">
SELECT CartItems.CartItemID, CartItems.Quantity, Item.*,
```

- The following subquery calculates the value for TotalPrice.
- Join Item and CartItems to find items contained in the cart.
- If it is a sale item use the sale price, if not use the price.

```
(SELECT
SUM(CASE
WHEN SaleItem=1
THEN Quantity*SalePrice
ELSE Quantity*Price
END) FROM (Item INNER JOIN CartItems ON Item.ItemID =
CartItems.ItemID)
WHERE CartItems.CartID='#CartSumCartID#') as TotalPrice,
```

- To calculate the total after discounting. (TotalDiscountPrice) use the following nested CASE expressions in the subquery below.
- If it is a sale item use the sale price, if not use the price.
- If discounting is allowed for this item multiply total item price (quantity*price) by 1-Discount; otherwise, use the total item price without discount.

```
(SELECT
SUM(CASE
WHEN SaleItem=1
THEN CASE WHEN Discount=1 THEN Quantity*SalePrice*(1-#Discount#) ELSE
Quantity*SalePrice END
ELSE CASE WHEN Discount=1 THEN Quantity*Price*(1-#Discount#) ELSE
Quantity*Price END
END) FROM (Item INNER JOIN CartItems ON Item.ItemID =
CartItems.ItemID)
WHERE CartItems.CartID='#CartSumCartID#') as TotalDiscountPrice,
```

- Next calculate SalesTax.
- TaxRate was set above.
- Apply sale prices and discounts before calculating sales tax.
- If the item is nontaxable, 0 is added to SalesTax.

```
(SELECT
SUM(CASE
WHEN Tax=1
THEN CASE WHEN SaleItem=1
THEN CASE WHEN Discount=1 THEN Quantity*SalePrice*(1-
#Discount#)*#TaxRate#*1/100 ELSE Quantity*SalePrice*#TaxRate#*1/100 END
ELSE CASE WHEN Discount=1 THEN Quantity*Price*(1-
#Discount#)*#TaxRate#*1/100 ELSE Quantity*Price*#TaxRate#*1/100 END
END
ELSE 0
END) FROM (Item INNER JOIN CartItems ON Item.ItemID =
CartItems.ItemID) WHERE CartItems.CartID='#CartSumCartID#') as
SalesTax,
```

- Now see if the total item price is to be used in the calculation of shipping charges by again using nested CASE expressions.
- If the item is not to be used in the shipping calculation, it is added as 0.

```
(SELECT
SUM(CASE
WHEN Shipping=1
THEN CASE WHEN SaleItem=1
THEN CASE WHEN Discount=1 THEN Quantity*SalePrice*(1-#Discount#) ELSE
Quantity*SalePrice END
ELSE CASE WHEN Discount=1 THEN Quantity*Price*(1-#Discount#) ELSE
Quantity*Price END
END
ELSE 0
```

```
END) FROM (Item INNER JOIN CartItems ON Item.ItemID =
CartItems.ItemID) WHERE CartItems.CartID='#CartSumCartID#') as
TotalShippingPrice
```

- Finish the query.

```
   FROM (Item INNER JOIN CartItems ON Item.ItemID = CartItems.ItemID)
   WHERE CartItems.CartID='#CartSumCartID#'
   ORDER BY Name
</CFQUERY>
```

The table returned contains rows of items in the customer's cart with the information about each item and the quantity ordered. In addition, each row of the table includes the item total prior to discount (TotalPrice), the item total after discount (TotalDiscountedPrice), the sales tax to be added to the order (SalesTax), and the item total for items that are to be used in the calculation of shipping charges (TotalShippingPrice).

There is one last task to complete prior to displaying the cart summary to the customer – determining shipping cost. Shipping cost is determined by the value of GetCartItems.TotalShippingPrice. ShipCost is returned by the following query where the value of GetCartItems.TotalShippingPrice falls between or is equal to MinTotal and/or MaxTotal in the Shipping table.

```
<CFQUERY NAME="GetShippingFee" DATASOURCE="#Application.Datasource#">
   SELECT ShipCost
            FROM Shipping
   WHERE #GetCartItems.TotalShippingPrice# >= MinTotal
   and #GetCartItems.TotalShippingPrice# <= MaxTotal
</CFQUERY>
```

Later the shipping cost and sales tax will be added to the total and passed along to the display template.

Conclusion

The CASE expression allows the programmer to create queries that use logical expressions to determine what value to use and/or what calculation to perform. Used in a subquery, the CASE expression allows for the generation of multiple values from the same data set. The CASE expression is, in many instances, a viable alternative to post query loops and calculations. Application of the CASE expression can help you make the most of SQL in development projects.

About the Author

Hudson Benson is the owner of The Cattail Company, a Web and media development company located in northeastern Maryland. His experience includes the development and marketing of Web applications for businesses, universities, and nonprofit organizations. Hudson also serves as North American director of marketing and business development for a global firm headquartered in Sweden.

hudson.benson@cattailcompany.com

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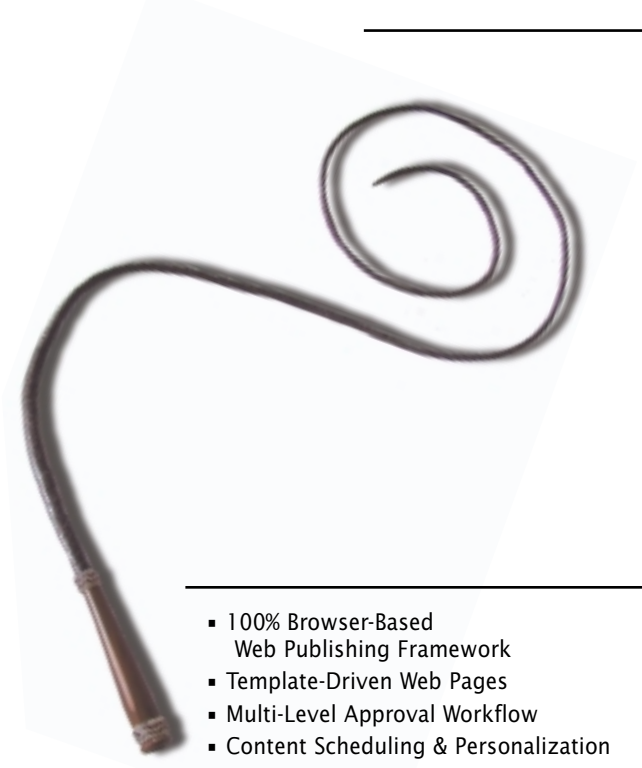

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Extending ColdFusion

Building a slide show

By Raymond Camden

If you own a digital camera, you probably have many (probably hundreds) pictures filling up your hard drive. If you're a parent, you probably have even more. Sharing those pictures with the world can be pretty simple. If you turn on directory browsing on your Web server, you can simply copy the pictures to a folder and share the URL. However, that's not a very clean solution. In this month's **Extending ColdFusion**, we're going to look at a custom tag, <cf_slideshow>, that will automatically create a simple slide show from a folder of pictures. It will handle generating links from one picture to the next, creating a thumbnail directory, and even allowing for captions.

Listing 1 contains the custom tag. Let's take a look line by line. Our very first line simply turns on the enablecfoutputonly setting. This removes the white space generated by our CFML code. It also means we need to wrap all of our output with <cfoutput> tags. Line 11 simply says that if our custom tag is called in "end" mode, we should turn off the enablecfoutputonly setting and then simply exit the tag. So, if someone calls the custom tag like so: <cf_slideshow ….. />, the extra slash at the end won't make the tag run twice.

For our custom tag to work, it needs to know two things – what directory contains the pictures, and what URL should be used for those pictures. In order to require these attributes, we use the <cfparam> tag on lines 15 and 17 without default parameters. As soon as you try to call the custom tag without them, ColdFusion will throw an error. The dir attribute will represent the full path to the pictures, for example, c:\web\pictures\june2003. The urldir attribute will represent the URL path to that folder. An example could be "/pictures/june/2003".

Lines 20–22 allow us to specify how the thumbnail directory should work. All have default values and can normally be left as is. Attributes.thumb_width and Attributes.thumb_height determine the width and height for the thumbnails. These values are defaulted to settings that will work best with pictures that are sized at 640x480. Attributes.thumb_perRow determines how many thumbnails are displayed per row.

In order for our custom tag to know which slide to display, it will pass along a URL parameter. In case this value does not exist, we use a cfparam on line 25 and default the value to 1, or the first slide.

Lines 27–29 use the directoryExists() function to ensure that the value specified by attributes.dir actually points to a real folder. If it does not, we throw an error to the user. Line 31 then uses the <cfdirectory> tag to list all the JPGs in the folder. (If you wanted, you could modify this to check for GIFs, or use a bit more code to filter by both.) We sort by name, but you could also sort by other properties as well, for example, by the last updated value of the file.

Lines 33–36 simply say that if the directory is empty (or if there were no JPGs found), we turn off the enablecfoutputonly setting and exit the tag. We don't throw an error because the folder may not contain pictures yet, but will later on.

The next thing we want to do is validate the slide URL parameter. It's possible that a user may change the value by hand, so we want to make sure that the value will work correctly. Line 39 first checks to see if the value is numeric, and then checks to see if the number makes sense. Don't forget that -1 is a number, but obviously our slide show won't have a negative-first slide. We also compare the value against the number of JPGs we found in our <cfdirectory> call. If it's bigger than the result, or if anything else was wrong, we simply reset the value to 1.

The next block of code is a bit confusing, so let's break it down. Our slide show will need to generate links from one slide to the next. At the same time it's possible that the page calling the custom tag already had some URL parameters defined. When we create our links from inside the custom tag, we want to preserve the original URL parameters, but remove the ones the custom tag adds. This line

```
<cfset qs = cgi.query_string>
```

gets the current set of URL parameters as defined in the query string. The next line

```
<cfset qs = rereplacenocase(qs,"&*slide=[0-9]*","")>
```

will use regular expressions to remove the slide parameter. We use regular expressions since we don't know exactly what the value will be. The regular expression, "&*slide=[0-9]*", will match zero or more & characters, the phrase slide=, and then any number. The next line works almost the same way:

```
<cfset qs = rereplacenocase(qs,"&*thumbs=1","")>
```

This will match zero or more & characters and then the phrase thumbs=1.

Let's look at a real example. Imagine if the value of cgi.query_string was "dir=foo&z=1". After running the slide show, the query string would look like "dir=foo&z=1&slide=2". Our code will remove the slide=2. Later on when we generate our link to slide 3, we won't have to worry about the old slide value getting in the way.

Now we get into the meat of our tag. Line 48 checks to see if url.thumbs is defined. If it isn't, then we're doing a normal slide display. Line 50 begins this display. I'm going to ignore the simple HTML markup and focus on the code. Line 53 simply outputs the current slide by using url.slide to point to one of the rows of the query returned by the <cfdirectory> tag.

Support for captions is done by checking for a specially named file. In a file with the same name as the picture, but with ".txt" at the end, we simply include the file and output the contents. Note that line 60 uses a tag with a class of "caption". This isn't defined in the custom tag but can instead be set in your own site's style sheet if you choose.

Next we need to determine if we should display a Previous Picture or Next Picture link. Obviously we only display a Previous Picture link if we're not on the first slide. Notice the link in line 68:

```
<a href="#cgi.script_name#?#qs#&slide=#decrementvalue(url.slide)#">
```

#cgi.script_name# points to the current file, not the custom tag, but the file that called it. #qs# is the stripped query_string value we created earlier. The slide parameter is simply one less then the current value of url.slide. The link for the next picture is almost exactly the same, except that we use incrementvalue instead.

Last, we output a link for the thumbnails. This is done by using just #qs# and thumbs=1. The thumbnails are output in lines 82–89. We simply loop over all the results of the original <cfdirectory> call and output direct links for each picture. Also note that we constrain the height and width by the attributes we discussed earlier. Please note that these are not real thumbnails. They are the original pictures just sized smaller.

For anyone on a dial-up modem, this is going to be a slow-loading page. However, it does allow you to see all the pictures at once, and for those on a high-speed connection, it will work just fine.

So how do we use it? The entire slide show can be run with one simple call:

```
<cf_slideshow dir="#expandPath("./pics")#" urldir="./pics">
```

You can even make a simple template to query a root folder of subfolders, each being a different set of pictures. You would then simply allow the user to pick a folder, and at that point call cf_slideshow.

About the Author

Raymond Camden is co-technical editor of **ColdFusion Developer's Journal** *and a senior software engineer for Mindseye, Inc. A longtime ColdFusion user, Raymond is a co-author of the* "Mastering ColdFusion" *series published by Sybex Inc, as well as the lead author for the* ColdFusion MX Developer's Handbook. *He also presents at numerous conferences and contributes to online webzines. He and Rob Brooks-Bilson created and run the Common Function Library Project (www.cflib.org), an open source repository of ColdFusion UDFs. Raymond has helped form three ColdFusion User Groups and is the manager of the Acadiana MMUG.*

raymond@sys-con.com

Listing 1: Slide Show

```
<cfsetting enablecfoutputonly=true>
<!---
   Name          : slideshow.cfm
   Author        : Raymond Camden
   Created       : November 13, 2003
   Last Updated : November 13, 2003
   History       :
   Purpose            :
--->

<cfif thisTag.executionMode is "end"><cfsetting
enablecfoutputonly=false><cfexit></cfif>

<!--- required attributes --->
<!--- This is the physical path to the images --->
<cfparam name="attributes.dir" type="string">
<!--- This is the URL equiv of attributes.dir --->
<cfparam name="attributes.urldir" type="string">

<!--- these defaults for W/H are perfect for 640/480 pics --->
<cfparam name="attributes.thumb_width" default=160>
<cfparam name="attributes.thumb_height" default=120>
<cfparam name="attributes.thumb_perRow" default=3>

<!--- The current slide --->
<cfparam name="url.slide" default=1>

<cfif not directoryExists(attributes.dir)>
   <cfthrow message="#attributes.dir# does not exist.">
</cfif>

<cfdirectory action="list" directory="#attributes.dir#" name="files" fil-
ter="*.jpg" sort="name">

<cfif not files.recordCount>
   <cfsetting enablecfoutputonly=false>
   <cfexit>
</cfif>

<!---- validate url.slide --->
<cfif not isNumeric(url.slide) or url.slide lt 1 or url.slide gt
files.recordCount>
   <cfset url.slide = 1>
</cfif>

<!--- remove slide=N and thumbs --->
<cfset qs = cgi.query_string>
<cfset qs = rereplacenocase(qs,"&*slide=[0-9]*","")>
<cfset qs = rereplacenocase(qs,"&*thumbs=1","")>

<cfif not isDefined("url.thumbs")>

    <cfoutput>
    <center>
   <p>
    <img src="#attributes.urldir#/#files.name[url.slide]#" vspace=4><br>
   </cfoutput>

   <cfset captionFile = attributes.dir & "/" & files.name[url.slide] &
".txt">
   <cfif fileExists(captionFile)>
          <cffile action="read" file="#captionFile#" variable="caption">
          <cfoutput>
          <span class="caption">#caption#</span>
          </cfoutput>
   </cfif>

   <cfoutput>
   </p>
   <p>
    <cfif url.slide gt 1>
          [ &laquo; <a href="#cgi.script_name#?#qs#&slide=#decrementval-
ue(url.slide)#">Previous Picture</a> ]
    </cfif>
    <b>Picture #url.slide# of #files.recordCount#</b>
    <cfif url.slide lt files.recordcount>
          [ <a
href="#cgi.script_name#?#qs#&slide=#incrementvalue(url.slide)#">Next
Picture</a> &raquo; ]
    </cfif>
    <br>
    [ <a href="#cgi.script_name#?#qs#&thumbs=1">View Thumbnails</a> ]
    </p>
    </center>
    </cfoutput>

<cfelse>

    <cfoutput>
    <center>
    <cfloop query="files">
        <a href="#cgi.script_name#?#qs#&slide=#currentRow#"><img
src="#attributes.urldir#/#name#" vspace=4 width="#attributes.thumb_width#"
height="#attributes.thumb_height#"></a>
          <cfif not (currentRow mod attributes.thumb_perRow)><br></cfif>
    </cfloop>
    </center>
    </cfoutput>

</cfif>

<cfsetting enablecfoutputonly=false>
```

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Flash Application Development Guidelines

Use Flash MX and ColdFusion to build the best solution on the Web

Flash MX is not a new technology for many ColdFusion developers. Many have started to write serious applications in Flash MX and have since searched for a way to improve structure and performance.

By Curtis P. Hermann

Developers apply Flash MX technology to create entertaining animations, business and communication applications, and more. Developing in Flash before the creation of Flash MX had its difficulties and kept developers apprehensive about using it. A primary source of hesitation arose out of the lack of standard components and the need to have some sense of design to develop an attractive and usable interface.

Since Flash MX introduced standard components, the dependency on designers decreased. As a result, application developers are now able to develop interfaces superior to HTML, keep up with other interfaces like Visual Basic, yet still retain a Web-based technology. However, like Visual Basic, using components makes file sizes very large and resource-intensive on the client machine. In addition, large file sizes slow down developers when the compile time increases, and debugging through the visual debugger becomes unusable.

Another issue that challenges developers with Flash MX is versioning code. Although the binary .fla file can be managed in a source versioning system (like CVS www.cvshome.org), developers cannot use all the nifty diff tools when conflicts arise while checking in code. In many cases this problem will arise during team development, and the need to see a side-by-side comparison of the code becomes necessary.

Finally, design, documentation, and quality assurance often occur during the wrong part of the development process. More often than not, these important steps occur ad hoc during the development process. This will always create a product that is buggy and hard to maintain. Instead, by designing, documenting, and implementing quality assurance throughout the life of the application, one can successfully develop quality applications in Flash MX.

Design and Documentation

While developing a product, I suggest spending the majority of development time gathering requirements, designing, and documenting the application. I subscribe to the "design for three weeks and develop for one" philosophy. In my early years of developing, I would habitually begin the project coding right away, only to realize later that I really did not understand the goal of the project. Consequently, I ended up with a plate of spaghetti code. Economically speaking, I quickly learned that I could not afford to do that.

Now, instead of blindly diving into a project, I begin an application design by gathering requirements from a customer, salesperson, or whoever may be a source of information that shapes the particular product. Next, I hit the whiteboard, drawing out ideas for either data flow or screens. Depending on the budget, I may put together a semi-working prototype to get sign-off on.

However, when it comes down to designing the core of the application, I fire up my UML (Unified Modeling Language) tool and begin to architect the application. For Flash MX development, I use an online UML tool called gModeler (www.gskinner.com/gmodeler). gModeler is a great free tool I have used on numerous occasions to design applications. Discussing the details of UML requires another article in itself, but in a nutshell, UML is a method of making a graphical blueprint for the development and documentation of an application. Moreover, it is based on industry standards and produces documentation as well as stub code. By taking the time to design this blueprint of an application, necessary design enhancements will emerge as a result of thoughtful preparation.

For new developers who come into the middle of a project, UML can help to translate an application and design. This ability reduces the cost of ramp-up time by reducing the expense of training new individuals to a project already in progress. Also, for developers who maintain the application, referencing the UML model for the application can be a huge time saver. For these reasons, software developed with documentation saves time and money.

Through design and documentation, your application can increase in value when you are faced with the opportunity of selling it. At some point, a larger business may become interested in buying your product. You will have great bargaining power if you can easily prove that your design is sound and that your application is documented. Otherwise, you may lose the sale. After all, no one wants to inherit someone else's mess.

File Size

When using UML to plan your architecture, look for ways to break the application into smaller parts. In many of my applications I have started with a main .fla, which acts as a controller to many other .flas, broken up into logical components. For instance, in an inventory application, I use an Inventory.fla that is the main controller for the application. Next, I use a Shipping.fla, Reporting.fla, and other .flas that logically fulfill an independent task. If the user wants to ship one of their

products then I will load the Shipping.swf into the Inventory.swf, likewise with the Reporting.swf. The idea here is to load only what the user needs.

For example, a user may log in to the inventory application in order to ship goods, but may not be interested in generating reports at that time. Using this design can greatly reduce the file size for the inventory application and increase performance for the user. Another benefit to this design is that the functionality requirements overlap with previously written applications. Thus, an example might be, if a Management.fla needs to report on inventory, load the Reporting.swf but not the whole inventory application, because nothing needs to be shipped at that point.

Code Reuse

So far, I have addressed the issue of separating an application into smaller logical parts to decrease the file size and increase performance. However, let's take this issue one step further. Not only do applications need to be more independent, but the supporting code must be independent as well. Like being able to reuse components of an application, code should be broken down into reusable objects as well. This ability is beneficial when functionality needs to be called from different aspects of the application. For instance, using a broker class to handle all of your Flash Remoting connections and calls prevents the need to have copies of that code placed throughout the application. After all, the code that establishes the connection to a Flash Gateway does not change. Avoid having it exist in every part of the application that a connection is needed. Rather, make an instance of an object that handles that code. Consequently, if you ever have a bug in your connection code, you will need to fix it in only one place.

While designing applications, I like to separate the presentation code from the business logic code. By doing this, I can isolate bugs, increase my code structure and readability, and even swap out an entirely new interface or data abstraction layer. An example would be a shopping cart interface with a list box that allows a customer to select the credit card they wish to check out with. In my design, I would have a presentation class that controls the population of a list box and handles the click events, and a business class that gets the values for the list box from a database.

The ability of an application to be hosted on multiple operating systems, database, and communication protocols is a desired trait in Web development. The flexibility of this design becomes necessary when you have to support different data-abstraction layers, where one client supports Flash Remoting, but the other client needs something like XML to transfer data. The separation of presentation and business layers allows the business layer to create a "switch" that would translate either an XML or Remoting call into an object the presentation layer would understand, never knowing anything different has occurred.

Quality Assurance

Many developers ignore quality assurance and will only deal with it at the end of application development. However, I urge you to deal with quality assurance from the beginning of the application process. Once you have the information and architecture planned, you need to be certain that the planned architecture will function correctly. For instance, does the application contain an element that is resource-intensive on the client or the server? What about usability? Can users navigate and accomplish the goals of the application?

All aspects of the design and development process must be tested. The testing can begin with a method as rudimentary as paper sketches of what the interface may look like. Usability testing on preliminary designs can save you the headache of rewriting.

Stress testing is something that should never be an afterthought and it's best to try to identify these problems in the early design stages. For example, if you build a discussion forum application for a company of 30,000 employees, you need to begin by asking a few key questions such as: How many employees can I expect to be online at the same time?; What are the peak hours of the day?; What do I do if the server crashes?

More often than not, we imagine the server crashing when too many users hit the database or Web server. However, keep in mind that Flash MX can run into system resource problems on the client. If your interface contains many components, drag-and-drop ability, and video (which is often in Flash), and works fine on your powerful development machine, then take it down to a 400MHz iMac running OS X, or an old 333MHz PC running Windows 95. This will expose any unexpected behavior you would not encounter on a faster machine.

Flash is not completely cross-browser compatible! Browser-support testing is important in the world of Flash too. Do not forget that even though Flash 6 runs on a wide range of machines and browsers, it does not follow that your code will work on those. Internet Explorer has ways of communicating with Flash that Netscape doesn't. Likewise, Internet Explorer on Mac cannot communicate the same way either.

To put it simply, test your ideas constantly, from the planning stages of your project to the final product. Always look for potential

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weaknesses before you build, and bounce your ideas off others. In addition, building quick proofs of concepts is an excellent opportunity to verify that your architecture and functionality plans are solid.

Code Standards

With the requirements gathered, prototype made and approved, and the architecture laid out in a UML diagram, it's almost time to lay down some code. Before you start plunging into code, however, take a second to look at the way you write code and answer the following questions. Does your coding style follow a standard? Will another developer be able to easily understand your code? Do you comment your code thoroughly? Ideally, the answer to all three questions is yes. Following standards, taking the time to make your code readable, and doing a good job at commenting is a skill that you must develop. It takes a few years of retracing code (a lot of times your own) and being completely frustrated before you get fed up and start thinking about improving those aspects of your code.

When I started developing I was very good at commenting; however, once I became more experienced in developing software, I made the mistake of coding without thoroughly commenting. I soon realized that even if you are experienced, developers reading your code may not be. Furthermore, code that you write in a coding fever may make sense for that moment, but two weeks later when you come back to fix a bug it may not make sense at all. I have lost hours on bug hunting, which could have been avoided if I had only commented my code from the beginning.

Putting It Together

There are a few things that I do in Flash MX development to make my applications a little easier to develop and maintain. The first is to keep my code in external ActionScript (.as) files. You can include these files in your .fla by using the #include statement.

```
#include "MyClass.as"
```

If you open one of my .fla files you will see only one line of code in a symbol, which is the include statement for that ActionScript file. Using the technique of maintaining code in files external to the .fla allows a source control system's advanced features to enable better team development. Moreover, you will have much more control over the maintenance development of your product.

Designing and building an application is easier when you have developed a pattern that you are comfortable with. I use, but am not limited to, the Model-View-Controller pattern for most of my development; this is probably the most popular pattern associated with Flash MX at this point. Getting into this habit with a pattern makes designing the architecture and coding go faster, because you have done it before.

One method of making the Model-View-Control pattern work effectively is to use events and listeners to communicate between the different layers. A Controller can listen to the View and Model layers and marshal data between the two.

This method of using events and listeners allows objects to remain independent and know only about themselves. Many objects can listen to an object for events. When a user submits data, the toolbar may listen for success to disable the save button, and the "Saving Data" dialog will listen for completion to set the _visible property to false.

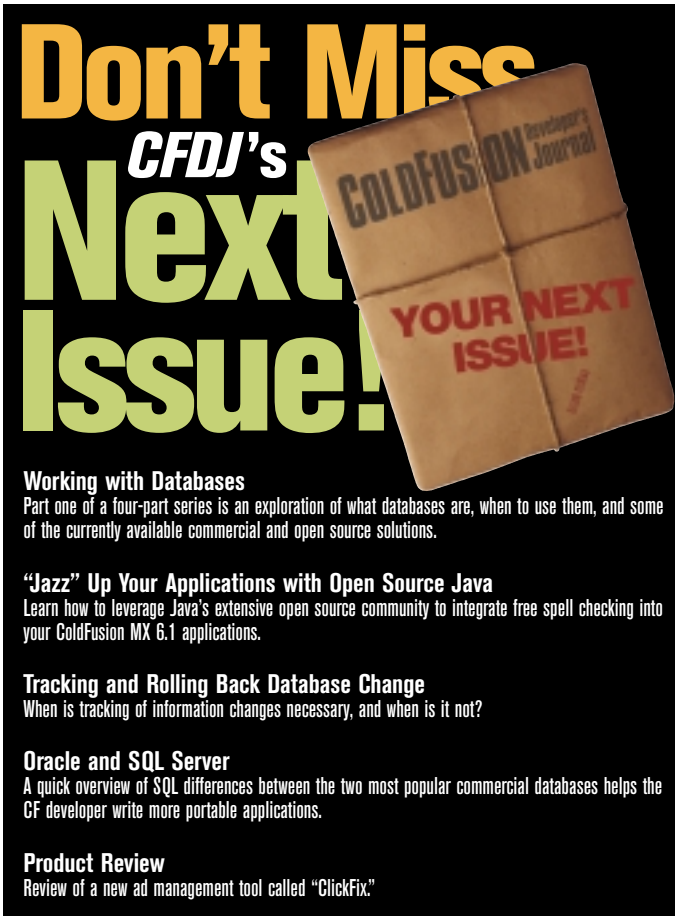
When designing in this pattern and using events, avoid using _root or _parent to access objects. If your object is truly independent, you will be able to raise an event to that parent to enable it to react. You will find much more flexibility in this design.

This article represents a high-level view of some production tips in order to build bigger, better, and stronger applications. By going online and digging deeper into things like UML, quality assurance, software design patterns, and events and listeners, you can master the skills necessary to develop enterprise applications. It takes years to get good at anything.

Unfortunately, just when you think you're at the top of your game, someone comes along and tells you how it really is. And that's okay! Flash MX development is fun, interesting, constantly changing, and *never* boring. I challenge you to exploit the power of Flash MX and ColdFusion to build the most professional, usable, efficient, powerful, and quality solution on the Web.

About the Author

Curtis P. Hermann is a Macromedia Certified Flash MX Developer. He owns and operates a small consulting firm, iindwell, inc. (www.iindwell.com). He also heads the Flash MX development and quality-assurance department for WisdomTools.com (www.wisdomtools.com). curtis@iindwell.com



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The Trouble with Macs

Make your upload problems disappear

By Randy L. Smith

Some of us have trouble just trying to get CFFILE to upload an image correctly and put it in its proper place, without having a Macintosh user report that it doesn't work for him or her. Diligently searching the Macromedia ColdFusion forums provided the base solutions for me, and I packaged those fixes with my own touches to create a custom file upload tag for you.

I realize that there are a number of areas where Windows developers pull their hair out when it comes time to test the code on a Mac. I don't have the solution for all of the problems I read about on the forums, but I do have fixes for two of them. This article will tackle problems with comparing strings and with uploading files.

Recognizing Your Options

How many times have you coded something like this?

```
<cfparam name="option" default="">
<cfswitch expression="#option#">
<cfcase value="EDIT">
   …your code here…
</cfcase>
   …more case statements here…
</cfswitch>
```

Works perfectly fine on your Windows machine, right? This will fail for certain Mac users because the "option" will be totally ignored.

The solution? UCASE(TRIM()). Get rid of the extra spaces, which are significant for some Mac versions, and compare case to case, and these comparison problems will disappear:

```
<cfparam name="option" default="">
<cfswitch expression="#UCASE(TRIM(option))#">
<cfcase value="EDIT">
   …your code here…
</cfcase>
   …more case statements here…
</cfswitch>
```

When in doubt, UCASE(TRIM()) the variables. A miniscule performance hit is *nothing* compared to the wrath of a customer who can't make your program work.

Uploading Files: the CF_UploadHelper Custom Tag

The problem of uploading files to a Mac was the subject of many forum messages. Through trial and error, I picked the best solutions from the bunch and combined them into a custom tag (see Listing 1: UploadHelper.cfm). (Code listings for this article can be downloaded from www.sys-con.com/coldfusion/sourcec/cfm.)

I purposely made UploadHelper as generic as possible so you wouldn't have to mess with it at all if you didn't want to. Those of you who want to further customize it, be my guest. As always, I welcome any suggestions for improving this tag – which is also now available on the Macromedia Developer Exchange.

The beginning of the tag does the customary checking to ensure that the minimum parameters have been passed. Variables are then set for acceptable MIME types that you want to allow to be uploaded, along with a list of file extensions to display to the user (if desired) upon failure.

Mapping Makes Life Easier

I'm now in the habit of using a global shared directory area for managing these types of files for all clients, and I mapped that directory using ColdFusion's Administrator. This makes life easier not only for uploading and managing files, but also for providing a common repository for global INCLUDE files, display templates, error-handling code, images, and other items that you can and do use with more than one client.

If you are managing a number of clients, mapping a common directory will help you manage uploaded files. I suggest that you have a separate subdirectory for each client under this mapped directory (e.g., /sharedfiles/client1/). You will likely find many more uses for this common mapped directory.

Testing the Tag

UploadHelper was developed to allow you to manage your uploaded files, including images, documents, or whatever

Figure 1: ImgTagTest.cfm's file management form

types of files your customer needs to manage. UploadHelper allows you to let your site visitor safely delete files from the server, manage file captions, and provide left/right alignment for images. A test script has been provided for you in Listing 2: ImgTagTest.cfm.

You will need to set the common variables to the appropriate values and ensure a table has been set up with the proper fields in order for this program to work. For now, create a test table and manually add an entry or two into it so that something shows up in your test list when you run ImgTagTest.cfm. Make sure you have a copy of UploadHelper.cfm either in your custom tags directory or in the same directory that ImgTagTest.cfm is in.

An example of the EDIT screen from ImgTagTest.cfm can be found in Figure 1. This example shows a thumbnail of the image to users so they can be sure they're editing, replacing, or deleting the correct file. UploadHelper allows your site visitor to delete a file or change the caption without uploading a new file, or upload a file without changing the caption. Of course, all three can be performed at the same time as well, and if a file exists when a new file is uploaded, the previous file will be deleted to keep your server from bloating due to orphaned files.

The Meat of the Matter

Why does this tag work? Why does your code fail? Some versions of Mac will report that a file has been uploaded even if you never touched the browse button to go look for a file. The CFFILE-ReadBinary command checks to see if the file is a valid one, and therefore weeds out the false alarms.

The Mac then throws a double-whammy at you by letting people manage their files without a proper file extension. The file may very well be valid, but without an extension, your Windows server hasn't a clue as to how to process it. The TRY/CATCH wrapper around the second CFFILE command with the ACCEPT list of types allows you to make a clean getaway when the file extension is not an approved one.

CF_ImageSize

There used to be a tag that would read the file type, regardless of whether there is an extension or not: cf_imagesize. You can use this tag if you have it, but it's no longer available on the Developer Exchange. I checked the Web site of the publishing company (Fuseware), but they don't appear to be active.

Rather than send you on a wild goose chase for this tag, I incorporated what was necessary into CF_UPLOADHELPER, and you can use it by simply setting the USEIMAGESIZE attribute to "YES". This will now let you upload those pesky, no-extension Mac files – as long as they are GIF or JPG files – without making your user go back and put an extension on and re-attempt the upload.

Conclusion

CF_UPLOADHELPER is a huge tag at 446 lines, no doubt about it. You can certainly shrink it by incorporating CFMX techniques and by deciding on some default behavior rather than allowing all sorts of possibilities, as I did.

One thing is for certain, though. If you use CF_UPLOADHELPER, your Mac file upload problems will disappear and you won't have to reinvent the wheel every time you want to safely handle file uploads in your applications.

About the Author

Randy L. Smith is president/CEO of Midwest Computer Programming and Internet (www.mcpi.com), an Internet/intranet database solution provider based in Hudson, Wisconsin. He has been developing large-scale, Web-based applications for businesses and nonprofits of all sizes, as well as state and federal entities, since 1993. Randy has been working in the computer industry since 1978, and with ColdFusion since 1996.

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There are limits, however. Today's Internet model for information and application distribution assumes access to a network connection, but ubiquitous Web connectivity still lies in the future. And some computing tasks require robust functionality that can only be provided efficiently by "rich" client applications that reside on the local computer.

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Squeezing Java

Java is a very powerful language; while it offers the developer a rich array of tools, the fundamentals mustn't be overlooked. Improving your code at the core layer will result in great improvements in efficiency and produce (hopefully) fewer bugs. We'll look at the do's and don'ts of programming and learn lots of hints and tips that will accelerate your Java coding.

Enterprise Architecture and Open Source

Use of open source software within the enterprise is gaining momentum. The vast majority of organizations are using some form of open source software in production environments, including Linux, Apache, and JBoss. The enterprise architecture, however, needs to incorporate the best thinking of the industry; this includes not only using open source but contributing to it.

The model in which open source software gets developed has practices that could assist an organization in becoming agile in their software development practices and allow them to develop software faster, with cheaper costs and better quality. In this session, you will learn:

- Two models of development: the cathedral and the bazaar
- The value proposition of using open source
- Harnessing the power of the mob: the value proposition of contributing to open source
- Making the build versus buy decision: additional thoughts

J2EE v14

Day-to-day work with deadlines makes it difficult to keep abreast of the rapidly evolving landscape of J2EE, especially given the numerous constituent J2EE technologies. J2EE v1.4 is chockful of new services that affect and benefit a wide range of enterprise development tasks. This talk will extract core material from the speaker's new J2EE Developer's Handbook and describe what's embodied in J2EE v1.4. In particular, the new Web services features provided by J2EE v1.4 will be highlighted. The talk will also briefly address those services missing from the current J2EE standards but still needed when building enterprise applications.

Apache Axis

Apache Axis is the popular SOAP engine that includes everything you need to start producing Web services. Discover just what Axis is, and how you can utilize the power of this free engine to kick start your Web services.

Empowering Java and RSS for Blogging

One of the fastest-growing areas over the last few years is the blogging community. The ease with which you can post and publish information has enabled everyone to become their own publisher. One of the powers of blogs has been the syndication of data via the RSS (XML) protocol. Discover how you can easily produce and consume RSS feeds within your Java applications for wider appeal and hook into JavaBlogs, for example.

JUnit/Ant

A defined and easily repeatable process is one of the most necessary but often least-used aspects of good software development. A defined build process ensures that your project's software is built, deployed, and tested identically each time. Without this type of control and predictability, valuable time is often lost chasing down bugs that don't exist or rejecting solutions that were only partially implemented.

A critical measure of the success of software can be found in whether or not it executes successfully. Equally important, however, is whether or not that software does what it was intended to do. JUnit is an open source testing framework that provides a simple means for developers to define their intentions of how their software should work. JUnit then provides test runners that process your intentions and verify that your code performs as intended. The result is software that not only works, but works in the correct way.

Apache's Ant is a powerful scripting tool that enables developers to define and execute routine software development tasks using the simplicity and extensibility of XML. Ant provides a comprehensive mechanism for managing software development projects, including compilation, deployment, testing, and execution. In addition, it is compatible with any IDE or operating system.

Next Phase in the Evolution of J2EE

J2EE has been making major inroads in the enterprise space for a number of years. However, it is only with the 1.4 release that we have had uniform and easy access to Web services. Discover how to leverage the new features of J2EE 1.4 and why this release is a significant milestone in the evolution of J2EE.

Simplifying J2EE Applications

J2EE is a large, complex specification for server-side, Web-enabled application development. Over the past few years, the presenter has led many teams through the J2EE jungle, trying to steer them away from the hype and keep them focused on delivering rock-solid, end-user applications. This tutorial will discuss a variety of tips, tricks, and lessons that he has learned so you and your teams can develop J2EE applications better, faster, and simpler than before.

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WEB SERVICES SESSIONS

Exploring the Dark Side

The growing use of services-oriented architectures puts pressure on application developers relying on Web services for key features of their applications. Performance, scalability, and reliability of these components affect the ability of applications to meet service-level agreements, yet can't easily be analyzed as a part of the application when developers have a problem. In fact, the Web service may be on a different software platform than the rest of the application. This session describes how developers can shed light on memory use in Web services written in either .NET or Java, even if they didn't write the code and do use another platform.

Web Services Progress Report

Web services have been the buzz for the last couple of years. There have been many technical and some market success stories but the concept remains confusing. New "standards" are proposed on a regular basis, but they overlap one another and seem to form rifts along the same fault lines as previous industry politico-strategic controversies. A group of people from the W3C Web Services Architecture working group have been arguing that many of the ideas coming from the Web services community are antithetical to the principles of the Web itself and are unlikely to ever work on an Internet scale. This presentation provides a progress report on the effort to distinguish Web services architectural principles from the marketing agenda of individual companies.

ID, Please. The Case for Giving Web Services an Identity

Without identity management, Web services can be consumed by anyone. The challenge for Web services developers is to provide appropriate access based on the user's identity. As identity management moves into the forefront of technology, directory services will evolve from simple LDAP repositories used for authentication and storage to robust engines that provide identity integration, access management, and policy enforcement. This presentation will discuss how identity management and directory services provide a robust solution for Web services authentication, authorization, and single sign-on.

Web Services Orchestration, Management, and Security: Will They Play Together?

Web services orchestration, management, and security are among the principal challenges facing implementers of service-oriented architectures today. There is still much confusion in the IT community about the standards themselves, which are at various stages of maturity. Their relevance to enterprise IT and how they might someday be able to effectively work together is often unclear. This session provides an overview of standards in these three critical areas; and more important, how each affects the other. Attendees will then gain practical knowledge and a deeper understanding of future trends and the need to address certain real-world issues in order to create a more cost-effective and agile IT infrastructure.

Service-Oriented Integration: Making the Right Choices To Support The Next-Generation of Integration

Applications are increasingly being developed "built-to-integrate," providing the ability to easily expose key functionality through commonly defined interfaces. Gartner calls this concept SODA, or service-oriented development of applications. When applied to the ever-present integration challenge, SODA represents a transition to service-oriented integration.

But making the right architectural decisions is absolutely vital to ensuring success with service-oriented integration projects – whether applications were built to integrate or not.

This presentation will examine the leading choices for supporting service-oriented integration: enterprise service buses, integration brokers, and application suite platforms.

Government Real-Time Fraud Detection Using Web Services

Government agencies are faced with increasing amounts of data and are challenged to make sense of, and act on, that data in real time. Failure to interpret and execute on data can result in security threats and, potentially, loss of life. Government agencies are increasingly investing in Web services solutions to address their need for real-time access to information.

The Canadian Passport Office is an example of a government agency leveraging Web services to exchange information in real time to combat terrorism and other illicit uses of fraudulently obtained passports. They selected IT consulting firm Pentelar and Sybase, Inc., technologies to electronically authenticate identity document data through the use of Web services and ebXML.

This session will discuss this pilot project and highlight the ebXML capabilities that enable the Canadian Passport Office to address real-time information exchange.

WS-CAF: Standardized Web Services Transactions and Composite Applications

The Web Services Composite Application Framework is a collection of three specifications – Web Service Context (WS-CTX), Web Service Coordination Framework (WS-CF), and Web Service Transaction Management (WS-TXM) – designed to solve problems that arise when multiple Web services are used in combination ("composite applications") to support information sharing and transaction processing. As coauthor of the specification, we will discuss how WS-CAF addresses the underlying issues of Web service context propagation and transaction management to expand the scope, usability, and reliability of Web services for business process automation.

Securing Web Services: What Can Be Done Today?

Security is listed as one of the main barriers to the adoption of Web services today. With the proliferation of security standards, there is a lot of confusion over which ones are mature enough to use and how they fit together. This session will present the current and emerging security standards for Web services and show how they can fit together architecturally to address various security concerns.

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XML SESSIONS

Universal Business Language

Web service technologies promise to revolutionize electronic business, but global interoperability of business processes cannot occur without the semantic standardization of the messages exchanged in business transactions. This session will describe the OASIS UBL project to create standard XML Schemas for basic business documents, explore the relationship of UBL-based business to traditional EDI, and note the explosive potential of standard markup combined with reliable XML messaging.

Real Best Practices for XML Web Services Management and Security

Companies deploying Web services in a meaningful way are increasingly finding they need to address Web services management and security early in the architectural phase. Basic Web services connections are easy to do, but managing the security, performance, scalability, and inevitable changes to the production environment requires some knowledge, expertise, and planning. This session cuts through the hype and outlines real-world mistakes many companies make when deploying Web services and the real best practices from companies that have successfully captured the value of XML Web services. It provides practical advice on how to successfully manage and secure your XML Web services environment.

SOA Foundation Components: Building an XML Content Router

One of the fundamental components for any burgeoning SOA will be an XML content router. This session explores the concepts, patterns, and open source software available that facilitate building an XML content routing system. The system can be exposed as a Web service or simply as a stand-alone J2EE component for use in your enterprise. The "restaurant" pattern is introduced as the principal design pattern for building the service, and this pattern's applicability to building generic services is discussed. Applying the router as an XML data integration tool is also discussed, as well as its potential for acting as a service orchestrator.

What's New in XSLT 2.0?

XSLT 2.0, which may achieve W3C Recommendation by conference time, offers unparalleled power in conjunction with XPath 2.0 for transforming XML documents. In this engaging, example-rich session, Steve Heckler demonstrates the most important new features of XSLT 2.0, including Sequences, new data types and XML Schema support, regular expressions, multiple document output, grouping, new control-flow operators, and much more. Current and future support for XSLT 2.0 on the Java and .NET platforms will also be discussed. Most examples will use Saxon, but .NET examples will be included if .NET supports XSLT 2.0 by conference time.

Using XML Schemas Effectively in WSDL Design

Developers building Web services today are beginning to see the value of using the document-style approach over RPC. Recent experience shows that to take full advantage of document-style Web services requires a strong knowledge of XML Schemas and related XML standards. This presentation presents a number of important tips and techniques for properly using XML Schemas in the design of a Web services interface (WSDL), including XML-based development tools, binding considerations between XML and underlying objects, WSDL reusability through XML Schemas, and XML Schema naming best practices.

XML: A Manager's Guide

As more and more IT projects utilize XML and its derivatives as fundamental technologies, it is key for today's manager to be aware of the various ingredients of XML. The objective of the session is to provide an essential introduction around XML from a manager's perspective. From core XML processing; transformation; metadata definition and schemas; applications in Web, wireless, and speech applications; Web services; industry-standard vocabularies; and more, this session provides a comprehensive review of the various technologies related to XML.

Using Rules to Clean Up XML

Garbage in, garbage out – it's an axiom that applies to many aspects of enterprise development, but none more so than building reliable and robust Web applications and integration projects with XML. Since its inception, XML has been seen as the cure-all for problems related to Web applications and integration projects. However, poorly written XML can slow down an integration project, or worse, cause the integration project to collapse. The key to successfully using XML in an integration project is to first understand the inefficiencies that may cause poorly written XML, and then apply a rule-based system that establishes policies to follow.

EXPO HALL
TUESDAY, FEBRUARY 24,
11:00AM-4:00PM, Welcome Reception 4:00PM

WEDNESDAY FEBRUARY 25,
11:00AM-4:00PM

XForms: Simplifying the Development of Transactional Web Forms

XForms is a W3C specification that specifies a declarative language for solving a common requirement for advanced user interaction, data validation, and XML processing. XForms is designed to be integrated into XHTML, but is not restricted to being a part of that language alone. It can be integrated into any suitable markup language. This session will give an introduction to XForms and explain how XForms fits in the client tier of the J2EE application architecture. In addition, it will cover the benefits of XForms and why it is a perfect fit for interacting with J2EE and Web services. A demonstration of XForms in a J2EE environment, using an XForms-compliant browser and a sample application, will further illustrate the advantages.

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.NET SESSIONS

.NET Compact Framework Performance Tips amd Tricks

Learn the techniques that can be used to increase the responsiveness of user interface and network operations for users of applications built on the .NET Compact Framework. Look under the covers at advances and changes in the "Whidbey" release to significantly improve performance. Get a general overview of how the .NET Compact Framework works under the hood at runtime, with specific focus on performance implications. Then we will cover general user interface tips to increase performance. Explore how asynchronous infrastructure, such as threading, in the .NET Compact Framework can be leveraged to optimize both user interface and network operations. Learn about the architectural guidelines for creating applications that perform well under frequently changing network conditions.

Best Practices and Techniques for Building Secure ASP.NET Applications

When the enterprise depends on your application, careful attention to security is essential. This session provides specific recommendations to follow when developing secure ASP.NET Web applications and services, and focuses on the details of configuring IIS for security. Understand how to use authentication, authorization, threat modeling, configuration settings, and secure database access to create secure systems and learn common coding techniques for storing secrets, error handling, data validation, and code access security.

Using the Enterprise Instrumentation Framework

The Microsoft .NET Framework 1.1 and Windows Server 2003 offer a number of new features to help developers instrument their code. In this session well learn about the challenges facing application management in today's distributed world. We will examine the new unified instrumentation API in the Enterprise Instrumentation Framework (EIF), including the new Windows Event Trace available in Windows Server 2003, configurable at-source event filtering, and how request-based event tracing using EIF allows you to put a request context around the trace messages that map to a business process flow in your application. We will also discuss the benefits of using EIF in your application for both the developer and the application administrator.

.NET Framework: Exploring What's New in the Base Class Library for "Whidbey"

The base classes serve as the essential libraries for any developer. Continued evolution of the base classes provides numerous benefits, including the ability to develop more reliable, faster solutions, easier-to-write code, and more solutions entirely in managed code. Take a look at the many features that are a part of that evolution, including features in IO, event-logging, and various features in System.Collections.Generic classes and interfaces.

Microsoft Office 2003: A Solutions Platform

For all developers who would like to integrate custom business solutions with Microsoft Office products, this session will introduce you to the expanded developer features that have been included in the newest version of Microsoft Office. Come explore new XML-based programmability in everything from Word 2003 and Excel 2003 to FrontPage 2003 and SharePoint. Build powerful, modular solutions with Web services. Learn about InfoPath 2003 support for XML standards. Discover how to use the Microsoft Visual Studio Tools for the Microsoft Office System to automate and extend Microsoft Office Word 2003 and Microsoft Office Excel 2003 using Visual Basic .NET and Visual C# .NET. More than ever, Office has a solution for you.

BizTalk Server 2004 Technical Drilldown

Biztalk Server 2004 is designed to enhance Enterprise Application Integration (EAI), Business Process Automation (BPA), and Information Worker Integration. Join us for a technical drilldown into the new features and toolsets available.

Moving your Architecture to .NET

This session's emphasis is on how to migrate existing business components from VB6 COM objects to VB.NET assembly components. We'll spend time discovering how to best move different tiers of a multi-tiered application from COM to .NET, as well as effective strategies on how to wrap existing COM components for interoperability. We'll also examine best practices for moving your application from a COM-based architecture to a .NET-based architecture.

Who Should Attend

- Software Developers
- Software Engineers
- CTOs
- CIOs
- Development Managers
- Application Developers
- IT Directors
- Technical Directors
- Analysts
- Consultants
- Programmers
- IT Managers
- Technical Architects
- Team Leaders
- Software Consultants

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MX SESSIONS

Enterprise Infrastructure for Rich Internet Applications

Learn how Macromedia's technology initiative "Flex" fits seamlessly into today's new service-oriented architectures (SOA). We'll cover design patterns for rich clients, accessing Web services, and securing your Flex application.

ColdFusion Components from the Ground Up

ColdFusion Components (CFCs) are considered to be the most important enhancement to the CFML language since it was created some eight years ago. CFCs combine the power of objects with the simplicity of CFML, and in this session, you'll discover that not only are they incredibly powerful, they're also remarkably easy to master.

Code-Based Rich Internet Applications

Learn how to use Macromedia's technology initiative "Flex" to create rich Internet applications. This session will cover using components, layouts, and managers to build user interfaces, as well as using Flex's XML-based language to create and manipulate client-side data models.

Tips and Tricks for Writing and Using CFCs

ColdFusion Components are simple to write and simpler to use. But that simplicity hides a series of powerful features and technologies that you can (and should) take advantage of. In this session, you'll learn how to use (and how to not use) inheritance, "super," persistence, constructors, and more.

Leveraging Web Services

Web services technology is changing the way we think about designing and building applications. Come and learn what all the fuss is about, find out exactly which problems Web services solve, see Web services created and used, and even discover how Web services expose the world of .NET.

Building an RIA with Macromedia Flash and ColdFusion Web Services

Learn about the quickest and easiest way to build rich Internet applications using Macromedia Flash with connections to Web services built in ColdFusion.

ColdFusion Components

ColdFusion Components combine the power of objects with the simplicity of CFML. This is the way object-based development was intended to be, and in this session, you'll learn about this combination first hand. Starting with a simple data-driven application, you'll gradually convert it into a highly scalable and manageable multitier application, and in the process, will be amazed at just how easy ColdFusion makes this process.

Rapidly Build Web Services Applications with ColdFusion and Studio MX

The last year has shown that Web services are not just another passing fad and their promise of platform-independent distributed applications has been realized. Compared to other application server platforms, ColdFusion makes creating Web services easy. This session covers how to create a ColdFusion Component (CFC) in Dreamweaver, as well as how to expose that CFC as a Web service by just toggling one attribute of the CFC. That's right: in ColdFusion, it is just that easy.

Using Macromedia Flash with Web Services

Web services, a technology that allows developers to execute remote procedures, is emerging as a revolutionary tool for Web application development. Macromedia Flash MX 2004 Professional is a powerful tool for building applications that consume Web services built in any technology, including Macromedia ColdFusion, Java, ASP.NET, and PHP. In this session you will explore the visionary computing model that Web services represent as you use Macromedia Flash components to develop a Web service–based application. You will learn how to discover Web services, work with data and UI components, perform data binding, examine security issues, and aggregate multiple Web services into a cutting-edge Web service consumer.

Using Web Services with ColdFusion

You're a ColdFusion user and want to be able to take advantage of Web services? You're in luck. No other language or platform makes Web services consumption as painless as ColdFusion does. In this hands-on session, you'll experience Web services for yourself by building a complete application around some of the most popular Web services available today.

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4

A. Your Job Title

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❑ Software Development Director/Manager/Evangelist
❑ IT Director/Manager
❑ Project Manager/Project Leader/Group Leader
❑ Software Architect/Systems Analyst
❑ Application Programmer/Evangelist
❑ Database Administrator/Programmer
❑ Software Developer/Systems Integrator/Consultant
❑ Web Programmer
❑ CEO/COO/President/Chairman/Owner/Partner
❑ VP/Director/Manager Marketing, Sales
❑ VP/Director/Manager of Product Development
❑ General Division Manager/Department Manager
❑ Other (please specify)_____

B. Business/Industry

❑ Computer Software
❑ Computer Hardware and Electronics
❑ Computer Networking & Telecommunications
❑ Internet/Web/E-commerce
❑ Consulting & Systems Integrator
❑ Financial Services
❑ Manufacturing
❑ Wholesale/Retail/Distribution
❑ Transportation
❑ Travel/Hospitality
❑ Government/Military/Aerospace
❑ Health Care/Medical
❑ Insurance/Legal
❑ Education
❑ Utilities
❑ Architecture/Construction/Real Estate
❑ Agriculture
❑ Nonprofit/Religious
❑ Other (please specify) _____

C. Total number of employees at your location and entire organization (check all that apply):

	Location	Company
10,000 or more	01 ❑	01 ❑
5,000 – 9,999	02 ❑	02 ❑
1,000 – 4,999	03 ❑	03 ❑
500 – 999	04 ❑	04 ❑
100 – 499	05 ❑	05 ❑
100 or less	06 ❑	06 ❑

D. Please indicate the value of communications and computer products and services that you recommend, buy, specify, or approve over the course of one year:

❑ $10 million or more
❑ $1 million – $9.9 million
❑ $500,000 – $999,999
❑ $100,000 – $499,999
❑ $10,000 – $99,999
❑ Less than $10,000
❑ Don't know

E. What is your company's gross annual revenue?

❑ $10 billion or more
❑ $1 billion – $9.9 billion
❑ $100 million – $999 million
❑ $10 million – $99.9 million
❑ $1 million – $9.9 million
❑ Less than $1 million
❑ Don't know

F. Do you recommend, specify, evaluate, approve or purchase wireless products or services for your organization?
01 ❑ Yes 02 ❑ No

G. Which of the following products, services, and/or technologies do you currently approve, specify or recommend the purchase of?

❑ Application Servers
❑ Web Servers
❑ Server-Side Hardware
❑ Client-Side Hardware
❑ Wireless Device Hardware
❑ Databases
❑ Java IDEs
❑ Class Libraries
❑ Software Testing Tools
❑ Web Testing Tools
❑ Modeling Tools
❑ Team Development Tools
❑ Installation Tools
❑ Frameworks
❑ Database Access Tools/JDBC Devices
❑ Application Integration Tools
❑ Enterprise Development Tool Suites
❑ Messaging Tools
❑ Reporting Tools
❑ Debugging Tools
❑ Virtual Machines
❑ Wireless Development Tools
❑ XML Tools
❑ Web Services Development Toolkits
❑ Professional Training Services
❑ Other [Please Specify]

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ColdFusion User Groups

For more information go to...
http://www.macromedia.com/cfusion/usergroups

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New Hampshire
Northern N.E. MMUG
www.mmug.info

Massachusetts
Boston, MA CFUG
www.cfugboston.org

Rhode Island
Providence, RI CFUG
www.ricfug.com

Vermont, Montpelier
Vermont CFUG
www.mtbytes.com/dfug/index.htm

Midatlantic

New Jersey, Raritan
Central New Jersey CFUG
www.freecfm.com/c/cjcfug/index.cfm

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Maryland, Bethesda
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California, MD CFUG
http://smdcfug.org

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Charlotte, NC CFUG
www.charlotte-cfug.org

North Carolina
Fayetteville, NC CFUG
www.schoollink.net/fcfug/

North Carolina
Raleigh, NC CFUG
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Oklahoma City, OK CFUG
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http://cfug.dotlogix.com

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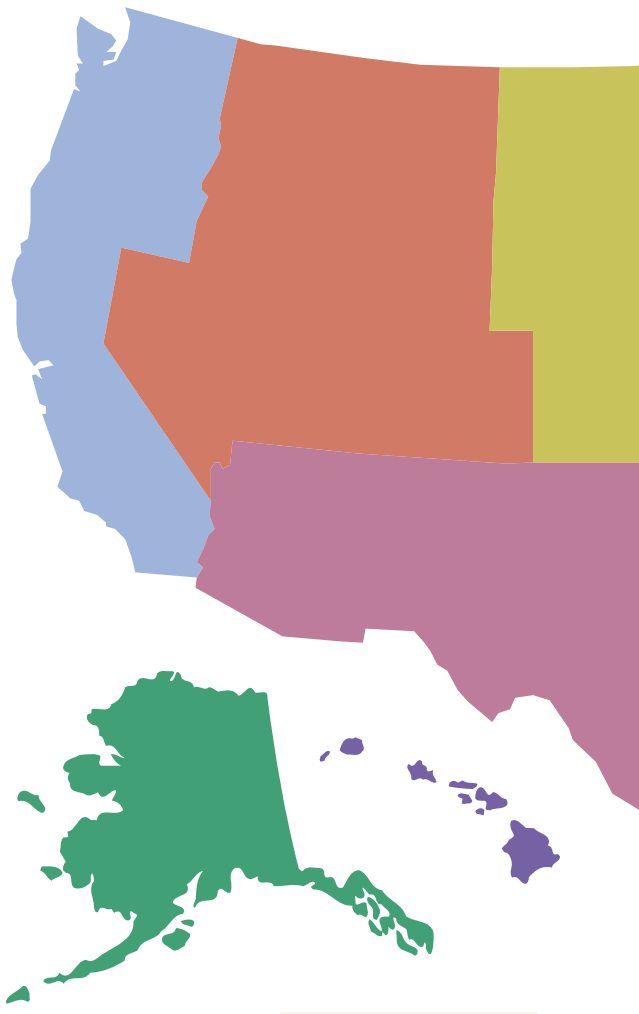

Midwest

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Northern Colorado CFUG
www.nccfug.com

Colorado Hamilton M.S. CFUG
http://hamilton.dpsk12.org/teachers/team-c/intro.html

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www.cfugorama.com

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www.hoosierfusion.com

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Northern Indiana CFUG
www.ninmug.org

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www.hungrycow.com/cfug/

Michigan, Dearborn Mmaniacs CFUG http://ciwebstudio.com/mmania/mmania.htm

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www.coldfusion.org/pages/index.cfm

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Twin Cities CFUG
www.colderfusion.com

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www.slcfug.org

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www.wycfug.org

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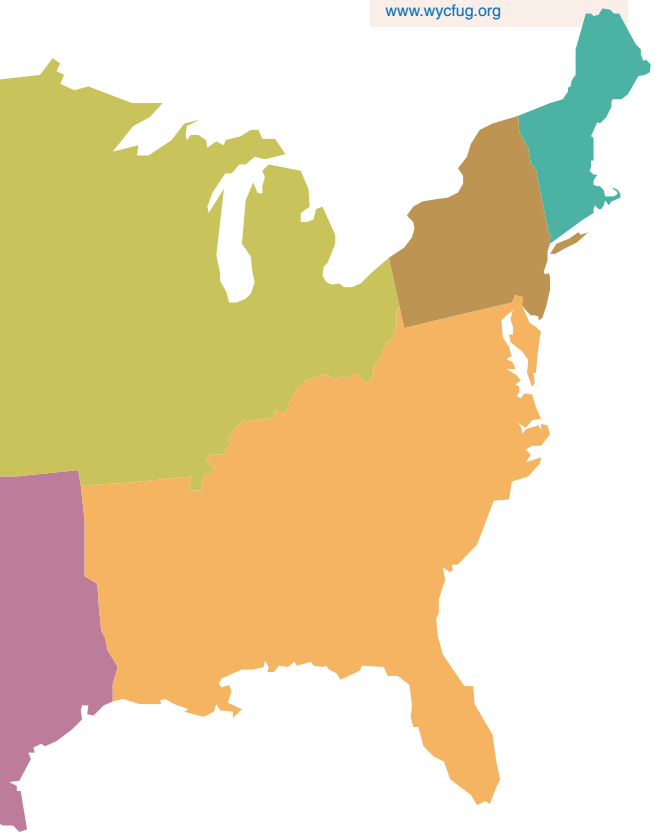

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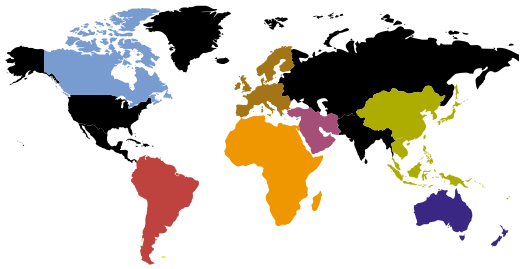
About CFUGs

ColdFusion User Groups provide a forum of support and technology to Web professionals of all levels and professions. Whether you're a designer, seasoned developer, or just starting out – ColdFusion User Groups strengthen community, increase networking, unveil the latest technology innovations, and reveal the techniques that turn novices into experts, and experts into gurus.



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Macromedia Introduces Macromedia Flex Product Strategy

(*Macromedia MAX 2003 – Salt Lake City – November 17, 2003*) – At the MAX conference, Macromedia unveiled Macromedia Flex, a presentation server and application framework that enables enterprise developers to deliver rich Internet applications using existing tools, design patterns, and infrastructure. Flex expands the Macromedia MX product family to address the requirements of enterprise IT departments seeking to deliver end-user experiences that combine the responsiveness and richness of desktop software with the broad reach of the Web. Previously code-named "Royale," Flex offers a standards-based, declarative programming methodology and server runtime services for delivering rich, intelligent user interfaces with the ubiquitous cross-platform, cross-device Macromedia Flash client.

"Flex brings the proven effectiveness of rich Internet application development to a new community," said Norm Meyrowitz, president of products, Macromedia. "The solution builds on the expertise, tools, and standards enterprise developers already use today to deliver a whole new class of enterprise rich Internet applications."

Flex is built to meet the expectations and practical requirements of enterprise development teams, leveraging their existing tools, workflow, design patterns, and infrastructure. Flex developers define rich user interfaces using an intuitive XML-based language that the Flex server renders into intelligent client applications running in the ubiquitous Flash Player. The Flex application framework combines an elegant yet familiar programming syntax; a rich, extensible class library of building blocks for creating effective applications; and powerful runtime services for data connectivity, deployment, and experience management. The initial Flex release will run on top of leading J2EE application servers, and a .NET version is planned for future releases. Consistent with Macromedia's ongoing commitment to standards, Flex is based on widely adopted, published standards such as XML, ECMAScript, SOAP Web services, and the Macromedia Flash (SWF) file format.

"An increasing number of enterprises are growing frustrated with the limitations of their current Web applications," said Mark Driver, Gartner analyst. "Rich Internet applications overcome the challenges by delivering great user experiences in a ubiquitous manner."

"Flex is a compelling evolution of the rich Internet application development offerings from Macromedia," said Chris Rogers, lead programmer analyst/architect, e-learning team, Boeing. "Our team has already had great success building rich user interface applications with Flash MX Professional 2004 and it's clear that the powerful Flex framework, programming model, and class libraries will have an even deeper impact on the technology landscape utilized by my team."

Macromedia Flex is expected to ship in the first half of 2004. The Flex server will be licensed as an enterprise server software product. Free licenses are planned for evaluation and single user workstation development. The Flex beta program is now accepting applications. For more information about Flex and the beta program, visit www.macromedia.com/go/flex/.

Macromedia Flash Update Available

(*San Francisco*) – Macromedia has announced the availability of an update for Macromedia, Flash MX 2004, and Flash MX Professional 2004 that includes performance and stability improvements as well as expanded documentation. The Flash MX 2004 7.0.1 updater is available at www.macromedia.com/go/updates/.

New, updated trial versions of Flash MX 2004 and Flash MX Professional 2004 are also available for download, and customers with previously expired trial versions will be able to try the new versions with a special serial number available at www.macromedia.com/go/tryfmx2004/.

Macromedia also added new resources to the Flash Developer Center that enable customers to take advantage of the breakthrough capabilities of the new products. The center is organized across a broad range of topics to quickly enable customers to find topics that match their interests, such as data integration, screens, video, Version 2 Components, and ActionScript 2.0. The Developer Center is available at www.macromedia.com/devnet/mx/flash.

Macromedia to Join Ecma Internatonal

(*Macromedia MAX 2003 – Salt Lake City*) – Also at MAX, Macromedia announced that it has formally applied for membership in Ecma International, an industry association dedicated to the standardization of information and communication technology, which developed and maintains the key standard ECMAScript (ECMA-262 and ISO/IEC 16262) – widely known through implementations such as Netscape JavaScript, Microsoft JScript, and Macromedia ActionScript. ActionScript is used as the procedural scripting language for Macromedia Flash and Macromedia Flex.

"As the adoption of rich Internet applications delivered with Flash continues to accelerate, ensuring developers can use the standards with which they are fluent becomes even more of a necessity," said David Mendels, senior vice president, Macromedia. "We look forward to working with Ecma International on this important standard."

By joining Ecma International, Macromedia will take a key role in the ongoing development of the ECMAScript standard in the organization's programming language technical committee (TC39). The goal of TC39 is to maintain a single leading standard for scripting that can be used for as many competing implementations as possible, and makes "forking" unnecessary.

"Standards have become business critical for any company building Web development and deployment technologies," said Jan W. van den Beld, secretary general, Ecma International. "Macromedia has clearly shown its commitment to open standards over the years and they are a welcome addition to ensuring the continued flexibility and power of ECMAScript."

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