

MX

developer's journal

THE LEADING MAGAZINE FOR
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volume 3 issue 10 2005 www.mxdj.com

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MAX is Angela Buraglia.

Angela Buraglia is a web developer and work-from-home mom who somehow finds time to co-author technical books, including her latest **Dreamweaver MX 2004 Killer Tips**. She is one of thousands of leading designers and developers that will gather at MAX 2005 this October to learn new skills, explore emerging technologies, share techniques with peers, and put exciting new ideas in motion.

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MAX

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12 Need for Speed?
*How to increase the frame rate
of your Flash movies*
by **guy watson**



24 Flex 2 Unleashed
*Ushering in a new
generation of RIAs*
by **david wadhvani**



33 The Fab 4
*Best articles of the
past year*

7 'RIA 2.0'
Begins
Right
Here
by **jeremy geelan**

8 Blog
The MX Blogosphere
by **mxdj newsdesk**

50 vanguard
Flash TV
by **sys-con.tv**

 **22** Using Flash for Digital Right
Managemnet
Tips and tricks
by **kevin airgid**

 **30** It's Time to Flex My Zorn
Flex Builder 2
by **scott barnes**

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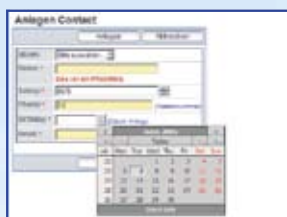
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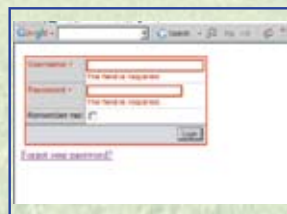
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'RIA 2.0' Begins Right Here

by jeremy geelan

A week is a long time in politics," they always say; but a week in the world of technology is – on occasion – longer than anyone ever imagined. This year's MAX, for example, where many of you will have picked up this month's issue, may seem to rush by – with its sure-to-be-packed sessions by MXDJ and ColdFusion Developer's Journal regulars like Ray Camden, Alexandru Costin, Ben Forta, Simon Horwith, and Stephanie Sullivan, in addition to a whole host of other MX stars.

However, most weeks in the Web world recently don't seem to fly by at all as there's just so incredibly much to digest.

In the week before this editorial went to press, for example, we had a welter of big announcements, from the possible assault on Microsoft's desktop monopoly by Google and Sun (yay!) to the release of the game-changing Flex 2 product line from Macromedia (double yay!). We had Weblogs, Inc., the blog company founded by Jason Calacanis and Brian Alvey, being scooped up by AOL for \$25 million, and before that News Corp. completing its \$580 million purchase of Intermix Media Inc., operator of the social network site MySpace.com.

The Weblogs acquisition, in particular, suggests that the big players are realizing what the rest of us have understood now for a while: "long tail" of the Internet – the specialty sites that attract small but devoted followings – are going to be an ever-increasing part of all our futures Web-wide.

In addition to bringing you the inside skinny on Flex 2, direct from David Wadhvani, who tells us how Flex Builder 2 and Flex Framework 2 builds on the

foundation provided by Flash Player 8.5 and ActionScript 3.0 and encourages MXDJ readers to download the public alpha and get involved – we are following up last month's well-received "Voices of the Community" feature by bringing you a selection of some of the best-received articles in 2005.

We're also delighted to be showcasing Guy Watson's "Need for Speed" feature article, in which he shows how to increase the frame rates of your Flash movies. As befits his moniker ("FlashGuru"), Guy is one of the high-energy new members of the expanded, widened, and deepened team behind MXDJ as we move toward the first "post-acquisition" issue next month, assuming everything closes this month as expected. Which it will.

As Scott Barnes, another new member of our expanded editorial board, reminds us, there is a new breed of developers who, so long as they are ready to learn the new world of ActionScript 3.0, will surely in future be given the title "User Experience Developer." Because Rich Internet Applications moved this month unmistakably from 1.0 toward 2.0, this October issue of MXDJ is dedicated to those hundreds and thousands of intrepid co-travelers in the great technology journey that Macromedia and Adobe tools between them make possible.

With the merger, a renewed wave of products and innovations will sweep over the world in 2006. We shall as always be there to showcase and analyze them. As Winston Churchill once so memorably expressed it: "This is not the end. It is not even the beginning of the end. But it is, perhaps, the end of the beginning."

See you in November! ☺

Jeremy Geelan is group publisher of SYS-CON Media, and is responsible for the new titles and online technology portals for the firm. He regularly represents SYS-CON at conferences and trade shows, speaking to technology audiences both in North America and overseas. jeremy@sys-con.com



The MX Blogosphere

Taking a stroll around the MX world
by mxdj newsdesk

Blog Topic: Studio 8

Are You Eligible for a Free Studio Upgrade?

By Stephanie Sullivan

from <http://www.communitymx.com/blog/>

I'm sure most everyone wants the new Studio 8. It rocks! But maybe you just recently broke down and purchased Studio MX 2004 (or any of the products contained therein) and you're just not ready to fork over more cash just yet. Well -- maybe you don't have to. If you purchased on or after July 8th, make sure to read Macromedia's page with the upgrade rules (http://www.macromedia.com/cfusion/knowledgebase/index.cfm?id=tn_15313). You might be pleasantly surprised!

Also, don't forget that if you own Dreamweaver, Fireworks or Flash, you can upgrade and get the whole Studio 8 package for the normal studio upgrade price (\$399USD). That's quite a generous deal. Not sure you want to upgrade? Take the 30-day test drive -- you may become addicted like I did and not be able to return to your previous versions. (BTW, I make no money whether you upgrade or not. I just love the stuff. ;))

Blog Topic: Flex

Switching Stylesheets on the Fly

By Manish Jethani

from <http://www.livejournal.com/users/mannu/>

One of the features I envy HTML for is the ability to switch CSS stylesheets at runtime. Doesn't matter how often it's used or if it even works reliably in most web browsers — it's just very cool from a developer's perspective.

I've often wondered why we don't

have support for runtime loading of stylesheets in Flex. It should be safe to assume that it didn't make it into the 20% of features for 80% of our customers.

So, we don't parse the CSS file on the client; instead, we parse it on the server and convert it to our own internal ActionScript representation, which is then loaded in the client at runtime. It's obviously much faster to parse CSS on the server than on the client (but wait for the next version of the Player and I might be wrong).

The reason I stressed on "runtime" in the previous paragraph is that I have a solution that I stumbled upon in a eureka moment while taking a walk and thinking about the compile-time vs. runtime issue. No, it does not involve writing a CSS parser in ActionScript (though I'd love to do that some day). You might be surprised at how simple it is to implement runtime switching of stylesheets once you know the internals of Flex's CSS implementation.

Without further ado, here's the trick: Load the multiple CSS files into multiple Flex applications, then load the applications into a Loader component within the main application, and then just point the global styles object of the main application to that of the sub-application (containing the new CSS rules).

Umm... that was English. In ActionScript it means you write a faceless component like the following (or just use mine):

```
import mx.controls.Loader;
import mx.core.MXMLObject;
import mx.utils.Delegate;
```

```
class RuntimeStyle implements
MXMLObject
{
    private var _document:Object;
    private var loader:Loader;

    public function
initialized(document:Object, id:
String):Void
    {
        _document = document;
    }

    private var _source:String;

    public function get source():String
    {
        return _source;
    }

    public function set source(value:
String):Void
    {
        if (_source != value)
        {
            _source = value;

            if (loader == undefined)
            {
                loader = Loader(_document.
createClassObject(Loader,
"runtimeStyleLoader",
21983));
                loader.width = loader.height
= 0;
                loader.addEventListener("com
plete",
                    Delegate.create(this,
loader_complete));
            }

            loader.source = _source +
```



```

".swf";
    }
}

private function loader_
complete(event:Object):Void
{
    _global.styles = Loader(event.target).content._global.styles;
    _document.styleName = _document.styleName == "!" ? "@" : "!";
}
}

```

What's happening here? Let's use it in the Flex Store sample (yes) and then I'll explain. Once you've saved the above code into a RuntimeStyle.as file, insert the following code snippet into your flexstore.mxml.

```

<local:RuntimeStyle xmlns:local="*"
    source="{stylesWrappers.selectedItem.source}" />
<mx:Model id="alternateStyles"
    source="alternateStyles.xml" />
<mx:ComboBox id="stylesWrappers"
    dataProvider="{alternateStyles.stylesheet}"
    labelField="name" selectedIndex="1" />

```

Here's what the alertnateStyles.xml file looks like:

```

<?xml version="1.0"?>
<styles>
    <stylesheet>
        <name>Autumn</name>
        <source>/samples/flexstore/css/autumn.mxml</source>
    </stylesheet>
    <stylesheet>
        <name>Club Orange</name>
        <source>/samples/flexstore/css/cluborange.mxml</source>
    </stylesheet>
    <stylesheet>
        <name>HTML Classic</name>
        ...
    </stylesheet>

```

It contains links to the 5 themes: Autumn, Club Orange, HTML Classic, Industrial, and Institutional. But really these files don't exist in the css directory, so they have to be created. Here's the autumn.mxml file — others should be similar:

```

<?xml version="1.0"?>
<mx:Application xmlns:mx="http://www.macromedia.com/2003/mxml">
    <mx:Style source="autumn.css" />
</mx:Application>

```

When you run Flex Store and select "Autumn" from the dropdown... it works!

Then try adding some products to your shopping cart and then switching the stylesheet to, say, "Club Orange." It works!

And how it works? Figuring that out by looking at the code should be a fun 2-minute exercise. If you have any questions, just leave a comment and I'll be happy to respond.

Forward compatibility note: This hack is almost guaranteed not to work in Flex 2.0. I'll try to ensure there's some equivalent, but no promises!

Blog Topic: Flash Lite

Flash Lite Application Contest

By Macromedia Mobile User Group of Boston from <http://www.flashmobilegroup.org/>

The Macromedia Mobile User Group of Boston is organizing the first Flash Lite 1.1 Application Contest. The prize for the winner is a new copy of Macromedia Studio 8.

The contest is open to anyone who is interested in developing mobile applications using Flash Lite 1.1 technology. Use your imagination and experience to create your application. We want to focus on applications and not games. The application should be localized in english, but if you want to do it in another language feel free to do so. Please include any release note and instructions.

Valid Flash Lite applications need to respect the following guidelines:

- Must run on Series 60 Mobile Phones (Applications will be tested on real phones)
- Applications must be new and not publicly available before September 25th

The applications will be judged using the following criteria:

- Usability
- User Experience
- Performance

- Uniqueness
- Functionality

The deadline for submitting applications is 11 PM of November 25th 2005, Boston time.

To submit your Flash Lite 1.1 application please send your content in ZIP format to the MMobileUG email: flashmobilegroup at gmail dot com. Also include a readme file with instructions and anything you might think is relevant. Is possible submit more than one application. Winner announcement:

The winner will be announced the first week of December.

You as developer retain all the rights of your application and you are the sole responsible for the application.

Blog Topic: ColdFusion

ColdFusion/J2EE and Flex

By Mike Britton from <http://www.mikebritton.com>

First off, let me say that I love ColdFusion. It's great and getting better. Just so you know, my gripes have nothing to do with ColdFusion as a language, just how it's set up and how soul-crushingly difficult it can be to set up for anyone who hasn't done it ten times before.

In order to ramp up for future Flex development work, one of the challenges is learning how to configure a system with J2EE ColdFusion. I realize there's a standalone development version of Flex that installs with JRun, but why delay the inevitable; if you want to use Flex with ColdFusion you need to know how to integrate it into an existing CF installation and if not, you need to understand how to change the existing installation to work with Flex.

That said, now that I've tried setting up Oracle 9i with CF7 J2EE, I have to say it's still one of the worst aspects of dealing with ColdFusion. I was able to get Apache/PHP/Oracle working in ten minutes. With CF7/JRun it's a monumental task requiring hours to get working.

There. I will return to this thread and explain my problems and their solutions once I understand them fully. For right now I'll just say that while ColdFusion is a good language to work with, very simple etc, the installation and configuration side could use some serious attention.



Blog Topic: Flash video

Google Video Switches to Flash Video!

By Peldi Guilizsoni from www.peldi.com/blog/

This is pretty huge, check out Google Video Beta: <http://video.google.com>

And look at the Google Video Help Page (http://video.google.com/video_help.html): In order to playback video on Google Video, you simply need to have Macromedia Flash Player installed on your computer. Once installed, you will be able to playback the video from within your browser.

It looks like they are doing progressive download, I wonder if they'll use FMS for longer videos in the future.

Blog Topic: Flash

Database Abstraction Code Generators

By Doug Hughes from <http://www.doug-hughes.net>

Recently there's been a lot of interest in code generators which create database abstraction layers. All of the code generators I've seen require that you run a separate program to generate DAOs, Gateways, TOs and beans. I'm currently finishing up a project where we used one.

Before I get into my experiences with database abstraction generators, let's do a quick review of how they work. Simply put, databases contain metadata which describe their structure. By reading this metadata, you can gain enough information to generate database abstractions.

The typical code generator will be an executable which you point at a table or a database and run. The generator then creates all your needed Data Access objects, Gateways, Transfer Objects and sometimes even Beans.

I've been using a code generator on my most recent project. There are some things I love about it and some things I don't like so much. But, in the end, after two months of using it, I can't imagine life without it.

The project I've been working on has 38 tables. This is not a large number of tables. However, if we had manually written each of the four data-related objects we would have written 152 distinct objects, all of which are almost identical.

Furthermore, with this three person team we had less than eight weeks to build

the application. That means that between all of us, working 60 hours weeks we would have a total of 1440 programming hours. However, if you consider the amount of time spent in meetings, debugging, QAing, fixing machine crashes, taking care of sick babies and wives, etc, you realize that you're lucky if programmers program 50% of the time. At that rate you have a measly 720 hours in which all of your development must be done. This means that, if each of those 152 database abstraction files took an average of one hour to write, you would be spending more than 20% of your entire development time writing your database abstraction.

Let me put it another way: the code generator we used was probably the most significant reason we're going to be hitting our deadline. (Actually, we hit it a week early.)

How it works is that you open up the code generator in a web browser and select the types of objects you wanted to generate for a particular table (or all tables) in your database. You provide the path to the directory where generated files should be written and click the generate button. The generator grinds away for a few seconds. When done, you receive a report as to what it did.

There is, of course a problem with this. First off, what happens if you need to customize the objects? There's no way (that I know of) that a code generator could generate all the queries you might need. So, if you customize the objects you would run the risk of losing your customizations the next time you regenerate your code.

We solved this problem by customizing the code generator to generate objects into a "base" directory and to also (if they don't already exist) generate empty shells of "custom" objects which extend objects in the base directory. This allows us to safely edit the custom shells without worry that they might be overwritten.

This particular code generator has a few shortcomings: it was brought into this project by one of the developers we contracted. They own the IP related to it. Also, it's closed source and is not available to the public. Another thing that I don't like is that it creates difficult to read code.

But still, the code generator is terrific, but why do I need to run it each

time the database changes? Why can't I just have a simple API which does all the work behind the scenes? If I know what I want and where it is, and it (the database) knows how to describe itself, why can't an API just generate objects on the fly as needed?

I suppose there's no reason it can't. Hence: Reaction For ColdFusion - An API for Inline Dynamic Database Abstraction.

Watch my blog for more on this in a little bit.

Blog Topic: Microsoft to Battle Flash?

"Just Like FrontPage...trash"

I have a feeling Microsoft's software will be much like FrontPage in the world of web design. All the pros will use Adobe products (a.k.a. Flash / AfterEffects) and all the hacks will use Microsoft. Thus it will be even easier what resumes to pitch out for interactive companies. Right now at all the big agencies if you have "FrontPage" as the only editor listed on your resume... it's off to the trash.

Kevin Airgid

<http://blog.airgid.com/>

Microsoft Sparkle

Much of the current online discussion seems to be consumed with determining whether Sparkle will "Kill flash" or whether the two are even competitors, but I'm not personally very interested in that debate. What interests me more is that another company is finally contributing to the exploration of rich application design and development. ...I'm really excited to see new metaphors for solving age-old rich content problems.

Whether you love or hate Microsoft, if you have any interest in rich content or application development, Sparkle is definitely worth looking at.

Colin Moock

<http://www.moock.org/blog/>

It's pretty apparent to me: we as Flash/Flex Developers are most definitely a "significant player" if Microsoft makes an application to respond to Flash, but only a framework to respond to AJAX.

Jesse Warden

<http://www.jessewarden.com/>



M E T A L I Q

Metaliq Components (*mCOM*)

Creating data-driven interfaces for online applications can be complicated and time-consuming. Developers and designers worldwide need an extensible solution that saves time and headaches. There needs to be a stable, innovative approach to solving common UI problems, such as navigation, forms, filtering and sorting immense amounts of data.

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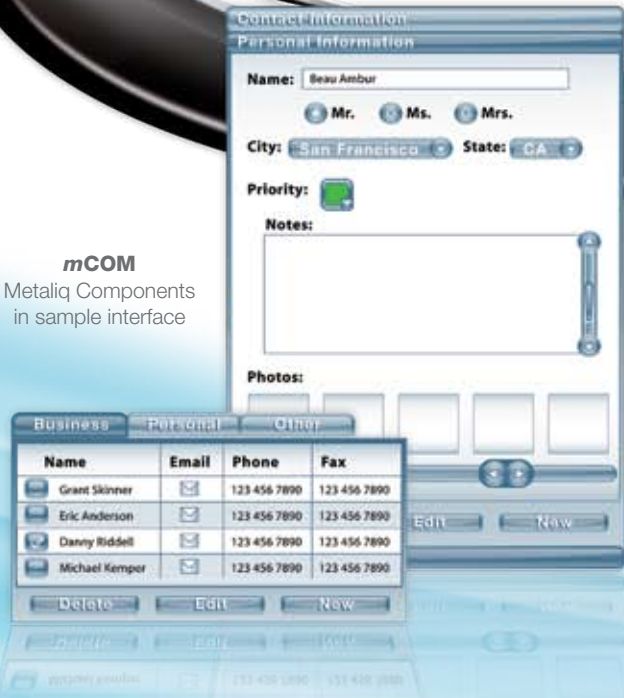
mCOM allow you to quickly create stable, lightweight data-driven interfaces that are extensible by designers and developers alike, both through extending classes and a simpler visual skinning process. *mCOM* include a fully implemented advanced focus manager that works seamlessly with all of our components, and allows for easy creation of tab groups. For anyone familiar with Flash components, there is no learning curve. In most cases, Flash components can be easily updated to *mCOM* with little or no modifications to your project.

Component List:

- Accordion
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- Color Pickers
- Combo Box
- Data Grid
- Field Set
- List
- Menu
- Numeric Stepper
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- Slider
- Tab Box
- Text Area
- Text Input
- And more...



mCOM
Metaliq Components
in sample interface



Key Features:

- Up to 75% smaller file size
- Faster download
- Lower CPU usage
- Simplified customization
- Flash Player 6, 7 and 8 compatible
- Reusable
- Easy to integrate

Integrated Technology:

- Effective, understandable code architecture
- Advanced tabbing management
- Improved event model
- Written in ActionScript 2.0
- Advanced focus manager

Metaliq is a solutions company, specializing in industrial strength creative, code and consulting. Identifying, creating, and implementing innovative solutions that are usable, intuitive and appealing. Metaliq offers a suite of solutions for video (*mVID*), dashboards (*mDAT*), applications (*mCAP*) and components (*mCOM*). Contact us by phone at 415.642.3332, email us at mCOM@metaliq.com or visit us at metaliq.com/mCOM.





NEED FOR SPEED?

How to increase the frame rates
of your Flash movies

by guy watson

flash in its essence began as a tool for creating vector animations on the web. The Flash Player was designed specifically as a lightweight animation viewer to display those moving vector objects which are in their simplest form, mathematical equations that describe complex shapes made up of points, lines, curves and fills. However, nowadays developers and designers are using Flash to do a lot more than just animation, today we see Flash being used for everything from interactive banner ads to games and large applications with complex user interfaces. We are now pushing Flash to its limits and our frame rates are starting to suffer as we continue to develop content that is more application centric.



The Flash Player has had obvious performance limitations for some time now; the vector renderer inside the player generally coughs and splutters when it attempts to play Flash Movies that contain large amounts of objects on the stage. This is because the player is not optimized to deal with large amounts of static content, by design, each frame all the vector objects on the stage have to be updated and redrawn regardless of whether they have changed, which is an intensive and unnecessary process.

In this release of the Flash Player, Macromedia have addressed these visual performance issues by making various improvements and optimizations to the renderer and adding various new features which developers can use to take advantage of these significant changes.

This article will show you how to effectively utilize these new performance related features to increase the frame rates of your Flash Movies.

Bitmap Caching

One of the most significant additions to the player in this release has to be the new Bitmap Caching capabilities. This feature gives developers that are expe-

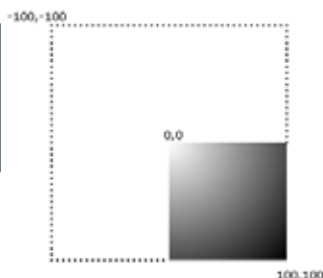
figure 1



riencing poor frame rates the power to greatly increase the speed at which large amounts of objects are updated and drawn onto the stage by the renderer.

The renderer is a very important part of the Flash Player; it is responsible for everything that you see when you view a Flash Movie. It draws all the vector and bitmap data onto the stage. Every frame, the renderer has to update the stage and

figure 2



the various objects it contains to reflect any changes since the last frame using ActionScript and/or animation. This process can become quite intensive when a large amount of updating has to be done on any given frame. Using this feature gives the developer some control over the amount of work that the renderer has to perform each frame. The less work you give the renderer, the faster and smoother your Flash Movie will run.

So How Does It Work?

When you turn on Bitmap Caching for any given movie clip, the player converts the contents of the movie clip into a bitmap which it generates and then stores in memory alongside the original vector data equivalent. The renderer then displays this bitmap in place of the vector data by copying the image from memory onto the stage. This process essentially makes the renderer's life easier, because it doesn't have to update the movie clip each frame, instead it only has to draw the bitmap it generated once and from then on it simply copies the bitmap from memory onto the stage, unless of course you change the movie clip or its contents, which will regenerate the bitmap.

There will be little or no visual difference when a movie clip has bitmap caching turned on. You may notice a very slight difference because the vector data is snapped to the nearest whole pixel when the bitmap is generated. Bitmap Caching also works perfectly well with nested movie clips (movie clips inside movie clips). To put it in simple terms, by turning on Bitmap Caching for a movie clip, you are essentially telling the Flash Player: "Hey Renderer, I'll make your life a little easier. Freeze this movie clip and display it as a bitmap instead because this movie clip or its contents are not going to change very often, if at all. They are static."

Turning Bitmap Caching On and Off

Bitmap Caching comes in the form of an additional movie clip property

that can be switched on or off at both Authortime using the Property Inspector and at runtime using ActionScript, on a per movie clip basis.

Using the Authoring Environment

You can turn Bitmap Caching on or off for any movie clip in the authoring environment using the Property Inspector. Bitmap Caching is disabled for all movie clips by default.

To turn Bitmap Caching on select the desired movie clip instance on the stage by clicking on it. Then open the Property Inspector from the Window menu. (Window > Properties > Properties) or use the Keyboard Shortcut CTRL + F3

In the bottom right hand corner of the Properties Inspector under the Blend field, you will see an option called Use Runtime Bitmap Caching. Click this checkbox to turn Bitmap Caching on for the selected movie clip. Bitmap Caching is turned off by default for all movie clips.

Using ActionScript

Bitmap Caching can also be turned on and off at runtime using actionscript. Every movie clip object now has a new actionscript property called `cacheAsBitmap`. To turn Bitmap Caching ON for a movie clip with actionscript you simply need to set the value of its `cacheAsBitmap` property to true like so: `someMovieClip.cacheAsBitmap=true;` //Turn Bitmap Caching ON Similarly, to turn Bitmap Caching OFF for a movie clip using actionscript you simple need to set the value of its `cacheAsBitmap` property to false as follows: `someMovieClip.cacheAsBitmap=false;` //Turn Bitmap Caching OFF You can also determine if a movie clip has Bitmap Caching turned on, by retrieving the value of the `cacheAsBitmap` property: `isCached=someMovieClip.cacheAsBitmap;`

When Should I Use Bitmap Caching?

If used correctly, Bitmap Caching can dramatically reduce the amount of updating instructions that the renderer has to process every frame and thus your movies should in practice run a lot quicker and smoother. However in certain circumstances Bitmap Caching could have a detrimental effect on the performance of your

“The Flash Player has had obvious performance limitations for some time now: the vector renderer inside the player generally coughs and splutters when it attempts to play Flash Movies that contain large amounts of objects on the stage”

flash movie, therefore you should choose the movie clips that you cache wisely.

Bitmap Caching works best for movie clips whose visual appearance doesn't change often or at all. That is because when a cached movie clip or its contents change, the area or region of vector data that changed is regenerated and then updated into the bitmap that is held in memory and the renderer displays the new bitmap. Bitmap Caching also works well for movie clips that contain complex vector data (i.e. shapes with lots of curves or gradient fills) as it is quicker for the renderer to copy a bitmap from memory onto the stage than draw all those vectors to the stage.

Every time you rotate, scale or change the alpha of a cached movie clip, the whole bitmap has to be regenerated. So, turning on bitmap caching for a movie clip that is constantly rotating, changing in size or contains an animation doesn't make much sense because every frame the renderer has to update the bitmap to reflect the new appearance of the movie clip as well as redraw it to the stage, which is added overhead.

The whole idea of this feature is to reduce the amount of updates that the renderer has to perform each frame, turning it on in such situations doesn't reduce the number of updates that the renderer has to perform. On the other hand it would be very beneficial for you to turn on Bitmap Caching for all movie clips that are either static or move around, but don't change visually. It is perfectly fine to move a cached movie clip around the stage, either with ActionScript or with timeline animation because moving it around won't change its visual appear-

ance and therefore the cached bitmap doesn't have to be updated; the renderer will merely draw the bitmap at its new position.

Valid Usecase Scenario

Consider the following scenario: You have a large application that contains multiple Window components; each Window component contains numerous other Components. Each Window component is draggable. When the user drags one of the Windows around the application, he notices a slow down and the Window has to catch up to the mouse position, which causes jerky movement.

To fix this problem, the developer turns on Bitmap Caching for each Window component instance. Now the player only has to update the internal bitmap representation of each Window component when the visual appearance of one of the UI Components inside it changes. The rest of the time, including when the Window component is being dragged around, it simply needs to move the bitmaps around the stage, as opposed to constantly updating the stage from the vector data in each movie clip. The result is a much smoother dragging experience for the user.

When are surfaces regenerated? Changes to a movie clip that make the player regenerate the internal bitmap representation should be used sparingly; otherwise you defeat the purpose of the feature. The bitmap that is generated when you turn bitmap caching on for a movie clip will be regenerated every time you change any of the following MovieClip ActionScript properties:

- `_xscale`

- `_yscale`
- `_rotation`
- `_alpha`
- `_width`
- `_height`
- `filters`
- `blendMode`
- `opaqueBackground`
- `transform`

So, try to avoid changing any of these ActionScript properties on a regular basis.

The bitmap will also be regenerated when:

- The timeline play head changes inside the movie clip

- When the outer boundaries of the movie clip change
- When you draw something inside the movie clip with the drawing api
- When you attach an image or symbol from the library into the movie clip
- Any of the above occur within a nested movie clip (child movie clip)
- The movie's viewing window changes (i.e. The viewer Zooms in using the RightClick menu)

Memory Usage

Bitmap Caching naturally makes the Flash Player utilize more memory because for every cached movie clip the player has to store the vector data and the additional bitmap equivalent in memory. When you turn bitmap caching off for any particular movie clip, its bitmap representation is removed from memory.

You should be concerned about the amount of memory that your Flash Movie uses, because it can affect the performance of other applications that are running on the same computer as the Flash Player. The more memory the Flash



Player uses, the less memory that is available for other programs to run effectively. Computers only have so much memory available to them; this comes in the form of RAM (Random Access Memory). Most computers nowadays have at least 256MB RAM. The operating system may provide more memory as and when required in the form of Virtual Memory. The Flash Player should never use that amount of memory, but now with the various new Bitmap related features added to the player, it is possible for Flash Movies to consume large amounts of memory in a short space of time so as the developer you should endeavor to minimize memory usage.

Before we talk about the specifics of bitmap caching memory usage, a little background information might be useful. Firstly, a bitmap is made up of pixels. It can be thought of as a grid of color values, which designate a particular color for each and every pixel. Each pixel is a cell in the grid. A bitmap that is 100 pixels wide, by 100 pixels high is described by a grid of 10000 color values, one for each pixel. Each color value in a bitmap is a binary number. A binary number is made up of bit's which can either be 0 or 1. This binary number will differ in length, depending upon the color depth of the bitmap. The color depth of a bitmap determines the range of possible color values that can be used in each pixel. For example, each pixel in a 24 bit image can be one of roughly 16.8 million colors. Those colors

are formed by mixing together varying quantities of three primary colors, Red, Green and Blue. The three main colors are called Channels. Each channel can have 256 possible values (0255).

255 * 255 * 255 = 16.8 million
256 decimal is 11111111 in binary.

This binary number is 8 bits long. 8 bits is 1 byte. Therefore each channel in a color uses 1 byte. The bitmaps that are created by the Flash Player when it converts a movie clip into a surface have a 32 bit color depth. 32 bit images have four channels; Red, Green, Blue and an additional Alpha Channel. Therefore the color value for each pixel in a surface created by the Flash Player is 32 bits long, or 4 bytes.

4 * 8 = 32 bit

The bitmap that is created by the Flash Player to represent the visual state of a movie clip when you turn Bitmap Caching on will have the same dimensions (width and height) as the movie clip. A cached movie clip that is 100 pixels high and 100 pixels wide has 10000 pixels.

100 * 100 = 10000 pixels

Each of those pixels will be 32 bits or 4 bytes. Therefore it will utilize a further 40,000 bytes of memory.

10000 * 4 = 40,000 bytes

There are 1024 bytes in 1 kilobyte (KB). So, 40,000 bytes can also be said to be roughly 40 kilobytes.

Size Limits

Because of the possibility of this feature using excessive amounts of memory, Bitmap Caching will not work, if the dimensions of a cached movie clip are larger, or become larger, than 2880 pixels in either width or height. 2880 is a restriction Macromedia has put in place for all bitmaps in the player, to try and minimize excessive memory use. That is because a 2880 * 2880 movie clip that is cached will use up roughly 32MB of memory. Four

of these cached movie clips with those same dimensions could potentially fill up a computer's memory and crash the machine.

Filters

It is worth noting here that if a filter effect is applied to a movie clip either in the Authoring Environment or using actionscript, then Bitmap Caching is automatically turned on and the cacheAsBitmap property will always return true, regardless of whether you turned Bitmap Caching off in the Authoring Environment or with ActionScript. To prove this, create a new movie clip, give it an instance name of scrollingMovieclip and add the following code to the first frame of the main timeline:

```
var blur=new flash.filters.  
BlurFilter(3,3) //gaussian blur  
scrollingMovieclip.filters=[blur]  
trace(scrollingMovieclip.cacheAsBit-  
map) //outputs 'true'
```

When all of the filters effects are removed from a movie clip the cacheAsBitmap property will return to its previous state. So for example, if Bitmap Caching is turned off for a movie clip but it has filters applied to it, then removing all of those filters from the movie clip will turn Bitmap Caching off again:

```
scrollingMovieClip.filters=undefined  
trace(scrollingMovieclip.cacheAsBit-  
map) //outputs 'false'
```

Loading External Content

Also when you load an external Flash Movie or image into a cached movie clip, using ActionScript, bitmap caching is turned off. This is because a movie clip is totally reset, all variables inside it are deleted, and all child movie clips are removed, all movie clip properties are set back to their default values.

To prove it, try the following code:

```
/*
```

This code fixes the onLoad bug, that is that anyMovieclip.onLoad event handler is deleted when loading external content into a movieclip

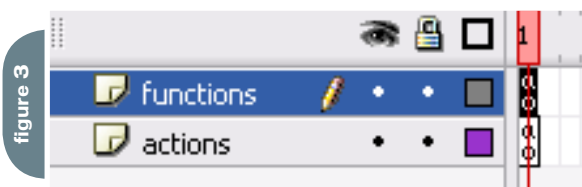


figure 3

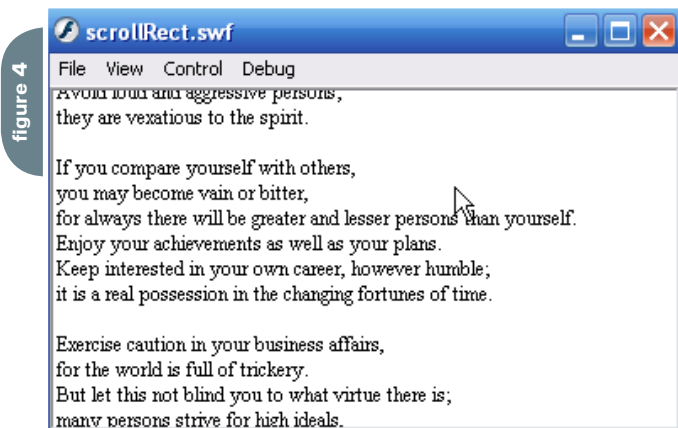


figure 4

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```

*/
_global.s_onLoad=function(f)
{
if(onLoadManager == undefined)
{
_global.onLoadManager={
}
onLoadManager[this] = f
}
_global.g_onLoad=function()
{
return onLoadManager[this]
}
MovieClip.prototype.
addProperty('onLoad', g_onLoad, s_
onLoad)
this.createEmptyMovieClip("scrollingMo
vieclip",this.getNextHighestDepth())
scrollingMovieclip.onLoad=function()
{
trace(this.cacheAsBitmap) //when the
photo is loaded, show that bitmap
caching was turned off
}
scrollingMovieclip.cacheAsBitmap=true
scrollingMovieclip.loadMovie("photo.
jpg")
}
}
circle_mc.cacheAsBitmap=true

```

Cropping and Scrolling

Scrolling large amounts of complex vector data or text was previously a very intensive task for the Flash Player, it still is. However, Macromedia has recognized this problem and has added a new feature to the latest release of the Flash Player that provides a solution to this particular problematic scenario

It is now possible for us to define a rectangular viewing window for a movie clip that basically visually crops the movie clip to a specified size and scrolls the content of the movie clip by a specified offset. The scrolling offset can then be changed to scroll the movie clip's content into view over a number of frames.

How Do I Use It?

As a fairly advanced feature, at present and for the foreseeable future, it can only be utilized through ActionScript. For this, a property has been added to all movie clips called scrollRect which we use to tell Flash to crop a movie clip and shift the position of its content.

The scrollRect property can be thought of as a very simplified equivalent of the ScrollPane component but for scrolling movie clips. That is because it allows you to show a certain part of a movie clip and move the content around inside this viewing area all by setting the value of one ActionScript property. This property is set by specifying an object that contains four properties; these four properties define the size and the scrolling offset of the movie clip's content.

They are:

- **Width** – width of the viewing rectangle
- **Height** – height of the viewing rectangle
- **X** – scrolling offset on the x-axis
- **Y** – scrolling offset on the y-axis

A scrolling offset determines the number of pixels that the contents of the movie clip should be shifted in the opposite direction. So, for example a scrolling offset of 10 on the x- axis will move the movie clip's contents minus 10 pixels (10) along the x-axis.

We can create an object that defines a viewing rectangle as follows:

```

scrollRect={x:50,y:50,width:100,height:100} //define the viewing area and scrolling offset

```

And then pass this object to the movie clip we want to scroll by setting the value of the scrollRect property:

```

scrollingMovieclip.
scrollRect=scrollRect //scroll and
crop the movie clip

```

This will basically crop the movie clip to a 100 * 100 square and the position of the movie clip's contents appears to have changed by 50 pixels along both the x and y axis. The movie clip's _width and _height will change to the cropped size of the movie clip after applying a scrollRect.

```

trace(scrollingMovieclip._width+"/>

```

Local coordinate space A movie clip is always cropped and scrolled in its local coordinate space, from the top left hand corner which is zero on both the x and y axis (0, 0). You cannot move the viewing window of the movie clip; you can only move the content of the movie clip in the opposite direction to bring it into view.

The cropping gives the same effect as having a mask that is positioned at 0,0 in the movie clip's local coordinate space. That's a hard concept to grasp, so let's take a look at an example and see what happens when we apply it to a movie clip.

Below you will see a movie clip with an instance name of gradientMc that contains a 200 * 200 square filled with a

Collision Detection

Finally, results from hittesting code using MovieClip.hitTest will not be affected by Bitmap Caching, as hittesting is still calculated based upon the vector data of a movie clip, not the generated bitmap that you actually see. To prove this create a new movie clip and draw a circle inside it, drag it onto the first frame of the main timeline and give it an instance name of circle_mc. Now add the following code to the first frame of the main timeline:

```

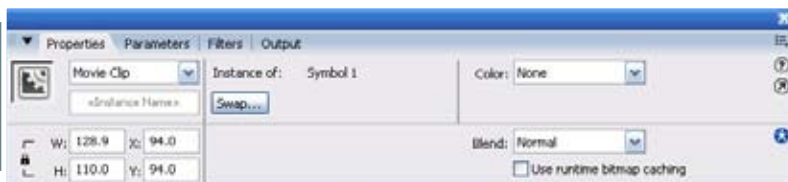
circle_mc.onMouseMove=function()
{
trace("hit: "+this.hitTest(_root._
xmouse,_root._ymouse,true))
}

```

figure 5



figure 6



gradient. That square is centered on the movie clips local original (0, 0). Therefore the squares top left hand corner in the movie clip's local coordinates starts at 100,100.

The following code defines a viewing area that is 100 * 100 in size with no scrolling offset:

```
scrollRect={x:0,y:0,width:100,height:100} //define the viewing area and no scroll offset
```

When we set the scrollRect property of this movie clip you can see below, that the movie clip has been cropped from, not around its local origin.

```
gradientMc.scrollRect=scrollRect
```

Scaling a movie clip will scale the size of the cropped area. For example, if you define the cropped area as a 100 * 100 rectangle:

```
scrollRect={x:0,y:0,width:100,height:100}
scrollingMovieclip.scrollRect=scrollRect
```

And then you scale the movie clip to twice its size:

```
scrollingMovieclip._xscale=scrollingMovieclip._yscale=200 //resize the movie clip to 200%
```

You will find that the cropped area is now actually a 200 * 200 square.

Similarly, if you rotate a movie clip that has a scrollRect property defined, the coordinate space of the scrollRect is rotated as well. Therefore, if you were to rotate a movie clip by 90 degrees and change the scrolling offset on the x-axis (left and right) by setting the scrollRect property, the movie clips content will actually scroll along the y-axis (up and down):

```
scrollingMovieclip.scrollRect={x:100,y:0,width:100,height:100}
scrollingMovieclip._rotation=90
```

Removing the cropping and scrolling Retrieving the value of a movie clip's scrollRect property actually returns a copy of its original scrollRect. It doesn't return

the original, which is a shame because it means we can't do something like this:

```
scrollingMovieclip.scrollRect.x+=10
//doesn't work
```

Instead you have to get a copy of the original scrollRect, change its properties and then reapply it:

```
var s=scrollingMovieclip.scrollRect
//store a copy of the scrollRect property
s.x+=10 //change the xaxis
scrolling offset
scrollingMovieclip.scrollRect=s //reapply with our changed copy
```

That also means that you can't simply delete the scrollRect property of a movie clip to remove it:

```
delete scrollingMovieclip.scrollRect //doesn't work
```

You have to explicitly set the scrollRect property of a movie clip to undefined to remove the cropping and scrolling:

```
scrollingMovieclip.scrollRect=undefined //remove the cropping and scrolling
```

The Rectangle Class

The Flash Player now contains a lot of new feature exposed to ActionScript that require Rectangles to be specified so Macromedia also added a new ActionScript class for us in this release that makes it really easy for developers to define and manipulate Rectangles. This class is therefore conveniently named the Rectangle class and we can use it to specify the scrollRect of a movie clip as opposed to using a simple object, like this:

```
squareMask = new flash.geom.Rectangle(0,0,100,100) //define the viewing area and scroll offset
scrollingMovieclip.scrollRect=squareMask //add the square mask
```

I recommend that you use an instance of the Rectangle class to specify the scrollRect of a movie clip as opposed to a simple object, simply because it allows a

lot more control over the rectangle once you have created it.

If you are going to be creating a lot of instances of the Rectangle class in your ActionScript, then you should import the Rectangle class namespace using the import statement, it will make your life a lot easier because you wont have to constantly type the full path to the Rectangle class, which is located in the flash.geom package:

```
import flash.geom.Rectangle
squareMask = new Rectangle(0,0,100,100)
scrollingMovieclip.scrollRect=squareMask
```

The Rectangle class constructor accepts four parameters; x, y, width and height.

```
flash.geom.Rectangle(x,y,width,height)
```

The first two parameters (x and y) define the position of the top left corner. Then the last two parameters (width and height) define the actual size of the rectangle. When you use an instance of the Rectangle class to set the scrollRect property of a movie clip, the x and y parameters are used as the scrolling offsets for each axis.

Once you have created an instance of the Rectangle class, you then have yourself an object that contains more than just the four properties required of an object passed to the scrollRect property. There are numerous other properties and methods that you can use to find out about or manipulate that rectangle object, for example to move the top left hand corner of the rectangle you can use the Rectangle.offset method:

```
import flash.geom.Rectangle
squareMask = new Rectangle(0,0,100,100)
squareMask.offset(10,10)
trace(squareMask)
scrollingMovieclip.scrollRect=squareMask
```

Or to change the width of the rectangle you can just set the value of the width property:



```
import flash.geom.Rectangle
squareMask = new
Rectangle(0,0,100,100)
squareMask.width+=100 //add 100 pixels
to the width of the rectangle
scrollingMovieClip.
scrollRect=squareMask
```

Also, you can for example, find out the position of the bottom right hand corner of the rectangle using the **bottomRight** property:

```
import flash.geom.Rectangle
squareMask = new
Rectangle(0,0,100,100)
bottomRight=squareMask.bottomRight
trace(bottomRight)
```

Scrolling Large Amounts of Text

So far, I have only shown you how to use the `scrollRect` property to crop a rectangular region of a movie clip and hide the rest, however, the real power of this feature comes into play when we actually need to scroll the movie clip's content around.

I am now going to show you a fairly simple example of how to use the `scrollRect` property to scroll some text, loaded from a text file. For added effect we will add some blur to the text while it is scrolling and a little inertia, just because we can.

1. First and foremost create a new Flash Document.
2. Set the movie's width and height to something reasonable (370 * 200) works for me.
3. Rename the first and only layer on the timeline to actions.
4. Select the first frame on the actions layer and open the Actions panel (F9).
5. Add the following code:

```
import flash.geom.Rectangle
import flash.filters.BlurFilter
/*
Ensure that the Flash Movie can only
be resized along the x and yaxis
*/
Stage.addListener(this)
Stage.align="TL"
Stage.scaleMode="noScale"
blur=new BlurFilter(0,0,3) //create
```

```
a blur filter and store a reference
to it
sRect=new Rectangle(0,0,w,h) //create
a rectangle with no scrolling offset
and store a reference to it
onResize() //resize the textfield and
scrollRect to the size of the Stage
initialize() //create a textfield
inside of a movie clip
*/
load the contents of the specified
text file into the textfield
*/
loadTextFile("desiderata.txt")
```

6. Create a new text file and put some content inside it, the more the merrier.
7. Save the text file in a new folder and remember the text files name.
8. Select the first frame of the actions layer again.
9. Open the Actions panel, if it is not already open. (F9).
10. Change the last line of code that looks like this:

```
loadTextFile("desiderata.txt")
```

11. Replace "desiderata.txt" with the name of your text file.
12. Now add a new layer above the layer named actions.
13. Rename the new layer to functions.
14. Select the first frame of the functions layer.
15. Open the Actions panel, if it is not already open. (F9).
16. Add the following code:

```
import mx.utils.Delegate
//create a textfield inside a movie
clip
function initialize()
{
//create a container movie clip
because you cant use scrollRect on a
textfield
c=this.createEmptyMovieClip("container
_mc",this.getNextHighestDepth())
//create a textfield inside the con-
tainer movieclip
c.createTextField("contents_txt",c.
getNextHighestDepth(),0,0,w,h)
//store a short reference to the text-
field
tf=c.contents_txt
//set the initial textfield properties
with(tf)
```

```
{
multiline=true
wordWrap=true
selectable=false
html=true
condenseWhite=true
autoSize=true
}
//specify the default scrollRect
c.scrollRect=sRect
}
//called each frame to scroll the text
into view with some inertia
function scroll()
{
//how far away is the current scroll
away from the target scroll
var diff=Math.round(tysRect.
y)
//if the difference is negative, make
it positive
if(diff<1)
diff*=1
//if the difference is too big, limit
it to 10
if(diff>10) diff=10
//update the blur on the yaxis
blur.blurY=diff
//add a percentage of the distance we
need to go to the yaxis
scroll.offset
sRect.y+=(tysRect.
y)/8
//if the text has scrolled to where it
is supposed to be, stop calling this
function
if(Math.round(tysRect.
y) == 0) delete c.onEnterFrame
//reapply
the changed scrollRect and blur filter
c.scrollRect=sRect
c.filters=[blur]
}
//loads a textfiles contents into the
textfield
function loadTextFile(url)
{
//show a message while we wait for the
file to load
tf.htmlText="Loading... please wait"
var txt=new LoadVars()
//hotwire
the onData event to set the contents
of the textfield
txt.onData=function(d)
{
tf.htmlText=d
}
}
```

```

//load the specified file
txt.load(url)
}
//called when the mouse moves
function onMouseMove()
{
//set the target position
ty=(this._ymouse)/200*(tf._height)

//call the 'scroll' function every
frame
c.onEnterFrame=Delegate.
create(this,scroll)
}
//called when the Stage resizes
function onResize()
{
//resize the textfield and the
scrollRect
tf._width=sRect.width=Stage.width
tf._height=sRect.height=Stage.
height
w=Stage.width
h=Stage.height
}

```

17. Now save the Flash Document (CTRL + S) in the same directory as the text file you created. 18. Test your Flash Movie (CTRL + ENTER). You should see a text field that is the same size as the Stage, containing the text from your text file. When you move your mouse up, the text scrolls down, when you move your mouse down, the text scrolls up. Try resizing the window, the text field should resize.

Even Faster Scrolling with Bitmap Caching

Although this feature can be used independently of Bitmap Caching, it is necessary to turn on Bitmap Caching for movie clips that have a scrollRect property defined, to achieve maximum performance when scrolling. This is because it is much faster for the player to shift around pixels in the bitmap equivalent of the movie clip that was generated by Bitmap Caching, than it is to copy around the vector data of a movie clip.

Using scrollRect to overcome size limits Previously I mentioned that bitmaps inside the player can-

not be large than 2880 pixels in either width or height. This can become a problem when you want to apply a filter to a movie clip that is larger than these dimensions. When you apply a filter to a movie clip, Bitmap Caching is turned on for that movie clip so that a bitmap representation of it is generated internally. The filter is then applied to the bitmap representation that is generated.

Let's say for example that you have one large movie clip that is 5000 pixels in width and you want to scroll it across the background of your Flash Movie with a blur filter applied. Unfortunately you cannot simply apply the filter to the movie clip because a bitmap cannot be generated internally to represent the movie clip, due to the fact that its dimensions are larger than the size limits. However you can work around this problem using the scrollRect property. I think it would be safe to say that your actual Flash Movie will not be 2880 pixels or more in width. So, all you need to do is set the scrollRect property of the scrolling movie clip to crop it to the size of the Flash Movie which makes the visual size of the movie clip smaller than the maximum size limit. Filters are applied last, so the filters you specified either in the authoring environment or using ActionScript will be applied to the movie clip's cropped state:

```

largeMovieclip.scrollRect=new
flash.geom.Rectangle(0,0,Stage.
width,Stage.height)
blur=new flash.filters.
BlurFilter(3,0,3) // a Gaussian
blur on the x axis
largeMovieclip.filters=[blur]

```

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Using Flash for Digital Right Management

It's not foolproof, but it can help deter folks from 'ripping' your content
by Kevin Airgid

Flash and Digital Rights Management is a topic not often discussed. In fact I tried to do a little research on the topic for this article and could turn up very little. I must start this article off by discussing why I wanted to get digital rights management (or DRM as all the cool people call it) going for a project I recently worked on. Recently I self-published a book called *Web Designers Success Guide*. After being no-so thrilled with publishing with larger publishers (they tend to give you fat advance and you never see royalties due to "hidden" clauses in the big old contract you sign) I decided to write and publish my own book using Lulu. The process is simple, you create your book in whatever program you want (I use InDesign CS2) and then upload it as a PDF. They print it on demand as people buy it. Lulu offers authors the ability to sell the book as a PDF and via dead tree (paper). I decided that selling the PDF would be bad since my target audience are very wired web designers and my PDF would end up making the old Peer-to-Peer book tour and I won't get paid!

PDF and DRM

So I locked my book in paper for now. I did a lot of research to find an affordable solution to host my PDF so people could read and print it out... but not copy and share the PDF. I found some very costly solutions such as LockLizard and WebPublisher for locking down my PDF to the server so people can't "share it" with their friends. I also found a whole host of other solutions provided by not-so trustworthy companies that many not be here tomorrow. In fact if you do a search for DRM and eBooks using Google you will find all sorts of fly-by-night operators who offer "DRM" for files. Most of these companies require you to host using their systems. The problem is most of these companies don't give a phone number or address for their business,

something that scares the hell out of me. So the only real solutions seem to be expensive ones.

What does any of this have to do with Flash and DRM?

You thought you were reading an article on Flash and DRM? Well you are... after doing a lot of searching I have discovered that you can use Flash to achieve a high degree (while not foolproof) form of DRM.

One of my clients wanted to create a full site using Flash. Other than making cool animations and such the main thrust for creating the site in Flash was to stop or slow down users from stealing the content from the site. In fact the Flash site does a really nice job of making stealing content much more difficult than traditional HTML or even a PDF.

Using some tricks we were able to stop people from doing the easy "dash-and-dine" rips. Here is a list:

- **The old rip from the browser cache trick:** Users just open up their browser cache and pillage the SWFs from their own hard drive. We added internal ActionScript code that disables the SWF if it isn't played from the original server.
- **Print screen (PrtScn Button Trick):** While you can't totally disable this, you can make it frustrating for the average user by "trapping" for the "print screen" button. And telling Flash to copy blankness into the clipboard of the computer. There are easy ways around this (which I won't reveal) but it's enough to frustrate users.
- **Remove the "right click":** While this might seem like a simple option. We used simple embed statements "menu=false" to remove the print command from the "right click" menu. This alone is often enough to discourage users from copying the content.
- **Local shared objects:** Using local shared objects (Flash's answer to the cookie) we can also do some other fun

things to discourage users from messing with the Flash content.

Of course there are many ways around this. Advanced users can get their hands on de-compilers for Flash (there are many around) and users can just circumvent the print screen by using "other tools." But for the most part if you have a subscription site where you want to at least slow people down from ripping you off, using Flash as a good DRM tool is a cheap and effective way to do it without spending thousands. And you can be assured that there are ways around those expensive PDF DRM solutions as well. Ours is cheap and doesn't require the user to install a different plugin... It works very well right with the Flash Plugin they have installed already.

So How Does This Apply to My Book?

In the upcoming months I plan to launch my book, along with many other articles I have written in the past as the form of a subscription-based website. This site will be completely built in Flash and will utilize all of the DRM topics I discussed above. The idea here is to slow down the copying of the material to the point where it doesn't affect the bottom line too much. As with all DRM solutions there is no "magic bullet" – users who are determined will always find a way around to steal the content. But the most important method is to make it so painful the average user won't bother, thus making it easier to make doing business this way profitable. ☺

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Flex

2

Unleashed

Ushering in a
new generation
of RIAs

by david wadhvani

In June 2005 Macromedia announced the Flash Platform – comprised of a set of clients, tools, frameworks, and services for the creation of rich content and applications that run on a broad set of desktops and devices. The Flex 2 product line provides the next generation of developer tools and services that enable developers everywhere to build and deploy Rich Internet Applications (RIAs) on the Flash Platform.

Pushing the Envelope on RIA Development

Macromedia coined the phrase “Rich Internet Application” a few years ago after seeing what developers and designers were building in Macromedia Flash. It was clear that these applications extended the design limitations and interaction constraints of traditional HTML applications. They didn’t require a full page refresh when users interacted with them. They efficiently utilized network bandwidth, transmitting only the portion of the data that changed and transmitting layout information sparingly. They contained a rich array of interactions that allowed end users to directly manipulate the data with which they were interacting. They seamlessly layered audio and video into the application’s user interface. They clearly maintained their context as the user navigated through the application. And, of course, they supported high-fidelity printing.

The impact of Rich Internet Applications has been incredible, both in breadth and depth. We’re seeing everyone from Internet hobbyists to large enterprises building RIAs – and seeing their business improve dramatically as a result. Large financial services institutions use RIAs to solidify their brand with customers and speed up internal business decision-making through better interaction with mission-critical data. Online retailers have reduced shopping cart abandonment by 50% during the checkout process. Individual developers have integrated slick online mapping services with webcams posted on New York City’s traffic lights to give commuters the most up-to-date and useful traffic information.

As customers began to broaden their use of Rich Internet Applications, developers quickly recognized some special needs. Some RIAs need to consume real-time data feeds. Others need to run in occasionally connected environments, intelligently synchronizing data when a connection is established. Others need to consume proprietary binary protocols. Still others require that multiple clients share a single instance of data.

Based on these observations, and our

experience building Flex 1.0, we set out to deliver an RIA platform that addressed these needs and could be extended easily to meet the specific needs of a given application. We wanted to give application developers a client runtime, development environment, class libraries, and data services that help developers do the following:

- Be extremely productive in RIA application development
- Create expressive applications with effective interface patterns
- Deploy applications through a well-distributed, high-performance, cross-platform, cross-browser runtime environment
- Use tools and technologies that scale with the size of the project and complexity of the task

We are thrilled to introduce the Flex 2 product line as the best way to build a wide range of immersive applications, from simple restaurant menus to complex workflow systems and synchronized trader desktops.

If you’re familiar with Flex 1.0, it’s very important to recognize that Flex 2 is far more than just a new release. It represents a major milestone in the evolution of the Flex technology and a continued evolution in Macromedia development processes. From a technical standpoint, Flex 2 introduces capabilities that enable developers to build an entirely new class of Rich Internet Applications, ushering in a new generation of RIAs. At the same time, we’re opening up Flex development to a much broader group of developers by re-introducing Flex Builder, which has been built from the ground up on the Eclipse open-source IDE framework and now includes Flex Framework and the compiler. That means that Flex applications can be deployed as a stand-alone option by placing a compiled SWF file on any web server or in conjunction with Flex Enterprise Services 2.

A New Foundation for Rich Internet Applications: Flash Player 8.5

Flash Player, the backbone of the Flash Platform, will also be evolving to provide the foundation for the Flex 2 product line and next-generation RIAs. Over the years the player, which began

primarily as a client for playing animation, incrementally extended its scripting language (ActionScript) by adding support for portions of the ECMAScript standard (the same standard that drives the development of JavaScript). By the release of Flash Player 7, ActionScript implemented the vast majority of the ECMA standard. With Flash Player 8.5 (scheduled to ship with the Flex 2 product line), we will be introducing ActionScript 3.0, a powerful object-oriented programming language designed for productivity and performance and based on the next generation of the ECMAScript standard.

Flash Player 8 (released in September of 2005) makes great advances in the rendering engine, introducing a set of extended expressiveness capabilities (filters, advanced gradient controls, rendering performance, and so forth), and video support enhancements (higher quality codec, alpha channel support, and so forth) that are unparalleled on the web today. Flash Player 8 also greatly improves the APIs that allow a developer to communicate between applications running in the player, the browser’s HTML document object model, and associated JavaScript functions, making it easier for developers to add Flash components to their existing web applications.

Flash Player 8.5 builds on the advances in Flash Player 8 by focusing on improving script execution on the virtual machine. In fact, it includes a brand new, highly-optimized ActionScript Virtual Machine (AVM) known as AVM2. AVM2 is built from the ground up to work with the next generation of ActionScript 3.0 to support the needs of RIA developers. The new virtual machine is significantly faster, supports full runtime error reporting and industry-standard debugging. It includes binary socket support, allowing developers to extend the player to work with any binary protocol. Flash player 8.5 will also contain AVM1, which executes ActionScript 1.0 and 2.0 code, for backward-compatibility with existing and legacy content.

With ActionScript 3.0, we have achieved more than simple compliance with the ECMAScript standard; Macromedia now chairs the ECMAScript committee and helps drive its evolution. ActionScript 3.0 features a compilation mode for stronger compile-time type



checking that provides the benefits of languages such as Java or C#. It supports new features to streamline data manipulation, including the E4X (ECMAScript for XML) standard, which extends the language and adds XML as a native data type allowing developers to more naturally interact with and manipulate XML. It adds regular expressions support for better text parsing and processing. It sheds some of the ad hoc event handling schemes in the old virtual machine in favor of a unified model based on the W3C DOM Events standard. And it has significantly updated APIs aimed at the application developer audience.

For a complete overview of the new capabilities, stay tuned as we release an overview of ActionScript 3.0 and the Flash Player 8.5 alpha.

The Macromedia Flex 2 Product Line

The Flex product line gives application developers a powerful client runtime, programming model, development environment, and data services. It supports common design patterns, works with existing development and deployment technologies, and provides the benefits of a modern, standards-based language. The product line is comprised of the following distinct technologies:

- Macromedia Flex Framework 2
- Macromedia Flex Charting Components 2
- Macromedia Flex Builder 2
- Macromedia Flex Enterprise Services 2

Flex Framework 2

Flex Framework 2 builds on the foundation provided by Flash Player 8.5 and ActionScript 3.0. It adds a rich class library based on ActionScript 3.0 that embodies best practices for building successful RIAs. It also extends the programming paradigm by adding an XML-based language called MXML that provides a declarative way to manage the visual elements of your application. Flex is packaged with a set of developer utilities such as a command-line compiler and debugger that enable developers to code in their favorite editors and invoke the compiler or debugger directly.

Essentially, Flex Framework provides the skeleton of the application. Developers can describe an application's user interface from prebuilt components by either extending them or creating new

ones from scratch. They can enable predefined interactions, such as draggable columns on a data grid, or hook into some well-defined events to define specialized behaviors. They can choreograph complex user interface transitions using a flexible effects infrastructure. They can describe the flow of data through the application's user interface. And they can define the look and feel of the application through a powerful skinning and styling infrastructure.

Flex Framework has significantly enhanced each of these areas in ways that help developers be more productive by reducing the amount of necessary code, enabling more engaging and expressive apps "out of the box," dramatically improving runtime performance, and simplifying the creation of new components and the extension of existing ones.

Additionally a set of new user interface components has been added to Flex, ranging from a pop-up button to a color picker to a rich text editor. We included a new constraint-based layout metaphor to give developers a finer grained level of control over the layout of an application and enable a more natural integration with Flex Builder Design view. We added a new organizational metaphor called "View States" to significantly simplify the creation of dynamic user interfaces. We overhauled the effects infrastructure to allow for far more intricate orchestration of user interface elements. We also added 9-slice support to the skinning infrastructure that allows a designer to create codeless, resizable skins in Flash Professional 8 that can be applied to Flex applications through Cascading Style Sheets.

Stay tuned as we release a more in-depth look at enhancements in Flex Framework 2.

Flex Charting Components 2

Macromedia provides a flexible charting extension to Flex. Developers can easily add these data visualization components to any application. The Charting components are dynamically rendered on the client, making it easy to add drill-down, rollover, and other interactivity that makes your charts even more insightful than before. The Charting components have a fully exposed API that allows you to easily customize the

components or create your own.

The charts package is fully integrated into the framework's general infrastructure for effects, styles, data binding, and drag and drop, and will work seamlessly with the enterprise services (see below).

Flex Builder 2

Flex Builder 2 is a brand new tool defined from the ground up to provide developers with an incredibly productive environment for building Rich Internet Applications. It provides a state-of-the-art coding and debugging environment; features intuitive layout, styling, and interaction design tools; and promotes good, maintainable coding practices. Built on the Eclipse platform, Flex Builder presents both a familiar and truly extensible set of capabilities.

Developers using Flex Builder 2 will find tools that significantly accelerate their coding efforts. "Content Assist" capabilities enable code hinting for both MXML and ActionScript. Code navigation capabilities help you find the definition of a method or class quickly. An option to incrementally compile your application automatically on every file save makes finding and fixing errors easy. The integrated help system makes it fast to find the necessary documentation. Its advanced Debugging perspective makes debugging Flash applications efficient and enables those who already use Eclipse to debug client and server code in a single IDE. Lastly, its integration with source control systems (such as CVS) and build tools (such as Ant) make team development easy.

Developers will find flexible visual support for laying out controls by absolute position, relative position, or predefined layout rules (such as vertical, tile, and so forth). Visual design support for "View States" is an innovative feature that enables you, with very few lines of code, to visually define how the appearance of a control or the entire application changes in response to some event. The CSS editor accelerates the creation of new style sheets, or integration with existing ones, and the ability to display edited styles and skins in the Design view as your code shortens the update and test cycle. It also supports seamless round tripping between hand-edited code and code generated by the Design view

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so that a team of developers can work together without code conflicts.

Developers using Flex Builder 2 can import multimedia and video produced by Flash Professional 8. Our goal is to give teams of interaction designers, videographers, multimedia producers, and application developers the best of all worlds. They can use Flash Professional to create the most precise, powerful, and expressive interactive content and media. They can use Flex Builder to create the most immersive application experiences. Over time, we intend to strengthen the workflow among these tools, making working together even easier and more efficient.

Flex Builder 2 will be available as an independent product with a standard tool pricing model. Stay tuned for an in-depth list of enhancements and more detail on the previously mentioned features.

Flex Enterprise Services 2

In Flex 1.0 we provided a set of run-time services to aid the transport of data and integration with existing server infrastructures. Data services in Flex Enterprise Services 2 take a massive step forward by providing a set of message-based services and supporting capabilities that join your enterprise architecture and information presentation by transparently synchronizing data between tiers. This significantly increases developer productivity by reducing time spent writing, debugging, and maintaining the often-error-prone code required to move data among the client, application, and database tiers.

Flex Enterprise Services also exposes a robust messaging infrastructure for moving data between the client and server, and allows developers to easily create applications that efficiently leverage real-time data, occasionally available services, and very large data sets. The Enterprise Services capabilities seamlessly extend the framework, allowing developers to realize the benefits with very little overhead. For example, the client-side messaging architecture provides an elegant model for event and data queuing and synchronization, allowing organizations to produce occasionally connected applications with minimal effort.

In addition to Flex data services, Enterprise Services adds support for automated testing; enhances our efficient, bina-

ry protocol for data transport (AMF); and continues to support RPC-style interaction with web services and Java objects. Stay tuned for more details on Flex data services in Flex Enterprise Services 2, available soon.

The Flash Platform: Expanding the Richness of Rich Internet Applications

Flash has always been at the forefront of user experiences, thanks to the capabilities of the technology and the incredibly creative community that pushes the envelope of traditional design practices. The resulting advances in user experience design are often immediately available to Flex developers. Take, for example, the recent explosion in the use of the Flash Platform for online audio and video.

Flash Player is the most widely deployed audio and video player on the market. It allows video elements to be seamlessly integrated into the surrounding content or application, such as triggering video cue point events in your RIA. It supports progressive download of short-form video files and integrates with Flash Media Server 2 for streaming more interactive, or higher quality, long-form video.

The community has leveraged these capabilities to create Rich Internet Applications that break down the silos that exist today between applications and rich media. Instead of having their applications launch a separate media player—thereby creating a discontinuous experience—Flex 2 developers can truly integrate video into their applications' user interface and workflow. For example, training videos can navigate and highlight particular UI elements of your application and your application can cue specific portions of a video to play based on a user's actions. Flash video and audio streams can be incorporated into Flex 2 applications by using Flash Media Server 2 or Flash Video Streaming Service, a hosted service for delivering large-scale Flash Video deployments developed by leading CDN (Content Delivery Network) partners in conjunction with Macromedia.

Expect other trends—such as the recent expansion of the Flash Platform into the real-time collaboration space—to work their way into the Flex product line over time.

A Call for Community Involvement

By now you've gotten a high-level overview of the Flex 2 product line, including Flash Player 8.5, Flex Framework, Flex Builder, and Flex Enterprise Services. Our goal for the Flex 2 product line is to provide the developer community with a great platform for delivering the best application experiences to their customers.

To ensure that we meet your needs, we will soon release a public alpha version of Flash Player 8.5, Flex Framework 2, and Flex Builder 2. An alpha of Flex Enterprise Services 2.0 will follow. This, the earliest public release ever of a Macromedia product, also signals a change to our development process and relationship with our community. We decided to make alpha 1 publicly available despite the fact that it is early in the development cycle and still has some incomplete features. Our goal in providing access at this stage is to get feedback so we can make refinements and course corrections to ensure that you can efficiently build the most immersive application experiences with the Flex 2 product line. To help make your initial experience with the alpha a productive one, we will provide a series of sample applications, tutorials, and other resources you can walk through before venturing "off road."

On behalf of the Flex product teams, I encourage MXDJ readers to download our public alpha and get involved. Sign up for early notification (http://www.macromedia.com/cfusion/mmform/index.cfm?name=labs_earlybird) so you can download the public alpha once it becomes available. At Macromedia look forward to collaborating with you to build a set of products that enables you to do your best work. ∞

David Wadhvani is the vice president of product development for Macromedia Flex. Prior to joining Macromedia in 2002 he was the founder and vice president of product development at iHarvest Corporation, where he led the development and deployment of a web-based knowledge management and collaboration system before selling it to Interwoven, Inc. He also spent approximately four years at Oracle in the early 1990s where he was part of the core team that conceived, designed, and implemented Oracle's first business analytics software package. dwadhvani@macromedia.com



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It's Time to Flex My Zorn

Flex 2.0 will change the web development sphere forever
by scott barnes

In the early days of Flex beta (Royale), we were shown a fantastic new product that would allow folks to write rich User Interface (UI) designs via an XML style solution, named MXML.

Flex is a product that sits in your presentation tier, it's not a "server-side" solution; it's a dream product, as it now fully gives the average web developer the total power they need to create Rich Internet Applications (RIA) without having to worry about complex things such as "timelines" (which catches many traditional programmers by surprise).

Flex also brings balance to the force, in that it allows a backend developer the ability to generate intuitive UI without having to fall into the trap of it looking and feeling like a typical "programmer art" web application. I say web application as the web is not simply about "websites" it has more, and it's being used as a delivery channel for a lot of simplistic applications (RIA != website).

What Is This "Zorn"?

Zorn was a code word given to the next generation development tool, now dubbed Flex Builder 2, that will allow you the average developer a piece of that pie currently reserved for the enterprise market. Flex Builder 2 will allow developers or designers the ability to write MXML based applications without Flex Server. Flex 2.0 Server itself will have a lot more "enterprise" solutions on offer that you will not get in unless you pay for the "extras," so the two will live separate lives amongst the Macromedia product suite.

Flex server has been this forbidden fruit to many Flash developers, as its price has always been a sore point amongst the non-enterprise elite. I for one have often been vocal about it, but yet after spending a year or so looking at how its being used in the enterprise world, it's by far the cheapest solution (yes, it's cheap, and no, you cannot e-mail me abuse). Say what you will about the existing price model for Flex, one thing is always clear; the mainstream web development world just couldn't afford it, until now.

That is why Flex Builder 2 + Flex 2.0 Framework exists, it is Macromedia's way of

capitalizing on a great product without backtracking on price points while at the same time giving the users more power in terms of generating non-enterprise specific applications around their motto "Experience Matters."

User Interface development is about emotion, it's the one sore point in many great applications as, without a clean consistent way of displaying backend systems, no matter how great and complex they maybe, people tend to associate its power with its UI, as it's the front-line component that takes most of the beating.

So yes, "Experience Matters" as it's the way things are slowly but surely heading. Recently Bill Gates was quoted saying "Focus on the User Experience" at this year's Microsoft PDC05 conference. Two similar messages, each asking for the one or same outcome: don't just build it but build it so that it's useable and with a bit more emotion.

Flex Builder 2 + Flex 2.0 Framework will offer a lot of folks the ability to back up these messages with Flash Platform as its delivery output. It has the potential to shift a lot of people's position(s) in the web development sphere to now becoming a hybrid "designer/programmer" in one, only now more formally in team environments. As, suddenly that guy/girl in your team who has always had this creative flair will now be able to execute the overall design vision more precisely and with minimal effort. This person will later take on the title "Creative Lead" among existing teams (or one of similar naming).

Flex Builder 2 + Flex 2.0 Framework will also give developers the ability to change pre-existing perceptions on how content is visualized, as existing plain "grid" metaphors can be upgraded and changed into something like images of documents even though the data may still be in grid form but remain part of the development process with known input and output.

Flex Builder 2 is the next-generation tool for Macromedia development but it will not replace Flash 8 Professional or its "liter" version – well, not for now anyway. I say that as who knows what the next steps post its release could be other than those mischievous

Macromedia (soon to be Adobe) engineers and product managers have in store for it. Flash 8 Professional serves a purpose and it's more suited towards the multimedia side of things, where Flex Builder 2 is essentially placed in the more "application" specific world, yet the two could overlap depending on context.

There is a lot of room here for Flex Builder 2 to grow outward and it maybe the new lease on life Macromedia developers require in terms of using a simplified, functional editing tool to generate RIAs, something its previous counterparts have failed (excluding Dreamweaver 8, as finally that product has gotten it right!)

The Internet application field is changing, there are new tools coming on the market that are allowing people the ability to step outside the comfort zone of HTML and into the domain of multimedia. Macromedia's Flash Platform is so well seeded into people's machines around the world, that it just cannot be ignored as one of many useful delivery channels for an Internet based product. Microsoft is now coming to the table with their own technology centered on XAML, which funnily enough smells and tastes like MXML.

Armed with products like Flex Builder 2 + Flex 2.0 Framework, the hardest part one has to overcome, is working through the initial blank canvas. The white empty canvas speaks volumes in the design world, and with these two products it won't change, there will be a lot of crazy, stupid and masterful ways to visualize existing content, buried deep within complex backend systems. The time is ripe for RIA dreams to come true as with these products, maybe we can see more of those complex backend systems having a more usable / accessible unified view.

It's far too early to comment fully on Flex Builder 2 or Flex 2.0 Framework, and hopefully after MAX 2005 people will start seeing more information about how Macromedia plans on counteracting the "XAML" dream with products like these.

Flex Builder 2 + Flex 2.0 Framework will deliver a new breed of developers, who will be given the title "User Experience Developer," provided they are ready to learn the new world of ActionScript 3.0.

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Following up on last month's very well received "Voices of the Community" feature, this issue we have great pleasure in showcasing four of the best-received MXDJ articles of 2005. The "Fab Four" are four articles which the MX community seemed particularly to enjoy and/or engage in, and we are happy to bring them together now in one issue for your reading convenience.

THE
FAB

41

*Best Articles
of the Past Year*

Captured by Captivate

Feature rich and a lot of fun
by tom green

As an educator with a post-secondary institution I have had something of a ringside seat watching the evolution of e-Learning. My biggest complaint was that, in general, most institutions getting into the game just “didn’t get it.” Their approach to the process was to create what I called “digital in-baskets” where the student completed the work and sent it in as an e-mail attachment. How they could regard this process as “distance learning” or the “digital classroom” was a mystery to me. One institution proudly walked me through their “digital in-basket” and was quite upset when I sug-

gested they could save themselves some serious infrastructure dollars by replacing the program with something more efficient: envelopes and stamps.

Things changed for me this spring. I was talking to my Dean about instituting an e-Learning program at my college and there was no discussion of “in baskets”. The rationale actually made sense. The college, looking to expand its reach, realized it was running out of parking lots for new buildings and that maybe the college should go to the students rather than the students come to the college. At about the same time, this discussion was going on, Peachpit Press asked if I would

uct. If you are looking at doing any sort of e-Learning either in the private or public sectors, Captivate will most likely become your most important course development and support tool. What follows is an overview of the major features of the product.

First, if you are a longtime RoboDemo user understand this: “RoboDemo is dead. Get over it.” What Macromedia has managed to do is to successfully retain all that was good about RoboDemo and then seriously improve on it by either beefing up the feature or replacing it with something even better. In fact, it starts as soon as you open the application.

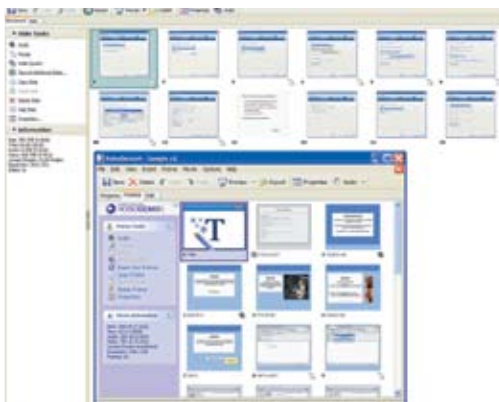
When Captivate launches you arrive in a very familiar place: a typical Macromedia Start Page that replaces RoboDemo’s Project View panel. Here you can open new documents, create new recordings, open other types of movies, and even work your way through a few tutorials. A rather nifty feature of this page is the ability to keep the page manageable. If you right-click on the name of a recent movie, you are given the opportunity to open the movie, hide the movie, or even delete it from the Start Page. If you are a RoboDemo user your movies are still compatible with Captivate. If you open a RoboDemo movie in Captivate, the movie is converted to the Captivate format, including the replacement of the .RD extension with the new .cpt file extension (see Figure 1).

When a movie opens you will experience another great change. The RoboDemo Frames and Edit View Panels have been replaced with panels named Storyboard and Edit. In fact, the term “frames” is defunct. It has been replaced with the more succinct term “slide”. Figure 2 shows you the differences between the Frames View panel in RoboDemo and Captivate’s new Slideshow View panel.

figure 1



figure 2



be interested in writing the RoboDemo Visual QuickStart. Right in the middle of that project, Macromedia unveiled the beta of RoboDemo’s replacement, Captivate, and it was at that point that I realized e-Learning had become serious business and Macromedia was, as is so typical of the company, in the vanguard of an evolving discipline.

It Does Almost Everything

Captivate has all the hallmarks of becoming an important Macromedia prod-

The two biggest changes are the addition of “Record” and “Publish” buttons to the Main toolbar. Click the Record button and Captivate will ask you where the new recording will be placed in the currently open movie (see Figure 3). Click the Publish button and you have one click access to a number of new and old output options (see Figure 2). The term “publish” replaces the term “export” in RoboDemo and moves Captivate’s terminology into line with the rest of Macromedia’s products.

The Edit View panel is another area where there have been some major changes. The first one you’ll notice is the addition of a timeline and a change in the Advanced Toolbar that reflects many of the changes in the application (see Figure 4).

The timeline is probably the single most important addition to the product. One of my biggest complaints with RoboDemo was an inability to control the timing and duration of objects in a frame and even the frame itself. This has all changed. If you are a Flash or Director user, the biggest mistake you can make is to view the Captivate timeline as being similar to the ones in those two applications. A good way of looking at the timeline in Captivate is to regard it as a micro view of each frame in a Flash or Director movie. Objects on the timeline can be dragged to new positions on the timeline. You can expand or contract their duration by dragging the edge inwards or outwards and, if you’re a control freak like me, double-click any object on the timeline and you can set its appearance and duration in the slide “by the numbers” (see Figure 5). Double-clicking a timeline object opens the Object’s properties dialog box where the object can be edited.

Even the recording process has undergone a fundamental change ... for the better. Macromedia spends an inordinate amount of time listening to its users and the changes to the recording process reflect how users approach the end use of the product. There are three types of recordings you can create. They are:

- Demonstration: A typical “sit-back-

and-watch-how-it-is-done” presentation

- Simulation: Simulates how the product is used and requires the viewer to be engaged in the process
- Training: The student is essentially told, “You have seen the demo and you have seen how to use it. Now you try it.”

These modes are now available to you right in the Recording Window. Click the Options button in the Recording dialog box and the options will appear (see Figure 6).

figure 3

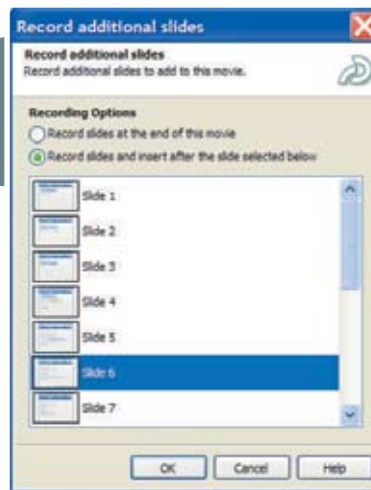


figure 4

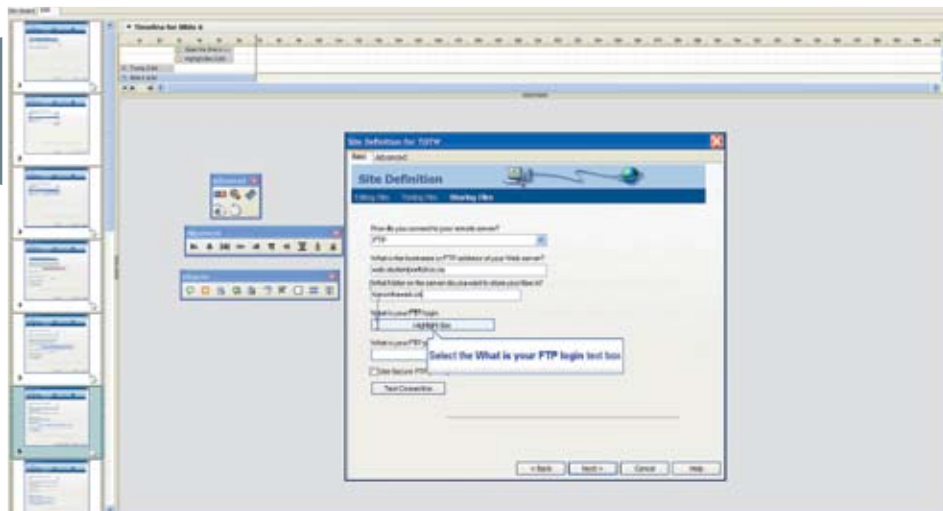


figure 5

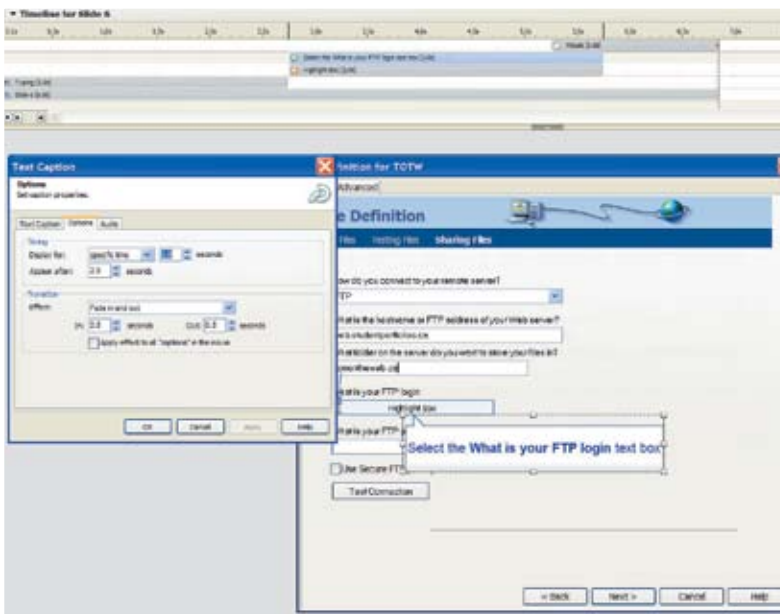


figure 6

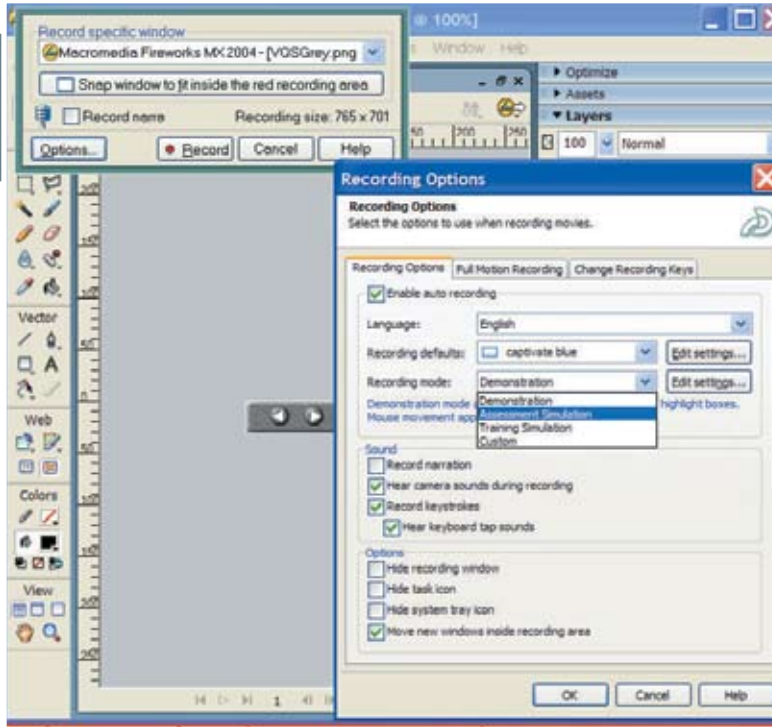


figure 7

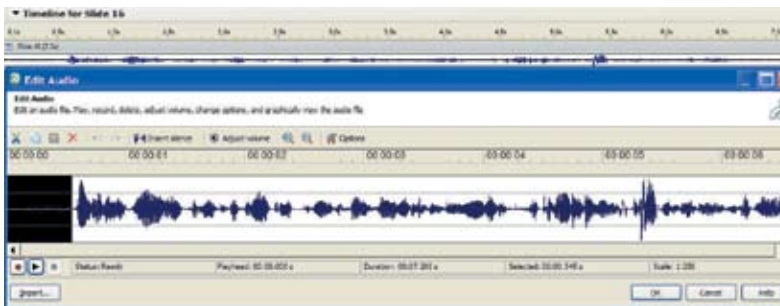
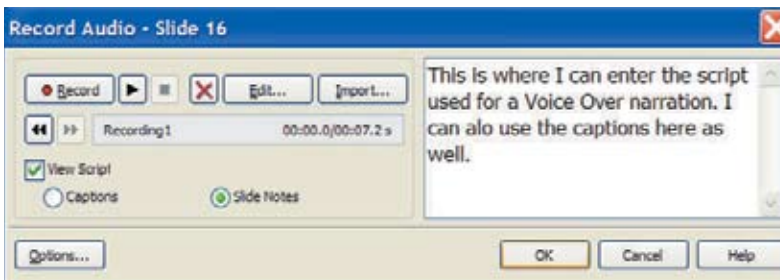


figure 8



Another handy feature of the Recording window is the “Snap window to fit inside the red recording area” button. Clicking this button moves the entire screen being recorded inside the recording area. Another major change to the recording process is the loss of “full motion” recording. This required a little

extra work in RoboDemo if you wanted to record mouse movements. It is now an automated process in Captivate.

Sound is a major element in any new media presentation and Macromedia hasn’t overlooked this feature. You can add MP3 background audio tracks to the movie or the slide and record slide-

by-slide voice-over narrations, but the handling of sound in Captivate has had its molecules turned inside out and rearranged when compared to RoboDemo’s abilities.

First, sound is added to the timeline and double-clicking the sound on the timeline opens the new Edit Audio dialog box (see Figure 7). When it opens you can perform some basic sound editing operations to the waveform which include adding silence, deleting sections of the waveform, and adding normalization to the waveform to “clean up” the recording.

Another welcome addition to the audio recording features is the ability to enter scripts directly into the audio recording dialog box by selecting View Script. Now when you click the Record button, you have the script for the narration visible right in the Recording dialog box (see Figure 8).

Creating and editing the movie is important, but the end game – preparing the movie for output – is also important. Again, Macromedia has added some very important changes to this process. The first, as noted earlier, is a terminology change. Movies are no longer exported, they are “published,” and this process has been added to and, more importantly, streamlined (see Figure 9).

Publishing a movie in RoboDemo was a rather complicated process. Captivate smoothes out this process and puts all of the options in one place for easy access. Click an output option and the window changes to reflect your choice and the ability to access the Movie Preferences to, for example, change the Playback Control style or remove the Controller entirely. One of the major changes to the publishing process is the ability to publish the movie directly to your Breeze or BreezeLive server from within Captivate.

Wait, There Are Flaws...

Though I have sounded pretty positive about the application there is one aspect that disturbs me. It is the ability to export your Captivate movies directly to Flash MX 2004 or Flash MX Professional 2004. This release marks the demise of

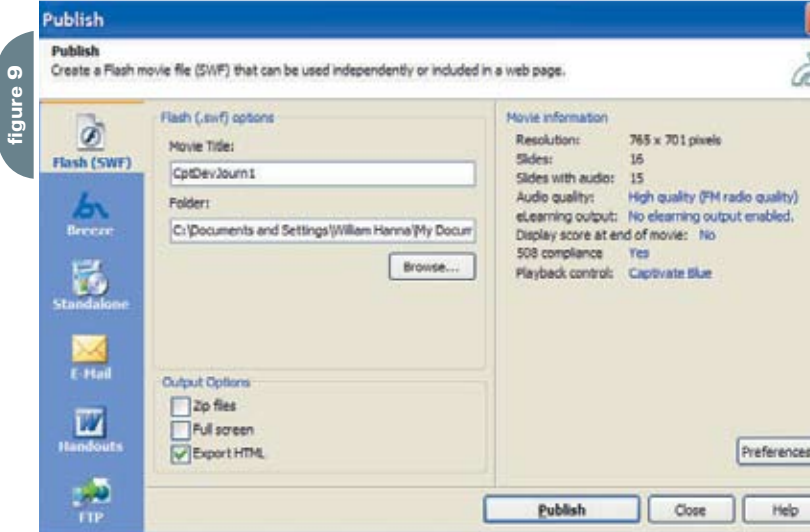
the Flash Module for RoboDemo. Instead of being a separate product, it has been folded into Captivate. The issue I have is the import into Flash.

First, if you select Import/Export> Export to Flash you will see a dialog box that essentially tells you nothing more than “Click this Button to launch Flash.” That’s exactly what the button does: it launches Flash. You then have to import the Captivate file into Flash using the Import dialog box in Flash (see Figure 10). If you are familiar with the Quick Export feature of Fireworks MX, for example, it strikes me that it makes sense to add this as a “Launch Flash” button on the Main Toolbar than as a menu item that implies more than it does.

When a file is imported into Flash the entire movie is placed on the Flash timeline. This means if you have a Captivate movie that is 30 seconds in duration you can reasonably expect to see a Flash timeline that is 900 frames long because Captivate movies play at a rate of 30 frames per second. When you consider that there are performance degradations in Flash when the frame count exceeds 16,000 frames, there are going to be some issues with longer Captivate movies. If you are a Flash developer and think you can get around this by importing the movie directly into the Library, think again. There is a known Flash bug involving .png images that will crash Flash if you try to drag the Captivate movie clip to the Main timeline.

When you do import a Captivate movie to the Flash stage pay careful attention to the Captivate Options dialog box (see Figure 11). The more items you deselect – the End Options, Hints, and Playback Controller are good candidates – the smaller the movie will be. Also, the Flash Library is populated with bitmaps for every item on every slide, each slide is indicated on the Flash timeline with a Label on the timeline, and, finally, if you create Question slides where the user takes a test, these slides currently don’t import into Flash.

The other “gotcha” to be aware of is the fact that Captivate movies play at



roughly 30 frames per second. Flash movies traditionally play at 12–15 frames per second. If you “downshift” the Captivate movie to that rate, you will wind up with fewer Flash frames but the timing of other media such as sounds and .swf files containing mouse movements will also be profoundly affected.

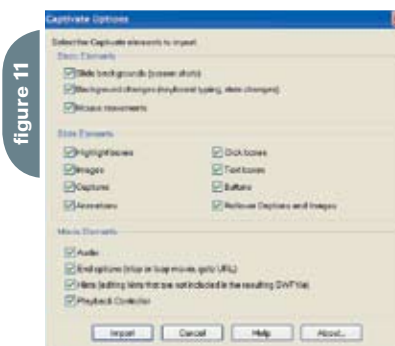
Having said all of that, the ability to move smaller Captivate movies into Flash allows you to take full advantage of all of the Flash Player 7 features – streaming video for example – that are simply unavailable in Captivate. They may require a bit of extra work to “clean up”, but in many respects the effort is worth it.

Conclusion

As you may have guessed, Macromedia has taken RoboDemo, turned it inside out, and rearranged its molecules. The end result is Captivate. I will tell anybody who cares to listen that Macromedia has a solid hit on its hands because it hands Web developers an easy-to-learn and easy-to-master tool that allows them to extend their service offerings. Educators, in both the private and the public sectors, once they catch

on to what it can do and how easily it integrates with their existing Learning Management System, are going to give this application more than a passing look. Even so, like all Macromedia products, Captivate is deep, rich, feature laden, and most important, a heck of a lot of fun. ∞

Teacher, author, chief cook and bottle washer. Instructor at Humber College's School of Media Studies in Toronto, Tom Green is also the author of Building Web Sites with Macromedia Studio MX and Building Dynamic Web Sites with Macromedia Studio MX 2004. Both are published by New Riders. tgreen17@cogeco.ca



A New Role for Flash

Hurray! Flex is here, but you still need your Flash developers.
by peter ent

Perhaps you've heard of Flex, maybe you've even dabbled with Flash, or you have one or more Flash developers on your team. Nevertheless, you aren't sure how Flash and Flex fit together.

As an enterprise application developer, I work on both the server side using Java and the client side using Flash. Knowing the benefits Flash has for the client, I looked into Macromedia's enterprise development offering, Flex. As a Flash developer myself, I saw my Flash skills being used differently on Flex-based projects. I have now begun using Flex because it fits in well with my own skills, but more important, it fits with the skills and needs of my team and our enterprise development environment.

However, since I started introducing Flex to colleagues, the same questions kept popping up: "Do I need to learn Flash to use Flex?," "How does Flash work with Flex?," and "What does Flex offer that Flash doesn't?"

This article shows you, based on my own experience, how Flash and Flex work

together and how the role of the Flash developer changes when involved with a Flex-oriented project.

Do I Need to Learn Flash to Use Flex?

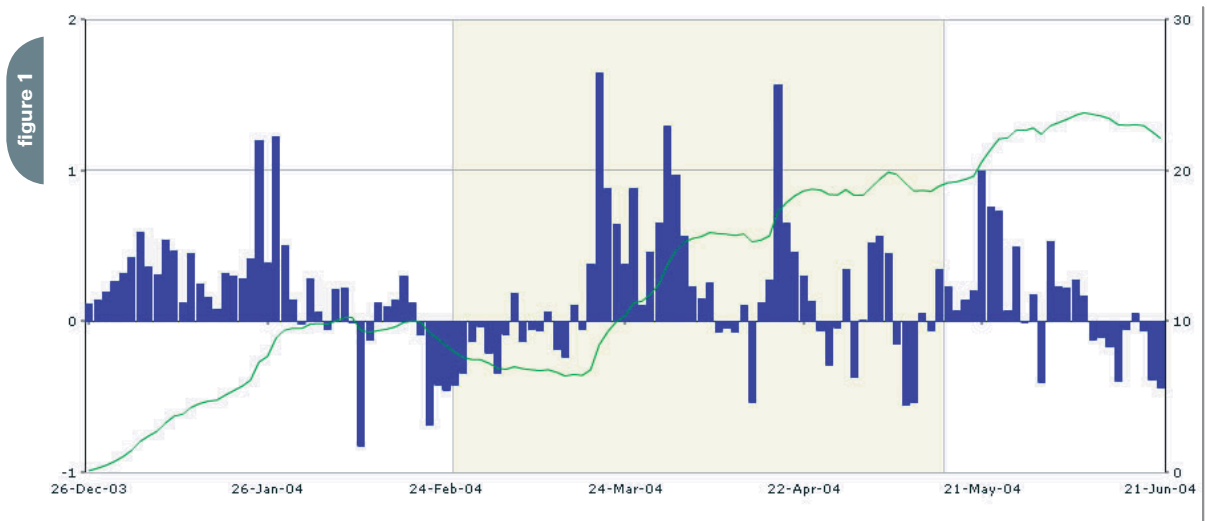
You don't have to learn Flash to write Flex applications. Flex applications are turned into Flash movie files (the SWF file) and sent to the end-user's Flash player; this means that you can think of Flex as an alternative to using the Flash IDE (Integrated Development Environment) to make Flash movies. If you are an enterprise application developer and you've tried to learn Flash but found the concepts of the movie clip, multiple timelines, and levels a bit confusing, then Flex will be much more to your liking.

How Does Flash Work with Flex?

Flash developers play an important role in developing high-quality, enterprise-level applications. It is important to understand how Flash and Flex fit together to appreciate how valuable a

Flash developer can be to your Flex team. Before Flash 5 debuted, it wasn't easy to use Flash as the sole front end to your Web application. Flash simply lacked the necessary communication link between itself and the server. When Flash 5 debuted it became possible to use Flash as a front end for Web applications. Not only could you create buttons to hyperlink to Web pages, but you could now request data from the server and modify the user interface without generating a new page. But to do this, you had to learn the Flash development environment and think in movie-making terms. This was great for the creative artist; Flash became the way to show off yourself and your company on the Web.

Tip: Flash had earned a reputation for snazzy "intro" movies, electronic greeting cards, and other, cartoonish uses. Even though it is possible to build applications in Flash 5, you have to build all of your own user interface controls. This effort, along with Flash's flamboyant reputation, didn't help convince IT organizations to use Flash instead of HTML.



Nonetheless, you probably discovered that the Flash environment is not for everyone. Just as not everyone's brain is wired to write software, not every programmer's brain is wired to think in terms of animation – a lot of us are old-fashioned, procedural-driver programmers.

Flex, on the other hand, has been clearly targeted at the enterprise Web application developer. Flex offers the advantages of Flash, but in a package that fits with enterprise development. Here's how:

- Flex applications are created in a manner similar to JSP-based applications and require an application server to run.
- The MXML files can easily be placed into source code control (with changes to them tracked – you can't do that with the binary Flash FLA files).
- MXML files can be edited by any text editor.
- ActionScript, the language of both Flash and Flex, is based on JavaScript, which many Web developers already know.
- Flex applications (that is, the MXML and related files) are deployed to production application servers as any JSP, HTML, or image file is deployed.
- Flash offers market penetration with 98% of the world's PCs running the Flash player. Furthermore, Flash applications have a much smaller download than Java applets or Java/Swing applications.
- Flash is priced for individuals and small firms; Flex is priced for corporations.

What Does Flex Offer That Flash Does Not?

Since Flex applications are ultimately translated into SWF files executed by the Flash player, you may ask "Can I build the

same application with Flash MX 2004 as I can with Flex?" Both Flash MX 2004 and Flex share a common look and feel. Both Flex and Flash use the halo-themed components. The on-screen objects, such as buttons and lists, have a glow, or halo, about them when you move the mouse over them. Since Flex applications are translated into Flash movies, you can logically assume that what Flex delivers, you can do in Flash MX 2004.

The short answer to the question above is, "Yes, you can." The long answer is "Yes, but why would you want to?" Flex contains more user interface components than Flash MX 2004, and Flex contains things enterprise developers are expected to provide in their applications. For instance:

- Flex contains the objects to validate phone numbers, email addresses, numbers, and strings. Feedback is automatically given to the user without the developer having to write any additional code.
- Layout managers provide the means to resize and reposition elements and happen transparently to the developer.

In the enterprise development arena, managers look at their return on investment, or ROI. If you had the choice to build an application in Flash MX 2004, but it took 3 months, versus an application built with Flex that took 1 month, which would you choose? Further, by using Flex, most members of the team could participate in the project, not just the Flash developers.

So Why Do I Need Any Flash Developers?

I have written several applications with Flash that fall into this "enterprise"

category. I made extensive use of the UI controls provided by the MX 2004 Professional edition. Yet it was still a handcrafted affair. I have since reworked these applications in Flex with much success.

Tip: Applications written for Flex not only take less time to build and test, they are easier to maintain.

But there is a catch. The original Flash applications contained user interface elements that I could not create with Flex alone. For example, one of the applications has a chart that the user can manipulate. The user can drag the mouse over the chart to zoom in. Flex does not come with a component to do this.

To solve the problem, I put on my Flash hat and created a component (see Figure 1) that sits beneath the chart. When the user moves the mouse over the

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Creating Cool Text Effects

Working with what's already there
by charles e. brown

I recently received a letter from a reader asking if I knew of any plug-in programs to create text effects in Fireworks MX. The reader seemed a bit surprised when I wrote back and told them that Fireworks already had the tools to get the job done. "Where is the button?" they asked. Many users feel that if a button isn't on the toolbar, the program can't do it.

In this article, we're going to create some stunning text effects with just a few simple steps and, more importantly, no additional plug-in programs.

Good text effects start with a good variety of fonts. Fortunately, there are a variety of Internet locations for downloading great fonts for free. One of my favorites is www.highfonts.com.

Once you've downloaded the fonts you want, check the directions for your operating system with regard to proper installation. Remember, you don't install the fonts just for the program but for the OS.

Three-Dimensional Text

Here is a simple way to create three-dimensional text. Once you master this basic technique, it will be easy to vary it for your own needs.

1. Open a new canvas to the dimensions you need. I usually like to start with a much larger size and then adjust it down later on. This gives me extra room to work and move things around. For this little exercise 500 pixels wide by 400 pixels high is sufficient.
2. I find that fonts with rounded edges make for nicer three-dimensional effects. After selecting the Text tool, I used the Property Inspector to select the Comic Sans MS font. I set the size to 100 pixels and the font to bold. Of course, you'll need to adjust these settings for your own particular needs.
3. For this example, I'm just going to

type the word Welcome as our working text. You could use whatever text you want.

4. Once typed, you want to make sure that your whole text box is selected so that any settings you make will apply to all the text and not just where the insertion point is. I usually instruct my beginner students to click on the Pointer tool, click away from the text, and then once on the text again. This should ensure that the whole box is selected.
5. The next step is to clone the text by selecting Edit @> Clone.
6. In my own work, when I create layers I like to move the cloned text, temporarily, to a different area of the canvas. I find this makes it easier to see fill effects.
7. Open the Layers panel. You should see two layers now. Click on the two layer icons to see what layer goes with what text. It's always good to name your layers. Name the original layer Bottom_Text, and the cloned layer Top_Text.
8. Make sure the Top_Text layer is selected and open the Fill Color Box in either the Tool panel or the Property Inspector. Once open, select Fill Options...
9. For this example, I'm going to select the Fill Category of Gradient and a pattern of Linear. For the color, I'm going to use silver. Later on, once you have this basic technique, you could try any combination of settings. I like textures also.
10. Your Top_Text layer should now have a metallic look. We'll leave the Bottom_Text layer set for black.
11. From here on in, the 3-D effect is easy. Using the Pointer tool, drag the Top_Text layer over the Bottom_Text layer and offset it a little to the left. You can use the arrow keys to move

the text one pixel at a time. This allows you to adjust the amount of 3-D that you want.

You now have great looking 3-D text that was easy to create and, more importantly, very easy to control in terms of offset, colors, patterns, etc. (see Image I).

Attaching Text to a Path

Sometimes you might want to curve your text around an ellipse. For example, we can use the technique you are about to see have the text surround an image.

1. Start a new canvas. For this second demonstration, let's make the canvas 500 by 400 once again (as before).
2. We are going to begin by drawing the path we want our text to follow. Let's select the Ellipse tool and draw an ellipse approximately 475 pixels wide by about 250 pixels high. If necessary, set the fill color to none and the stroke color to black so that we just see the outline.
3. For the time being, we just want to use the top half of the ellipse as the guide. The bottom half will be used shortly. In order to split the top and bottom of the ellipse, select the Knife tool from the Tools panel. While slicing the ellipse from left to right, use the Shift key to keep the slice straight. After doing that, you can select each half and, if you want, move them apart slightly.
4. In the Layers panel you should now see two Path layers. Name the layer associated with the top half Top_Half. Name the bottom layer Bottom_Half.
5. Select the Text tool. For this exercise, I am once again using the Comic Sans MS. Set it to 75 pixels and Bold. I'm using black as the color, but you can use any color you want. To help position it properly on the guide, set the alignment to Center (using the Property Inspector).

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WLDJ
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figure 1



figure 2



figure 3



figure 4



figure 5



figure 6

6. Type the text Welcome To. Name this layer Top_Text. Its position on the canvas is not critical at this point.
7. Using either the canvas or the Layers panel, select the Top_Text layer. Using the Shift key, select the Top_Half layer. You should see both layers selected.
8. Select Text @> Attach To Path. (Note: If that option is unavailable, you don't have both paths selected.) Your text should now be aligned with the Top_Half path (see Image II).

9. Select the Text tool again and, with the same settings, type Fireworks MX.
10. Name this layer Bottom_Text.
11. Like before, select the Bottom_Text and Bottom_Half and, again, Text @> Attach To Path.

12. Your text is probably backwards and upside down. Unless you want to keep it like that, it is easily fixed by selecting Text @> Reverse Direction. Your finished result should look something like Image III.

You can fill in the center with an image of your choice. Also, the two halves can be moved at will.

Filling Text in with an Image

Here is a very startling effect: we're going to fill in the text with an image. For this one, I selected a photograph taken by a friend, June Daniel, in New York State. Also, to make this effect stand out, you should use a thick font. I am going to use an Arial Black set to 90 pixels and bold.

1. For this demonstration, I'm using a canvas set to 800 pixels wide by 275 pixels high. I imported my friend's JPEG image, taken with a digital camera, and stretched it to accommodate the canvas.
2. Name this layer Base_Photo.
3. I select the Text tool and, as discussed, use Arial Black set to 90 pixels and bold. Type Fall In New York.
4. Name this layer Fill_Text.
5. Use the Pointer tool and position the

- text so that it is approximately centered on photograph. Precise placement is not critical. Image IV will show you the initial setup.
6. Select the Base_Photo layer and select Edit @> Cut.
7. Click on the Fill_Text layer and select Edit @> Paste Inside. The results will be something similar to what you see in Image V.

The photograph is now inside the font as a fill. Of course you could change the background to anything you want to create some interesting effects.

Freeform Text

For a final demonstration, we're going to give each letter a life of its own.

1. Start a new canvas and decide what size you want.
2. Select a font and size it so that the words Fireworks MX fit on the canvas.
3. As before, use the Pointer tool and select the entire text box.
4. We are now going to break the text apart. Select Text @> Convert to Paths. This converts each letter to a vector path. Select Modify @> Ungroup. Each letter is now a layer of its own with its own life.
5. In addition to moving each letter around, you can use the Pen tool to reshape the letters. Image VI is an example of what is possible.

Summary

As you can see, we created some great effects by using some simple, built-in tools. In addition, they were not very difficult to create. Try combining two or more of the above effects to do even more.

There is no question that plug-in filters add a lot of great functionality. In addition, most are very easy to use. However, before you go out and spend money, take a look at what you can do with existing tools. You might be pleasantly surprised.

Next month we're going to look at built-in, and third-party, filters for Fireworks MX. ☺

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ColdFusion MX: A Web Services Example

Verify e-mail addresses at time-of-entry

by richard gorremans

From the first day the Internet was conceived, its primary goal was to allow people to access information stored on remote computers.

Over the last couple of years, the technology of Web services has evolved not only to enhance accessing this information, but to share it as well.

Web services are in action everywhere. When you see 20-minute delayed stock quotes on a Web site, or you track eBay auctions on another, you are most likely seeing Web services in action. Look a little further and you'll find Web services that can provide these functions as well as spell checking, address verification, ZIP code to city search, and even validation of e-mail addresses. In this article, you'll see how to access one of these Web services and display the results on your own Web site.

Sending e-mail responses to users is one of the most important services you can provide to a customer visiting your site. E-mail is used for sending response messages, reports, and personal messages, and almost without exception, any site that has an online form has a field for entering an e-mail address. This information is, or at least was, one of the hardest pieces of information to verify. This article will outline a very simple application of Web services that will have you verifying e-mail addresses at time-of-entry in no time.

Web Services

Four main components make up a Web service:

- XML: eXtensible Markup Language provides a language-neutral format for exchanging information.
- WSDL: Web Service Definition

Language file in XML format that describes the Web service.

- SOAP: XML-based messaging framework used for Web services.
- UDDI: standardized directory service for registering and querying Web service meta data.

For this article, I will be concerned only with the URL location of a single Web service WSDL file.

WSDL

A WSDL file is an XML file with the following elements:

- <definitions>: Root element specifying namespace definitions for the Web service.
- <types>: Specifies data type definitions for the messages being exchanged.
- <message>: Defines the data being exchanged (input/output).
- <part>: Describes the content of the message being exchanged, typically used to name parameters being passed to the WSDL file.
- <portType>: Defines the operations the Web service can be called to perform.
- <operation>: Function or operation that can be performed with the Web service.
- <input>: Input parameters for the parent <operation>.
- <output>: Output parameters for the parent <operation>.
- <fault>: Message returned to the parent <operation> in the event of an error.
- <binding>: Protocol for accessing the operation described in the <portType>.
- <service>: Related port definitions.

- <documentation>: Information about the Web service operations.
- <port>: Endpoint definition for a <binding> element.

ColdFusion MX has incorporated three ways to access these WSDL files (referred to as "consuming a Web service"): the <CFINVOKE> tag, the <CFOBJECT> tag, and the createObject() function. This article will focus on using the <CFINVOKE> tag. Dreamweaver MX also has a components panel (see Image 1) where you can access various Web services, view tree diagrams of the WSDL files, and create code snippets by drag and drop.

Since there are numerous documents describing how to add a Web service to the component panel, this article will provide WSDL output file information directly from the Web service. <CFINVOKE>

The <CFINVOKE> tag provides access to a registered WSDL component on a server. This WSDL component can be written as a ColdFusion Component (CFC), ASP.NET, SOAP, or in other languages that are capable of outputting a WSDL file.

The first attribute of the <CFINVOKE> tag to be populated is WEBSERVICE. The value of this attribute is the literal URL of the WSDL file for the Web service component being "consumed." For this example, the Web service is located at: <http://soap.einsteinware.com/email/emailservices.asmx?WSDL>.

The next <CFINVOKE> attribute that will be populated is METHOD. The value of METHOD will correspond to the <part> element used for processing the request in the WSDL file. Image 11 shows that the <part> element is located

in the `s:element` element and has an attribute of "ValidateEmailAddress". The "ValidateEmailAddress" will be the value entered for METHOD.

The last attribute that will be populated for this example is the RETURNVARIABLE. This attribute specifies the name of the ColdFusion variable that will be populated with the result set returned from the Web service. Image III shows that the WSDL return values are located in the `simpleType` element named "CheckEmailResult". The sub-element `s:restriction` specifies that the result set will be a string and the `s:enumeration` sub-elements show five possible results.

The possible values that can be returned are:

- Valid
- InvalidUser
- InvalidAddress
- InvalidServer
- Error

<CFINVOKEARGUMENT>

In some cases, as with the example shown, the Web service may require parameters to be supplied. Viewing the `http://soap.einsteinware.com/email/emailservices.asmx?WSDL` file shows that the `<part>` element named "ValidateEmail" has a sub-element `complexType`. `sequence` element with a name attribute of "emailAddress" with a type of string. This is the parameter for the e-mail address that's to be verified.

When parameters are required to be passed to the Web service you can use the `<CFINVOKEARGUMENT>` tag. This tag has two attributes: "NAME" and "VALUE".

The "NAME" attribute, for this example, is populated with the name attribute value from the `complexType`. `sequence` element – "emailAddress".

The "VALUE" attribute is populated with the e-mail address to be verified.

You now have code that will "consume" a Web service located on the Einstein Technologies server that you can pass an e-mail address, and verify if the e-mail address:

- Is properly formatted
- Has a valid server
- Has a matching valid user on that server

```
<cfinvoke
webservice="http://soap.einsteinware.
com/email/emailservices.asmx?WSDL"
method="ValidateEmailAddress"
returnvariable="aGetXMLValidEmail">

<cfinvokeargument name="emailAddress"
value="#Trim(form.formEmailAd-
dress)#"/>
</cfinvoke>
```

Now that you have the code for the `<CFINVOKE>` tag completed, the next step is

adding code for getting the e-mail address (see Image IV for screen print) that will be sent as the `emailAddress` parameter. The code used in this example is shown below:

```
<hr />
<h1>E-Mail Verification Form</h1>
<hr />
<form name="formEmailSubmit"
action="#CGI.SCRIPT_NAME#"
method="post">
Enter E-Mail Address:
<input type="text" value=""
name="formEmailAddress"
maxlength="254" width="50">
<input type="submit"
name="formSubmit" value="Verify">
```

figure 1

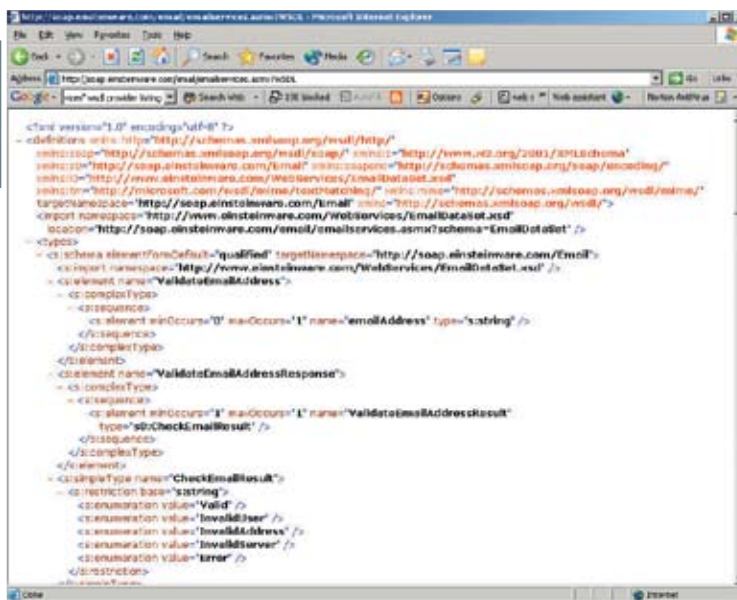
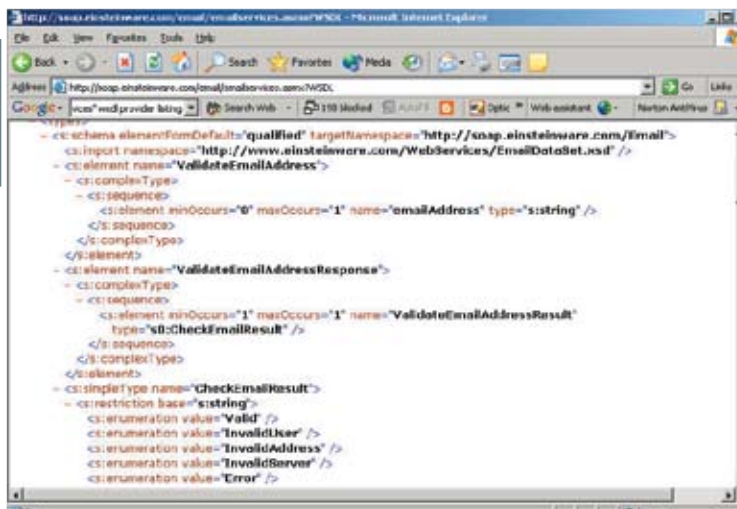


figure 1



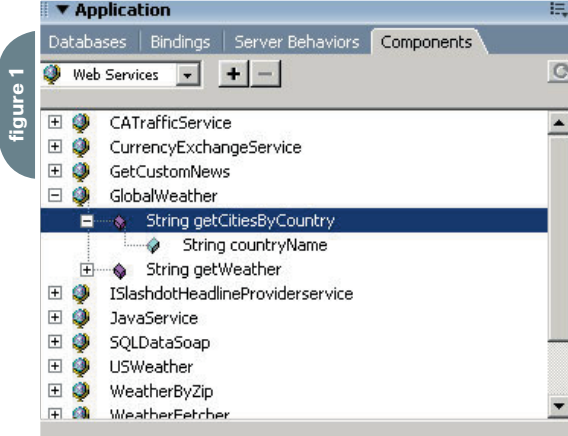


figure 1

```

E-Mail Provided Is Valid
</cfcase>
<cfcase value="InvalidUser">
    E-Mail Server is Valid but the User
does not exist.
</cfcase>
<cfcase value="InvalidServer">
    E-Mail Server is not valid, cannot
verify E-Mail address
provided. Please re-enter and try
again.
</cfcase>
<cfcase value="InvalidAddress">
    E-Mail provided is not properly for-
    
```

Highway” was coined. Except for a very few, most drivers on this “Information Highway” got lost or missed a lot of the wondrous sights. The biggest problem, in my opinion, was that there were not enough road signs to indicate what services were available at the millions of off-ramps.

My sixth grade teacher, my mentor even now that she has been gone for many years, once told me, “The smartest person in the world is not the one who knows the most, but the one who knows where to find the most.” She told me this the day she took me to the school library, gave me my first library card, and showed me how to use the card catalog to locate a book.

With this article you now have a road sign that spells out some of the services that are available on the off-ramp called Web services. Take the exit, explore the countryside, and enjoy the wonders and advantages that this article barely touches on. ☺

Acknowledgments

A special thanks to Josh Einstein of Einstein Technologies for allowing the use of their Web service for the examples in this article.

Listings and information on hundreds of Web services can be found at the following URLs:

- www.xmethods.com
- www.salcentral.com
- www-306.ibm.com/software/solutions/webservices/uddi/
- www.webservices.org/
- www.macromedia.com/devnet/mx/coldfusion/articles/creating_cfcs.html

For the past four years Richard Gorremans has been working for EDFUND, the non-profit side of the Student Aid Commission, located in Rancho Cordova, California. As a senior software engineer, with over 13 years in the business, he has worked as a technical lead producing Web-based products that enable borrowers, lenders, and schools to view and maintain student loan information via the Web. xbase@volcano.net

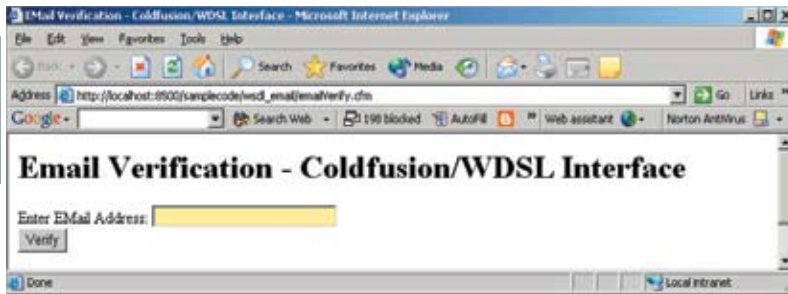


figure 1

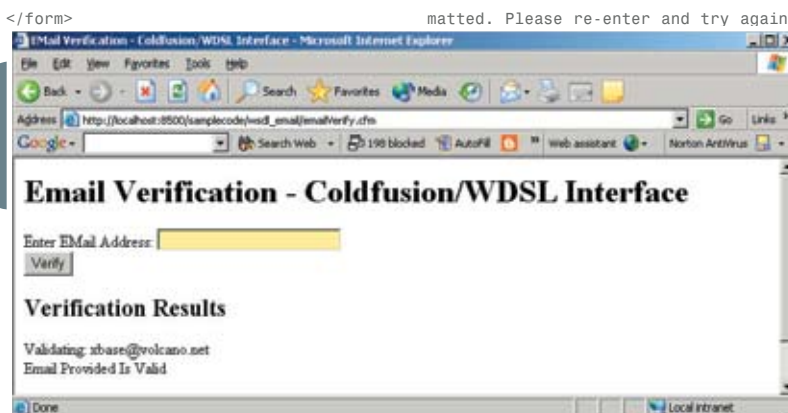


figure 1

Displaying the Results

The final step is processing the result set returned from the Web service that will be stored in the `aGetXMLValidEmail` ColdFusion variable created by the `<CFINVOKE>` tag. For this example `<CFSWITCH>` will be used to display, dynamically, a “user friendly” message based on the value of the result set.

```

<cfswitch expression="#aGetXMLValidEmail#">
    <cfcase value="Valid">
    
```

```

</cfcase>
<cfcase value="Error">
    An error was encountered with the
web service verification.
Please try again later.
</cfcase>
</cfswitch>
    
```

Using the returned result set, a custom message can be displayed to the user (see Image V).

Conclusion

Sometime near the start of the Internet the term “Information

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