

Running head: Using Flash MX and Flash MX Remoting



**Using Flash MX and Flash MX Remoting for
Client/Server Technologies**

Wednesday, January 29, 2003

B. Dianne Calhoun

MCIS 4305: Distributed Client/Server, Wednesday Class

Glenn Berry, Instructor

University College

Table of Contents

Using Flash MX and Flash MX Remoting for Client/Server Technologies	1
Table of Contents	2
Abstract	4
Using Flash MX and Flash MX Remoting for Client/Server Technologies	5
What is Flash?	5
Animation Building Tool.....	6
Flash’s Early History.....	6
Flash’s Bad Reputation	7
Real Application User Interface	8
Flash’s ActionScript Language.....	8
Flash Makes Client-Side Business Rule Processing Possible	9
Flash Makes User Experience Flexible	9
Communicate through Flash Remoting Server to any Service.....	10
Flash Remoting Invokes Methods to Talk to Web Services.....	10
Flash Remoting uses Client ActionScript Extensions	10
Flash Remoting Also Uses a Server Gateway.....	11
Flash MX and Flash Remoting Offer Many Possibilities.....	11
Conclusion	13
Flash MX and Flash Remoting Combine to Make the Client-Server Computing Easier	13
Disadvantages of Flash	13
Advantages of Flash	13

Is Flash Worth Using?	14
Recommendations	15
References	16
Appendix A	19
Author Note	21
Figure Captions	22

Abstract

What is Flash? Programmers use ActionScript, which is Flash's programming language, to create these user interfaces. All of Flash's capabilities discussed above with the use of Flash Remoting help programmers to create responsive client-server Internet applications that enrich the user's experience. Flash programmers and Flash users now both have an easier time with the creation of Flash MX and Flash Remoting making it easier for programmers to create a rich Internet application that is user friendly.

Flash began as a simple drawing tool, has been through five revisions since then, and is now called Flash MX (Flash 6.0).

Flash creates real application user interfaces by using Flash's built in programming language called ActionScript. Flash makes client-side business rule processing possible, and makes the user experience flexible.

Flash can communicate through Flash Remoting Server to any web service. Flash does this through a server gateway. Flash MX and Flash Remoting offer many possibilities and together are very promising.

Flash MX and Flash Remoting combine to make the client-server computing easier. Programmers not developing their web pages correctly usually cause disadvantages of Flash. Flash has many advantages for programmers and users alike, which make it worth using.

Using Flash MX and Flash MX Remoting for Client/Server Technologies

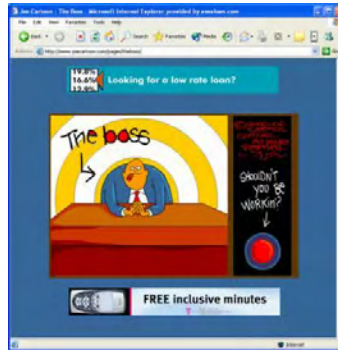


Figure 1. Early Flash movie example taken from the Designer-info.com website

http://www.designer-info.com/master.htm?http://www.designer-info.com/Writing/flash_usability.htm

What is Flash? Perfetti says, “Macromedia Flash is a powerful development tool that offers tremendous capabilities (at <http://www.uie.com/whitepaper.htm>, 2002).” In Flash’s early days, it was mainly used to create animations or short movies. As Flash’s popularity grew so did its functionality with each new version. Programmers were able to build real application user interfaces with the latest versions of Flash. Flash could now boast that it had client-server capabilities. Programmers use ActionScript, which is Flash’s programming language, to create these user interfaces. Franklin says, “ActionScript is a language that bridges the gap between what you understand and what Flash understands (p. 8, 2002)”.

The most recent tool that has been released for use with Flash is Flash Remoting MX. Aberdeen Group, Inc. says that Flash Remoting lets developers treat objects hosted on remote application servers as though they were local to the client (at http://www.macromedia.com/software/flashremoting/whitepapers/pdf/flr_architecture.pdf, 2002).” The Flash Remoting service takes care of many details that Flash programmers once had to do themselves.

All of Flash's capabilities discussed above with the use of Flash Remoting help programmers to create responsive client-server Internet applications that enrich the user's experience. Flash programmers and Flash users now both have an easier time with the creation of Flash MX and Flash Remoting making it easier for programmers to create a rich Internet application that is user friendly.

Animation Building Tool

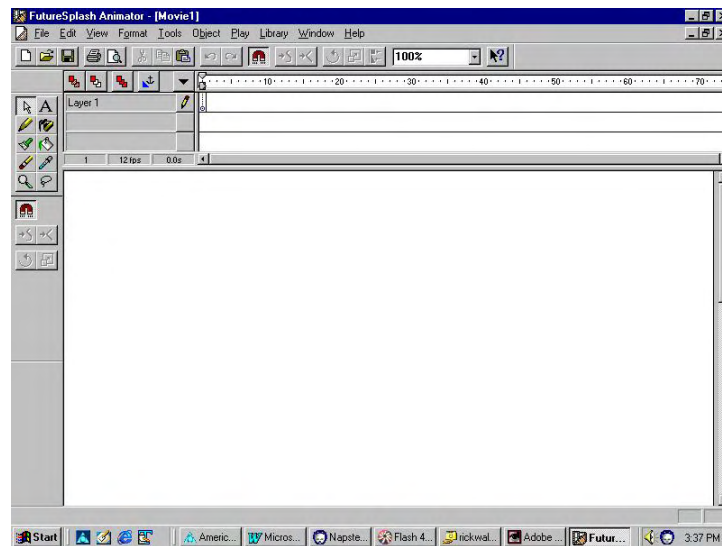


Figure 2. Early Flash application called FutureSplash Animator taken from the Flashmagazing.com website <http://www.flashmagazine.com/html/413.htm>

Flash's Early History

Flash began as a simple drawing tool. Flash's creator, Jonathan Gay, eventually added the animation part of this tool to his product and began selling it under the name FutureSplash Animator. In October of 1995, Jonathan tried to sell his product to Adobe, but they thought the demo was too slow and declined. Eventually, in December of 1996, Macromedia bought FutureSplash Animator, and named it Macromedia Flash 1.0. Flash has been through five revisions since then, and is now called Flash MX (Flash 6.0).

Flash's Bad Reputation

Flash has had a bad reputation for being slow, and creating a bad user experience for the user. In October of 2000, Nielsen wrote that Flash technology discourages usability for three reasons (at <http://www.useit.com/alertbox/20001029.html>, 2000):

1. Encourages bad design
2. Breaks with the Web's fundamental interaction style
3. Consumes resources that would be better spent enhancing a site's core value

It is true that many designers have created web sites with Flash that are not user friendly and are slow to load. The way some designers have used Flash is what really has given Flash its bad name. Meloni agrees that there are problems but his recommendations are as follows (at <http://www.useit.com/alertbox/20001029.html>, nd.):

1. Designers: Read up on usability. Practice it within your medium.
2. Project Mangers: Plan and outline your projects well.
3. Check-writers: Hire the right agencies, ones that look out for their clients, not themselves.
4. Nielsen: Step into the present. Adapt your tenets of usability and bridge the gap between the Ten Usability Heuristics and today's designers.

Nielsen has since recanted some of his beliefs, but his original remarks put a slight damper on Flash's use as a web tool.

Real Application User Interface



Figure 3. Flash application example taken from the Moen.com website

<http://www.moen.com/consumer/homepage/index.cfm?CFID=2852066&CFTOKEN=57311786>

Flash's ActionScript Language

Flash has a built in programming language called ActionScript. It is similar to JavaScript, but has a lot more functionality. With Flash, you can create lists, trees, input fields, buttons, sliders, and many other components that help build user interfaces. Kollmeyer says, “The possibilities for creating sophisticated controls go way beyond what was possible with client/server tools (at <http://www.blueedgedata.com/flash/flashremoting.htm>, 2002)”. Users have come to expect the cool animations and interactivity that Flash allows developers to create. A Flash developer can no longer just know how to do animation; they need know how to use ActionScript to create the interactive websites. Franklin says that by acquiring an in-depth knowledge of ActionScript, you can (p. 8, 2002):

1. Provide a personalized user experience
2. Achieve greater control over movie clips and their properties

3. Animate elements in your movie programmatically—that is, without using the timeline
4. Get data in and out of Flash to create forms, chat programs, and more
5. Create dynamic projects that respond to the passage of time or the current date
6. Dynamically control sound volume and panning
7. Much more

Flash Makes Client-Side Business Rule Processing Possible

HTML development went back wards as far as being able to process client-side business rules. With Flash, we again have the additional possibility of processing client-side business rules. Perfetti says Flash can help process business rules by doing some of the following (at <http://www.uie.com/whitepaper.htm>, 2002):

1. Graying out: conditionally enabling and disabling data fields
2. Solving validation problems
3. Pop-up windows that give immediate feedback of specified rules

Flash Makes User Experience Flexible

Flash is used on many Internet platforms, which include motion graphics, video, audio, two-way communications, and complex forms. Flash not only is flexible on the devices it is installed on, but it is flexible in the way a user can navigate the application they are using. One example of an Internet application that has this flexibility is the Broadmoor Hotel (<http://www.broadmoor.com>). The Broadmoor Hotel's web application was built using one easy screen, and allows the user to make a reservation without leaving the page to check on other details. The user performs all aspects of the reservation from picking dates, reserving the room, and then paying for the room all without the application having to leave the original page.

Perfetti says users perceive that they are getting immediate responses to their queries, because of the invisible interaction between the client and the server (at <http://www.uie.com/whitepaper.htm>, 2002). This is a marked difference from the old HTML applications where every query is sent to the server from the client and the user must wait for the results to be returned.

Communicate through Flash Remoting Server to any Service

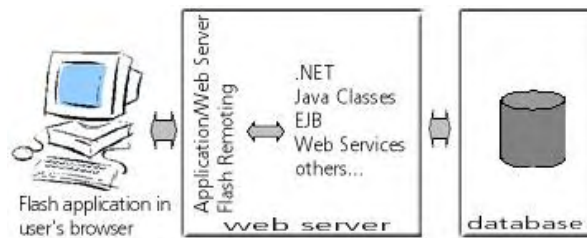


Figure 4. Flash Remoting example taken from the blueedgedata.com website

<http://www.blueedgedata.com/flash/flashremoting.htm>

Flash Remoting Invokes Methods to Talk to Web Services

Flash Remoting is able to invoke methods to talk to web services. Marinescu says that Flash out of the box – provides an asynchronous messaging model that allows Flash to invoke methods RPC-style directly on web services, EJB's, JavaBeans, JMX MBeans, POJOs, ColdFusion pages, ASP pages, to perform ASO.Net data binding operation, and creates links to a number of other resources in the ColdFusion and .NET worlds that are probably less important to TSS than the JAVA cases (at http://www2.theserverside.com/home/thread.jsp?thread_id=14080, 2002).

Flash Remoting uses Client ActionScript Extensions

Flash Remoting uses client ActionScript to invoke the methods that talk to the web services. The ActionScript extensions are built into the Flash Player 6 and developers can include them at the top of their scripts. An example of an ActionScript extension is

“NetServices.as”. When the developer includes this in their script, they then have access to all the functions of that service without writing any extra code.

Flash Remoting Also Uses a Server Gateway

The Flash Remoting gateway is how the web services are retrieved from within the Flash client. The gateway simply allows us to communicate through different protocols. Watkins says, “The gateway translates one protocol into the other allowing the actual message contained within the protocol to be understood by the destination (at <http://www.devmx.com/articles.cfm?Mode=Article&c=4&a=2>, 2002).”

Flash MX and Flash Remoting Offer Many Possibilities

The possibilities that Flash MX and Flash Remoting offer together are very promising. Chambers says Macromedia Flash Remoting can seamlessly call remote server-side services from Macromedia Flash, and Flash Remoting handles all of the data serialization and deserialization allowing developers to focus on the core logic of their applications (at http://www.macromedia.com/desdev/articles/flash_databases.html, 2003). Flash Remoting brings the gap between the rich-client development capabilities of Flash MX and the growing wealth of enterprise data and functionality residing on application servers. Kollmeyer offers the following possibilities (at <http://www.blueedgedata.com/flash/flashremoting.htm>, 2002):

1. Local data storage for your application, for example, being able to save a quote that you have created locally
2. Building solid database applications, including rich user interface elements, such as robust, event driven controls, lists, multiple windows, drag and drop and many more
3. Integrated on-line help, with streaming audio and video

4. True, interactive, graphical interfaces, including creating images and objects that the user can manipulate
5. Real-time collaborative applications, including multi-user drawing, live video, remote control and many more
6. Running “outside the browser” and off-line through the Flash Player
7. True printing capabilities, such as printing documents that are different from what is currently seen on the screen
8. Minimal deployment concerns
9. Integrate with your existing databases, web services, and .NET applications
10. Running the same system on various platforms with no or minimal changes, including the iPAQ and the wireless Nokia 9200 cell phone / PDA combination
11. Full programming language, with complete component architecture that is easily created for your own reusable components
12. Small, download of the runtime environment because an earlier version of Flash is probably already installed on your users’ computers

Conclusion

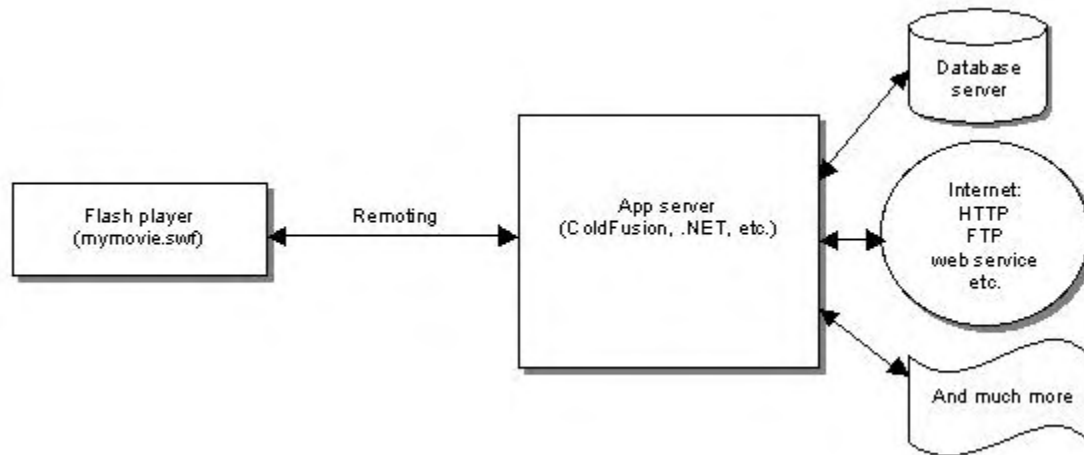


Figure 5. Flash MX and Flash Remoting example taken from the macromedia.com website http://www.macromedia.com/desdev/mx/flashcom/articles/coding_guidelines.html

Flash MX and Flash Remoting Combine to Make the Client-Server Computing Easier

The above picture shows the path of communication between the client, Application servers, and the database. The Flash Remoting is shown in between the Flash Player and the Application server. Lozben says, “Remoting simplifies the Macromedia Flash application development process by providing a programming mode and runtime support for connecting ActionScript directly to remote server objects (at http://www.macromedia.com/desdev/mx/flashcom/articles/coding_guidelines.html, 2002).”

Disadvantages of Flash

Most of the disadvantages of Flash have to do with programmers not designing their applications correctly. When this happens, the applications load slowly, and are hard to use.

Advantages of Flash

Flash has many advantages for programmers and users alike. Aberdeen Group, Inc. says that Macromedia has given Web developers a productive framework for assembling scalable,

secure, well-performing Internet applications (at http://www.macromedia.com/software/flashremoting/whitepapers/pdf/flr_architecture.pdf, 2002).” See [Appendix A](#) at the end of this paper for Macromedia’s list of 10 reasons why it is advantageous for you to buy Flash MX.

Is Flash Worth Using?

Macromedia Flash has come a long way since it began its existence as a plug-in for rendering animated movies in the web browser. Flash programmers can now create full-blown web applications that make the user experience better, and faster than in the past. In addition, with Flash Remoting that helps translate the data from the Flash Player to the server(s) and back again. This allows for instantaneous access of data stored in the database. Aberdeen Group, Inc says, “The Flash MX/Flash Remoting MX offering is a timely and fully realized answer to the distributed object challenge that provides significant development and runtime advantages over XML (at http://www.macromedia.com/software/flashremoting/whitepapers/pdf/flr_architecture.pdf, 2002).” Is Flash worth using? I think it is worth using even if extra time is needed to make sure the applications meet usability requirements for disabled users. It just makes sense to offer the users an experience that will give them less grief in the end.

Recommendations

1. Usability should be a high priority
2. Make a good roadmap of your project
3. Use the full functionality of Flash MX and Flash Remoting by using components or other pre-made code that comes with the products or is offered on Macromedia's website
4. Use Macromedia's forums or other user websites for suggestions or help with problems you might have implementing Flash MX and Flash Remoting

References

- Aberdeen Group, Inc. (2002). *Flash Remoting MX: A responsive client-server architecture for the web*. Retrieved January 20, 2003, from http://www.macromedia.com/software/flashremoting/whitepapers/pdf/flr_architecture.pdf
- Allaire, J. (2002a). *Is this Flash a little brighter?* Retrieved January 14, 2003, from <http://archive.devx.com/webdev/articles/ja073102/ja073102-1.asp>
- Allaire, J. (2002b). *Macromedia Flash MX - A next -generation rich client*. Retrieved January 20, 2003, from <http://www.macromedia.com/desdev/mx/flash/whitepapers/richclient.pdf>
- CapeScience. (2003). *Building a Flash client for web services*. Retrieved January 14, 2003, from <http://www.capescience.com/articles/flashclient/index.shtml>
- Chambers, M. (2002). *Getting started with Coldfusion MX and Flash Remoting*. Retrieved January 14, 2003, from <http://www.webmasterbase.com/article/816>
- Chambers, M. (2003). *An overview of client/server interaction using Macromedia Flash and databases*. Retrieved January 20, 2003, from http://www.macromedia.com/desdev/articles/flash_databases.html
- The Disenchanted Developer, DevShed.com (2002). *Building data-driven Flash movies*. Retrieved January 14, 2003, from http://www.devshed.com/Client_Side/Flash/DataDrivenFlash/page1.html
- Flashmagazine.com. (nd.). *The Flash history*. Retrieved January 28, 2003, from <http://www.flashmagazine.com/html/413.htm>
- Franklin, D. and Makar, J. (2002). *Macromedia Flash MX ActionScripting advanced* (1st Edition ed.). Berkeley: Macromedia Press.

- ITWeb, Dax Data Press Release. (2002). *Macromedia Flash Remoting MX available for Java, Microsoft.Net servers*. Retrieved January 14, 2003, from <http://www.itweb.co.za/sections/software/2002/0210150910.asp?O=S&CiRestriction=flash%20remoting>
- Kollmeyer, R. (2002). *Awesome new technologies for building web applications*. Retrieved January 14, 2003, from <http://www.blueedgedata.com/flash/flashremoting.htm>
- Lozben, S. (2002). *Understanding Macromedia Flash Communication Server Remoting*. Retrieved January 26, 2003, from http://www.macromedia.com/desdev/mx/flashcom/articles/coding_guidelines.html
- Macromedia, Inc. (2002a). *Developing rich internet applications with Macromedia MX*. Retrieved January 20, 2003, from http://www.macromedia.com/desdev/mx/studio/whitepapers/rich_internet_apps.pdf
- Macromedia, Inc. (2002b). *Macromedia Flash Remoting MX*. Retrieved January 20, 2003, from http://www.macromedia.com/software/flashremoting/productinfo/top_ten/
- Macromedia, Inc. (2002c). *Understanding Macromedia Flash Communication Server Remoting*. Retrieved January 26, 2003, from http://www.macromedia.com/desdev/mx/flashcom/articles/coding_guidelines.html
- Marinescu, F. (2002). *Macromedia builds Flash MX rich client front-end to J2EE petstore*. Retrieved January 20, 2003, from http://www2.theserverside.com/home/thread.jsp?thread_id=14080
- Meloni, J. (nd.). *Tipping Jakob's ladder*. Retrieved January 28, 2003 from <http://www.useit.com/alertbox/20001029.html>

Nielsen, J. (2000). *Flash: 99% bad*. Retrieved January 28, 2003 from

<http://www.useit.com/alertbox/20001029.html>

Nielsen, J. (2002). *Flash and web-based applications*. Retrieved January 28, 2003 from

<http://www.useit.com/alertbox/20021125.html>

Orfali, R. and Harkey, D. and Edwards, J. (1999). *Client/Server survival guide* (Third Edition ed.). New York: John Wiley & Sons, Inc.

Perfetti, C. and Spool, J. (2002). *Macromedia Flash: A new hope for web applications*. Retrieved

January 20, 2003, from <http://www.uie.com/whitepaper.htm>

Schall, D. (2003). *Flash Remoting with Server Side ActionScript*. Retrieved January 20, 2003,

from <http://www.devmx.com/articles.cfm?Mode=Article&c=4&a=19&p=40>

Watkins, J. (2002). *An introduction to Flash Remoting*. Retrieved January 20, 2003, from

<http://www.devmx.com/articles.cfm?Mode=Article&c=4&a=2>

Appendix A

Macromedia Flash Remoting MX *Top Ten Reasons to Buy*

1. Easy Access to Business Logic

Access web application services, XML documents, and web services quickly and easily using powerful new Macromedia Flash Remoting MX ActionScript commands. Flash Remoting MX enables you to expose well-defined application APIs to Macromedia Flash as simple ActionScript APIs, enabling easy workflow between UI designers and back-end developers.

2. Easy Access to Web Services

Access SOAP-based web services directly from Macromedia Flash using built-in SOAP 1.1/WSDL 1.1 proxy capabilities, enabling Rich Internet Applications to access and use remote web services—even when they're outside the originating domain.

3. Support for Leading Web Application Server Technology

Flash Remoting MX supports today's leading web application server technologies—including Macromedia ColdFusion, Microsoft .NET, and Java—enabling the use of Macromedia Flash as a rich user interface for a wide range of business applications.

4. Easy Testing and Debugging

Streamline testing and debugging of the most complex applications using the NetConnection Debugger. Developers can watch and trace events across both the client and server, reviewing detailed information about the data and instructions passed between them.

5. Simplified Recordset Handling

Use new Flash Remoting MX APIs for recordset handling and databinding. Simplify the use of recordsets within Macromedia Flash, enabling rich client applications to be front-ends for standard relational databases. Binding recordset data to a scrolling list or datagrid is now a simple operation.

6. Fully Supports XML Use

Seamlessly access any remote service that accepts or returns XML documents. Flash Remoting MX parses and translates ActionScript XML objects on the server into an org.w3c.xml DOM, making any remote service (a CFC, a page, an EJB, a Java class, a .NET DLL, etc.) that accepts or returns XML documents, or both, seamlessly accessible to Macromedia Flash. Developers who are currently using SOAP for custom XML documents can now easily expose them to Macromedia Flash clients in a simple model, eliminating the development of server-side parsing previously required when passing an XML stream from Macromedia Flash.

7. Promote Well-Designed Applications

Create well-designed Rich Internet Applications by using Flash Remoting MX to implement a three-

tier or n-tier model, with a clear separation of presentation logic from business logic and data.

8. Seamless Integration With Important Application Server Services

Utilize built-in application server features, such as security and session management. Flash Remoting MX ensures that security and session management mechanisms work between rich Macromedia Flash clients and application servers.

9. Deploy in Your Native Application Server Environment

Flash Remoting MX for Microsoft .NET is a pure .NET implementation that runs as 100% managed code, exploiting the benefits of .NET by providing optimal performance, functionality, and security. Flash Remoting MX for Java is a 100% pure Java solution that can be deployed as a WAR or EAR on compliant Java application servers.

10. Deploy Consistently Across Platforms and Devices

Deploy consistently to over 455 million Internet users across all major platforms and devices. The Macromedia Flash Player is the leading rich client, installed on over 98% of all Internet-connected devices. Deploying Rich Internet Applications built with Macromedia Flash MX and Macromedia Flash Remoting MX requires no additional client software deployment.

Author Note



Beverly Dianne Calhoun, University College CIS Student.

Beverly Dianne Calhoun is now a Masters student in Computer Information Systems at the University College of The University of Denver.

Address correspondence concerning this article to Beverly Dianne Calhoun at 560 S. Dahlia Circle #G-105, Glendale, CO 80246, or e-mail: dpeach2959@aol.com

Figure Captions

Figure 1. Early Flash movie example taken from the Designer-info.com website http://www.designer-info.com/master.htm?http://www.designer-info.com/Writing/flash_usability.htm shown on page 5 of this document.

Figure 2. Early Flash application called FutureSplash Animator taken from the Flashmagazing.com website <http://www.flashmagazine.com/html/413.htm> shown on page 6 of this document.

Figure 3. Flash application example taken from the Moen.com website <http://www.moen.com/consumer/homepage/index.cfm?CFID=2852066&CFTOKEN=57311786> shown on page 8 of this document.

Figure 4. Flash Remoting example taken from the blueedgedata.com website <http://www.blueedgedata.com/flash/flashremoting.htm> shown on page 10 of this document.

Figure 5. Flash MX and Flash Remoting example taken from the macromedia.com website http://www.macromedia.com/desdev/mx/flashcom/articles/coding_guidelines.html shown on page 13 of this document.