Chapter 1: Introduction to ColdFusion MX 7 Developer Edition

In This Chapter

- ✓ Defining dynamic Web sites
- Understanding the components of ColdFusion
- Beginning to work with the ColdFusion application server
- Working with databases
- Integrating ColdFusion with the rest of Macromedia Studio

ColdFusion MX 7 Developer Edition is a rapid development environment for creating dynamic — not to mention compelling — Internet applications. Three main components make up ColdFusion:

- Application server
- Administrative tool
- Custom scripting language

Together, these three components give you a diverse set of tools that make ColdFusion the quickest and easiest way to bring dynamic, interactive, and database-driven content to your Web site. (A *database* is a program, such as Microsoft Access, that is used to collect information in tabular format, namely, rows and columns.) In this chapter, we give you a basic introduction to each of the three components as well as an overview of what makes a Web site dynamic.

Creating Dynamic Web Sites

Web pages are wonderful. After you create a page with HyperText Markup Language (HTML) and then upload it to a *Web server* (a program such as Microsoft Internet Information Server [IIS] or Apache that enables people to view your Web site), it's ready to be viewed by the world. If you know HTML, this approach is simple, but it can create problems when your Web site expands in size and complexity. When your Web site grows, you may find yourself wanting to do one or more of the following:

 Display Web pages for a variety of different products or services by maintaining the same *look and feel* (each page having the same banner, company logo, background image, and so on).

- Sort and display the same content in different ways; for example, you
 may want to highlight sports articles over news articles on a page if a
 user is more interested in sports than news.
- Customize content based on actions that a user takes at a site.
- Personalize content based on preferences that a user sets when visiting your site.
- ◆ Allow users to perform complex searches of documents and databases.
- Create shopping carts and user accounts that keep track of purchases and other shipping information.

If you've ever wanted to do any of these things, you're longing to create a *dynamic* Web site. Dynamic Web sites use a *Web application server*, such as ColdFusion, to extend the capabilities of a standard Web server by creating custom content for each browser request. A Web application server can also connect to a database to retrieve information used to build pages, or it can save information submitted by the user.

To demonstrate what we're talking about, take a look at the Web site for the California HealthCare Foundation, as shown in Figure 1-1. This foundation provides a diverse set of information — reports, studies, analyses — on a wide array of healthcare topics. Note in the figure that you can click any of a number of relevant healthcare-related topics. Within each of these topics are literally hundreds of articles.

Instead of creating *static* (nonchanging) pages for each of these topics and their subsequent articles, the foundation can instead use the ColdFusion application server and a database to drive its Web site, which allows the foundation to use a handful of ColdFusion pages to do the following:

- Look up the basic information about any number of reports and studies that the foundation funds.
- ◆ Insert data from a database into a specific topic or report template. A *template* is a bit of HTML and ColdFusion Markup Language (CFML) code that gets combined with data from a database to help construct a Web page. Several templates may make up one individual page.
- Display the topic or report page for an item that the user requests via a Web browser.



The idea behind creating a dynamic Web site is to create the least number of templates to represent the largest number of pages on the site. This way, when you change something on the site, you don't have to make the change on every single page.

Figure 1-2 shows a topic within the California HealthCare Foundation. If you compare Figure 1-2 with Figure 1-1, you can see that the topics are different, but the *architecture* (design) of the two pages is identical.



California HealthCare	oundation: Health Policy - Microsoft Internet Explorer		
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Home About Ci	ICE Grants & REPS Press Programs Publication	nos Helo	
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CALIFORNIA			
HEALTHCARE	California's large and turbulent health care environment presents real	Health Policy	
Fairmont	challenges for stakeholders to be effective agents of change in setting health	in the News	
FOUNDATION	policy. From managed care to managing the health care workforce, CHCF		
	presents the facts about health care in California.	California Healthline	
Browse Topics		 50 Governors Support 	
Health Care Delivery		Federal Prescription Drug	
Health Care Financing	Sort By: Alpha Chron Default	Coverage for Dual-	
 Health Insurance Health Plans 	Racial and Ethnic Data Collection and Use in Health Care: Examples of	August 18, 2003	
Health Policy	Projects that Might Be Affected by Proposition 54	NOO Examinan Marilla	
Health Privacy	August 2003	Savinos Account	
Healthy Families	Proposition 54 will appear before California voters on the October 2003 ballot.	Provision in Medicare	
▶ HIPAA	recisiletopic information that the opvergment could collect	Legislation	
Hospitals Hospitals		August 14, 2003	
 Managed Care 	California's Budget Crisis: Consumers Respond to Proposed Cuts to Health	 JAMA Publishes 	
▶ Medi-Cal	Services	Physician Group Dranosal for Single	
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Patient Safety	Californians are concerned that state and local budget problems will translate	Svatem	
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Figure 1-2: Another topic within the foundation.

Exploring the Components of ColdFusion

The workhorse of ColdFusion is the application server, which provides a fast, reliable platform for your Web applications. To make the most of this powerful application server, you must be able to configure and control it, which you do with

- ◆ ColdFusion Administrator: The ColdFusion Administrator allows you to configure the server to meet your specific needs. (Read more about this in the upcoming section, "Working with the ColdFusion Administrator," and in Book VII, Chapter 2.)
- ColdFusion Markup Language (CFML): ColdFusion Markup Language can be used to communicate instructions to the application server. (Read more about CFML in the upcoming section, "Investigating CFML," and in Book VII, Chapter 4.)



The ColdFusion Application Server is built on top of the Java 2 Platform, Enterprise Edition (J2EE). Check out the Sun Microsystems Web site at http://java.sun.com for more information on J2EE, where it came from, and who supports it.

Understanding the Role of the Web Application Server

An *application server* executes the business logic of your Web application. By *business logic*, we mean the way in which you want something to run for your business — in this case, how you want your Web site to display content. Your business logic may be as simple as verifying (that is, ensuring that users have entered all the required information) the data that the user enters in a form on your Web page and inserting it into a database. No matter what sort of task you need to accomplish, if it requires any sort of logical processing (conversion of CFML code to HTML), the application server is the component of ColdFusion that does the work.

The infrastructure of most Web applications can be divided into three parts, which are commonly referred to as a *three-tier architecture:*

- ◆ Display tier: A Web browser
- ✦ Application tier: ColdFusion
- ✤ Database tier: Any compatible database

The application server is responsible for managing the interactions between all three of these tiers. It accepts inputs from the Display Tier, interprets the CFML in the Application Tier, and brokers requests to databases at the Database Tier.

Investigating CFML

In a three-tier application, the application server executes all the business logic, as we discuss in the preceding section. In ColdFusion, you use CFML to build that business logic.

CFML provides the instructions for each page while it is processed by the application server. Like HTML, CFML uses *tags*, which instruct the application server as to what kind of functions to perform. Built-in tags can handle many common tasks required by Web applications, including the following:

- ♦ Page formatting
- ♦ Form validation
- ♦ Database access
- ✦ Generating and sending e-mail
- ♦ User security
- ✦ Generating charts and graphs

In addition to tags, CFML also includes hundreds of built-in functions (best to think of them as tools built into ColdFusion) that you can use to test and manipulate your data. By adding CFML tags and functions to your pages, you build the instructions for the application server. We cover CFML in more detail in Book VII, Chapter 4.

Working with the ColdFusion Administrator

ColdFusion Markup Language provides the application server with instructions for each page, but some information (such as database connectivity) is configured only once for the entire server — and thus, all the sites that use that server. The ColdFusion Administrator is used to control server-wide settings, such as the following:

- ✤ Database connections
- Variable scopes (check out Book VII, Chapter 3 for more information on what variable scoping means in the context of ColdFusion)
- Debugging options
- ♦ Security settings
- ♦ Application logging



The ColdFusion Administrator is used not only to set up your server, but it's also a valuable maintenance tool for reporting on things occurring in your Web site. We cover the ColdFusion Administrator, including how to use it to set up database connections, change your logging settings, set your debugging options, and optimize the speed of your Web site, in more detail in Book VII, Chapter 2.

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Setting Up the ColdFusion Environment

To begin working with ColdFusion, you need access to a working server. You may want to find an Internet service provider (ISP) that already runs ColdFusion, or you can install your own server right on your desktop PC. Be aware that ColdFusion Server has traditionally been available for both the UNIX and Windows environments, but Macromedia Studio is a Windowsand Macintosh-only product, and the Macintosh version of Macromedia Studio does not include ColdFusion.

Finding an ISP

If you need to get a site up and running as soon as possible, hosting your Web application via an ISP saves you the trouble of installing and configuring your own server. You generally have limited control over the server configuration with an ISP, but that drawback is usually outweighed by the other benefits of using an existing server.

A large number of ISPs have offered ColdFusion hosting for years, and many of these providers now support ColdFusion. You need to check the version of ColdFusion that the ISP supports before you sign up. Here are some of the more well-known ColdFusion ISPs:

- CrystalTech: www.crystaltech.com
- CFDynamics: www.cfdynamics.com
- ◆ Definitive Web Solutions: www.dwsgroup.com
- Edge Web Hosting: www.edgewebhosting.net

Installing the application server

Installing your own application server on your PC is a great way to learn about ColdFusion. The Developer Edition is designed for a single user machine for personal development. Previous editions of Studio MX included the ColdFusion Developer Edition. With Studio MX 8, Macromedia eliminated ColdFusion MX 7. To take advantage of ColdFusion using Studio MX 8, go to the Macromedia Web site at www.macromedia.com/software/coldfusion and download the Developer Edition.

After you download the ColdFusion MX 7 Developer Edition from the Macromedia Web site, you can set up the program by following these steps:

1. Double-click the Macromedia ColdFusion MX 7 installation executable file.

After the installer finishes loading, notice the dialog box that prompts you to pick a language for your ColdFusion installation.

- 2. From the ColdFusion MX 7 installation screen, select your language and then click OK.
- 3. Click Next on the initial installation screen.
- 4. Select the I Accept the Terms in the License Agreement radio button on the Licensing Agreement screen and then click Next.
- 5. Enter the ColdFusion serial number in the Serial Number field or select the 30-Day Trial (Enterprise Edition) or the Developer Edition (Single-IP Only) check box; then click Next.

If you already have an installation of ColdFusion MX on your system, the installer will preselect the Update ColdFusion MX to ColdFusion MX 7 radio button. Otherwise, it selects the Install New Version of ColdFusion MX 7 option.

- 6. Select the Server Configuration radio button on the Install Configuration screen and then click Next.
- 7. If you have a previous version of ColdFusion server running on your machine, select Next at the warning screen reminding you to shut down all ColdFusion services.

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Having ColdFusion completely shut down when installing an upgrade is always a good idea.

8. Select the ColdFusion subcomponents you want to include in your installation.

In nearly all cases, install all the subcomponents.

9. Choose the directory in which you want to install the product.

By default, ColdFusion installs the product in C:\CFusionMX7 and the Web files in C:\CFusionMX7\wwwroot. You can change this by clicking the Change button. Otherwise, you can just click the Next button to install into the default directories.



As a general rule, install your Web files on the D: drive if you have a *partitioned* drive (meaning a C: drive and a D: drive that are both hard drives). This helps prevent potential hackers from finding any other information on your computer, should you be attacked.

10. Select the Web server you want to use with ColdFusion and then click Next.

For personal development on a single machine, select the Built-In Web Server option (as you may or may not have another Web server installed on your machine). For Microsoft IIS, you can configure the All IIS Websites option as shown in Figure 1-3. If you choose the Configure Specific IIS Website or Another Web Server radio button, you must click Add and step through the wizard. Book VII Chapter 1

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11. Select the directory location for the ColdFusion Administrator.

By default, this is the location that maps to the Web server you specified. For example, if you chose Microsoft IIS, the location is C:\Inetpub\ wwwroot. If your administrator directory is different from the one specified, enter it in the path provided.

12. Enter and confirm your Administrator password; then click Next.

This password is required to enter the ColdFusion Administrator.

13. Enter and confirm your password for Remote Development Service (RDS), as shown in Figure 1-4.

		Administrator Passwo
	 Introduction License Agreement Configure Installer Configure ColdFusion MX Pre-installation Summary Interview 	Enter the password that you will use to control access to the ColdFusion MX Administrator. This field is required.
	Installation Complete	Enter password: *******
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This password is required to allow you to connect to your ColdFusion server remotely for development purposes.

14. Review your installation settings and then click the Install button to install the product.

Installation takes a few minutes, and the progress is shown as the installation is occurring.

15. After the installation is complete, click the Done button to complete your installation.

Leave the Launch the Configuration Wizard in the Default Browser radio button selected to go directly to the ColdFusion Administrator and finish configuring your server.

Configuring the application server

After the installation is complete, you can test and configure your application server by loading the ColdFusion Administrator:

1. Load the ColdFusion Administrator.

Do this by using the shortcut in the Start menu or navigating directly to http://localhost:8500/CFIDE/administrator/index.cfm (http://127.0.0.1/CFIDE/administrator/index.cfm also works) via your Web browser. (The administrator is a Web-based application.)

2. Enter your password.

Use the username and password for the administrator (as opposed to the RDS; see Step 12 in the list in the preceding section) that you created during the installation process to log on as the administrator, as shown in Figure 1-5.

A number of administrative tasks, including setting up database connections, configuring e-mail, and setting your debugging options, are covered in more detail in Book VII, Chapter 2.



If you're using another Web server, such as IIS or Apache, you also need to make sure that that application server is running properly and that it has its default directory as the same location where you installed ColdFusion.

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Introducing Databases

Databases are often an integral part of any dynamic site, and ColdFusion is no exception. A *database*, in very general terms, is simply a structured set of data. The power of a database is in its ability to organize data for easy retrieval when requested. If you've ever used a spreadsheet program, such as Microsoft Excel, you've probably created a structured collection of data that could, in fact, be a database.

Databases are generally made up of the following elements:

- ★ Tables: The containers for similar sets of data, made up of columns, rows, and cells. For example, a table might contain *records* (a collection of rows in a table) of all your products.
- ✦ Cells: The individual blocks that make up the table. Cells contain only a single piece of data and are grouped by columns and rows.
- ◆ Columns: The vertical block of cells that groups the data in the table into categories. Using our previous example of the product table, the data entered into columns in that table might include things like Name, Price, and Description.

♦ Rows: The horizontal block of cells in a table that contains the information for each individual record, spanning all the columns. Using the example of the product table, a row contains all the information about a single product, such as Silver Streak Bowling Ball, \$200 and The finest pure silver bowling ball money can buy.

Databases come in all shapes and sizes, from the simple to the complex. Following are the most common database types:

- ✦ Flat file: A text file that contains a single set of columns and rows, with the data usually being separated by commas or tabs. A Comma Separated Values (CSV) file is an example of a flat file.
- ✦ Relational: A collection of tables with common data elements (values in like-named columns) between them, providing expanded collection and reporting capabilities. These usually require a query language to retrieve information from the database.

When you become more comfortable with ColdFusion, you begin to see (and of course, we show you!) just where databases can be extremely useful. For now, you can whet your appetite by checking out Figure 1-6, which shows an example of a database table in Microsoft Access. Relational database design, which is central to harnessing the power of ColdFusion, is covered in more detail in Book VII, Chapter 6.



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Taking a Quick Tour of ColdFusion in Dreamweaver

Dreamweaver 8 is specially designed to make writing ColdFusion pages easier. The great thing about Dreamweaver is its ability to flip back and forth between Code view and Design view:

- ◆ Code view: Gives you direct control over the code. If you've used previous versions of ColdFusion Studio or HomeSite (the HTML editor that is part of previous versions of ColdFusion), you may notice that the Code view in Dreamweaver looks similar to those products.
- Design view: Enables you to see a visual representation of your page, just like it would appear in a Web browser.
- Split Screen mode: Displays both the code and the graphical representation on your screen, as shown in Figure 1-7.



When you're using Code view, many features are available to you that are made specifically for ColdFusion development:

- ♦ CFML toolbars
- ✦ CFML function auto-complete
- ♦ CFML validation
- ♦ Code view that works similarly to previous versions of HomeSite and ColdFusion Studio
- Debugging commands
- ✦ ColdFusion server connection
- Drag-and-drop components
- ♦ Database access

These features are covered in more detail in the rest of Book VII.

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