Practical Liferay: Java™-based Portal Applications Development

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CHAPTER 1

Introducing and Installing Liferay

Web portals have become commonplace in today's online world. While surfing the Internet, you often open web portals without even realizing it. So what's a portal, anyway? Why are portals so important? How do you create your own portal? Are there any frameworks and tools that are suitable for creating portals? What kind of management is required to maintain a portal? How do you administer a portal? You will find answers to these and many other questions in this book, which walks you through an example of creating and managing a typical web portal.

In this chapter, you'll first learn what a portal is. You will then be introduced to Liferay, a popular open source framework for creating portals. You'll learn to install Liferay on your machine and create a portal of your own as you read through the book. This chapter comprises the following sections:

- What Is a Portal?
- Kinds of Portals
- Portal Advantages
- Creating a Portal with Liferay
- Liferay Features
- Under the Hood
- Installing Liferay
- Testing the Liferay Installation

What Is a Portal?

You have already encountered a web portal if you've used Yahoo!—one of the world's best-known and most-used portals. Yahoo! Sports, Yahoo! Finance, Yahoo! Movies, and Yahoo! Music each aggregate the contents provided by their partners. This is exactly what a portal does: it provides a single point of entry to widely distributed information on the web, and it offers a unified way to access that diverse information.

Some portals allow users to decide what they want to display on their portal pages. In many of these cases, the portal designer will customize the user's page contents and generate them dynamically. Regardless of whether the customization is done by the portal designer or the user, portals provide an easy way to configure desired content on a personal web page. Plus, portals provide a consistent look and feel. Users can take advantage of diverse applications in the same manner, making it easy for them to access information from various sources.

Now let's look at the formal definition of a "portal." If you search for "portal definition" on Google, you'll pull up several definitions that all convey the same meaning. Wikipedia (`http://en.wikipedia.org/wiki/Web_portal`), the popular free encyclopedia, provides the following definition:

> *A web portal is a site that provides a single function via a web page or site. Web portals often function as a point of access to information on the World Wide Web. Portals present information from diverse sources in a unified way. Apart from the search engine standard, web portals offer other services such as e-mail, news, stock prices, infotainment, and other features. Portals provide a way for enterprises to provide a consistent look and feel with access control and procedures for multiple applications, which otherwise would have been different entities altogether.*

The Wikipedia definition is probably the most comprehensive one. As it states, a web portal gives a user access to contents generated by diverse applications in a unified way.

Here's another definition from Sun Microsystems, which defines "portal" in its Java Portlet Specifications (JSR 286) as follows:

> *A portal is a web-based application that commonly provides personalization, authentication, [and] content aggregation from different sources and hosts the presentation layer of information systems.*

This definition states that a portal is a kind of web application that aggregates content from different sources—web sites or web applications. The content generated by these web sites can be static or dynamic. For example, a sports-related portal might generate a web page that aggregates and presents information from several sports web sites. If a user decides to gather further information from one of the displayed web sites, she can simply visit that web site by navigating to it from the portal page. After doing that, she can return to the portal page with ease and continue navigating to the other web sites if desired.

Some of the displayed web sites might require the user to sign on, in which case a portal can offer the capability of single sign-on. Single sign-on means that once the portal authenticates the user, it applies the same credentials to all the applications displayed on the portal page so that the user can access them. In some cases, a portal simply communicates to an aggregated application that the user is authenticated, and the application trusts that.

As stated in the Sun Microsystems definition, a portal provides personalization, whereby the user can decide what applications should be initially displayed on the personal portal page. The user can configure this page any time by adding and removing different applications.

Different web sites offer several other definitions, all of which describe portals as user-customizable web sites that serve as gateways to diversified content arising from various sources. However, these definitions neglect to describe an important feature of today's portals:

they provide collaboration among their users. Most of the Web 2.0 features such as wikis, blogs, video sharing, and even social networking are available on today's portals.

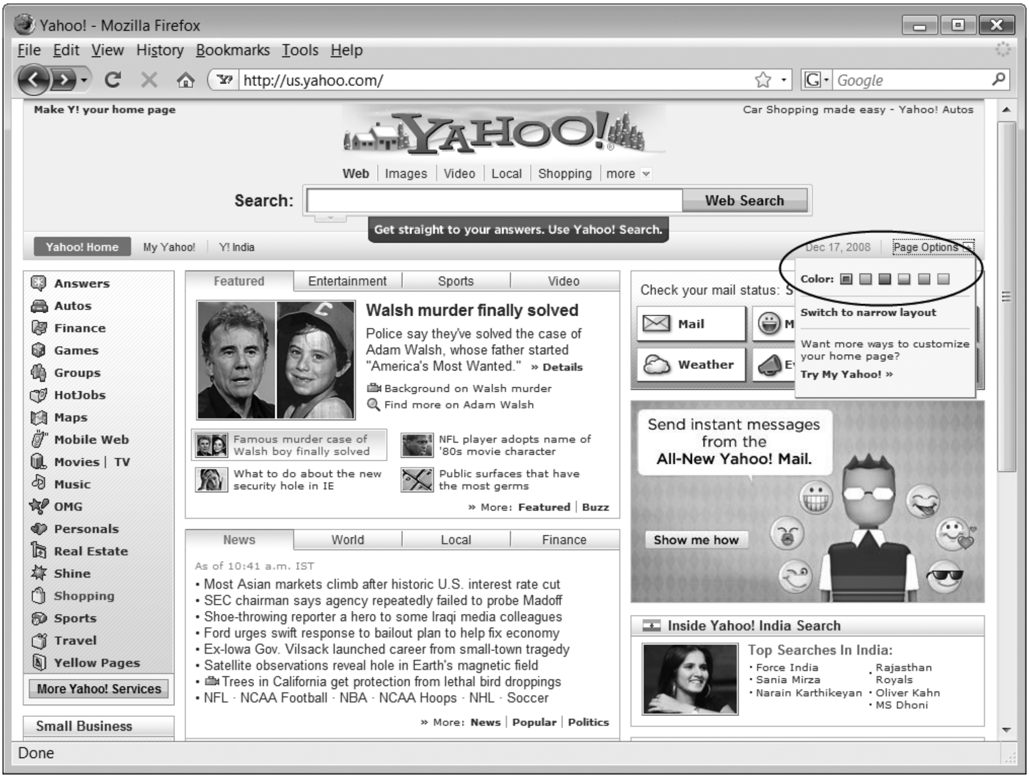
Generally, these new types of portals give users tools and applications to create sites for social networking and collaboration. I'll describe one such portal, uPortal, later in this chapter. The Liferay portal that we'll explore also falls into this new category of portals.

Now that I've defined what a web portal is, I'll discuss two real-life examples: Yahoo! and Google.

Example Portal: Yahoo!

To understand what a portal is and how to customize its contents, look at what Yahoo! provides to a user. When you open the Yahoo! web site, you see a screen similar to the one shown in Figure 1-1, assuming that you are in the United States (`http://us.yahoo.com`).

Note The Yahoo! pages shown in this section vary by region. Depending on your location in the world, the menus and their locations appear in different places. So do not get alarmed if the menus discussed here do not appear in the shown location. You will need to locate the appropriate menu to proceed further.



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Background on Walsh murder

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Famous murder case of Walsh boy finally solved

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Want more ways to customize your home page? Try My Yahoo! »

Send instant messages from the All-New Yahoo! Mail.

As of 10:41 a.m. IST

- Most Asian markets climb after historic U.S. interest rate cut
- SEC chairman says agency repeatedly failed to probe Madoff
- Shoe-throwing reporter a hero to some Iraqi media colleagues
- Ford urges swift response to bailout plan to help fix economy
- Ex-Iowa Gov. Vilsack launched career from small-town tragedy
- Satellite observations reveal hole in Earth's magnetic field
- Trees in California get protection from lethal bird droppings
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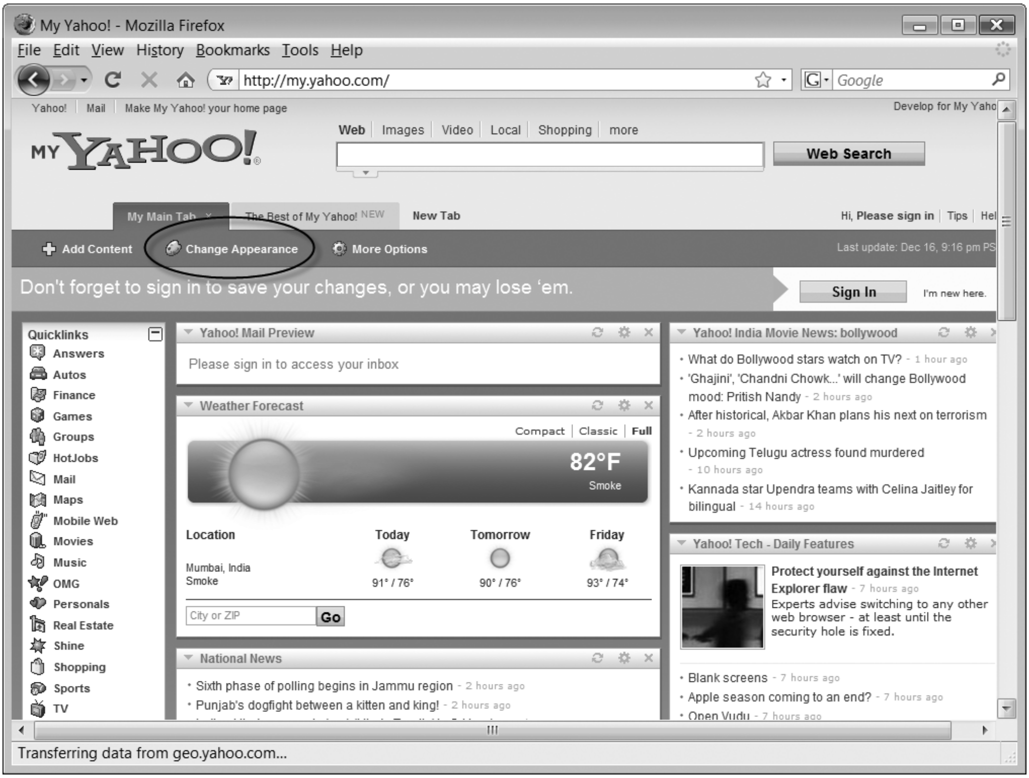
Inside Yahoo! India Search

Top Searches In India:

- Force India
- Sania Mirza
- Narain Karthikeyan
- Rajasthan Royals
- Oliver Kahn
- MS Dhoni

Figure 1-1. *Yahoo! home page*

On the right-hand side, you will see the *Page Options* drop-down menu. One of the options in the drop-down list is *Try My Yahoo!*, which allows you to customize your Yahoo! page (see Figure 1-2).



Don't forget to sign in to save your changes, or you may lose 'em.

Please sign in to access your inbox

- What do Bollywood stars watch on TV? - 1 hour ago
- 'Ghajini', 'Chandni Chowk...' will change Bollywood mood: Pritish Nandy - 2 hours ago
- After historical, Akbar Khan plans his next on terrorism - 2 hours ago
- Upcoming Telugu actress found murdered - 10 hours ago
- Kannada star Upendra teams with Celina Jaitley for bilingual - 14 hours ago

Protect yourself against the Internet Explorer flaw - 7 hours ago
Experts advise switching to any other web browser - at least until the security hole is fixed.

- Blank screens - 7 hours ago
- Apple season coming to an end? - 7 hours ago
- Open Vudu - 7 hours ago

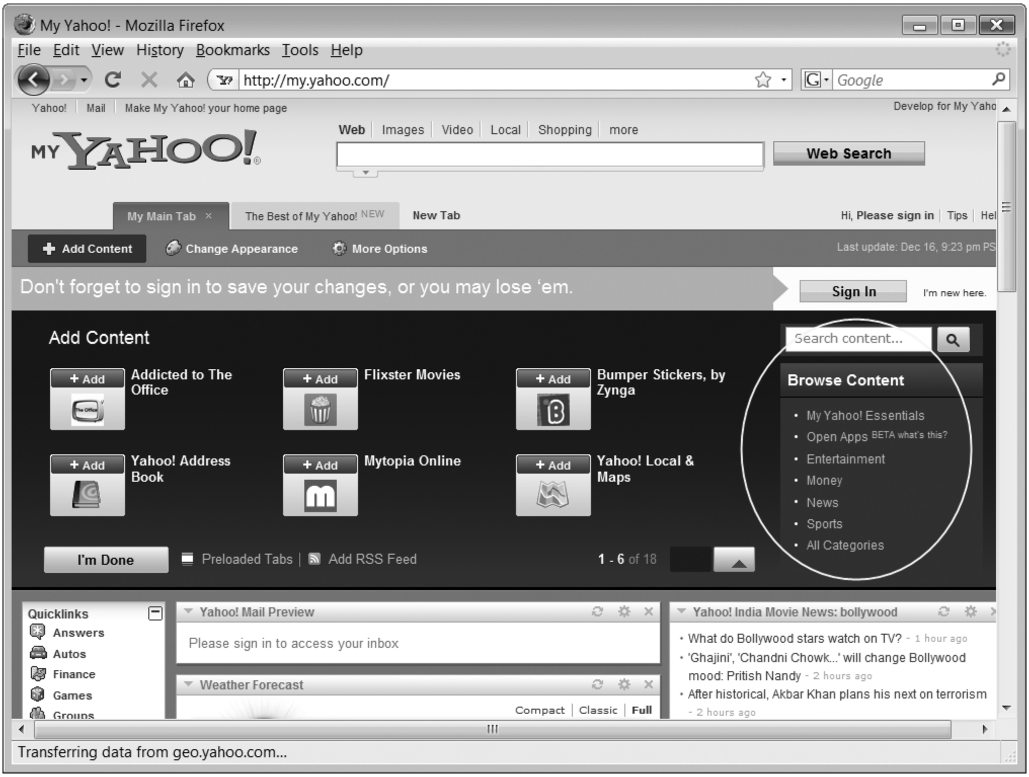
- Sixth phase of polling begins in Jammu region - 2 hours ago
- Punjab's dogfight between a kitten and king! - 2 hours ago

Transferring data from geo.yahoo.com...

Figure 1-2. *My Yahoo! portal page*

Aggregating Contents

At the top of the page, you will find a toolbar that allows you to add content to the page and change its appearance. When you click the *Add Content* menu option, you will see a list of options as shown in Figure 1-3.



Don't forget to sign in to save your changes, or you may lose 'em.

Please sign in to access your inbox

- What do Bollywood stars watch on TV? - 1 hour ago
- 'Ghajini', 'Chandni Chowk...' will change Bollywood mood: Pritish Nandy - 2 hours ago
- After historical, Akbar Khan plans his next on terrorism - 2 hours ago

Transferring data from geo.yahoo.com...

Figure 1-3. *Content-selection menu option*

Click the desired item in the displayed list to add it to your page. Before adding an item, you can preview it by hovering the mouse over it and clicking the *Show Preview* link that's displayed. You can add multiple items to the page.

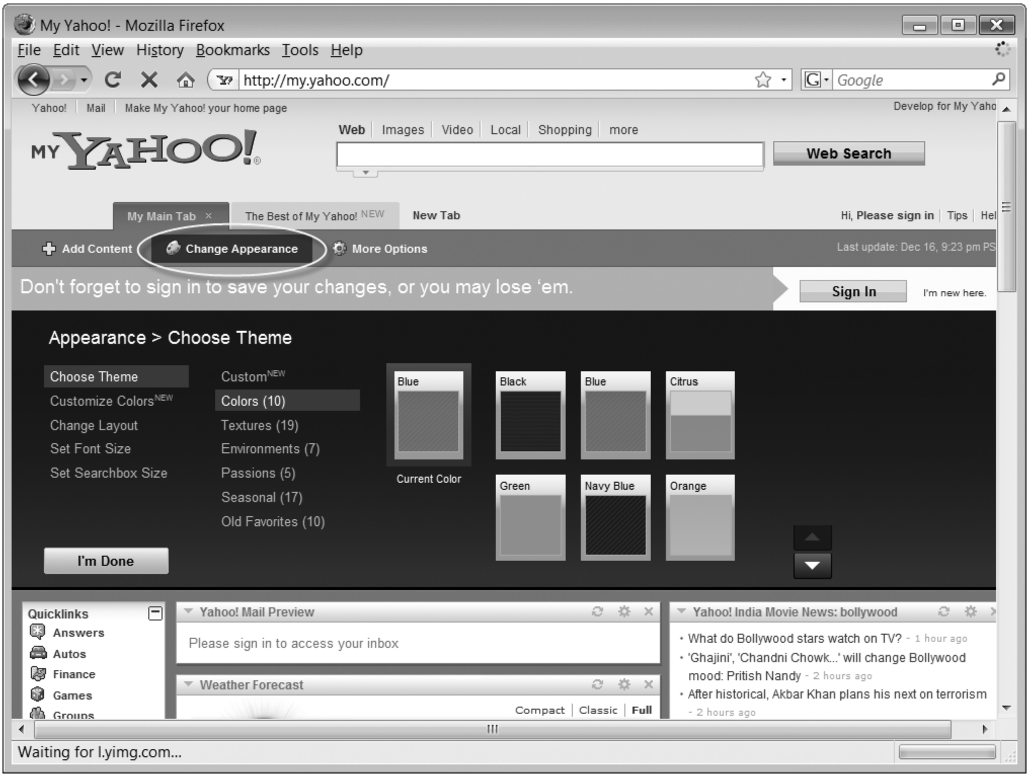
Once you've added an item, you can relocate it on the page simply by selecting it and dragging it to the desired position. You can remove any of the added or existing items from the page by clicking the "x" symbol shown in the top-right corner of each. After deleting the undesired items, you can relocate the remaining items to your liking.

Once you've finished adding items to your page, click the *I'm Done* button to return to full-page view. You've just configured the entry-point page that provides easy, uniform access to several distributed applications on the web.

Now, you'll change the page's appearance—its look and feel.

Changing Look and Feel

Clicking the *Change Appearance* menu option opens the screen shown in Figure 1-4.



Don't forget to sign in to save your changes, or you may lose 'em.

Please sign in to access your inbox

- What do Bollywood stars watch on TV? - 1 hour ago
- 'Ghajini', 'Chandni Chowk...' will change Bollywood mood: Pritish Nandy - 2 hours ago
- After historical, Akbar Khan plans his next on terrorism - 2 hours ago

Waiting for l.yimg.com...

Figure 1-4. *Changing the look and feel of a page*

Here, you will find options for changing the color, layout, font size, and search-box size. Select the color of your choice from the displayed colors. You can also select textures, environments, and so on from the displayed menu choices. To change the layout, click the *Change Layout* option and select the size and number of columns from the choices offered. After selecting a different column layout, you might want to rearrange the display items to your liking. Likewise, you can configure font size and search-box size by clicking the respective menu choices.

Try out the other configuration options. If you want your changes to persist, you should sign on before making them.

You've used a portal that lets the user aggregate desired home-page content and you've set the page's look and feel. Now consider Google, another popular portal in the market.

Example Portal: Google

When you open the Google home page, you will find an *iGoogle* link on the right-hand side (see Figure 1-5).

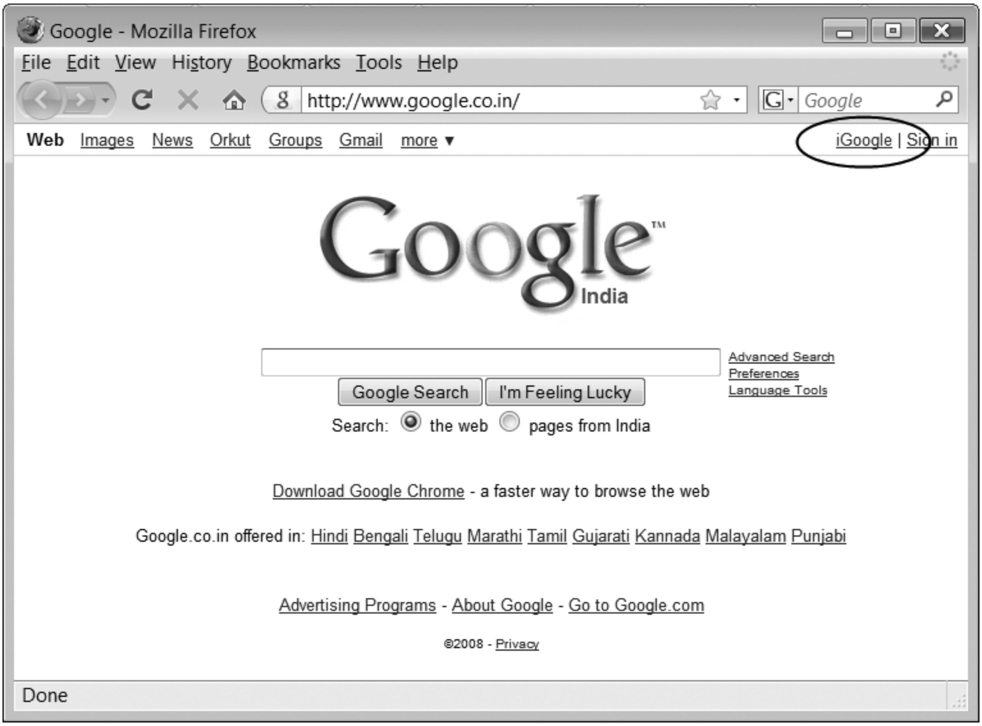

Google - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://www.google.co.in/
Google
Web Images News Orkut Groups Gmail more ▾
iGoogle | Sign in
Google™
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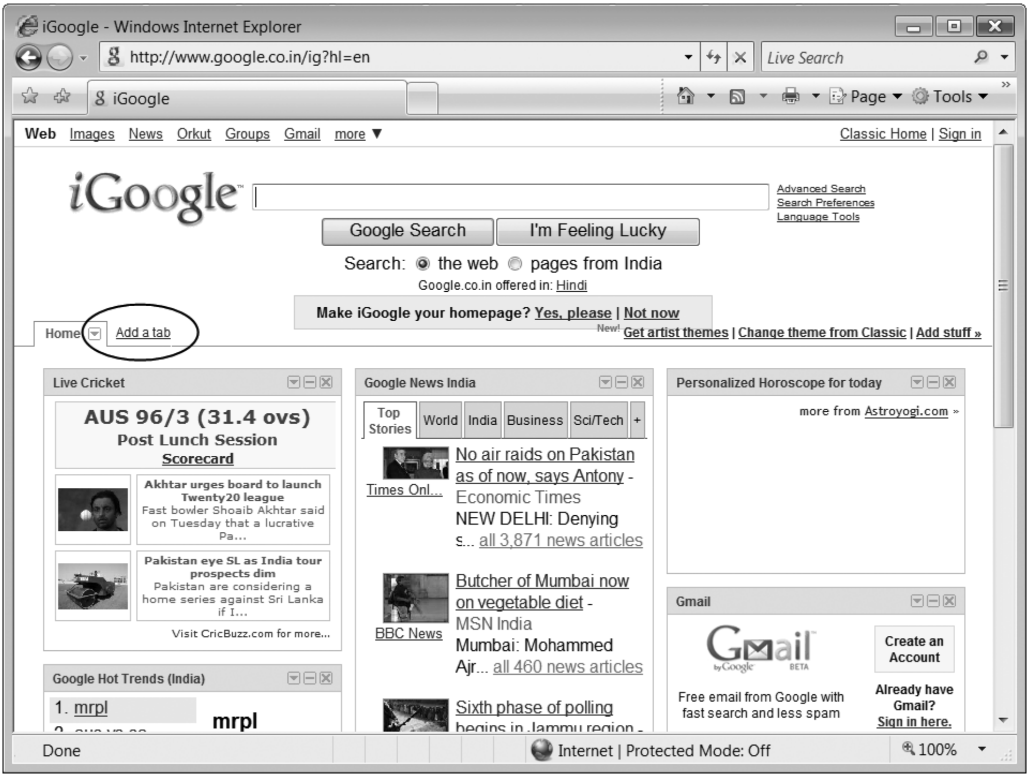
Figure 1-5. *Google home page displaying the iGoogle link*

Clicking this link opens the Google portal page that you can customize to suit your needs (see Figure 1-6).


iGoogle - Windows Internet Explorer
http://www.google.co.in/ig?hl=en
Live Search
iGoogle
Page
Tools
Web
Images
News
Orkut
Groups
Gmail
more ▼
Classic Home | Sign in
iGoogle
Advanced Search
Search Preferences
Language Tools
Google Search
I'm Feeling Lucky
Search: ● the web ○ pages from India
Google.co.in offered in: Hindi
Make iGoogle your homepage? Yes, please | Not now
Home
Add a tab
New! Get artist themes | Change theme from Classic | Add stuff »
Live Cricket
Google News India
Personalized Horoscope for today
Top Stories
World
India
Business
Sci/Tech
+
more from Astroyogi.com »
Gmail
Create an Account
Already have Gmail?
Sign in here.
Google Hot Trends (India)
1. mrpl
mrpl
Done
Internet | Protected Mode: Off
100%

AUS 96/3 (31.4 ovs)
Post Lunch Session
Scorecard

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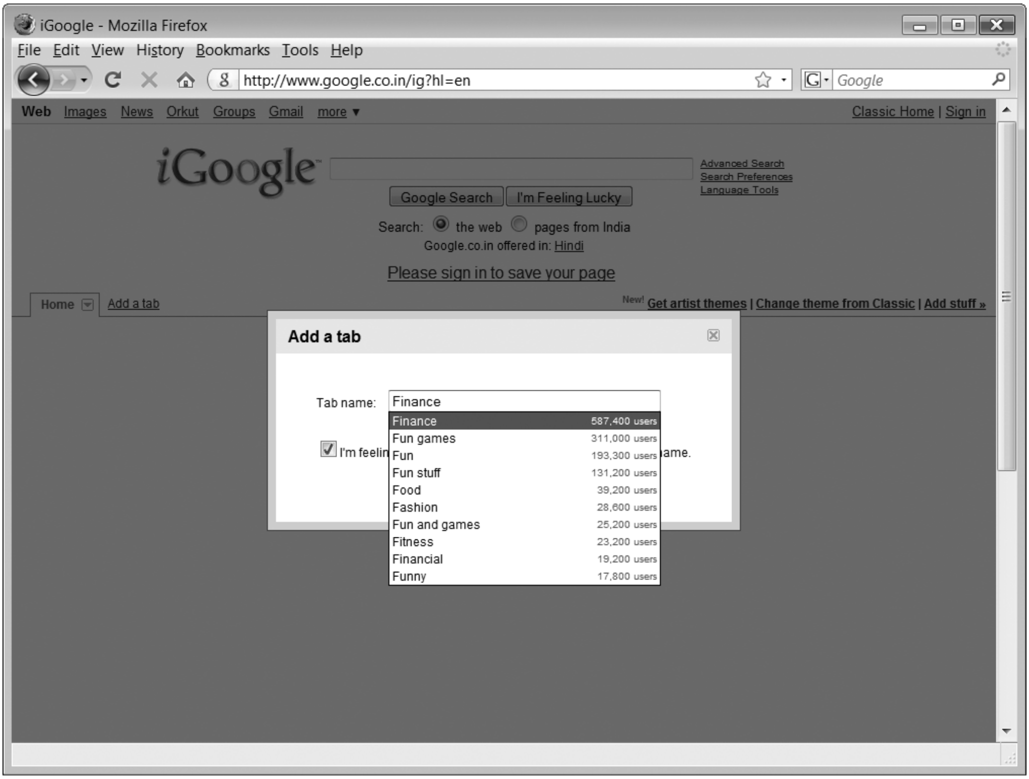
Figure 1-6. *A typical Google portal page*

The iGoogle portal allows you to add more pages. Note the *Add a tab* link next to the *Home* tab. Clicking the *Add a tab* option opens a dialog box that asks for the tab name.

■ **Note** The *Add a tab* menu appears as a link or as an option in a drop-down list, depending on your location. Google's user interface varies from country to country, and the company can change it any time without notice. So do not get alarmed if your screen looks different from the one shown here. You will need to search for the menu options discussed in this book on your own Google portal page.

Entering a character in the displayed edit control opens a drop-down list showing the available predefined tabs, as shown in Figure 1-7.


iGoogle - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://www.google.co.in/ig?hl=en
Google
Web Images News Orkut Groups Gmail more ▾
Classic Home | Sign in
iGoogle
Advanced Search
Search Preferences
Language Tools
Google Search
I'm Feeling Lucky
Search: ● the web ○ pages from India
Google.co.in offered in: Hindi
Please sign in to save your page
Home
Add a tab
New! Get artist themes | Change theme from Classic | Add stuff »
Add a tab
☑ I'm feelin
ame.

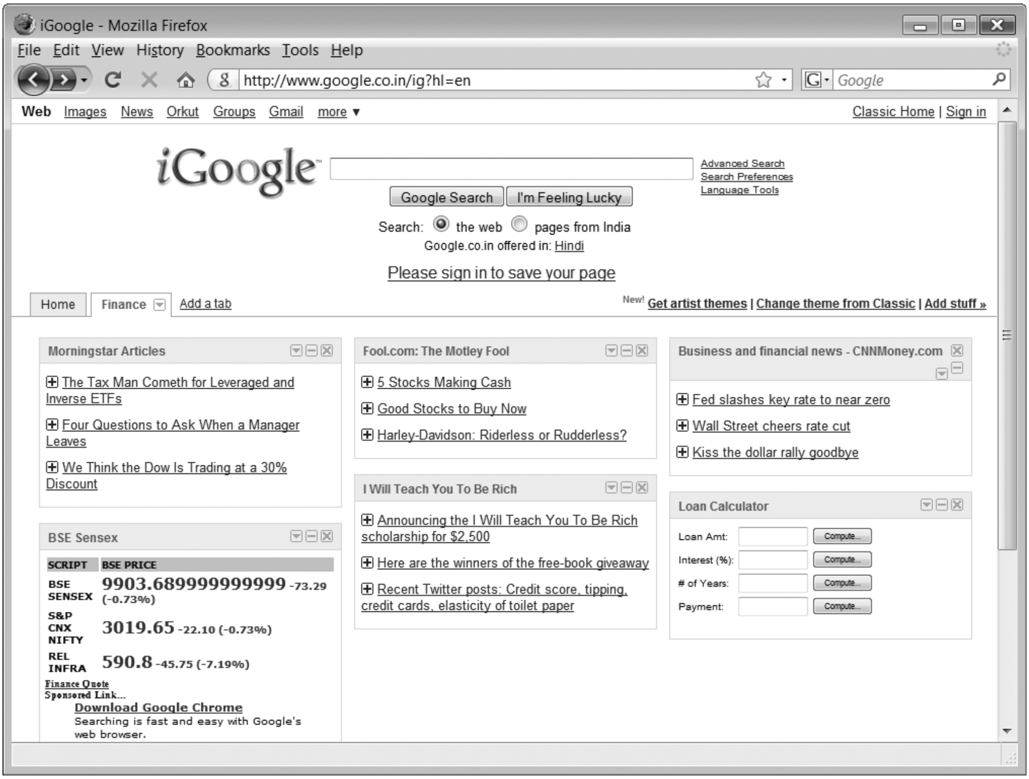
Tab name: Finance

Finance	587,400 users
Fun games	311,000 users
Fun	193,300 users
Fun stuff	131,200 users
Food	39,200 users
Fashion	28,600 users
Fun and games	25,200 users
Fitness	23,200 users
Financial	19,200 users
Funny	17,800 users

Figure 1-7. *Selecting from predefined tabs*

Google provides the user with several tabbed pages pertaining to different categories. Simply type a letter in the *Tab name* edit box to drop down a list of predefined tabs starting with that letter. The list also shows the number of users who have used each tab on their portal pages. Google tracks the tab names created by users worldwide and provides these as suggestions whenever you try to find a name for your new tab.

If, for example, you select the *Finance* tab, a preconfigured Finance portal page would open (see Figure 1-8), provided the *I'm feeling lucky* check box in the *Add a tab* window is checked.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Advanced Search
Search Preferences
Language Tools
Google Search
I'm Feeling Lucky
Search: ● the web ○ pages from India
Google.co.in offered in: Hindi
Please sign in to save your page
Home
Finance
Add a tab
New! Get artist themes | Change theme from Classic | Add stuff »

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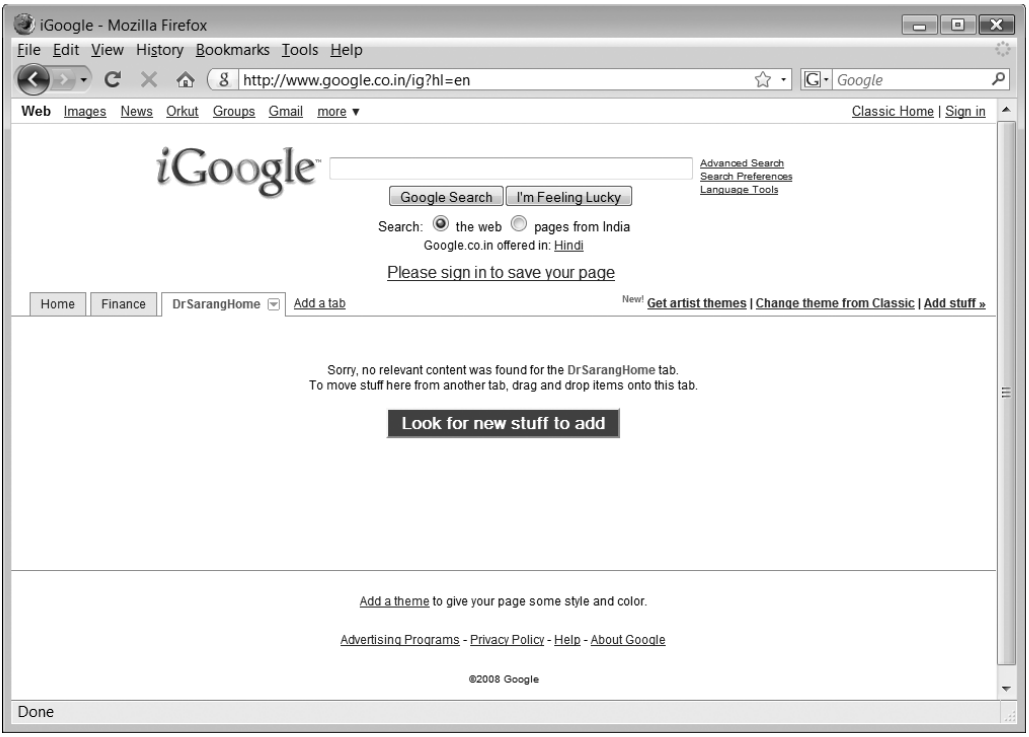
Loan Calculator

Figure 1-8. *A predefined Finance portal page*

You will find many finance-related applications displayed on this tabbed page. Likewise, you can add multiple tabbed pages by selecting a category of your choice for each page. In addition to using the preconfigured pages, you can add tabs that you create yourself. If you type in a tab name that does not exist in the predefined list, Google adds a blank tabbed page to your iGoogle portal. For example, entering the tab name **DrSarangHome** opens a page like the one shown in Figure 1-9.

Note You can use your own name for creating a blank portal page. You can also create a blank page with an existing name by unchecking the *I'm feeling lucky* check box in the *Add a tab* window.


iGoogle - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://www.google.co.in/ig?hl=en
Google
Web Images News Orkut Groups Gmail more ▾
Classic Home | Sign in
iGoogle
Advanced Search
Search Preferences
Language Tools
Google Search
I'm Feeling Lucky
Search: ● the web ○ pages from India
Home
Finance
DrSarangHome
Add a tab
New! Get artist themes | Change theme from Classic | Add stuff »
Look for new stuff to add
Done

Google.co.in offered in: Hindi

Please sign in to save your page

Sorry, no relevant content was found for the DrSarangHome tab.
To move stuff here from another tab, drag and drop items onto this tab.

Add a theme to give your page some style and color.

Advertising Programs - Privacy Policy - Help - About Google

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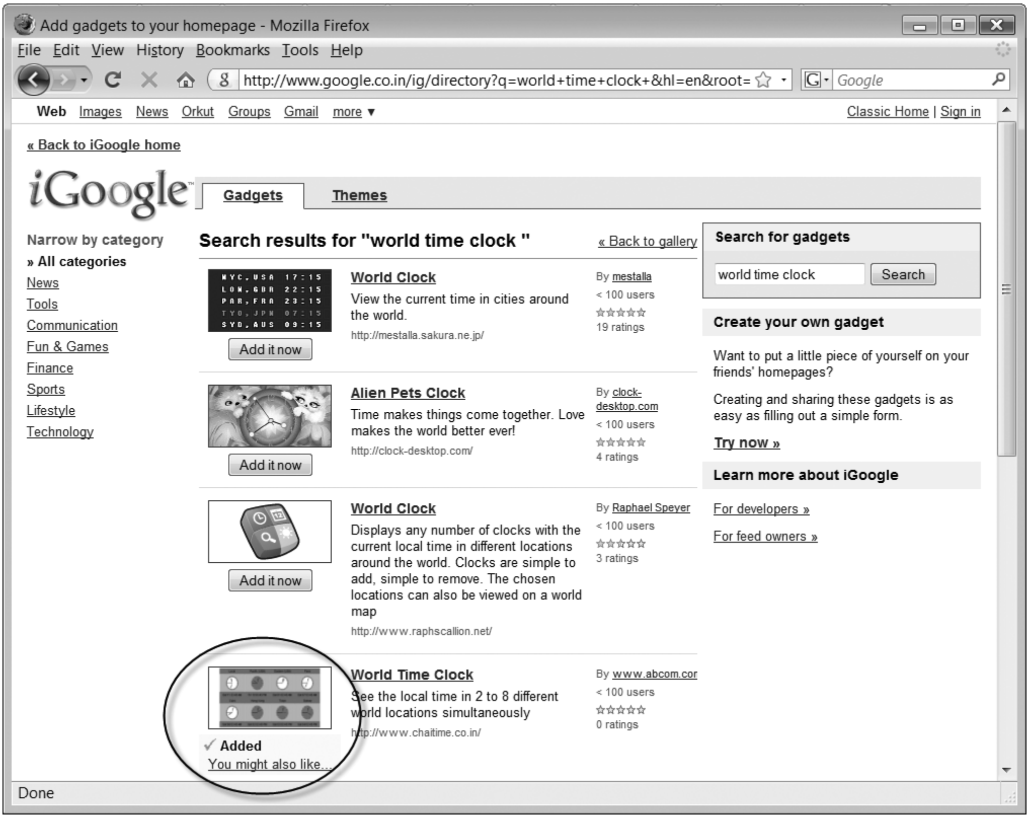
Figure 1-9. *A blank portal page*

You can now add various applications of your choice to this page. The easiest way to do so: select an existing application from any of the other tabbed pages and drag it to the newly created tab. This moves the item from the existing page to the new page. To add new applications to the page, click the *Add stuff* link on the right-hand side of the page to pull up a list of available items. You can add a Google gadget or theme to the page, for example. To add a gadget, browse the sequential list displayed on the page or search for a specific gadget using the search box on the right. For example, searching for **world time clock** results in a page similar to the one shown in Figure 1-10.



Search results for "world time clock "

World Clock
View the current time in cities around the world.
http://mestalla.sakura.ne.jp/
By mestalla
< 100 users
☆☆☆☆☆
19 ratings

Alien Pets Clock
Time makes things come together. Love makes the world better ever!
http://clock-desktop.com/
By clock-desktop.com
< 100 users
☆☆☆☆☆
4 ratings

World Clock
Displays any number of clocks with the current local time in different locations around the world. Clocks are simple to add, simple to remove. The chosen locations can also be viewed on a world map
http://www.raphscallion.net/
By Raphael Speyer
< 100 users
☆☆☆☆☆
3 ratings

World Time Clock
See the local time in 2 to 8 different world locations simultaneously
http://www.chaitime.co.in/
By www.abcom.cor
< 100 users
☆☆☆☆☆
0 ratings

Create your own gadget

Want to put a little piece of yourself on your friends' homepages?

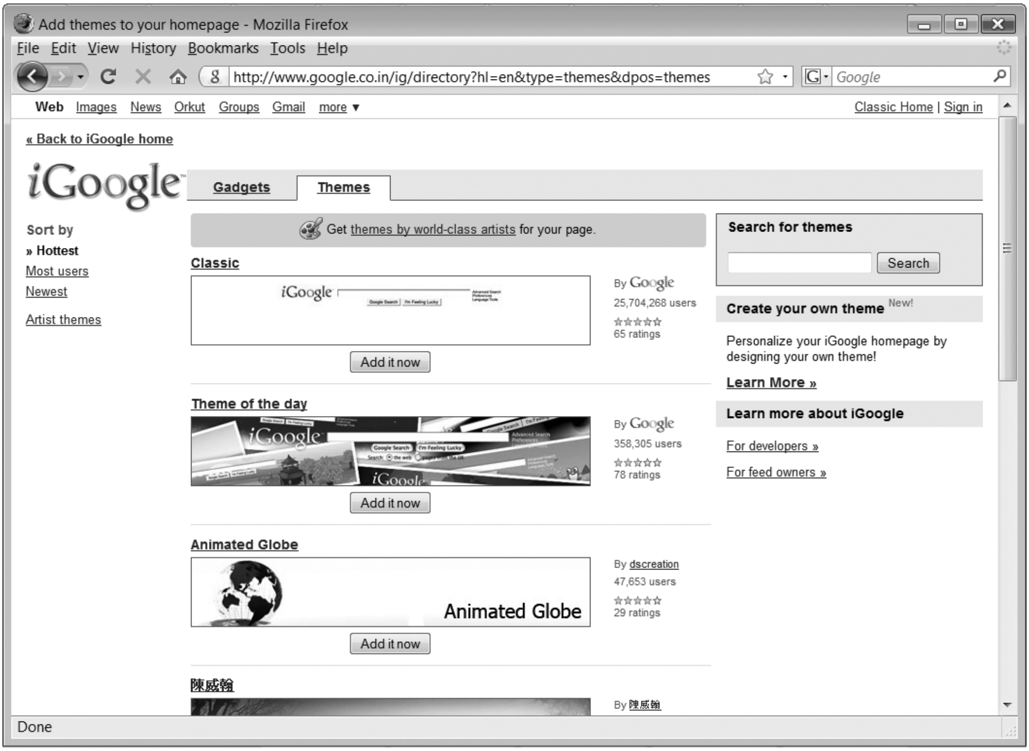
Creating and sharing these gadgets is as easy as filling out a simple form.

Learn more about iGoogle

Figure 1-10. *Page showing the list of searched gadgets*

You can now select the world time clock of your choice from the displayed list and add the application to your portal page by clicking the *Add it now* button. You can add multiple gadgets to the page in this manner. When you're finished, return to the home page by clicking the *Back to iGoogle home* link displayed on the top-left corner of the page.

To change the page's theme, click the *Add stuff* link and select the *Themes* tab (see Figure 1-11).



Add themes to your homepage - Mozilla Firefox

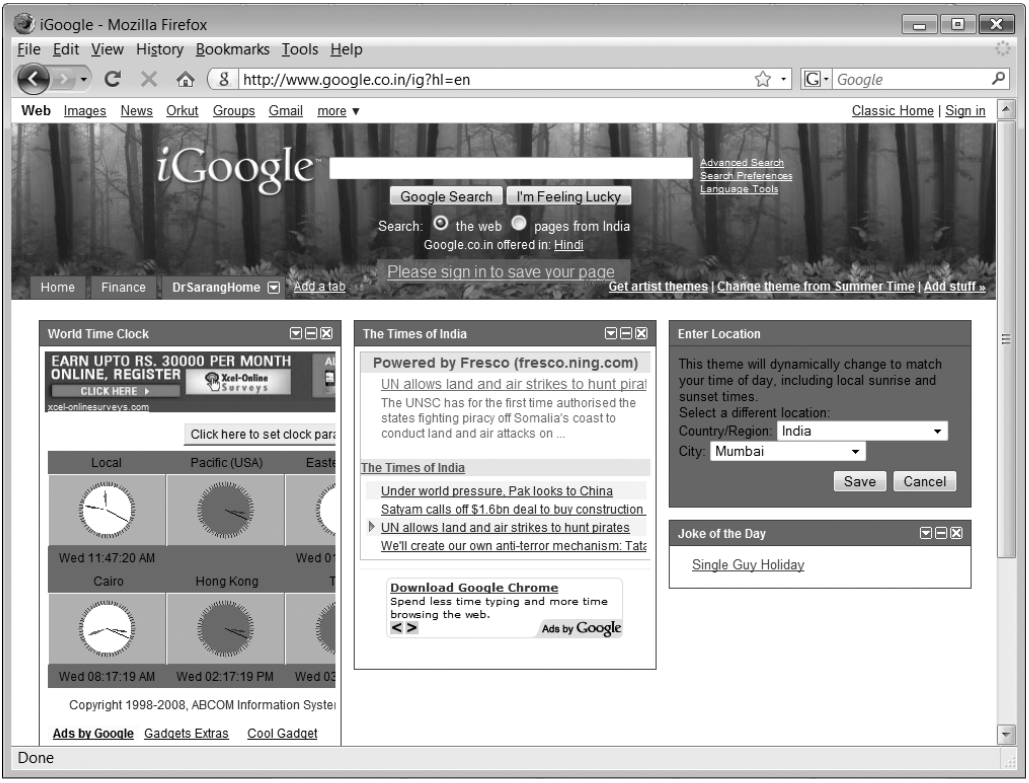
http://www.google.co.in/ig/directory?hl=en&type=themes&dpos=themes

Get themes by world-class artists for your page.

Personalize your iGoogle homepage by designing your own theme!

Figure 1-11. *Page showing available themes*

After applying applications and a theme, you will find a screen similar to the one shown in Figure 1-12 when you return to your iGoogle home page. This page displays the Summer Time theme (although the theme name might differ, depending on your location).



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This theme will dynamically change to match your time of day, including local sunrise and sunset times.
Select a different location:
Country/Region: India
City: Mumbai

Figure 1-12. *A customized portal page*

Your home page should now display the applications you selected and the theme you applied. You can relocate the applications on the page by clicking and dragging them.

From these two example portals, Yahoo! and Google, you can easily appreciate the power of web portals. Other web portals include Excite, Lycos, Netscape, MSN, AOL, and AltaVista. You probably have visited one or more of these sites, but you might not have realized that you were using a web portal.

The aim of this book is to teach you how to create your own portals similar to the ones I've described so far and other portals on the web. Before I go into the details of creating a portal, however, I'll describe the kinds of portals you might like to create.

Kinds of Portals

Wikipedia classifies portals into several different types:

- Personal portals
- Academic portals
- Regional web portals
- Government web portals

- Corporate web portals
- Domain-specific portals
- Sports portals

These classifications are essentially based on the use of each portal type.

Note Wikipedia is a collaborative encyclopedia maintained and edited directly by several worldwide users. The preceding classifications were in effect at press time, but they're subject to change. Regardless of how these classifications change, you should know the different kinds of portals, which I'll describe next.

Personal Portals

A personal portal is a portal that an individual can customize to meet his or her requirements and suit his or her tastes. Examples of these include My Yahoo! and iGoogle, which you saw earlier in this chapter. These portals are easily customizable, and the customization information is stored in the individual's user account. A user needs to log on to the account to regenerate the personalized page. A personal portal generally aggregates the contents provided by several distributed applications hosted by various worldwide sources, but it doesn't necessarily meet business-driven requirements such as support for various kinds of input devices like PDAs, cell phones, and so on.

These kinds of portals are best if you are not satisfied with the preconfigured portals on the web and you'd like to create customized pages with the look and feel of your choice.

Academic Portals

An academic portal addresses the needs of academicians. An example of a typical academic portal is uPortal (`http://www.uportal.org/`), a sharable portal under development. Unlike Yahoo! and Google, uPortal is portal *software*. Whereas Yahoo! and Google provide customizable portal sites, uPortal provides a platform for collaboration. Several institutions of higher education have joined together to create uPortal, which is freely downloadable and based on standard technologies such as Java, XML, JSP, and J2EE. It supports collaboration with the help of several community tools such as chat, forums, surveys, and so on. It basically provides "an abridged and customized version" of the campus web presence.

Another example of an academic portal is the Austrian Academic Portal (`http://www.portal.ac.at/index-en.html`). This portal—a straightforward portal site like Yahoo! and Google—is a gateway to Austrian institutions that teach science and humanities, research, education, and culture. Anybody wishing to pursue studies in Austria in the specified fields would find this portal useful.

You'll find several such academic portals for each country. For example, if you wish to get information on education in Switzerland, you can visit the education portal SWITCH (`http://www.switch.ch/`).

Regional Web Portals

A regional web portal provides information pertinent to a specific geographic location. Such information might consist of weather forecasts, street maps, local news, and shopping. One such popular regional web portal in India is Rediff (`http://www.rediff.com`). It provides regional information related to travel, local news, stocks, matrimony, Bollywood, and so on.

A similar regional portal for China is SINA (`http://www.sina.com`), which is available in both Chinese and English. It offers information about business, sports, lifestyle, and entertainment. Other countries and regions within countries offer portals, such as Greece (`http://www.in.gr`) and the South East of England (`http://www.southeastofengland.com/`). The former targets only users who read Greek.

Government Web Portals

Many governments worldwide provide portals for their citizens. One such portal is The National Portal of India (`http://india.gov.in`), which provides useful government-related information to its residents, information for entrepreneurs who are setting up businesses in India, and tourist information for visitors and students.

A portal hosting government-related information for the United States is USA.gov (`http://www.usa.gov`). This portal provides information for citizens, businesses and not-for-profit organizations, government employees, and visitors. Because the United States is a large country, many of its states have set up their own regional portals, such as Clark County Now, A Regional Portal for East Central Illinois (`http://www.clarkcountynow.com`) and the State of Illinois Business Portal (`http://www.business.illinois.gov`).

Corporate Web Portals

Corporate web portals, also known as *intranet portals*, have become a widely accepted standard among corporations. These corporate intranets provide a consolidated view of the company's information to its employees and often allow employees to personalize and customize the site's content display.

Today's corporate portals also allow the creation and publication of workflows that facilitate better collaboration among the company's divisions. They permit the creation of wikis that allow the users to share knowledge, thereby increasing the company's overall productivity. Generally, these portals provide single sign-on to its employees; once a user is authenticated at the entry point, he can navigate the organization's departments using the privileges assigned to the specific login role.

Such corporate web portals might expose part of their contents to external users through the Internet. In such cases, these portals are called *extranet portals*.

Corporate web portals for big companies are likely hosted on the company's internal servers; portals for smaller organizations might be hosted on external servers supplied by service providers.

Domain-Specific Portals

Portals geared toward a particular industry are called *domain-specific portals*. For example, a portal for real-estate agents brings a region's agents to a single site and allows consumers to buy and sell their properties. A single real-estate agent could even create a portal for facilitating the buying and selling of real estate.

Examples of real-estate portals in the U.S.A. include HomesWEB (`http://www.homesweb.com/`) and RealEstateBig (`http://www.realestatebig.com/`), and the U.K. offers SeLoger (`http://www.seloger.co.uk`). Examples of such portals in India include MagicBricks (`http://www.magicbricks.com/`), Makaan (`http://www.makaan.com/`), and Propertymart (`http://www.propertymart.co.in/`).

■ **Note** The sites presented here are simply examples of domain-specific portals; their inclusion does not mean they outperform other sites in their domain.

Sports Portals

Several portals cater to the needs of sports lovers. A typical example of a sports portal is ESPN STAR Sports (`http://www.espnstar.com`), which covers tennis, hockey, international cricket, and motorsports. Other popular sports portals, to name a few, are Sky Sports (`http://www.skysports.com/`), Sportal (`http://sportal.nic.in/`), and Sify Sports (`http://sify.com/sports/`). The last two specifically cater to sports in India. All these portals cover various aspects of different sports, such as live scores, live matches, replays, game analysis, and so on.

Now that you've seen the classifications of web portals depending on their use and application, consider some of the advantages offered by portals over conventional web sites.

Portal Advantages

I've mostly discussed portals in terms of content aggregation and page-layout customization. But I also hinted at extended functionality that portals can offer: collaboration among user communities. In fact, a portal designer can create different user communities on a single portal and ask users to register for each of them. The designer can present different content, a different look and feel, and different collaboration features that depend on the community to which the user belongs. You might find these kinds of collaboration features in a portal:

- *Group discussions*: You can host group discussions on your portal, whereby the users can discuss a topic in a message board that you establish. This kind of collaboration offers several advantages over conventional group e-mail discussions. Users can join or leave the discussion at any time without affecting others who have currently logged in, and they can archive discussion threads for later viewing.
- *Blogs*: A portal can allow the user to publish opinions in a blog, just as users can do on Blogger (`http://www.blogger.com`) or Windows Live Spaces (`http://home.spaces.live.com/`). The blogs can be made public for others to view, so general users can read the views of senior-level users who offer insight into industry and market trends, for example.
- *Document sharing*: A portal can allow sharing of existing documents and other media such as photographs. This feature would require proper document management.

- *Wikis*: Your portal can host wikis, which enable users to create web pages, edit them, and link them together. Wikis function like a shared notebook whereby users can share their ideas collaboratively.
- *Shared calendars*: A portal can also host shared calendars, which can prove useful in managing both company-hosted and user-hosted events. This feature lets users schedule meetings and send invitations.

As you can see, a portal can provide several features to facilitate collaboration among its users, thus providing a richer user experience than conventional web sites can offer.

Creating a Portal with Liferay

Now that you've seen what a web portal is and what benefits it offers over conventional web sites, I'll show you how to create one. A portal, as I mentioned earlier, consists of a wide variety of applications that might or might not relate to one another: blogs, document management apps, wikis, calendars, and so on. Obviously, no single vendor can provide all the necessary tools to integrate those features into your web portals. You will thus need to incorporate tools from different vendors. These tools might use diverse technologies, which could pose an integration challenge because the portal's applications need to work together.

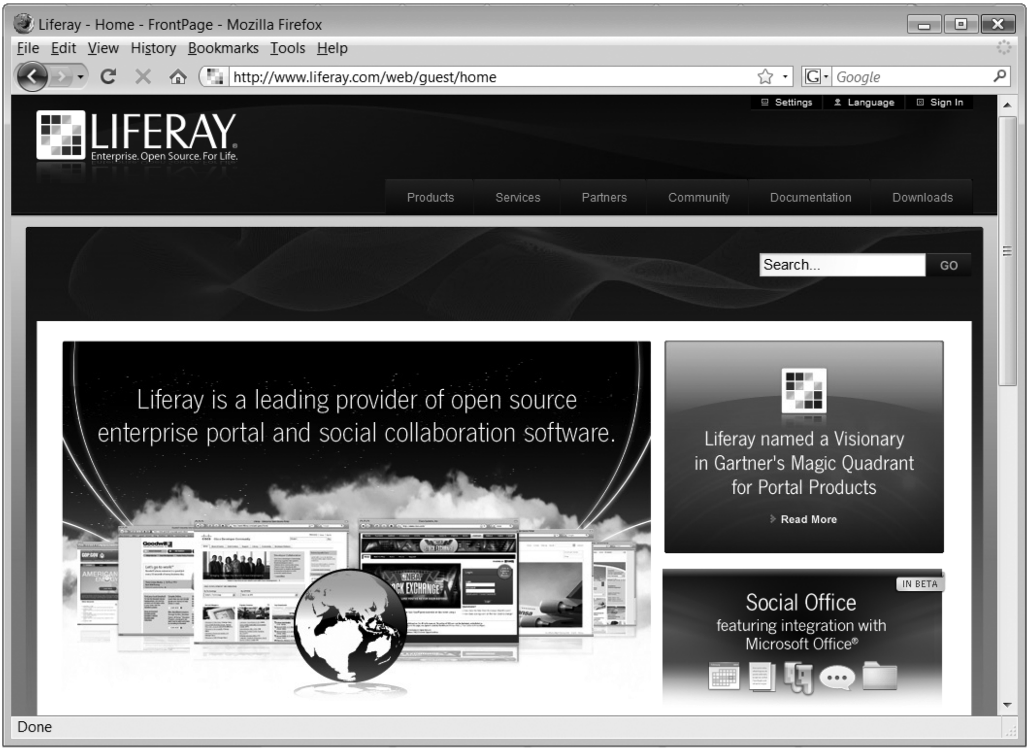
Many vendors provide tools for creating portals and servers to host the portals. Some of the popular tools and servers are Oracle WebLogic Portal, IBM WebSphere Portal Server, Sun Java System Portal Server (also known as GlassFish Web Space Server), and Microsoft Office SharePoint Server. Among open source technologies, Liferay is a popular portal server.

Liferay Portal essentially provides a framework for creating any of the types of portals that I've discussed. Think of it like a web application that's hosted on a web server of your choice. It supports many servers in the market because it complies strictly with standards.

Liferay provides a complete development environment you can use to create a portal. It provides a runtime environment for hosting Java-based portal applications, also known as *portlets*. It offers a container where you assemble the portlets, configure them, and set their look and feel.

A typical portal page running in a Liferay portal is shown in Figure 1-13.

The Liferay web site shown in Figure 1-13 is itself based on the Liferay Portal product. As you can see, it resembles other web portals you've seen. Perhaps the next web portal you encounter will be running on Liferay.



Liferay - Home - FrontPage - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://www.liferay.com/web/guest/home
Google
Settings
Language
Sign In
LIFERAY
Enterprise. Open Source. For Life.
Products
Services
Partners
Community
Documentation
Downloads
Search...
GO
Read More
IN BETA
Done

Liferay is a leading provider of open source enterprise portal and social collaboration software.

Liferay named a Visionary in Gartner's Magic Quadrant for Portal Products

Social Office featuring integration with Microsoft Office®

Figure 1-13. *A sample Liferay portal page*

Liferay Features

Liferay offers several benefits over similar frameworks in the market:

- Ease of use
- Support for a wide variety of applications
- Liberal licensing and open source code
- Extensibility
- Scalability
- Internationalization support
- Integration with other tools
- Adherence to industry standards

I will now discuss these features in more depth.

Ease of Use

Like the Yahoo! portal, portals created using Liferay are easy to use. You can add various applications to portal pages by using Liferay's drag-and-drop feature, and you can move them around by clicking and dragging. You can remove an existing application from the page with a single click on the close icon, and you can easily change the page layout by applying a different page template. You can also change the look and feel of a page by applying a theme provided by Liferay or third parties. So you can create a portal easily and allow the user to configure it as desired. You can take advantage of all these features without writing a single line of code.

Support for a Wide Variety of Applications

Liferay provides a wide range of applications or portlets that you can use, including wikis, blogs, chat, and discussion forums, to name a few. In addition to these, you can incorporate applications made available by user communities. You will be using several of these applications as you work through the examples in this book.

Liberal Licensing and Open Source Code

The use of Liferay on your servers is entirely free. The company has a liberal licensing policy: you don't need a license to use the product, even for commercial purposes.

Note Liferay Inc. earns its revenue by selling support and providing training.

Plus, Liferay has made the portal's entire source code available to the developer community. The ability to modify the source has the following implications:

- You can add features to your portals by modifying the code.
- Contributors can improve Liferay itself.
- Developers can add features to Liferay by creating plugins.

Extensibility

Liferay is easily extensible. You can add new features to it without making any changes to the source code. This makes it easy to migrate to newer versions of Liferay upon their release.

Scalability

Liferay is highly scalable. It can handle a large user base.

Internationalization Support

Liferay provides excellent support for internationalization. If your portal boasts many users from non-English-speaking countries, you can extend it to use other languages. You do not need to do any coding to accomplish this; you simply use the appropriate resource bundles. You can easily support languages such as German, Spanish, French, Italian, Japanese, and many more.

Integration with Other Tools

Liferay integrates easily with many third-party tools. For example, Liferay has its own content management system (CMS), but it also supports the more powerful Alfresco (`http://www.alfresco.com`). Liferay can also integrate with third-party Lightweight Directory Access Protocol (LDAP) servers. You'll find this integration useful when your existing data is stored in LDAP. In addition, Liferay supports several popular databases such as Oracle, IBM DB2, Apache Derby, MySQL, Informix, SQL Server, Sybase, and others.

Adherence to Industry Standards

Liferay is based on standard technologies, so it easily integrates with other standards-based technologies. For example, it easily integrates with the following:

- *Apache ServiceMix*: A popular open source ESB (Enterprise Service Bus)
- *Mule*: A lightweight messaging framework and highly distributable object broker
- *Ehcache*: A distributed cache for general-purpose caching
- *Hibernate*: A relational persistence service for Java and .NET
- *ICEfaces*: An open source Asynchronous JavaScript Technology and XML (Ajax) framework
- *jBPM*: A platform for executable process languages ranging from business process management (BPM) over workflow to service orchestration
- *Intalio/BPP*: Open source BPM and SOA (service-oriented architecture) software
- *JGroups*: A toolkit for reliable multicast communication
- *jQuery*: A JavaScript library that simplifies HTML document traversing, event handling, animating, and Ajax interactions for rapid web development
- *Apache Lucene*: A full-featured text search engine library written entirely in Java
- *PHP*: A general-purpose scripting language especially suited for web development; you can embed it into HTML
- *Ruby*: A dynamic, open source programming language
- *JBoss Seam*: An application framework for building next-generation Web 2.0 applications by unifying and integrating technologies such as Ajax, JSF (JavaServer Faces), EJB3 (Enterprise JavaBeans), Java portlets, and BPM
- *Spring and aspect-oriented programming (AOP)*: A leading Java/J2EE application framework
- *Apache Tapestry*: An open source framework for creating dynamic, scalable web applications in Java
- *FreeMarker*: A generic tool to generate text output based on templates

In addition to its integration with the preceding technologies, Liferay itself is written entirely in Java, a standard programming language. So you can easily modify, extend, and maintain Liferay.

Now let's look at Liferay's internals.

Under the Hood

Before you install Liferay, look under the hood to see how it works. A web portal consists of several web pages, also known as portal pages. Each portal page has a header and footer, and can also contain some menus and a logo. Between the header and footer, you'll see several applications that have been arranged via a predefined template. These applications are essentially the portlets.

A portlet, as I mentioned earlier, is an application that delivers content to the user. The underlying portlet code can generate the content dynamically. A portal page includes one or more portlets, and a portlet *container* manages the portlets.

The portlet container is responsible for persisting the user's preferences for each portlet and providing a runtime environment for each. Plus, a portlet container manages the interactions and communications among the hosted portlets. Thus, the container handles user requests made on the portal and forwards them to the appropriate portlets. The container displays the aggregated output of all its portlets to the user.

Page Internal Structure

The internals of a typical portal page are illustrated in Figure 1-14.

As Figure 1-14 shows, a portal page runs a portlet container that embeds several portlets. Each portlet has its own decoration and controls. Using these controls, you can customize the corresponding portlet. For example, you can easily change a portlet's look and feel by setting its border and background colors, width, text style, window title, margins, and so on. You will explore several of these features as you read the book and develop your own portals.

With the configuration control, you can set permissions on each individual portlet so that only designated users are authorized to use it. You can import or export data, and you can even share the entire portlet by giving its code to other users.

You can customize the location of each portlet on the displayed page by applying a template to change the layout. You can also create your own custom layouts and apply them to your pages. You can add and remove portlets to and from a web page at any time.

Portlets can communicate with other portlets on the same page, irrespective of the technologies they're using. The portlet container is responsible for providing all the features I just described.

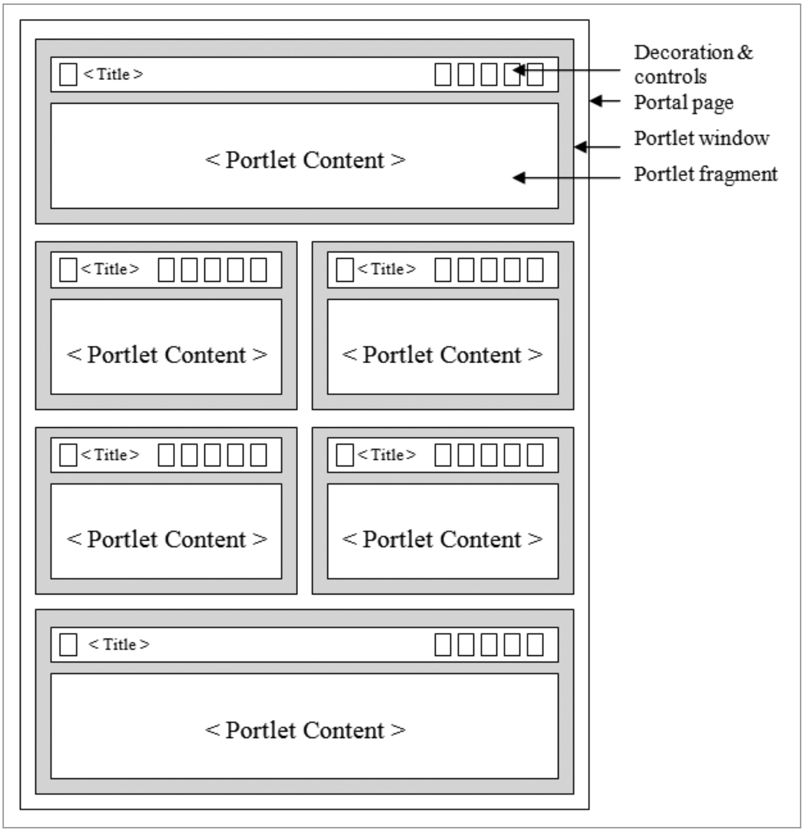


Figure 1-14. *Internal structure of a portal page*

Page Creation Process

When you display a portal page in your browser, certain activities take place in the portal server and container. These are illustrated in Figure 1-15.

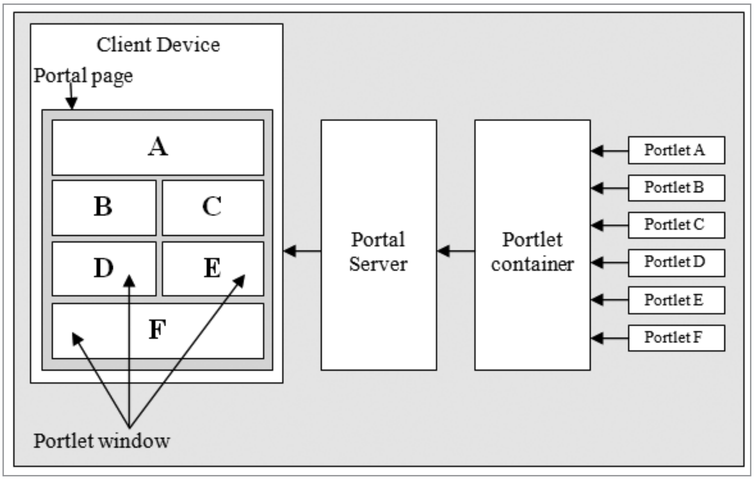


Figure 1-15. *How a portal page gets generated*

Assume that the portal page is to be rendered as six portlets embedded on the page (see Figure 1-15). Here's the process that occurs during page generation:

1. Each portlet—A, B, C, D, E, and F—generates the contents for the user. The contents might be static or generated dynamically, depending on the logic of the portlet application. Note that each portlet is basically a Java application that runs some code when activated.
2. The container receives the contents generated by several portlets.
3. The container hands over the contents to the portal server.
4. The portal server creates the portal page, which is essentially a sequence of HTML code that the browser can use. During page creation, the portal server applies the designated page layouts to place each portlet at the appropriate location.
5. The server sends the created page to the client device (the browser).
6. The browser displays the contents to the user.

At this stage, the portal is ready for further interactions with the user. The user looks at the presented contents and can decide to fetch further information by clicking one of the items on the displayed page. Let's examine what actions take place in the portal server and portlet container when a user requests additional data.

Request Handling

Examining the sequence (object interaction) diagram of a typical user action is the best way to understand the actions that take place in the portal server, portlet container, and portlets in response to a user request.

Tip A sequence diagram is one of the standard diagrams drawn during the object-oriented analysis and design (OOAD) of a software system. It describes the interactions among the various objects in the system and the order in which these interactions occur. You can obtain more information on sequence diagrams at `http://en.wikipedia.org/wiki/Sequence_diagram`.

Suppose the portal page contains three portlets: A, B, and C. The user initiates an action on the portal page that requires the contents of portlets A, B, and C to be modified. The events that take place during this interaction are illustrated in the sequence diagram presented in Figure 1-16.

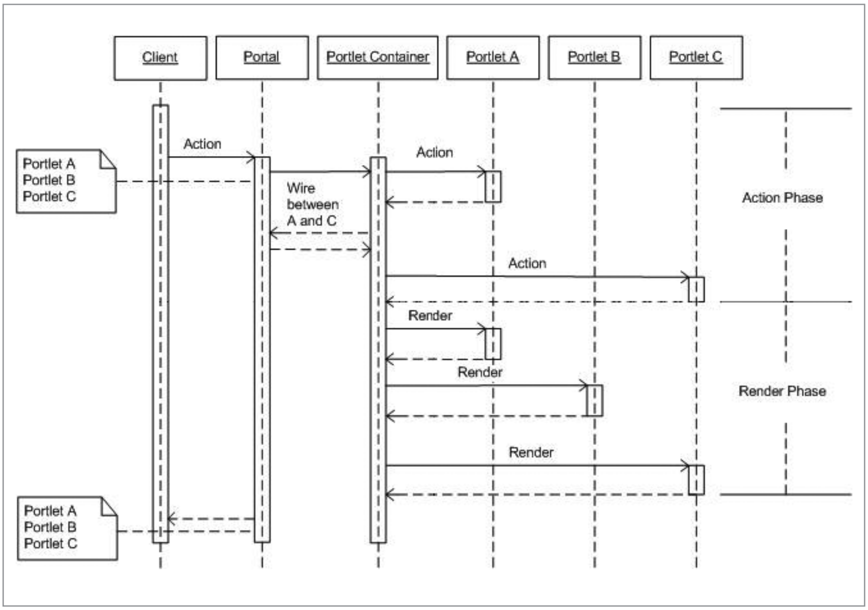


Figure 1-16. *Sequence diagram for user request*

Here are the events in the order they take place:

1. The user requests a data update by clicking the portal page.
2. The user request generates an action event on the portal server.
3. The portal server generates an event on the portlet container.
4. The container determines that the user request requires data in portlets A and C to be updated.
5. The container makes an `Action` request to portlet A to perform the data update.
6. Portlet A performs the requested action and returns the result, if any, to the container.
7. The container makes an `Action` request to portlet C.

8. Portlet C performs the action and sends the result, if any, to the container.
9. At this stage, the `Action` phase of the user request is completed. The container has all the data that it needs to render the page for the user.
10. The rendering phase of the user request starts.
11. The container fires a `Render` event to all three portlets—either sequentially or in parallel.
12. The container gathers the responses of all three portlets.
13. The container returns the updated page to the server.
14. The server displays the page on the user's browser.
15. At this stage, the user request is fully processed.
16. The server now awaits another interaction from the user.

You've now studied Liferay's internal architecture. It's time to install Liferay on your machine and run your first portal.

Installing Liferay

Installing Liferay on your machine is easy. The Liferay portal comes bundled with many popular web and application servers that are free for distribution. Liferay also supports many commercial servers, which you would have to obtain separately. If you are using any of the commercial servers, you will need to install and configure Liferay for these servers by following the instructions in the Liferay installation guide.

■**Note** The installation guide comes bundled with the downloaded software.

Some of the popular free servers bundled with Liferay are:

- Geronimo
- GlassFish
- JBoss
- Jetty
- JOnAS
- Pramati
- Resin
- Tomcat

It is easy to set up a bundled installation. Liferay recommends the use of Tomcat as a bundled option because it's lightweight and popular among developers. We'll use Tomcat for the examples in this book.

Note After you create a portal using the server of your choice, you can port it without changes to any other server that supports portlets (the JSR 168 and JSR 286 specifications).

Downloading Liferay

You can download the Liferay installation from the official Liferay site (`http://www.liferay.com/web/guest/downloads`). On this page, you will find several bundles for download. Under "Liferay Portal Standard Edition," download Liferay Portal Bundled with Tomcat 6.0 (at press time, the current Liferay version was 5.1.2 and the current Tomcat version was 6.0).

After you select the Tomcat 6.0 option, the browser redirects to Sourceforge.net and begins the download automatically. The name of your downloaded file is `liferay-portal-tomcat-6.0-5.1.2.zip`.

Setting Up J2SE

Before you set up Liferay, you need to download and install Java on your machine. If you have Java 2 Platform, Standard Edition (J2SE) 1.5 or above already installed, you can skip this step. You can download the latest J2SE version from `http://java.sun.com/javase/downloads/index.jsp` (Java SE 6 Update 10 RC, at press time). The name of the downloaded file is `jre-6u10-rc2-bin-b31-windows-i586-p-05_sep_2008.exe`.

To set up Java on your machine, simply double-click the installer. The setup wizard guides you through the entire installation procedure. After the installation completes successfully, you will need to set the following environment variables.

Create a new system variable called `JAVA_HOME` and set its value to your installation folder. For example, if you selected `C:\Java\jdk1.6.0_02` as the installation folder, use this complete path as the value for the `JAVA_HOME` environment variable. You will then need to modify the system `PATH` variable. Add the value `%JAVA_HOME%\bin` to the beginning of the path.

Tip The preceding installation instructions are for the Windows platform. For Linux and other platforms, follow the appropriate procedures in the Java SE installation instructions.

Setting Up Liferay

Setting up Liferay on your machine is easy: simply extract the contents of the downloaded file to any folder on your machine. For the purposes of this book, I'll assume that the files are extracted to the root folder of the `C` partition. When you extract the files to `C:\`, you will notice that the installation creates a folder called `liferay-portal-tomcat-6.0-5.1.2` in `C:\`. That's all you need to do to set up Liferay.

If you examine the contents of the installation folder, you will find several subfolders. The `bin` subfolder contains the binaries for starting and stopping the server, whereas the `webapps` subfolder contains the installed web applications. The `lib` subfolder holds the various runtime libraries. You will be examining the contents of these folders when you deploy your custom-made themes and portlets for your portal. Even the third-party themes and portlets provided by Liferay user communities are deployed to these folders. You will need to navigate to the `bin` folder to start and stop the Tomcat server. When you start the Tomcat server, Liferay automatically starts and is ready to use.

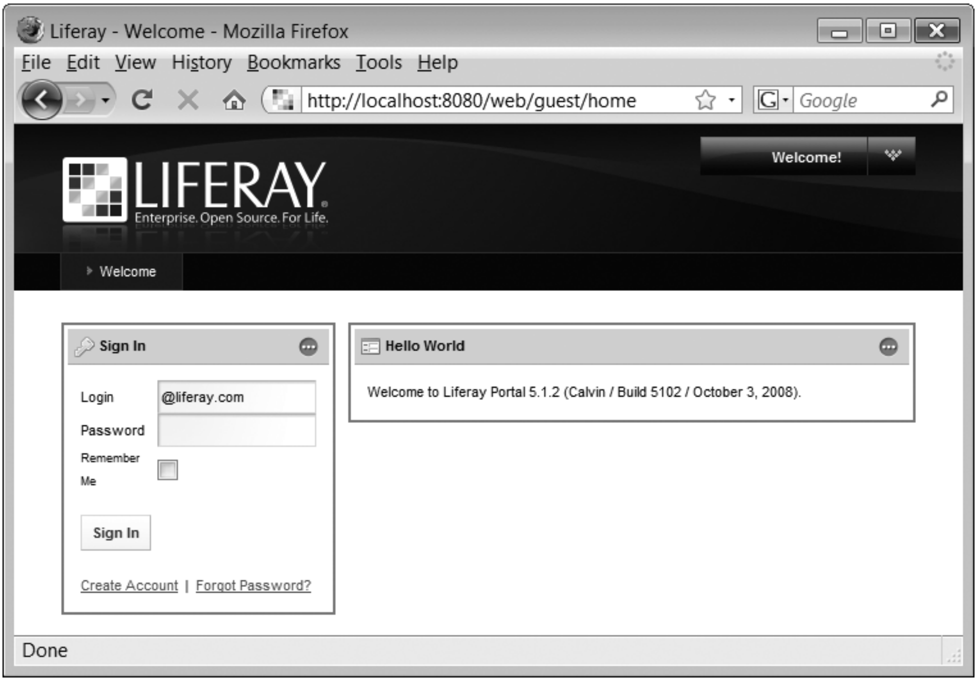
Testing the Liferay Installation

To start Liferay, navigate to the `c:\ liferay-portal-tomcat-6.0-5.1.2\bin` folder and double-click the `startup` batch file. This opens a console window and starts Tomcat server. The server startup messages are displayed in the console window. When the server completes its startup, you are ready to use Liferay.

Open the browser and type the following URL:

```
http://localhost:8080
```

You will see the page shown in Figure 1-17 displayed in your browser.



Liferay - Welcome - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:8080/web/guest/home
Google
Welcome!
LIFERAY
Enterprise. Open Source. For Life.
Welcome
Sign In
Hello World
Login
Password
Remember Me
Sign In
Create Account | Forgot Password?
Done

Login: @liferay.com

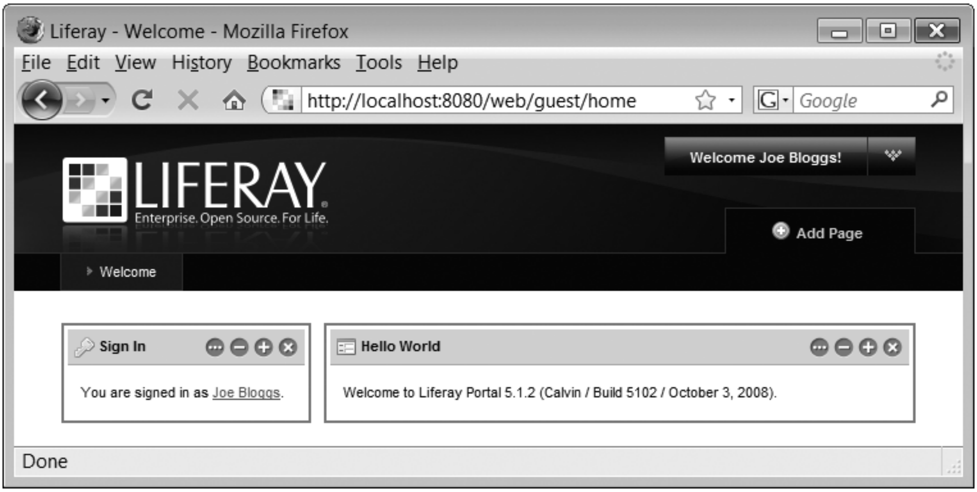
Welcome to Liferay Portal 5.1.2 (Calvin / Build 5102 / October 3, 2008).

Figure 1-17. *Liferay startup page*

You can now log in to the portal using the following information:

```
Login: test@liferay.com
Password: test
```

Accept the Terms of Use on the next page. Upon logging in successfully, you will see the page shown in Figure 1-18.



Liferay - Welcome - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Google
LIFERAY
Enterprise. Open Source. For Life.
Welcome Joe Bloggs!
Add Page
Welcome
Sign In
Hello World
Done

http://localhost:8080/web/guest/home

You are signed in as Joe Bloggs.

Welcome to Liferay Portal 5.1.2 (Calvin / Build 5102 / October 3, 2008).

Figure 1-18. *Liferay portal page upon successful login*

Note the welcome message shown in the top-right corner. The default user for this portal is Joe Bloggs, whose name also appears in the *Sign In* portlet. The *Hello World* portlet shows another welcome message along with the current build version of the Liferay portal. At this stage, you have set up Liferay on your machine and are ready to explore further and create your own portals.

To shut down Liferay, you will have to shut down the Tomcat server. You can do so by running the `shutdown` batch file provided in the `bin` folder of the Liferay installation.

Summary

In this chapter, I first considered a few definitions of the term *portal*. A portal is essentially a gateway to a set of potentially dispersed Internet applications. It provides the aggregation of contents from several applications, offering uniform access and a consistent look and feel. You saw the workings of well-known portals Yahoo! and Google as examples, and you explored different categories of portals based on their content, such as personal, academic, regional portals, and more. This category list continues to grow.

In addition to its aggregation functionality, portals offer even more benefits than conventional web sites, such as support for user collaboration. A portal can facilitate group discussions, blogs, document sharing, and calendars.

I then discussed some of the resources for creating portals. Many vendors provide tools for creating and hosting portals, such as Liferay, which provides a portlet container for assembling portlets in a portal. It also provides several off-the-shelf portlets for your immediate use. You will be studying and using Liferay for this book’s sample portal application. Portals created using Liferay must be hosted on an application server; Liferay supports many application servers, both commercial and free.

Liferay offers several benefits over other portal servers and portlet containers on the market. First, it is easy to use: creating a portal in most cases is a simple process of dragging and dropping portlet applications provided by Liferay and its user communities. Second, Liferay is open source and free. Third, it's extensible: you can extend it easily without making any changes to the source code. So when you upgrade to newer versions of Liferay, your existing portals will not break. Fourth and fifth, Liferay is highly scalable and supports internationalization. Sixth, it easily integrates with several existing products. Seventh, it is standards-based. So a portal created with Liferay can be hosted on any of the standards-compliant application servers without any code changes.

After looking at the benefits of Liferay, we turned to its architecture. A Liferay portal page runs under a container that aggregates several portlets. A user can add any number of portlets to the container, which manages the lifecycle of each portlet and provides for proper interaction among portlets. The container also handles user interactions.

A user request causes `Action` and `Render` phases to take place in the portal server. Whenever a user makes a request on a portal page, the server initiates actions on the container, which in turn brings about further actions on the embedded portlets. The portlets perform the requested actions and return the results to the container. The container then starts the `Render` phase in which all concerned portlets are asked to render their portions of the output. The aggregated page is then returned to the server, which finally renders the output page in the user's browser.

After studying the theory, you began some hands-on work. You downloaded and installed Liferay on your machine. After setting up Liferay, you tested the installation by running a sample portal provided with it.

In the next chapter, you will begin creating your own portal.