PRIMIX SOLUTIONS

Core Labs

Primix Virtual Library

CORE LABS

Primix Virtual Library

One Arsenal Marketplace
Phone (617) 923-6639 • Fax (617) 923-5139

Table of Contents

Chapter

1

An Improved Demonstration

The Primix Virtual Library is an improved Tapestry demonstration, demonstrating, in a realistic concepts, how Tapestry integrates into a J2EE environment.

The initial Tapestry demonstration, the so-called "blue border" demo, is really more of a test bench for Tapestry during its initial development. Since it didn't access a database, it was very much the toy application.

The Primix Virtual Library is a more full-fledged demostration. It is based on an actual application developed internally at Primix; the idea is to have an application that allows everyone at the company to share their books. A database stores information about the users of the application and the book they own and are borrowing.

Users should be able to connect to the application and begin using it immediately to search for books. If they want to borrow books they must first log in (possibly, registering themselves on the fly).

The goal was to have a useful, streamlined system that couldbe used internally at Primix *and* to serve as a demonstration of the full power of Tapestry.

The application consists of two modules: VlibBeans which contains the entity and session beans for the application, and Vlib, which contains the Tapestry user interface for the application.

The Virtual Library uses the Cloudscape database to store its data. Cloudscape is an all-Java database. Free developer evaluation copies are available at http://www.cloudscape.com. The Virtual Library was developed using Cloudscape version 3.0.

At the time of this writing, the Virtual Library requires BEA WebLogic server as its Enterprise JavaBeans container. The Virtual Library was developed using WebLogic Server 5.1 Service Pack 3. The Virtual Library makes use of WebLogic's internal container managed persistence, so it is not immediately deployable on other application servers.

Note that WebLogic ships with an earlier version of Cloudscape, it is necessary to change the WebLogic configuration to make use of the more recent version.

An evaluation copy of BEA Weblogic Server is available at http://www.bea.com/products/weblogic/server/index.html.

The Tapestry portion of the Virtual Library can be adapted to any servlet container, though the source code currently available is also designed to work with WebLogic. It should be possible to deploy it on another server by creating a server-specific deployment descriptor.

Finally, all development has been under Windows NT and Windows 2000. We have not yet had a chance to setup under Linux or Solaris.

Chapter

2

Setting up the Application

This discussion assumes that you have already installed WebLogic and the Java Build Environment[1] (JBE). In addition, you must have installed Cloudscape, and have set the `CLOUDSCAPE_INSTALL` environment variable.

Setup the basic environment

First, you must select a working directory. This document assumes the directory `D:\Work`.

Create a directory `D:\Work\lib`. Copy into this directory the following Jar files:

Name	Description
gnu-regexp.jar	GNU Regular Expression Library, available from the Giant Java Tree: http://www.gjt.org/servlets/JCVSlet/list/gjt/gnu/regexp
j2ee.jar	Java 2 Enterprise Edition libraries, available from Sun: http://java.sun.com/j2ee/download.html
PrimixFoundation.jar	Utility classes used by Tapestry and EJBs, available (as source) from the Tapestry project: http://sourceforge.net/projects/tapestry/
Tapestry.jar	Core Tapestry framework, available (as source) from the Tapestry project: http://sourceforge.net/projects/tapestry/
xerces.jar	Xerces XML parser, available from Apache.org: http://xml.apache.org/xerces-j/index.html

[1] The JBE is part of the Tapestry project. It is a set of GNU Makefiles used to compile, build and deply Java projects.

In addition, extract the contents of the Example archive as `D:\Work\Examples`. There will be several sub-directories: Tutorial, SessionTracker, TapestryDemo, VlibBeans and Vlib. This document is concerned only with the final two (VlibBeans and Vlib).

To compile VlibBeans, the JBE needs to know where WebLogic was installed. This is done by setting the variable WEBLOGIC_DIR. The best way to do this is by editting the file `config/SiteConfig.mk` in your JBE directory.

config/SiteConfig.mk

```
TOOLS_DIR := C:/Cygnus/cygwin-b20/H-i586-cygwin32/bin

JDK_DIR := C:/jdk1.2.2

WEBLOGIC_DIR := C:/WebLogic
```

Compile the VlibBeans module

This module contains the EJBs used by the Vlib web application. It makes use of WebLogic's container managed persistence and includes a WebLogic specific deployment descriptor.

Change to the directory `D:\Work\Example\VlibBeans`

Execute the command `make install`:

```
make install

*** Cataloging package com.primix.vlib.ejb ... ***


*** Compiling ... ***

C:/jdk1.2.2/bin/javac.exe -d .build/classes -classpath
"D:/Work/Examples/VlibBeans;D:/Work/Examples/VlibBeans/.build/classes;C:/we
blogic/lib/weblogicaux.jar;C:/weblogic/classes;D:/Work/lib/j2ee.jar;D:/Work
/lib/PrimixFoundation.jar" com/primix/vlib/ejb/AbstractEntityBean.java
com/primix/vlib/ejb/Book.java com/primix/vlib/ejb/BookBean.java
com/primix/vlib/ejb/BookQueryBean.java com/primix/vlib/ejb/IBook.java
com/primix/vlib/ejb/IBookHome.java com/primix/vlib/ejb/IBookQuery.java
com/primix/vlib/ejb/IBookQueryHome.java
com/primix/vlib/ejb/IEntityBean.java com/primix/vlib/ejb/IKeyAllocator.java
com/primix/vlib/ejb/IKeyAllocatorHome.java
com/primix/vlib/ejb/IOperations.java
com/primix/vlib/ejb/IOperationsHome.java com/primix/vlib/ejb/IPerson.java
com/primix/vlib/ejb/IPersonHome.java com/primix/vlib/ejb/IPublisher.java
com/primix/vlib/ejb/IPublisherHome.java
com/primix/vlib/ejb/KeyAllocatorBean.java
com/primix/vlib/ejb/OperationsBean.java com/primix/vlib/ejb/Person.java
com/primix/vlib/ejb/PersonBean.java com/primix/vlib/ejb/Publisher.java
com/primix/vlib/ejb/PublisherBean.java
com/primix/vlib/ejb/RegistrationException.java

*** Copying META-INF resources ... ***
```

```
Copying: ejb-jar.xml weblogic-ejb-jar.xml Book-weblogic-cmp.xml Person-
weblogic-cmp.xml Publisher-weblogic-cmp.xml

*** Building VlibBeans.jar ... ***

C:/jdk1.2.2/bin/jar.exe cf VlibBeans.jar -C .build/classes .

*** Creating VlibBeans-deploy.jar ... ***

cd .build ; \
C:/jdk1.2.2/bin/java.exe -classpath
"C:/weblogic/lib/weblogicaux.jar;C:/weblogic/classes;D:/Work/lib/j2ee.jar;D
:/Work/lib/PrimixFoundation.jar" \
weblogic.ejbc -keepgenerated ../VlibBeans.jar ../VlibBeans-deploy.jar
[EJB]: Creating output jar:../VlibBeans-deploy.jar

*** Installing VlibBeans.jar to ../../lib ***


*** Installing VlibBeans-deploy.jar to ../../lib ... ***
```

The last step, "Creating VlibBeans-deploy.jar" may take several minutes.

This creates two Jar files: `VlibBeans.jar` and `VlibBeans-deploy.jar`. The first is the client jar, used to compile the Vlib application[2]. The second is the deployment jar, that contains the extra classes and resources needed to deploy the EJBs using WebLogic.

Compile the Vlib module

This module contains the Vlib web application as well as a WebLogic deployment descriptor.

Change to the directory `D:\Work\Examples\Vlib` and execute `make install`:

```
make install

*** Cataloging package com.primix.vlib ... ***


*** Cataloging package com.primix.vlib.pages ... ***


*** Cataloging package com.primix.vlib.components ... ***


*** Compiling ... ***
```

[2] In some application servers, it is possible to create a true client Jar, that contains only the EJB interfaces (and data objects passed as paramters or return values). This client Jar also contains the bean implementation classes, which aren't used by the client.

```
C:/jdk1.2.2/bin/javac.exe -d .build/wapp/WEB-INF/classes -classpath
"D:/Work/Examples/Vlib;D:/Work/Examples/Vlib/.build/wapp/WEB-
INF/classes;D:/Work/lib/j2ee.jar;D:/Work/lib/xerces.jar;D:/Work/lib/PrimixF
oundation.jar;D:/Work/lib/Tapestry.jar;D:/Work/lib/VlibBeans.jar"
com/primix/vlib/EntitySelectionModel.java
com/primix/vlib/IExternalPage.java com/primix/vlib/Protected.java
com/primix/vlib/VirtualLibraryApplication.java
com/primix/vlib/VirtualLibraryServlet.java
com/primix/vlib/pages/ConfirmBookDelete.java
com/primix/vlib/pages/EditBook.java com/primix/vlib/pages/EditProfile.java
com/primix/vlib/pages/Home.java com/primix/vlib/pages/Login.java
com/primix/vlib/pages/Logout.java com/primix/vlib/pages/Matches.java
com/primix/vlib/pages/MyBooks.java com/primix/vlib/pages/NewBook.java
com/primix/vlib/pages/PersonPage.java com/primix/vlib/pages/Register.java
com/primix/vlib/pages/ViewBook.java com/primix/vlib/components/Book.java
com/primix/vlib/components/Border.java
com/primix/vlib/components/ExternalLink.java
com/primix/vlib/components/Person.java

*** Copying WEB-INF resources ... ***

Copying: web.xml weblogic.xml

*** Copying package resources ...***

Copying: Vlib.application ConfirmBookDelete.html EditBook.html
EditProfile.html Home.html Login.html Logout.html Matches.html MyBooks.html
NewBook.html PersonPage.html Register.html ViewBook.html
ConfirmBookDelete.jwc EditBook.jwc EditProfile.jwc Home.jwc Login.jwc
Logout.jwc Matches.jwc MyBooks.jwc NewBook.jwc PersonPage.jwc Register.jwc
ViewBook.jwc Border.html Book.jwc Border.jwc Person.jwc

*** Building Vlib.war ... ***

C:/jdk1.2.2/bin/jar.exe cf Vlib.war -C .build/wapp .

*** Installing Vlib.war to ../../lib ***
```

This creates the file `Vlib.war` in `D:\Work\lib`.

Configure WebLogic environment

The Vlib web application requires serveral frameworks to be in the Weblogic class path at execution time (Tapestry.jar, PrimixFoundation.jar, xerces.jar, gnu-regexp.jar). There's also some additional configuration necessary to use Cloudscape 3.0.

This involves executing the wlconfig command to set the necessary parameters. Normally, this is a time consuming and error prone process, but using the JBE we can perform the necessary operations automatically.

In the `D:\Work\Example\Vlib` directory, execute the command make `configure-weblogic`:

```
make configure-weblogic

*** Configuring WebLogic Server options ***

C:/WebLogic/bin/wlconfig.exe -mx128M -mx128M -
Dweblogic.class.path="C:/weblogic/
lib/weblogic510sp3.jar;C:/weblogic/license;C:/weblogic/classes;C:/weblogic/
lib/weblogicaux.jar;D:/Work/lib/gnu-
egexp.jar;D:/Work/lib/xerces.jar;D:/Work/lib/Tapestry.jar;D:/Work/lib/Primi
xFoundation.jar" -Dweblogic.system.home=C:/WebLogic -
Dcloudscape.system.home="C:\Cloudscape_3.0_Eval/demo/databases" -classpath
"C:/w
eblogic/lib/weblogic510sp3boot.jar;C:/Cloudscape_3.0_Eval/lib/cloudscape.ja
r;C:/
Cloudscape_3.0_Eval/lib/license.jar"
Updating CLASSPATH from:

"C:/weblogic/lib/weblogic510sp3boot.jar;C:/Kawa4.1/cmd/Cloudscape_3.0_Ev
al/lib/cloudscape.jar;C:/Kawa4.1/cmd/Cloudscape_3.0_Eval/lib/license.jar"
to

"C:/weblogic/lib/weblogic510sp3boot.jar;C:/Cloudscape_3.0_Eval/lib/cloud
scape.jar;C:/Cloudscape_3.0_Eval/lib/license.jar"
WebLogic new settings are:

CLASSPATH Prefix
C:/weblogic/lib/weblogic510sp3boot.jar;C:/Cloudscape_3.0_Eva
l/lib/cloudscape.jar;C:/Cloudscape_3.0_Eval/lib/license.jar
CLASSPATH
C:/weblogic/lib/weblogic510sp3boot.jar;C:/Cloudscape_3.0_Eva
l/lib/cloudscape.jar;C:/Cloudscape_3.0_Eval/lib/license.jar;C:\weblogic\jre
1_2\l
ib\tools.jar;C:\weblogic\jre1_2\jre\lib\rt.jar;C:\weblogic\jre1_2\jre\lib\i
18n.j
ar;C:\weblogic\license;C:\weblogic\classes\boot;C:\weblogic\classes;C:\webl
ogic\
lib\weblogicaux.jar;C:\weblogic\eval\cloudscape\lib\cloudscape.jar
JAVA_HOME           C:\weblogic\jre1_2
WEBLOGIC_LICENSEDIR C:\weblogic\license
WEBLOGIC_HOME       C:\weblogic
system properties:
                    java.security.manager
                    java.security.policy==C:\weblogic\weblogic.policy
                    weblogic.system.home=C:/WebLogic
                    java.compiler=symcjit

weblogic.class.path=C:/weblogic/lib/weblogic510sp3.jar;C:/we
blogic/license;C:/weblogic/classes;C:/weblogic/lib/weblogicaux.jar;D:/Work/
lib/g
nu-
regexp.jar;D:/Work/lib/xerces.jar;D:/Work/lib/Tapestry.jar;D:/Work/lib/Prim
ix
Foundation.jar

cloudscape.system.home=C:\Cloudscape_3.0_Eval/demo/databases

INITIAL_HEAP        128 MB
```

```
MAX_HEAP            128 MB
SERVERCLASSPATH
C:/weblogic/lib/weblogic510sp3boot.jar;C:/Cloudscape_3.0_Eva
l/lib/cloudscape.jar;C:/Cloudscape_3.0_Eval/lib/license.jar;C:\weblogic\jre
1_2\j
re\lib\rt.jar;C:\weblogic\jre1_2\jre\lib\i18n.jar;C:\weblogic\classes\boot;
C:\we
blogic\eval\cloudscape\lib\cloudscape.jar

Type "wlconfig -help" for program usage.
```

This assumes that you have installed patch SP3 to WebLogic, and that the two path Jars (`weblogic510sp3.jar` and `weblogic510sp3boot.jar`) are in `C:\WebLogic\lib`.

Having done all this, it will be possible launch WebLogic as an NT service or using its Start Menu icon.

Change WebLogic Configuration

Before WebLogic can be run, we must add deployment information for the EJBs and web application, and set up pools and data sources.

Edit the weblogic.proprties file and add the following lines:

```
weblogic.httpd.webApp.vlib=D:/Work/Examples/Vlib/.build/wapp

weblogic.ejb.deploy=\
      D:/Work/lib/VlibBeans-deploy.jar

weblogic.jdbc.connectionPool.com.primix.vlib.Pool=\
         url=jdbc:cloudscape:vlib,\
         driver=COM.cloudscape.core.JDBCDriver,\
         initialCapacity=1,\
         maxCapacity=2,\
         capacityIncrement=1,\
         props=user=none;password=none;server=none

weblogic.allow.reserve.weblogic.jdbc.connectionPool.com.primix.vlib.Pool=ev
eryone
weblogic.jdbc.TXDataSource.com.primix.vlib.DataSource=com.primix.vlib.Pool
```

In addtion, you should edit the configuration to remove the reference to the Cloudscape install directory (that was set in the previous step), and comment out all the demos that are included with WebLogic.

Due to a WebLogic bug[3], we can't deploy the `Vlib.war` file itself, instead we deploy its build image (generated by the JBE), from which the `Vlib.war` file is generated.

---

[3] When WebLogic deploys a War file, it partially unpacks it, extracting all the .class files. Unfortunately, it doesn't unpack all the class resource files Tapestry needs, such as HTML templates and specification files.

Setup the Database

The database is shipped as a Zip archive.

Open the file `D:\Work\Examples\VlibBeans\Vlib.zip`.

Extract its contents to `C:\Cloudscape_3.0_Eval\demo\databases` (this may vary, depending on where you installed Cloudscape).

This will create the directory `C:\Cloudscape_3.0_Eval\demo\databases\vlib`, which is the Vlib database. It comes with three users and a dozen or so books:

Name	E-Mail	Password
Alternate Test User	alt@primix.com	secret
Howard Ship	hship@primix.com	secret
Test User	test@primix.com	secret

Launch WebLogic

Finally, launch WebLogic from the Start menu. If all the steps have been followed, it will launch without error.

Chapter

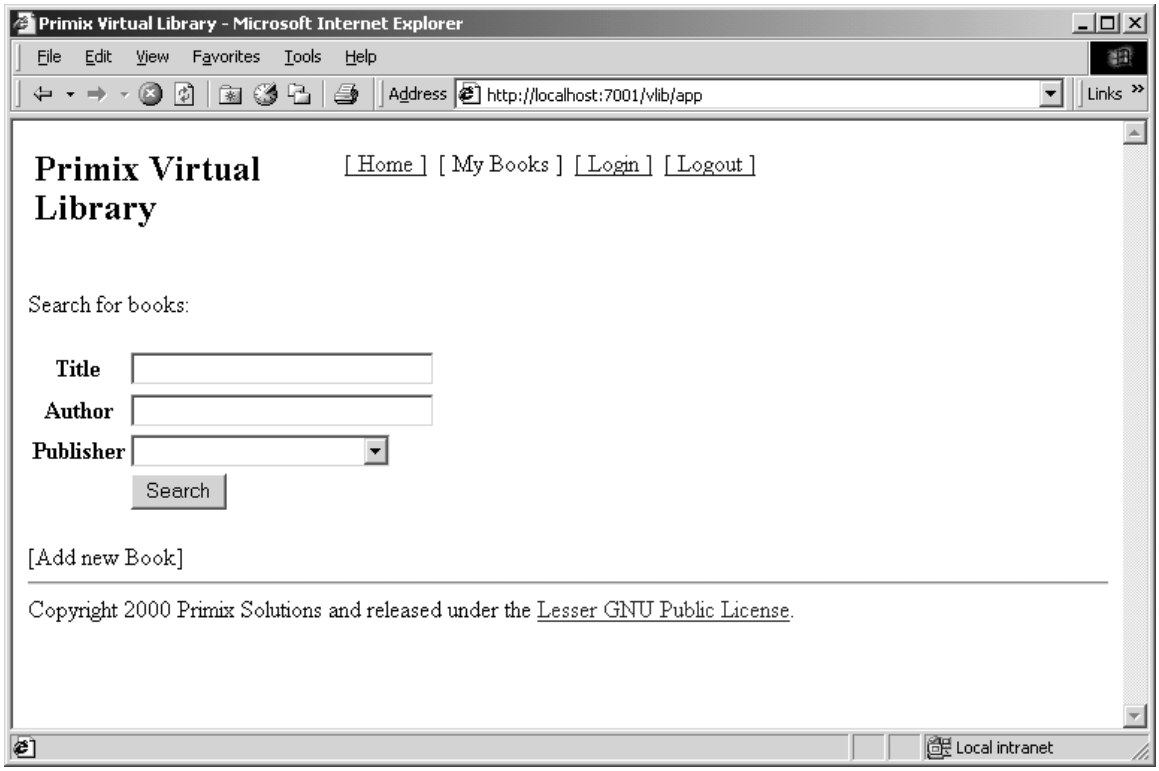
3

A Tour of the Virtual Library Application

You can start the Vlib application with the URL:

```
http://localhost:7001/vlib/app
```

You'll then see the home page for the application, from which you may search for books.

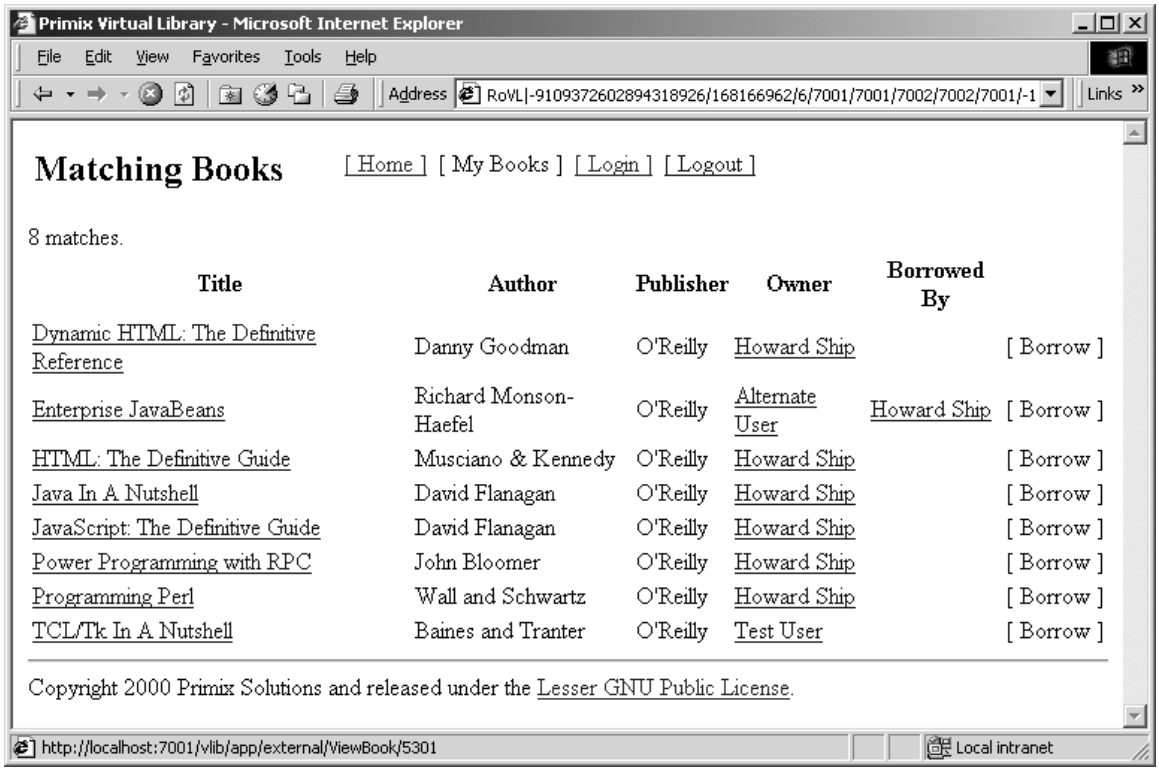


The current version of the Primix Virtual Library is simple, presentation wise. We will shortly be sprucing it up with graphics and colors.

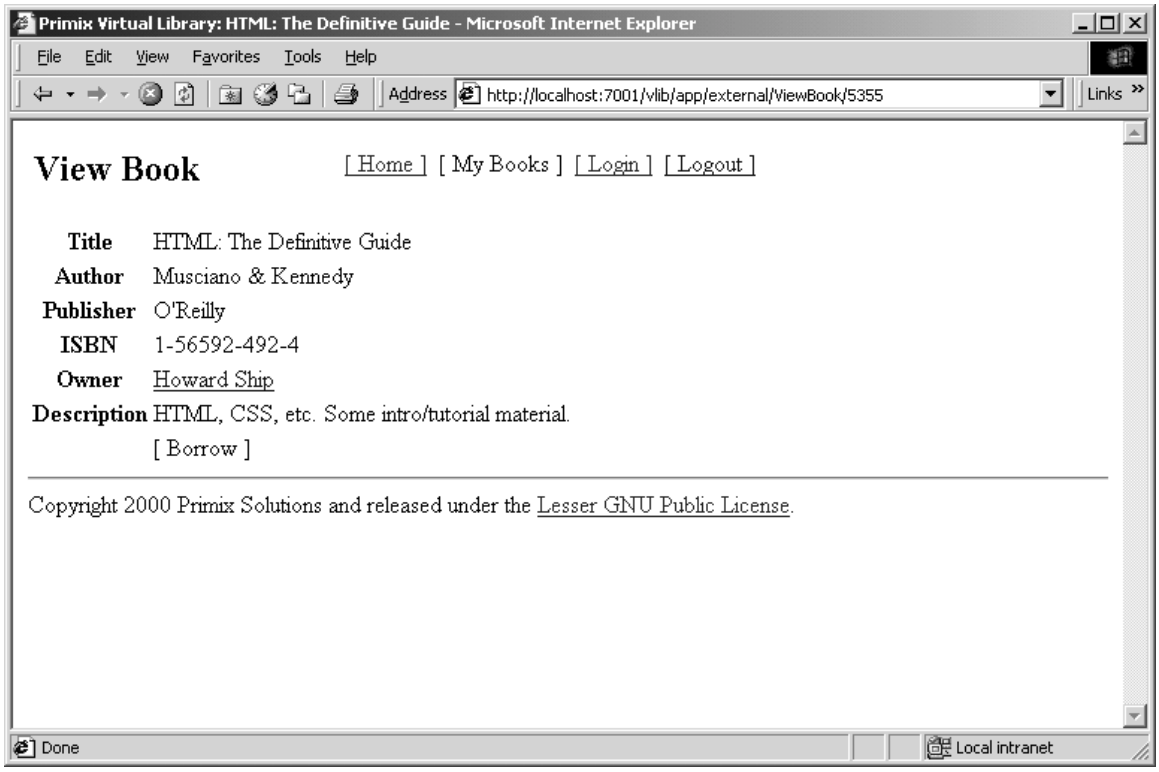
Let's start by finding all the O'Reilly books in the database.

Select "O'Reilly" in the Publisher pulldown, then click the Search button.

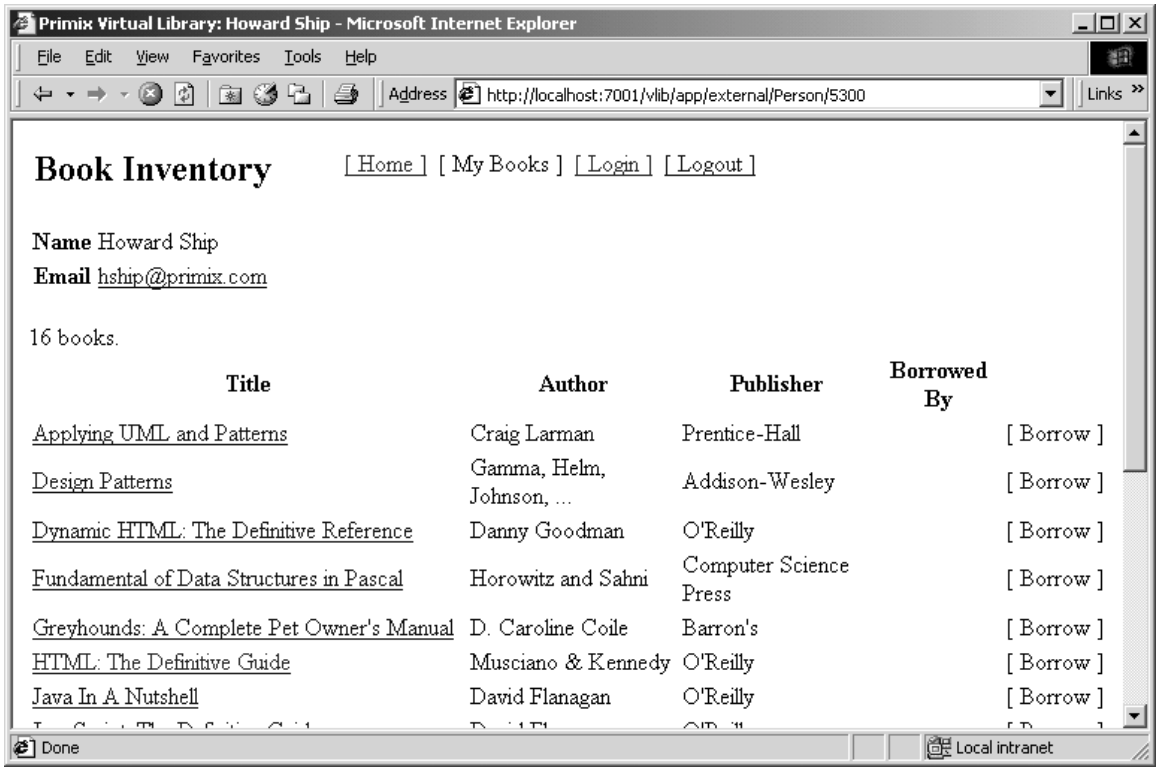
You'll get a list of all the books, sorted by title.



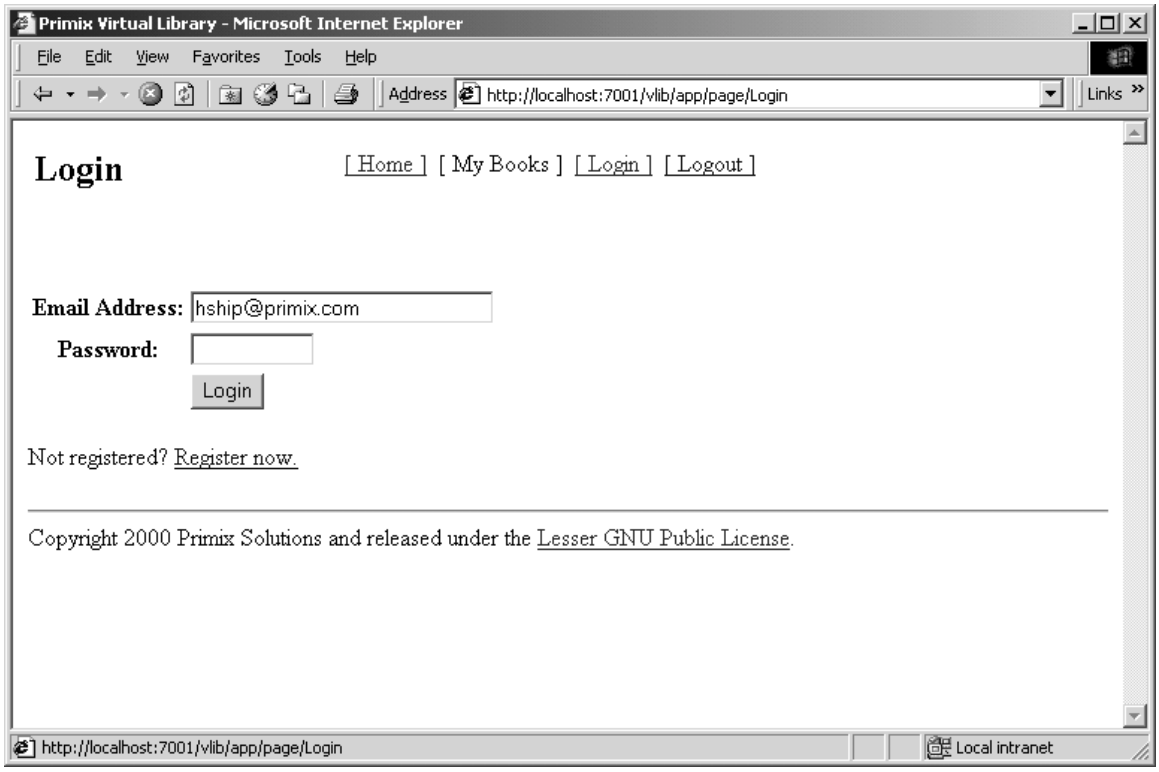
You can click on the title of a book to get more information about that book:



Or, you can click on the name of a person to see the books they own:

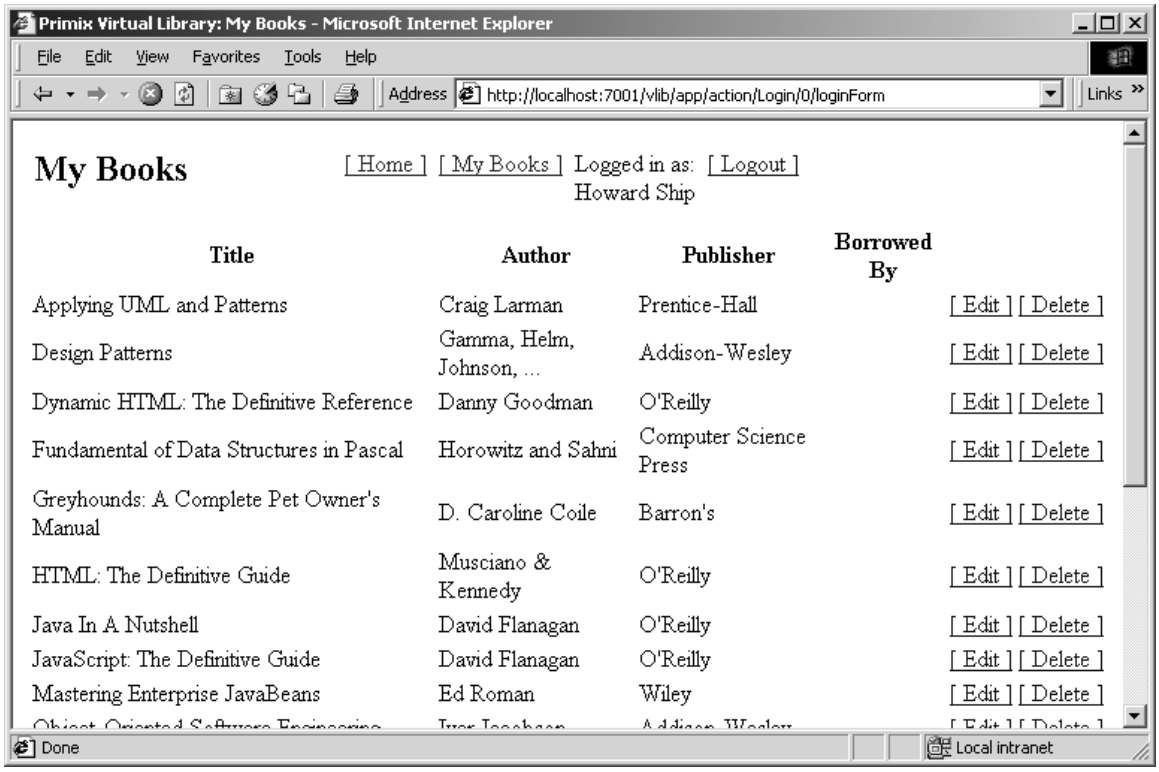


You might notice the "[Borrow]" that appears on several pages ... this is the borrow button, and is only enabled once you login. Use the "[Login]" button to log into the application.



The application uses a cookie to remember you email address (which is used as a unique identity when logging in). Enter the email address "hship@primix.com" and the password "secret".

This brings you to the "My Books" page, where you can manage the books you own:



The remainder of the application, adding and editting books, is basically self-explanatory.