



2

Using Zope

THIS CHAPTER GETS YOU UP AND RUNNING WITH ZOPE. It guides you through installing and running Zope and covers the most important Zope concepts. By the end of this chapter, you should be able to use Zope to create and manage simple, yet powerful, Web applications.

Downloading Zope

The first steps to using Zope are to download and install it. Zope is available for free from the Zope.org Web site (<http://www.zope.org>). The most recent stable version is always available from the Download section at Zope.org (<http://www.zope.org/Products>).

Zope is currently available as a binary for Windows, Linux, and Solaris. This means that you can just download and install it without having to compile any programs. For other platforms, you must download the source and compile Zope. Zope can be compiled and run on almost any UNIX-like operating system. As a general rule of thumb, if Python is available for your operating system and you have a C compiler, then you can probably use Zope.

Installing Zope

You will install Zope differently, depending on your platform. If you are running a recent version of Linux, you might already have Zope installed. You can get Zope in both binary and source forms. Several different binary formats are also available.

Installing Zope for Windows

Zope for Windows comes as a self-installing .exe file. To install Zope, double-click the .exe file. This launches an Installer that walks you through the installation process. Pick a name for your Zope installation and a directory in which to install it. Click Next, and create a new Zope user account. This account is called the initial user account. This creates an account that you can use to log into Zope for the first time. You can change this username and password later if you want.

If you are using Windows NT or Windows 2000, you can choose to run Zope as a service. Running Zope as a service is a good idea for a public server. If you are just running Zope for personal use, don't bother running it as a service. Keep in mind that if you are running Windows 95, Windows 98, or Windows ME (Millenium Edition), you cannot run Zope as a service.

If you decide to uninstall Zope later, you can use the Unwise.exe program in your Zope directory.

Downloading Linux and Solaris Binaries

The following code shows how to download the binary for your platform and extract the tarball:

```
$ tar xvfz Zope-2.3.0-linux2-x86.tgz
```

In the previous example, you are downloading version 2.3.0. This might not be the most recent version of Zope when you read this, so be sure to get the latest stable version of Zope for your platform.

The following code unpacks Zope into a new directory. Enter the Zope directory and run the Zope Installer script:

```
$ cd Zope-2.3.0-linux2-x86
$ ./install
```

The Installer prints information as it installs Zope. Among other things, it creates an Initial User account. You can change the initial username and password later with the `zpasswd.py` script (see Chapter 6, “Users and Security”).

The Installer configures Zope to run as your UNIX userid. If you prefer to run Zope as another userid, you can use the `-u` command-line switch and specify the user you want to configure Zope to run as. Many books on the market contain more information on userids and UNIX administration; in general, you should check out userids and UNIX administration if you want to do anything fancy. For now, things will work fine if you just install Zope as your user by not specifying any extra command-line options.

For more information on installing Zope, see the installation instructions in `doc/INSTALL.txt`, and find out more about the Installer script by running it with the following `-h` help switch:

```
$ ./install -h
```

Getting Zope in RPM and deb Format

Zope Corporation doesn't make Zope available in RPM format, but other people do. Jeff Rush regularly packages Zope as RPMs. For more information, check out his Web page (<http://starship.python.net/crew/jrush/Zope/>). Zope is also available in the Debian Linux deb package format. You can find Zope deb packages at the Debian Web site (<http://packages.debian.org/zope>). Generally, the latest Zope releases are found in the unstable distribution.

Compiling Zope from Source Code

If binaries aren't available for your platform, then chances are you can compile Zope from the source. To do this, install Python from your platform sources and make sure you have a C compiler. You can get Python from the Python Web site (<http://www.python.org>). Although we try to use the most recent Python for Zope, often the latest Python version is more recent than the version we "officially" support for Zope. For information on what version of Python you need to compile Zope, see the release notes on the Web page for each version.

The following code shows how to download the Zope source distribution and extract the tarball:

```
$ tar xvfz Zope-2.2.0-src.tgz
```

The previous example unpacks Zope into a new directory. In the following example, enter the Zope directory and run the Zope Installer script:

```
$ cd Zope-2.2.0-src
$ python wo_pcgi.py
```

The Installer compiles Zope and sets up your installation. The Installer prints information as it runs, including the initial username and password. It's important to write down that information so that you can log into Zope. For more information, see the installation instructions in the file `doc/INSTALL.txt`. Again, you can change the initial user account later with the `zpasswd.py` script (see Chapter 6).

Starting Zope

Depending on your platform, Zope is run with different commands. Whatever your platform, you can either run Zope manually, or automatically. When running Zope manually, you simply tell Zope when to start and when to stop. When running Zope automatically, Zope starts and stops when your computer starts and stops.

Starting Zope on Windows

The Installer creates a Zope directory with a batch file called `start.bat`. Double-click the `start.bat` icon. This opens a window that includes logging information. In this window, you find the port on which Zope is listening. You can now log into Zope with a Web browser.

If you are running Zope as a service, you can start and stop Zope via the Services Control Panel. Zope writes events to the event log so that you can keep track of when your service starts and stops. If you run Zope as a service, you must know what port Zope is running on because you will not have direct access to its detailed logging information.

Zope comes with its own Web server. When you start Zope, its Web server starts. If you want, you can connect Zope to your existing Web server, such as IIS, but that is beyond the scope of this book. The Zope Administrator's Guide covers this kind of material (<http://www.zope.org/DocProjects/AdminGuide>).

Starting Zope on UNIX

Run the following Start script:

```
$ ./start &
```

Zope starts running and prints logging information to the console. You should see information telling you on which port Zope is listening. You can now log into Zope with a Web browser.

Zope comes with its own Web server. When you start Zope, its Web server starts. If you want, you can connect Zope to your existing Web server, such as Apache, but that is beyond the scope of this book. The Zope Administrator's Guide covers this kind of material (<http://www.zope.org/DocProjects/AdminGuide>).

The Start script can also be edited to start Zope with many different options. How to customize your Zope startup is also described in the Administrator's Guide.

Logging In

To log into Zope you need a Web browser. Zope's interface is written entirely in HTML; therefore, any browser that understands modern HTML works. Mozilla, and any 3.0+ version of Microsoft Internet Explorer or Netscape Navigator, will do.

To log into the management interface, point your Web browser to Zope's management URL. The management URL for Zope is Zope's base URL with `/manage` appended. Assuming you have Zope installed on your local machine serving on the default port 8080, the management URL is

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

This URL usually works, but you might need to log in to a different machine than the one shown here. To find out exactly where to log into your URL, look at the logging information Zope prints as it starts up. For example:

```

---
2000-08-07T23:00:53 INFO(0) ZServer Medusa (V1.18) started at
➔Mon Aug 7 16:00:53 2000
    Hostname: peanut
    Port:8080

---
2000-08-07T23:00:53 INFO(0) ZServer FTP server started at
➔Mon Aug 7 16:00:53 2000
    Authorizer:None
    Hostname: peanut
    Port: 8021

```

The first log entry indicates Zope is running on a machine named `peanut` and that the Web server is listening on port `8080`. This means that the management URL is `http://peanut:8080/manage`.

After you enter Zope's management URL in your browser, your browser prompts you to provide a username and password. Type in the initial username and password created during the install process. If you don't know the initial username and password, then shut Zope down by closing its window, and change the initial user password with the `zpasswd.py` script and restart Zope. See Chapter 6 for more information about configuring the initial user account.

Controlling Zope with the Management Interface

After you successfully log in, you see a Web page of the Zope management interface, as shown in Figure 2.1.

The Zope management interface enables you to control Zope within your Web browser.

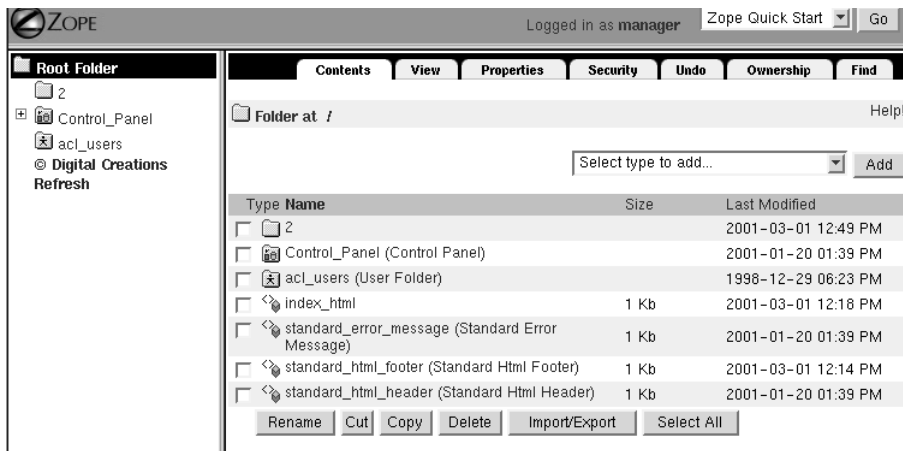


Figure 2.1 The Zope management interface.

Using the Navigator

The Zope management interface is broken up into three frames. With the left frame, you navigate around Zope much like you would navigate around a file system with a file manager, such as Windows Explorer. This frame is called the Navigator, and it is shown in the left frame of Figure 2.1. In this frame, you see the Root folder and all its subfolders. The Root folder is in the upper-left corner of the tree. The Root folder is the “top” of Zope. Everything in Zope lives inside the Root folder.

Some of the folders have plus marks to the left of them. These plus marks enable you to expand the folders to see the subfolders that are inside.

Above the folder tree, Zope shows you login information. In this screenshot, you can see that you are currently logged in as `manager`. When you log in to Zope you will use the initial user account and you will see the name of this account in place of `manager`.

To manage a folder, click it, and it appears in the right frame of the browser window. This frame is called the Workspace.

Using the Workspace

The right frame of the management interface shows the object you are currently managing. When you first log onto Zope, the current object is the Root folder, as shown in the right frame of Figure 2.1. The Workspace gives you information about the current object and enables you to change it.

Across the top of the screen are a number of tabs. The currently selected tab is highlighted in a lighter color. Each tab takes you to a different view of the current object. Each view enables you to perform a different management function on that object.

In Figure 2.1, you are looking at the Contents view of the Root folder object.

Another feature of the Workspace is a description of the current object’s type and URL. Just below each tab is an icon representing the current object’s type. The object’s URL is next to that icon.

In Figure 2.1, `Folder` at `/` tells you that the current object is a folder and that its URL is `/`. Note that this URL is the object’s URL relative to Zope’s base URL. So, if the URL or your Zope site was `http://mysite.example.com:8080`, then the URL of the `Folder` at `/myFolder` would be `http://mysite.example.com:8080/myFolder`.

As you explore different Zope objects, you find that the URLs (as displayed in the management screen) can be used to navigate between objects.

For example, if you are managing a folder at `/Zoo/Reptiles/Snakes`, you can return to the folder `/Zoo` by clicking the word “Zoo” in the folder’s URL.

The last frame is the uppermost top frame in Zope. This contains a pull-down box that enables you to select:

- **Preferences**—Here, you can set a default preference for your Zope session, and you can even set it to hide the top frame.

- **Logout**—Selecting this menu item logs you out of Zope.
- **Quick Start Links**—These are quick links out to Zope documentation and community resources.

Understanding Users in Zope

Zope is a multi-user system. You've already seen how you can log into Zope via the management interface with the initial username and password. Zope supports other kinds of users:

- **Emergency User**—The Emergency User is rarely used in Zope. This account is used for creating other user accounts and fixing things if you accidentally lock yourself out. The Emergency User is both very powerful and very weak. It is not restricted by most security controls. However, the Emergency User can only create one type of object—Users. Using the Emergency User to repair your Zope system in the case of accidental lockout is discussed in the Administrator's Guide (<http://www.zope.org/DocProjects/AdminGuide>).
- **Manager**—The Manager is the Zope workhorse. You need to log in with the Manager account to do most of the work involved with building Zope Web sites. The initial user is a Manager, and you can create as many Manager accounts as you need.
- **Others**—You can create your own kind of users that fit into groups or are responsible for carrying out a role that you define. This is explained more in Chapter 6, which discusses Zope security and users.

Creating Users

Managers can create Zope users in a unique kind of folder called a User folder.

User folder icons look like folders with a person on them. User folders always have the name `acl_users`, as shown in Figure 2.1.

Click the `acl_users` folder in the Root folder to enter it. User folders contain User objects. You can create new users and edit existing users. Click the Add button to create a new user, as shown in Figure 2.2.

Fill out the form to create a new user. In the Name field, put your chosen username. Choose a password and enter it in the Password and (Confirm) fields. Leave the Domains field blank. This is an advanced feature and is discussed in Chapter 6. Select the Manager role from the Roles select list. Then click the Add button.

Congratulations, you just created a Manager account. Zope shows you this new Manager account inside the User folder. Later, you can change or delete this user if you want.

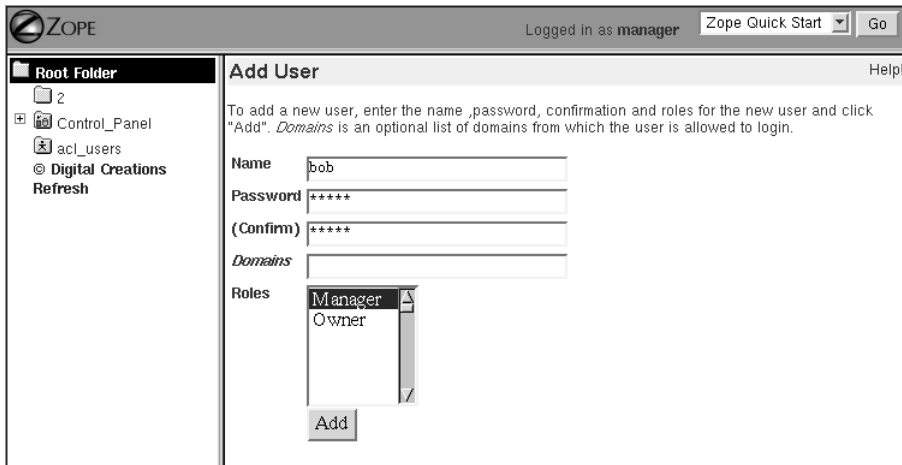


Figure 2.2 Adding a new user.

Changing Logins

To change your login, you must completely exit all instances of your Web browser and then restart your browser and log in with the new authentication information. This cumbersome procedure is unfortunately necessary because most browsers cache authentication information.

To log in as your new user, quit your browser, restart it, and log in using the user-name and password of the Manager that has just been created.

Understanding Objects in Zope

Zope is built on the concepts of objects and folders. The next two sections address this fundamental aspect of the way Zope works.

Creating Objects

The Zope management interface represents everything in terms of objects and folders. When you build Web applications with Zope, you spend most of your time creating and managing objects in folders. For example, to make a new Manager account, you create a User object in a User folder.

Return to the Root folder by clicking the top-left folder in the Navigator frame.

To add a new object to the current folder, select an object from the pull-down menu labeled Select Type to Add... This pull-down menu is called the Product Add List.

For example, to create a folder, select Folder from the pull-down menu. At this point, you are taken to an Add form that collects information about the new folder, as shown in Figure 2.3.

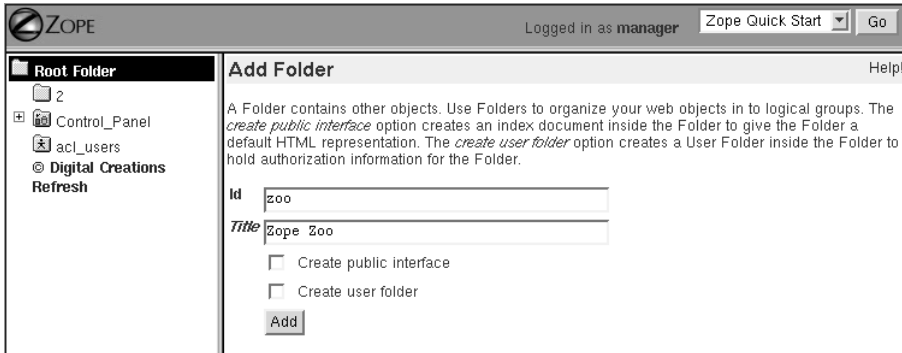


Figure 2.3 The Add Form folder.

Type `zoo` in the `Id` field, and `Zope Zoo` in the `Title` field. Then click the `Add` button.

Zope creates a new folder in the current folder. You can verify this by noting that a new folder named `zoo` is inside the `Root` folder.

Click the `zoo` folder to enter it. Notice that the URL of the folder is based on the folder's id. You can create more folders inside your new folder if you want. For example, create a folder inside the `zoo` folder with an id of `arctic`. Go to the `zoo` folder and choose `Folder` from the pull-down menu. Then type in `arctic` for the folder id, and `Arctic Exhibit` for the title. Now click the `Add` button. You always create new objects in the same way:

1. Go to the folder where you want to add a new object.
2. Choose the type of object you want to add from the pull-down menu.
3. Fill out an Add form and submit it.
4. Zope creates a new object in the current folder.

Notice that every Zope object has an id that you need to specify on the Add form when you create the object. The id is how Zope names objects. Objects also use their ids for their URLs.

Objects also use their ids for their URLs, for example:

```
http://localhost:8080/zoo/arctic/
```

is the URL to the `arctic` folder.

Chapter 3, “Using Basic Zope Objects,” covers all the basic Zope objects and what they can do for you.

Moving Objects

Most computer systems enable you to move files around in directories with cut, copy, and paste. Zope has a similar system that enables you to move objects around in folders by cutting or copying them, and then pasting them to a new location.

To experiment with copy and paste, create a new folder in the Root folder with an id of bears. Then select bears by checking the check box just to the left of the folder. Then click the Cut button. Cut removes the selected objects from the folder and places them on a clipboard. The object does not, however, disappear from its location until it is pasted somewhere else.

Now enter the zoo folder by clicking it, and then enter the arctic folder by clicking it. You could also have used the Navigator to get to the same place. Now, click the Paste button to paste cut object(s) into the current folder. You should see the bears folder appear in its new location. You can verify that the folder has been moved by going to the Root folder and noting that bears is no longer there.

Copy works similarly to Cut. When you paste copied objects, the original objects are not changed. Select the object(s) you want to copy and click the Copy button. Then navigate to another folder and click the Paste button.

You can cut and copy folders that contain other objects and move many objects at one time with a single cut and paste. For example, go to the zoo folder and copy the arctic folder. Now paste it into the zoo folder. You will now have two folders inside the zoo folder, arctic and copy_of_arctic. If you paste an object into the same folder where you copied it, Zope changes the id of the pasted object. This is a necessary step because you cannot have two objects with the same id in the same folder.

To rename the copy_of_arctic folder, select the folder by checking the check box to the left of the folder. Then click the Rename button. This takes you to the Rename Items form as shown in Figure 2.4.

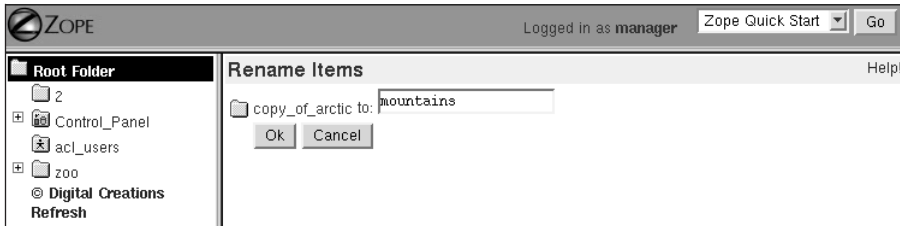


Figure 2.4 Renaming an object.

Type in a new id mountains and click OK. Zope ids can consist of letters, numbers, spaces, dashes, underscores and periods, and they are case-sensitive. Here are some legal Zope ids: index.html, 42, and Snake-Pit.

Now your zoo folder contains an arctic and a mountains folder. Each of these folders contains a bears folder. This is because when we made a copy of the arctic folder, it also copied the bears folder that it contained.

If you want to delete an object, select it and then click the Delete button. Unlike cut objects, deleted objects are not placed in the clipboard and cannot be pasted. In the next section, we'll see how we can retrieve deleted objects.

Zope does not allow you to cut, delete, or rename a few particular objects in the Root folder. These objects include `Control_Panel`, `standard_html_header`, `standard_html_footer`, and `standard_error_message`. These important objects are necessary for Zope's operation. Also, these operations don't work in some cases. For instance, you can't paste a User object into a regular folder.

If you are having problems with copy and paste, make sure that you have enabled cookies in your browser. Zope uses cookies to keep track of the objects that you cut and copy.

Undoing Mistakes

Any action in Zope that causes objects to change can be undone via the Undo tab. You can recover from mistakes by undoing them.

Select the zoo folder that we created earlier and click Delete. The folder disappears. You can get it back by undoing the delete action.

Click the Undo tab, as shown in Figure 2.5.

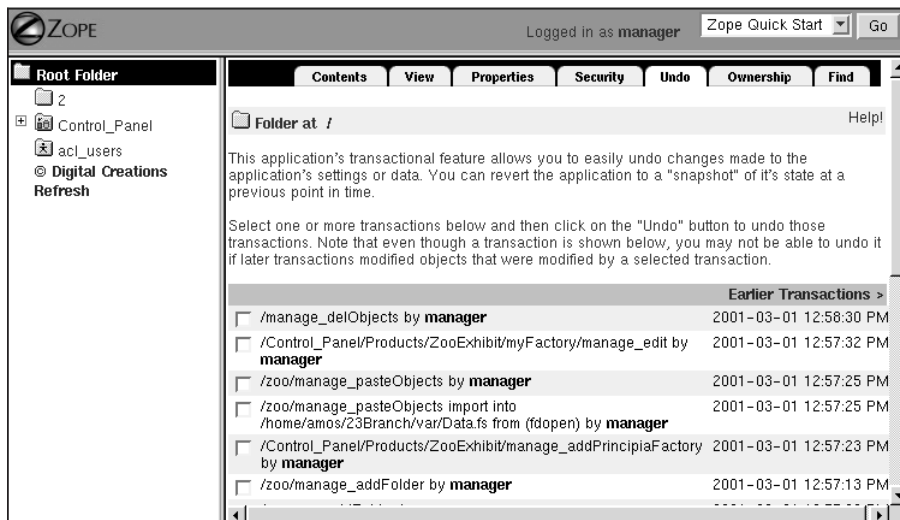


Figure 2.5 The Undo view.

Select the first transaction labeled `/manage_de10bjects`, and click the Undo tab.

This action tells Zope to undo the last transaction. You can verify that the task has been completed by making sure that the zoo folder has returned.

Undo Details and Gotchas

Undo works on the object database that Zope uses to store all Zope objects. Changes to the object database happen in transactions. You can think of a transaction as any change you make to Zope, such as creating a folder or pasting a bunch of objects to a new place. Each transaction describes all the changes that happen in the course of performing the action.

You cannot undo a transaction that a later transaction depends upon. For example, if you paste an object into a folder and then delete an object in the same folder, you might wonder whether or not you can undo the earlier paste. Both transactions change the same folder so that you can not simply undo the earlier transaction. The solution is to undo both transactions. You can undo more than one transaction at a time by selecting multiple transactions on the Undo tab and then clicking Undo.

Another problem to be aware of is that you cannot undo an undo. Therefore, if you add a folder and then undo that particular action, you cannot get the new folder back by undoing the undo.

One last note on undo. Only changes to objects stored in Zope can be undone. If you have integrated data in a relational database server, such as Oracle or MySQL (as discussed in Chapter 10, “Relational Database Connectivity”), changes to data stored there cannot be undone.

Administering and Monitoring Zope

The Control Panel is an object in the Root folder that controls various aspects of Zope’s operation.

Click the Control_Panel object in the Root folder, as shown in Figure 2.6.

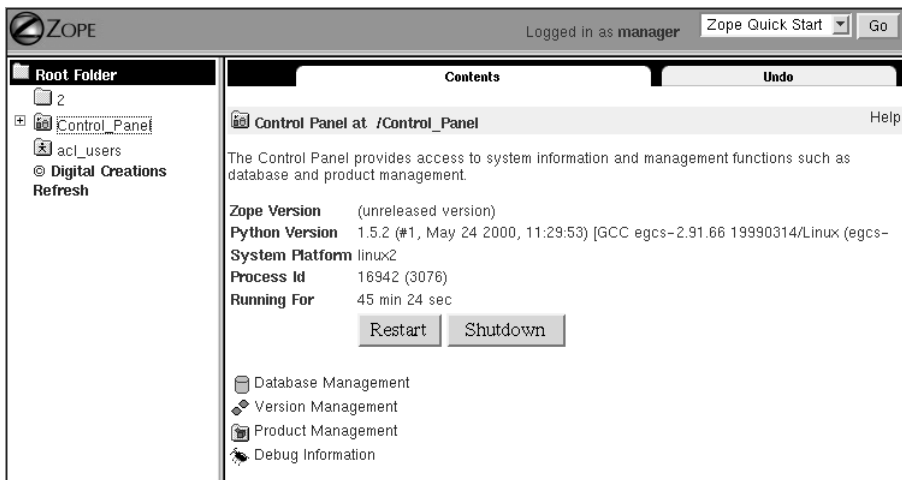


Figure 2.6 The Control Panel.

To shut down Zope, click the Shutdown button. Shutting down Zope causes the server to stop handling requests and completely removes Zope from memory. You have to manually start Zope to continue using it. Only shut down Zope if you are finished using it and have the ability to access the server on which Zope is running so that you can manually restart it later.

If you are running Zope on UNIX under daemon control or as a service on Windows, you can restart Zope from the Control Panel folder. Clicking the Restart button shuts down Zope and then immediately starts up a new instance of the Zope server. It might take Zope a few seconds to come back up and start handling requests.

On the Control Panel you will also see several links at the bottom of the screen, one of which is Database Management.

Transactions don't go away until you pack the Zope database. This means that you can undo all transactions except ones that have been removed by packing the database. When you choose to pack the database, you can specify what transactions to remove so that you can, for example, only remove transactions older than a week.

Using the Help System

Zope has a built-in Help system. Every management screen has a Help button in the upper right-hand corner. This button launches another browser window and takes you to the Zope Help system.

Go to the Root folder. Click the Help button, and you should see what is shown in Figure 2.7.

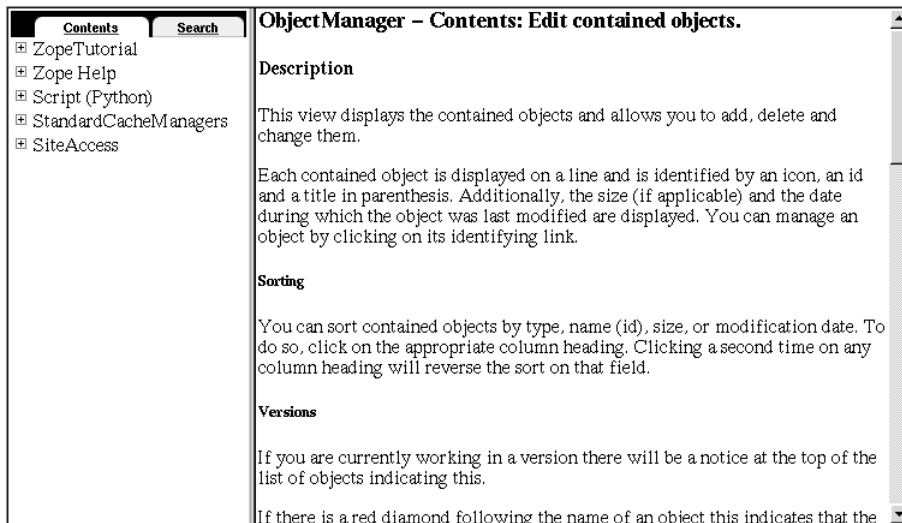


Figure 2.7 The Help system.

The Help system, like the Zope management interface, is divided into two frames—one for navigation and one for displaying the current topic.

When you click the Help button from the Zope management screen, the right frame of the Help system displays the help topic for the current management screen. In this case, you see information about the Contents view of a folder.

Browsing and Searching Help

Normally, you use the Help system to get help on a specific topic. However, you can browse through all the help content if you are curious or want to find out about things besides the management screen you are currently viewing.

The Help system enables you to browse all the help topics in the Contents tab of the left help frame (refer to Figure 2.7). You can expand and contract help topics. To view a help topic in the right frame, click it.

All help on the Zope management screens is located in the Zope Help folder. Inside you'll find many help topics. You'll also find a Help folder called API Reference. This folder contains help on scripting Zope, which is explained further in Chapter 8, "Advanced Zope Scripting."

When you install third-party components, they also include help that you can browse. Each installed component has its own Help folder.

Search the Help system by clicking the Search tab and entering one or more search terms. For example, to find all the help topics that mention folders, type `folder` into the search form.

Starting with the Zope Tutorial

Zope comes with a built-in tutorial. The tutorial guides you through all the basics of creating and managing Zope objects. To launch the tutorial, add a Zope Tutorial to the current folder by selecting Zope Tutorial from the Product Add List. The tutorial comes with several examples that you can change and copy for your own use.

If you start the tutorial and want to stop using it before you have completed all the lessons, you can later return to the tutorial. Just go to the Help system and find the lesson you would like to continue with by browsing the Zope Tutorial Help folder. You do not need to reinstall the tutorial.

If you are having problems with the tutorial, make sure to enable cookies in your browser. The tutorial uses cookies to keep track of where your example objects are. Also, if you enable JavaScript in your browser, the tutorial makes sure that the Zope management interface stays in sync with your tutorial lesson.

Now that you have Zope running, it's time to explore the system more thoroughly. You've seen how to manage Zope through the Web and have learned a little about Zope objects. In Chapter 3, you are introduced to many different Zope objects and you learn how to build simple applications with them.