Building a Blog System using Yii

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Chapter 1

Getting Started

1.1 Building a Blog System using Yii

This tutorial describes how to use Yii to develop a blog application shown as the blog demo which can be found in the Yii release files. It explains in detail every step to be taken during the development, which may also be applied in developing other Web applications. As a complement to the Guide and the Class Reference of Yii, this tutorial aims to show practical usage of Yii instead of thorough and definitive description.

Readers of this tutorial are not required to have prior knowledge about Yii. However, basic knowledge of object-oriented programming (OOP) and database programming would help readers to understand the tutorial more easily.

Note: This tutorial isn’t a complete step by step guide. You will have to fix errors popping up, check API and read the definitive guide while following it.

This tutorial is released under the Terms of Yii Documentation.

1.2 Testdriving with Yii

In this section, we describe how to create a skeleton application that will serve as our starting point. For simplicity, we assume that the document root of our Web server is /wwwroot and the corresponding URL is http://www.example.com/.

1.2.1 Installing Yii

We first install the Yii framework. Grab a copy of the Yii release file (version 1.1.1 or above) from www.yiiframework.com and unpack it to the directory /wwwroot/yii. Double check to make sure that there is a directory /wwwroot/yii/framework.
1. Getting Started

Tip: The Yii framework can be installed anywhere in the file system, not necessarily under a Web folder. Its framework directory contains all framework code and is the only framework directory needed when deploying an Yii application. A single installation of Yii can be used by multiple Yii applications.

After installing Yii, open a browser window and access the URL http://www.example.com/yii/requirements/index.php. It shows the requirement checker provided in the Yii release. For our blog application, besides the minimal requirements needed by Yii, we also need to enable both the pdo and pdo_sqlite PHP extensions so that we can access SQLite databases.

1.2.2 Creating Skeleton Application

We then use the yiic tool to create a skeleton application under the directory /wwwroot/blog. The yiic tool is a command line tool provided in the Yii release. It can be used to generate code to reduce certain repetitive coding tasks.

Open a command window and execute the following command:

% /wwwroot/yii/framework/yiic webapp /wwwroot/blog
Create a Web application under &#039;/wwwroot/blog&#039;? [Yes|No]y

Tip: In order to use the yiic tool as shown above, the CLI PHP program must be on the command search path. If not, the following command may be used instead:

path/to/php /wwwroot/yii/framework/yiic.php webapp /wwwroot/blog

To try out the application we just created, open a Web browser and navigate to the URL http://www.example.com/blog/index.php. We should see that our skeleton application already has four fully functional pages: the homepage, the about page, the contact page and the login page.

In the following, we briefly describe what we have in this skeleton application.

Entry Script

We have an entry script file /wwwroot/blog/index.php which has the following content:
1.2 Testdriving with Yii

```php
<?php
$yii='/wwwroot/framework/yii.php';
$config=dirname($_FILE_).'/protected/config/main.php';

// remove the following line when in production mode
defined('YII_DEBUG') or define('YII_DEBUG',true);

require_once($yii);
Yii::createWebApplication($config)->run();
```

This is the only script that Web users can directly access. The script first includes the Yii bootstrap file yii.php. It then creates an application instance with the specified configuration and executes the application.

**Base Application Directory**

We also have an application base directory /wwwroot/blog/protected. The majority of our code and data will be placed under this directory, and it should be protected from being accessed by Web users. For Apache httpd Web server, we place under this directory a .htaccess file with the following content:

deny from all

For other Web servers, please refer to the corresponding manual on how to protect a directory from being accessed by Web users.

**1.2.3 Application Workflow**

To help understand how Yii works, we describe the main workflow in our skeleton application when a user is accessing its contact page:

1. The user requests the URL http://www.example.com/blog/index.php?r=site/contact;
2. The entry script is executed by the Web server to process the request;
3. An application instance is created and configured with initial property values specified in the application configuration file /wwwroot/blog/protected/config/main.php;
4. The application resolves the request into a controller and a controller action. For the contact page request, it is resolved as the site controller and the contact action (the actionContact method in /wwwroot/blog/protected/controllers/SiteController.php);
5. The application creates the site controller in terms of a SiteController instance and then executes it;

6. The SiteController instance executes the contact action by calling its actionContact() method;

7. The actionContact method renders a view named contact to the Web user. Internally, this is achieved by including the view file /wwwroot/blog/protected/views/site/contact.php and embedding the result into the layout file /wwwroot/blog/protected/views/layouts/column1.php.

1.3 Requirements Analysis

The blog system that we are going to develop is a single user system. The owner of the system will be able to perform the following actions:

- Login and logout
- Create, update and delete posts
- Publish, unpublish and archive posts
- Approve and delete comments

All other users are guest users who can perform the following actions:

- Read posts
- Create comments

Additional Requirements for this system include:

- The homepage of the system should display a list of the most recent posts.
- If a page contains more than 10 posts, they should be displayed in pages.
- The system should display a post together with its comments.
- The system should be able to list posts with a specified tag.
- The system should show a cloud of tags indicating their use frequencies.
- The system should show a list of most recent comments.
- The system should be themeable.
- The system should use SEO-friendly URLs.
1.4 Overall Design

Based on the analysis of the requirements, we decide to use the following database tables to store the persistent data for our blog application:

- **tbl_user** stores the user information, including username and password.

- **tbl_post** stores the blog post information. It mainly consists of the following columns:
  - **title**: required, title of the post;
  - **content**: required, body content of the post which uses the Markdown format;
  - **status**: required, status of the post, which can be one of following values:
    * 1, meaning the post is in draft and is not visible to public;
    * 2, meaning the post is published to public;
    * 3, meaning the post is outdated and is not visible in the post list (still accessible individually, though).
  - **tags**: optional, a list of comma-separated words categorizing the post.

- **tbl_comment** stores the post comment information. Each comment is associated with a post and mainly consists of the following columns:
  - **author**: required, the author name;
  - **email**: required, the author email;
  - **url**: optional, the author website URL;
  - **content**: required, the comment content in plain text format.
  - **status**: required, status of the comment, which indicates whether the comment is approved (value 2) or not (value 1).

- **tbl_tag** stores post tag frequency information that is needed to implement the tag cloud feature. The table mainly contains the following columns:
  - **name**: required, the unique tag name;
  - **frequency**: required, the number of times that the tag appears in posts.

- **tbl_lookup** stores generic lookup information. It is essentially a map between integer values and text strings. The former is the data representation in our code, while the latter is the corresponding presentation to end users. For example, we use integer 1 to represent the draft post status and string Draft to display this status to end users. This table mainly contains the following columns:
The following entity-relation (ER) diagram shows the table structure and relationships about the above tables.

![Entity-Relation Diagram of the Blog Database]

Figure 1.1: Entity-Relation Diagram of the Blog Database

Complete SQL statements corresponding to the above ER diagram may be found in the blog demo. In our Yii installation, they are in the file /wwwroot/yii/demos/blog/protected/data/schema.sqlite.sql.

**Info:** We name all our table names and column names in lower case. This is because different DBMS often have different case-sensitivity treatment and we want to avoid troubles like this.

We also prefix all our tables with tbl_. This serves for two purposes. First, the prefix introduces a namespace to these tables in case when they need to coexist with other tables in the same database, which often happens in a shared hosting environment where a single database is being used by multiple applications. Second, using table prefix reduces the possibility of having some table names that are reserved keywords in DBMS.
1.4 Overall Design

We divide the development of our blog application into the following milestones.

- Milestone 1: creating a prototype of the blog system. It should consist of most of the required functionalities.
- Milestone 2: completing post management. It includes creating, listing, showing, updating and deleting posts.
- Milestone 3: completing comment management. It includes creating, listing, approving, updating and deleting post comments.
- Milestone 4: implementing portlets. It includes user menu, login, tag cloud and recent comments portlets.
- Milestone 5: final tune-up and deployment.
1. Getting Started
Initial Prototyping

2.1 Setting Up Database

Having created a skeleton application and finished the database design, in this section we will create the blog database and establish the connection to it in the skeleton application.

2.1.1 Creating Database

We choose to create a SQLite database. Because the database support in Yii is built on top of PDO, we can easily switch to use a different type of DBMS (e.g. MySQL, PostgreSQL) without the need to change our application code.

We create the database file `blog.db` under the directory `/wwwroot/blog/protected/data`. Note that both the directory and the database file have to be writable by the Web server process, as required by SQLite. We may simply copy the database file from the blog demo in our Yii installation which is located at `/wwwroot/yii/demos/blog/protected/data/blog.db`. We may also generate the database by executing the SQL statements in the file `/wwwroot/yii/demos/blog/protected/data/schema.sqlite.sql`.

Tip: To execute SQL statements, we may use the `sqlite3` command line tool that can be found in the SQLite official website.

2.1.2 Establishing Database Connection

To use the blog database in the skeleton application we created, we need to modify its application configuration which is stored in the PHP script `/wwwroot/blog/protected/config/main.php`. The script returns an associative array consisting of name-value pairs, each of which is used to initialize a writable property of the application instance.

We configure the `db` component as follows,
return array(
    ................
    'components'=>array(
        ................
        'db'=>array(
            'connectionString'=>'sqlite:/wwwroot/blog/protected/data/blog.db',
            'tablePrefix'=>'tbl_',
            ),
        ),
    ................
    );

The above configuration says that we have a db application component whose connectionString property should be initialized as sqlite:/wwwroot/blog/protected/data/blog.db and whose tablePrefix property should be tbl_.

With this configuration, we can access the DB connection object using Yii::app()->db at any place in our code. Note that Yii::app() returns the application instance that we create in the entry script. If you are interested in possible methods and properties that the DB connection has, you may refer to its class reference. However, in most cases we are not going to use this DB connection directly. Instead, we will use the so-called ActiveRecord to access the database.

We would like to explain a bit more about the tablePrefix property that we set in the configuration. This tells the db connection that it should respect the fact we are using tbl_ as the prefix to our database table names. In particular, if in a SQL statement there is a token enclosed within double curly brackets (e.g. {{post}}), then the db connection should translate it into a name with the table prefix (e.g. tbl_post) before sending it to DBMS for execution. This feature is especially useful if in future we need to modify the table name prefix without touching our source code. For example, if we are developing a generic content management system (CMS), we may exploit this feature so that when it is being installed in a new environment, we can allow users to choose a table prefix they like.
2.2 Scaffolding

Create, read, update and delete (CRUD) are the four basic operations of data objects in an application. Because the task of implementing the CRUD operations is so common when developing Web applications, Yii provides some code generation tools under the name of Gii that can automate this process (also known as scaffolding) for us.

Note: Gii has been available since version 1.1.2. Before that, you would have to use the yiic shell tool to achieve the same task.

In the following, we will describe how to use this tool to implement CRUD operations for posts and comments in our blog application.

2.2.1 Installing Gii

We first need to install Gii. Open the file /wwwroot/blog/protected/config/main.php and add the following code:

```
return array(
    ......
    'import'=>array(
        ......
        'db'=>array(
            'connectionString' => 'mysql:host=localhost;dbname=blog',
            'emulatePrepare' => true,
            'username' => 'root',
            'password' => '',
            'charset' => 'utf8',
            'tablePrefix' => 'tbl_',
        ),
    ),
    ......
);
```
'application.models.*',
'application.components.*',
),

'modules'=&gt;array(
    'gii'=&gt;array(
        'class'=&gt;'system.gii.GiiModule',
        'password'=&gt;'pick up a password here',
    ),
),
);

The above code installs the a module named gii, which enables us to access the Gii module by visiting the following URL in browser:

http://www.example.com/blog/index.php?r=gii

We will be prompted to enter a password. Enter the password that we set in /wwwroot/blog/protected/config/main.php previously, and we should see a page listing all available code generation tools.

**Note:** The above code should be removed when running on the production machine. Code generation tools should only be used on development machines.

### 2.2.2 Creating Models

We first need to create a model class for each of our database tables. The model classes will allow us to access the database in an intuitive object-oriented fashion, as we will see later in this tutorial.

Click on the Model Generator link to start using the model generation tool.

On the Model Generator page, enter tbl_user (the user table name) in the Table Name field, tbl_ in the Table Prefix field and then press the Preview button. A preview table will show up. We can click on the link in the table to preview the code to be generated. If everything is ok, we can press the Generate button to generate the code and save it into a file.
2.2 Scaffolding

Info: Because the code generator needs to save the generated code into files, it is required that the Web process have the permission to create and modify the corresponding files. For simplicity, we may give the Web process the write permission to the whole /wwwroot/blog directory. Note that this is only needed on development machines when using Gii.

Repeat the same procedure for the rest of the database tables, including tbl_post, tbl_comment, tbl_tag and tbl_lookup.

Tip: We can also enter an asterisk character * in the Table Name field. This will generate a model class for every database table in a single shot.

At this stage, we will have the following newly created files:

- models/User.php contains the User class that extends from CActiveRecord and can be used to access the tbl_user database table;
- models/Post.php contains the Post class that extends from CActiveRecord and can be used to access the tbl_post database table;
- models/Tag.php contains the Tag class that extends from CActiveRecord and can be used to access the tbl_tag database table;
- models/Comment.php contains the Comment class that extends from CActiveRecord and can be used to access the tbl_comment database table;
- models/Lookup.php contains the Lookup class that extends from CActiveRecord and can be used to access the tbl_lookup database table.

2.2.3 Implementing CRUD Operations

After the model classes are created, we can use the Crud Generator to generate the code implementing the CRUD operations for these models. We will do this for the Post and Comment models.

On the Crud Generator page, enter Post (the name of the post model class we just created) in the Model Class field, and then press the Preview button. We will see a lot more files will be generated. Press the Generate button to generate them.

Repeat the same procedure for the Comment model.
Let’s take a look at the files generated by the CRUD generator. All the files are generated under /wwwroot/blog/protected. For convenience, we group them into controller files and view files:

- controller files:
  - controllers/PostController.php contains the PostController class which is the controller in charge of all CRUD operations about posts;
  - controllers/CommentController.php contains the CommentController class which is the controller in charge of all CRUD operations about comments;

- view files:
  - views/post/create.php is the view file that shows an HTML form to create a new post;
  - views/post/update.php is the view file that shows an HTML form to update an existing post;
  - views/post/view.php is the view file that displays the detailed information of a post;
  - views/post/index.php is the view file that displays a list of posts;
  - views/post/admin.php is the view file that displays posts in a table with administrative commands.
  - views/post/_view.php is the partial view file used by views/post/index.php. It displays the brief view of a single post.
  - views/post/_search.php is the partial view file used by views/post/admin.php. It displays a search form.
  - a similar set of view files are also generated for comment.

2.2.4 Testing

We can test the features implemented by the code we just generated by accessing the following URLs:

http://www.example.com/blog/index.php?r=post
http://www.example.com/blog/index.php?r=comment
2.3 Authenticating User

Notice that the post and comment features implemented by the generated code are completely independent of each other. Also, when creating a new post or comment, we are required to enter information, such as author_id and create_time, which in real application should be set by the program. Don’t worry. We will fix these problems in the next milestones. For now, we should be fairly satisfied as this prototype already contains most features that we need to implement for the blog application.

In order to understand better how the above files are used, we show in the following the workflow that occurs in the blog application when displaying a list of posts:

1. The user requests the URL http://www.example.com/blog/index.php?r=post;

2. The entry script is executed by the Web server which creates and initializes an application instance to handle the request;

3. The application creates an instance of PostController and executes it;

4. The PostController instance executes the index action by calling its actionIndex() method. Note that index is the default action if the user does not specify an action to execute in the URL;

5. The actionIndex() method queries database to bring back the list of recent posts;

6. The actionIndex() method renders the index view with the post data.

2.3 Authenticating User

Our blog application needs to differentiate between the system owner and guest users. Therefore, we need to implement the user authentication feature.

As you may have found that the skeleton application already provides user authentication by checking if the username and password are both demo or admin. In this section, we will modify the corresponding code so that the authentication is done against the User database table.

User authentication is performed in a class implementing the IUserIdentity interface. The skeleton application uses the UserIdentity class for this purpose. The class is stored in the file /wwwroot/blog/protected/components/UserIdentity.php.
By convention, the name of a class file must be the same as the corresponding class name suffixed with the extension .php. Following this convention, one can refer to a class using a path alias. For example, we can refer to the UserIdentity class with the alias application.components.UserIdentity. Many APIs in Yii can recognize path aliases (e.g. Yii::createComponent()), and using path aliases avoids the necessity of embedding absolute file paths in the code. The existence of the latter often causes trouble when we deploy an application.

We modify the UserIdentity class as follows,

```php
<?php
class UserIdentity extends CUserIdentity
{
    private $_id;

    public function authenticate()
    {
        $username=strtostrip($this->username);
        $user=User::model()->find('LOWER(username)=?',array($username));
        if($user===null)
            $this->errorCode=self::ERROR_USERNAME_INVALID;
        else if(!$user->validatePassword($this->password))
            $this->errorCode=self::ERROR_PASSWORD_INVALID;
        else
        {
            $this->_id=$user->id;
            $this->username=$user->username;
            $this->errorCode=self::ERROR_NONE;
        }
        return $this->errorCode==self::ERROR_NONE;
    }

    public function getId()
    {
        return $this->_id;
    }
}
```

In the authenticate() method, we use the User class to look for a row in the tbl_user table whose username column is the same as the given username in a case-insensitive manner. Remember that the User class was created using the gii tool in the prior section. Because the User class extends from CActiveRecord, we can exploit the ActiveRecord feature to access the tbl_user table in an OOP fashion.
2.3 Authenticating User

In order to check if the user has entered a valid password, we invoke the `validatePassword` method of the `User` class. We need to modify the file `/wwwroot/blog/protected/models/User.php` as follows. Note that instead of storing the plain password in the database, we store a hash of the password. When validating the user-entered password, we should compare the hash results, instead. We use the Yii built-in `CPasswordHelper` to hash the password and to validate it.

```php
class User extends CActiveRecord
{
    ....
    public function validatePassword($password)
    {
        return CPasswordHelper::verifyPassword($password,$this->password);
    }
    public function hashPassword($password)
    {
        return CPasswordHelper::hashPassword($password);
    }
}
```

In the `UserIdentity` class, we also override the `getId()` method which returns the `id` value of the user found in the `tbl_user` table. The parent implementation would return the `username`, instead. Both the `username` and `id` properties will be stored in the user session and may be accessed via `Yii::app()->user` from anywhere in our code.
Tip: In the UserIdentity class, we reference the class CUserIdentity without explicitly including the corresponding class file. This is because CUserIdentity is a core class provided by the Yii framework. Yii will automatically include the class file for any core class when it is referenced for the first time.

We also do the same with the User class. This is because the User class file is placed under the directory /wwwroot/blog/protected/models which has been added to the PHP include_path according to the following lines found in the application configuration:

```php
return array(
    ......
    'import'=>array(
        'application.models.*',
        'application.components.*',
    ),
    ......
);```

The above configuration says that any class whose class file is located under either /wwwroot/blog/protected/models or /wwwroot/blog/protected/components will be automatically included when the class is referenced for the first time.

The UserIdentity class is mainly used by the LoginForm class to authenticate a user based on the username and password input collected from the login page. The following code fragment shows how UserIdentity is used:

```php
$identity=new UserIdentity($username,$password);
$identity->authenticate();
switch($identity->errorCode)
{
    case UserIdentity::ERROR_NONE:
        Yii::app()->user->login($identity);
        break;
    ......
}
```

Info: People often get confused about identity and the user application component. The former represents a way of performing authentication, while the latter is used to represent the information related with the current user. An application can only have one user component, but it can have one or several identity classes, depending on what kind of authentication it supports. Once authenticated, an identity instance may pass its state information to the user component so that they are globally accessible via user.
To test the modified `UserIdentity` class, we can browse the URL `http://www.example.com/blog/index.php` and try logging in with the username and password that we store in the `tbl_user` table. If we use the database provided by the blog demo, we should be able to login with username `demo` and password `demo`. Note that this blog system does not provide the user management feature. As a result, a user cannot change his account or create a new one through the Web interface. The user management feature may be considered as a future enhancement to the blog application.

### 2.4 Summary

We have completed the milestone 1. Let’s summarize what we have done so far:

1. We identified the requirements to be fulfilled;
2. We installed the Yii framework;
3. We created a skeleton application;
4. We designed and created the blog database;
5. We modified the application configuration by adding the database connection;
6. We generated the code that implements the basic CRUD operations for both posts and comments;
7. We modified the authentication method to check against the `tbl_user` table.

For a new project, most of the time will be spent in step 1 and 4 for this first milestone. Although the code generated by the gii tool implements fully functional CRUD operations for a database table, it often needs to be modified in practical applications. For this reason, in the next two milestone, our job is to customize the generated CRUD code about posts and comments so that it reaches our initial requirements.

In general, we first modify the model class file by adding appropriate validation rules and declaring relational objects. We then modify the controller action and view code for each individual CRUD operation.
Chapter 3

Post Management

3.1 Customizing Post Model

The Post model class generated by the Gii tool mainly needs to be modified in two places:

- the rules() method: specifies the validation rules for the model attributes;
- the relations() method: specifies the related objects;

**Info:** A model consists of a list of attributes, each associated with a column in the corresponding database table. Attributes can be declared explicitly as class member variables or implicitly without any declaration.

3.1.1 Customizing rules() Method

We first specify the validation rules which ensure the attribute values entered by users are correct before they are saved to the database. For example, the status attribute of Post should be an integer 1, 2 or 3. The Gii tool also generates validation rules for each model. However, these rules are based on the table column information and may not be appropriate.

Based on the requirement analysis, we modify the rules() method as follows:

```php
public function rules()
{
    return array(
        array('title, content, status', 'required'),
        array('title', 'length', 'max'=>128),
        array('status', 'in', 'range'=>array(1,2,3)),
        array('tags', 'match', 'pattern'=>'/^\w\s,]+$/',
            'message'=>>'Tags can only contain word characters.'),
```
In the above, we specify that the title, content and status attributes are required; the length of title should not exceed 128; the status attribute value should be 1 (draft), 2 (published) or 3 (archived); and the tags attribute should only contain word characters and commas. In addition, we use normalizeTags to normalize the user-entered tags so that the tags are unique and properly separated with commas. The last rule is used by the search feature, which we will describe later.

The validators such as required, length, in and match are all built-in validators provided by Yii. The normalizeTags validator is a method-based validator that we need to define in the Post class. For more information about how to specify validation rules, please refer to the Guide.

```php
public function normalizeTags($attribute,$params)
{
    $this->tags=Tag::array2string(array_unique(Tag::string2array($this->tags)));
}
```

where array2string and string2array are new methods we need to define in the Tag model class:

```php
public static function string2array($tags)
{
    return preg_split('/\s*,\s*/',trim($tags),-1,PREG_SPLIT_NO_EMPTY);
}
```

```php
public static function array2string($tags)
{
    return implode(', ',',$tags);
}
```

The rules declared in the rules() method are executed one by one when we call the validate() or save() method of the model instance.

**Note:** It is very important to remember that attributes appearing in rules() must be those to be entered by end users. Other attributes, such as id and create_time in the Post model, which are set by our code or database, should not be in rules(). For more details, please refer to Securing Attribute Assignments.
After making these changes, we can visit the post creation page again to verify that the new validation rules are taking effect.

### 3.1.2 Customizing relations() Method

Lastly we customize the relations() method to specify the related objects of a post. By declaring these related objects in relations(), we can exploit the powerful Relational ActiveRecord (RAR) feature to access the related object information of a post, such as its author and comments, without the need to write complex SQL JOIN statements.

We customize the relations() method as follows:

```php
public function relations()
{
    return array(
        'author' => array(self::BELONGS_TO, 'User', 'author_id'),
        'comments' => array(self::HAS_MANY, 'Comment', 'post_id',
            'condition'=>'comments.status='.Comment::STATUS_APPROVED,
            'order'=>'comments.create_time DESC'),
        'commentCount' => array(self::STAT, 'Comment', 'post_id',
            'condition'=>'status='.Comment::STATUS_APPROVED),
    );
}
```

We also introduce in the Comment model class two constants that are used in the above method:

```php
class Comment extends CActiveRecord
{
    const STATUS_PENDING=1;
    const STATUS_APPROVED=2;

    ......
}
```

The relations declared in relations() state that:

- A post belongs to an author whose class is User and the relationship is established based on the author_id attribute value of the post;
- A post has many comments whose class is Comment and the relationship is established based on the post_id attribute value of the comments. These comments should be sorted according to their creation time and the comments must be approved.
• The commentCount relation is a bit special as it returns back an aggregation result which is about how many comments the post has.

With the above relation declaration, we can easily access the author and comments of a post like the following:

```php
$author=$post->author;
echo $author->username;

$comments=$post->comments;
foreach($comments as $comment)
    echo $comment->content;
```

For more details about how to declare and use relations, please refer to the Guide.

### 3.1.3 Adding url Property

A post is a content that is associated with a unique URL for viewing it. Instead of calling CWebApplication::createUrl everywhere in our code to get this URL, we may add a url property in the Post model so that the same piece of URL creation code can be reused. Later when we describe how beautify URLs, we will see adding this property will bring us great convenience.

To add the url property, we modify the Post class by adding a getter method like the following:

```php
class Post extends CActiveRecord
{
    public function getUrl()
    {
        return Yii::app()->createUrl('post/view', array('id'=>$this->id, 'title'=>$this->title, 'title'=>$this->title));
    }
}
```

Note that in addition to the post ID, we also add the post title as a GET parameter in the URL. This is mainly for search engine optimization (SEO) purpose, as we will describe in Beautifying URLs.

Because CComponent is the ultimate ancestor class of Post, adding the getter method getUrl() enables us to use the expression like $post->url. When we access $post->url,
the getter method will be executed and its result is returned as the expression value. For more details about such component features, please refer to the guide.

### 3.1.4 Representing Status in Text

Because the status of a post is stored as an integer in the database, we need to provide a textual representation so that it is more intuitive when being displayed to end users. In a large system, the similar requirement is very common.

As a generic solution, we use the `tbl_lookup` table to store the mapping between integer values and textual representations that are needed by other data objects. We modify the `Lookup` model class as follows to more easily access the textual data in the table,

```php
class Lookup extends CActiveRecord
{
    ...

    private static $_items=array();

    public static function items($type)
    {
        if(!isset(self::$_items[$type]))
            self::loadItems($type);
        return self::$_items[$type];
    }

    public static function item($type,$code)
    {
        if(!isset(self::$_items[$type]))
            self::loadItems($type);
        return isset(self::$_items[$type][$code]) ? self::$_items[$type][$code] : false;
    }

    private static function loadItems($type)
    {
        self::$_items[$type]=array();
        $models=self::model()->findAll(array(
            'condition' => 'type=:type',
            'params' => array(':type' => $type),
            'order' => 'position',
        ));
        foreach($models as $model)
            self::$_items[$type][$model->code]=$model->name;
    }
}
```
Our new code mainly provides two static methods: `Lookup::items()` and `Lookup::item()`. The former returns a list of strings belonging to the specified data type, while the latter returns a particular string for the given data type and data value.

Our blog database is pre-populated with two lookup types: `PostStatus` and `CommentStatus`. The former refers to the possible post statuses, while the latter the comment statuses.

In order to make our code easier to read, we also declare a set of constants to represent the status integer values. We should use these constants through our code when referring to the corresponding status values.

class Post extends CActiveRecord
{
    const STATUS_DRAFT = 1;
    const STATUS_PUBLISHED = 2;
    const STATUS_ARCHIVED = 3;
    ......
}

Therefore, we can call `Lookup::items('PostStatus')` to get the list of possible post statuses (text strings indexed by the corresponding integer values), and call `Lookup::item('PostStatus', Post::STATUS_PUBLISHED)` to get the string representation of the published status.

### 3.2 Creating and Updating Posts

With the `Post` model ready, we need to fine-tune the actions and views for the controller `PostController`. In this section, we first customize the access control of CRUD operations; we then modify the code implementing the `create` and `update` operations.

#### 3.2.1 Customizing Access Control

The first thing we want to do is to customize the access control because the code generated by gii does not fit our needs.

We modify the `accessRules()` method in the file `/wwwroot/blog/protected/controllers/PostController.php` as follows,

```php
public function accessRules()
{
    return array(
        array('allow', // allow all users to perform 'list' and 'show' actions
            'actions'=>array('index', 'view'),
            'users'=>array('*'),
        ),
    );
}
```
3.2 Creating and Updating Posts

The above rules state that all users can access the index and view actions, and authenticated users can access any actions, including the admin action. The user should be denied access in any other scenario. Note that these rules are evaluated in the order they are listed here. The first rule matching the current context makes the access decision. For example, if the current user is the system owner who tries to visit the post creation page, the second rule will match and it will give the access to the user.

3.2.2 Customizing create and update Operations

The create and update operations are very similar. They both need to display an HTML form to collect user inputs, validate them, and save them into database. The main difference is that the update operation will pre-populate the form with the existing post data found in the database. For this reason, gii generates a partial view /wwwroot/blog/protected/views/post/_form.php that is embedded in both the create and update views to render the needed HTML form.

We first change the _form.php file so that the HTML form only collects the inputs we want: title, content, tags and status. We use plain text fields to collect inputs for the first three attributes, and a dropdown list to collect input for status. The dropdown list options are the text displays of the possible post statuses:

```php
<?php echo $form->dropDownList($model,'status',Lookup::items('PostStatus')); ?>
```

In the above, we call Lookup::items('PostStatus') to bring back the list of post statuses.

We then modify the Post class so that it can automatically set some attributes (e.g. create_time, author_id) before a post is saved to the database. We override the beforeSave() method as follows,

```php
protected function beforeSave()
{
    if(parent::beforeSave())
    {
```

When we save a post, we want to update the `tbl_tag` table to reflect the change of tag frequencies. We can do this work in the `afterSave()` method, which is automatically invoked by Yii after a post is successfully saved into the database.

```php
protected function afterSave()
{
    parent::afterSave();
    Tag::model()->updateFrequency($this->oldTags, $this->tags);
}
```

```
private $_oldTags;
protected function afterFind()
{
    parent::afterFind();
    $this->_oldTags=$this->tags;
}
```

In the implementation, because we want to detect if the user changes the tags in case he is updating an existing post, we need to know what the old tags are. For this reason, we also write the `afterFind()` method to keep the old tags in the variable `_oldTags`. The method `afterFind()` is invoked automatically by Yii when an AR record is populated with the data from database.

We are not going to give details of the `Tag::updateFrequency()` method here. Interested readers may refer to the file `/wwwroot/yii/demos/blog/protected/models/Tag.php`.

### 3.3 Managing Posts

Managing posts mainly refers to listing posts in an administrative view that allows us to see posts with all statuses, updating them and deleting them. They are accomplished by
the **admin** operation and the **delete** operation, respectively. The code generated by **Gii** does not need much modification. Below we mainly explain how these two operations are implemented.

### 3.3.1 Listing Posts in Tabular View

The **admin** operation shows posts with all statuses in a tabular view. The view supports sorting and pagination. The following is the `actionAdmin()` method in `PostController`:

```php
public function actionAdmin()
{
    $model=new Post('search');
    if(isset($_GET['Post']))
        $model->attributes=$_GET['Post'];
    $this->render('admin',array('model'=>$model,));
}
```

The above code is generated by the **Gii** tool without any modification. It first creates a `Post` model under the `search` scenario. We will use this model to collect the search conditions that the user specifies. We then assign to the model the user-supplied data, if any. Finally, we render the **admin** view with the model.

Below is the code for the **admin** view:

```php
$this->breadcrumbs=array(  
    'Manage Posts',
);
?><h1>Manage Posts</h1>
<?php $this->widget('zii.widgets.grid.CGridView', array(  
    'dataProvider'=>$model->search(),
    'filter'=>$model,
    'columns'=>array(  
        array(  
            'name'=>'title',
            'type'=>'raw',
            'value'=>'CHtml::link(CHtml::encode($data->title), $data->url)'  
        ),
        array(  
            'name'=>'status',
            'value'=>'Lookup::item("PostStatus",$data->status)',
        )
    )
));
```
We use CGridView to display the posts. It allows us to sort by a column and paginate through the posts if there are too many to be displayed in a single page. Our change is mainly about how to display each column. For example, for the title column, we specify that it should be displayed as a hyperlink that points to the detailed view of the post. The expression $data->url returns the value of the url property that we define in the Post class.

**Tip:** When displaying text, we call CHtml::encode() to encode HTML entities in it. This prevents from cross-site scripting attack.

### 3.3.2 Deleting Posts

In the admin data grid, there is a delete button in each row. Clicking on the button should delete the corresponding post. Internally, this triggers the delete action implemented as follows:

```php
public function actionDelete()
{
    if(Yii::app()->request->isPostRequest)
    {
        // we only allow deletion via POST request
        $this->loadModel()->delete();

        if(!isset($_GET['ajax']))
            $this->redirect(array('index'));
    }
    else
        throw new CHttpException(400,'Invalid request. Please do not repeat this request again.');?>
```
The above code is the one generated by the Gii tool without any change. We would like to explain a little bit more about the checking on \$_GET['ajax']. The CGridView widget has a very nice feature that its sorting, pagination and deletion operations are all done in AJAX mode by default. That means, the whole page does not get reloaded if any of the above operations is performed. However, it is also possible that the widget runs in non-AJAX mode (by setting its ajaxUpdate property to be false or disabling JavaScript on the client side). It is necessary for the delete action to differentiate these two scenarios: if the delete request is made via AJAX, we should not redirect the user browser; otherwise, we should.

Deleting a post should also cause the deletion of all comments for that post. In addition, we should also update the tbl_tag table regarding the tags for the deleted post. Both of these tasks can be achieved by writing an afterDelete method in the Post model class as follows,

```
protected function afterDelete()
{
    parent::afterDelete();
    Comment::model()->deleteAll('post_id='.$this->id);
    Tag::model()->updateFrequency($this->tags, '');
}
```

The above code is very straightforward: it first deletes all those comments whose post_id is the same as the ID of the deleted post; it then updates the tbl_tag table for the tags of the deleted post.

**Tip:** We have to explicitly delete all comments for the deleted post here because SQLite does not really support foreign key constraints. In a DBMS that supports this constraint (such as MySQL, PostgreSQL), the foreign key constraint can be set up such that the DBMS automatically deletes the related comments if the post is deleted. In that case, we no longer this explicit deletion call in our code.
Comment Management

4.1 Customizing Comment Model

For the Comment model, we mainly need to customize the rules() and attributeLabels() methods. The attributeLabels() method returns a mapping between attribute names and attribute labels. We do not need to touch relations() since the code generated by the Gii tool is good enough.

4.1.1 Customizing rules() Method

We first customize the validation rules generated by the Gii tool. The following rules are used for comments:

```php
public function rules()
{
    return array(
        array('content, author, email', 'required'),
        array('author, email, url', 'length', 'max'=>128),
        array('email','email'),
        array('url','url'),
    );
}
```

In the above, we specify that the author, email and content attributes are required; the length of author, email and url cannot exceed 128; the email attribute must be a valid email address; and the url attribute must be a valid URL.

4.1.2 Customizing attributeLabels() Method

We then customize the attributeLabels() method to declare the label display for each model attribute. This method returns an array consisting of name-label pairs. When we call CHtml::activeLabel() to display an attribute label.
public function attributeLabels()
{
    return array(
        'id' => 'Id',
        'content' => 'Comment',
        'status' => 'Status',
        'create_time' => 'Create Time',
        'author' => 'Name',
        'email' => 'Email',
        'url' => 'Website',
        'post_id' => 'Post',
    );
}

Tip: If the label for an attribute is not declared in attributeLabels(), an algorithm will be used to generate an appropriate label. For example, a label Create Time will be generated for attributes create_time or createTime.

4.1.3 Customizing Saving Process

Because we want to record the creation time of a comment, we override the beforeSave() method of Comment like we do for the Post model:

protected function beforeSave()
{
    if(parent::beforeSave())
    {
        if($this->isNewRecord)
        {$this->create_time=time();
        return true;
        }
        else
        return false;
    }
}

4.2 Creating and Displaying Comments

In this section, we implement the comment display and creation features.

In order to enhance the user interactivity, we would like to prompt users the possible errors each time he finishes entering one field. This is known client-side input validation. We will show how this can be done in Yii seamlessly and extremely easy. Note that this requires Yii version 1.1.1 or later.
4.2 Creating and Displaying Comments

4.2.1 Displaying Comments

Instead of displaying and creating comments on individual pages, we use the post detail page (generated by the view action of PostController). Below the post content display, we display first a list of comments belonging to that post and then a comment creation form.

In order to display comments on the post detail page, we modify the view script /wwwroot/blog/protected/views/post/view.php as follows,

```php
...post view here...
<br>
<div id="comments">
    <?php if($model->commentCount>=1): ?>
    <h3>
        <?php echo $model->commentCount . 'comment(s)'; ?>
    </h3>
    <?php $this->renderPartial('comments',array('post'=>$model,'comments'=>$model->comments)); ?>
    <?php endif; ?></div>
```

In the above, we call renderPartial() to render a partial view named comments to display the list of comments belonging to the current post. Note that in the view we use the expression $model->comments to retrieve the comments for the post. This is valid because we have declared a comments relation in the Post class. Evaluating this expression would trigger an implicit JOIN database query to bring back the proper comments. This feature is known as lazy relational query.

The partial view comments is not very interesting. It mainly goes through every comment and displays the detail of it. Interested readers may refer to /wwwroot/yii/demos/blog/protected/views/post/comments.php.

4.2.2 Creating Comments

To handle comment creation, we first modify the actionView() method of PostController as follows,

```php
public function actionView()
{
    $post=$this->loadModel();
```
$comment=$this->newComment($post);

$this->render('view',array(
    'model'=>$post,
    'comment'=>$comment,
));
}

protected function newComment($post)
{
    $comment=new Comment;
    if(isset($_POST['Comment']))
    {
        $comment->attributes=$_POST['Comment'];
        if($post->addComment($comment))
        {
            if($comment->status==Comment::STATUS_PENDING)
                Yii::app()->user->setFlash('commentSubmitted','Thank you for your comment. Your comment will be posted once it is approved.');
            $this->refresh();
        }
    }
    return $comment;
}

And then we modify the Post model class by adding the method addComment() as follows,

public function addComment($comment)
{
    if(Yii::app()->params['commentNeedApproval'])
        $comment->status=Comment::STATUS_PENDING;
    else
        $comment->status=Comment::STATUS_APPROVED;
    $comment->post_id=$this->id;
    return $comment->save();
}

In the above, we call the newComment() method before we render view. In the newComment() method, we generate a Comment instance and check if the comment form is submitted. If so, we try to add the comment for the post by calling $post->addComment($comment). If it goes through, we refresh the post detail page, which will display the newly created comment unless approval is required. In the case where the comment first requires approval prior to display, we will show a flash message to indicate to the user that the comment will be displayed once approved. A flash message is usually a confirmation message displayed to end users. If the user clicks on the refresh button of his browser, the message will disappear.
4.2 Creating and Displaying Comments

We also need to modify /wwwroot/blog/protected/views/post/view.php furthermore,

.......

        <div id="comments">
        .......
        <h3>Leave a Comment</h3>

          <?php if(Yii::app()->user->hasFlash('commentSubmitted')): ?>
          <div class="flash-success">
            <?php echo Yii::app()->user->getFlash('commentSubmitted'); ?>
          </div>
          <?php else: ?>
          <?php $this->renderPartial('/comment/form',array(
              'model'=>$comment,
          )); ?>
          <?php endif; ?>

        </div><!-- comments -->

In the above code, we display the flash message if it is available. If not, we display the comment input form by rendering the partial view /wwwroot/blog/protected/views/comment/form.php.

4.2.3 Ajax-based Validation

In order to improve user experience, we can use Ajax-based form field validation so that the user is provided with validation feedback as they fill out the form, before having to submit the entire form to the server. To support Ajax-based validation on the comment form, we need to make some minor changes to both the comment form view /wwwroot/blog/protected/views/comment/form.php and the newComment() method.

In the _form.php file, we mainly need to set CActiveForm::enableAjaxValidation to be true when we create the CActiveForm widget:

      <!-- form -->
And in the `newComment()` method, we insert a piece of code to respond to the AJAX validation requests. The code checks if there is a `POST` variable named `ajax`. If so, it displays the validation results by calling ` CActiveForm::validate`.

```php
protected function newComment($post)
{
    $comment = new Comment;

    if(isset($_POST['ajax']) && $_POST['ajax'] == 'comment-form')
    {
        echo CActiveForm::validate($comment);
        Yii::app()->end();
    }

    if(isset($_POST['Comment']))
    {
        $comment->attributes = $_POST['Comment'];
        if($post->addComment($comment))
        {
            if($comment->status == Comment::STATUS_PENDING)
                Yii::app()->user->setFlash('commentSubmitted','Thank you for your comment. Your comment will be posted once it is approved.');
            $this->refresh();
        }
    }
    return $comment;
}
```

### 4.3 Managing Comments

Comment management includes updating, deleting and approving comments. These operations are implemented as actions in the `CommentController` class.

#### 4.3.1 Updating and Deleting Comments

The code generated by Gii for updating and deleting comments remains largely unchanged.

#### 4.3.2 Approving Comments

When comments are newly created, they are in pending approval status and need to be approved in order to be visible to guest users. Approving a comment is mainly about changing the status column of the comment.

We create an `actionApprove()` method in `CommentController` as follows,

```php
public function actionApprove()
```
4.3 Managing Comments

```php
if(Yii::app()->request->isPostRequest)
{
    $comment=$this->loadModel();
    $comment->approve();
    $this->redirect(array('index'));
}
else
    throw new CHttpException(400,'Invalid request...');
```

In the above, when the approve action is invoked via a POST request, we call the approve() method defined in the Comment model to change the status. We then redirect the user browser to the page displaying the post that this comment belongs to.

Of course, we also need to create the approve() method in the Comment model. It is as follows,

```php
public function approve()
{
    $this->status=Comment::STATUS_APPROVED;
    $this->update(array('status'));
}
```

Here we are simply setting the status property of the comment to approved as defined by the status constants in the Comment class:

```php
class Comment extends CActiveRecord
{
    ...

    const STATUS_PENDING=1;
    const STATUS_APPROVED=2;

    ...
}
```

and then calling the update() method to save this newly set property to the database.

We also modify the actionIndex() method of CommentController to show all comments. We would like to see comments pending approval show up first.

```php
public function actionIndex()
```
Notice that in the above code, because both `tbl_post` and `tbl_comment` have columns `status` and `create_time`, we need to disambiguate the corresponding column reference by prefixing them with table alias names. As described in the guide, the alias for the primary table in a relational query is always `t`. Therefore, we are prefixing `t` to the `status` and `create_time` columns in the above code to indicate we want these values taken from the primary table, `tbl_comment`.

Like the post index view, the index view for `CommentController` uses `CListView` to display the comment list which in turn uses the partial view `/wwwroot/blog/protected/views/comment/_view.php` to display the detail of each individual comment. We will not go into details here. Interested readers may refer to the corresponding file in the blog demo `/wwwroot/yii/demos/blog/protected/views/comment/_view.php`. 
5.1 Creating User Menu Portlet

Based on the requirements analysis, we need three different portlets: the "user menu" portlet, the "tag cloud" portlet and the "recent comments" portlet. We will develop these portlets by extending the CPortlet widget provided by Yii.

In this section, we will develop our first concrete portlet - the user menu portlet which displays a list of menu items that are only available to authenticated users. The menu contains four items:

- Approve Comments: a hyperlink that leads to a list of comments pending approval;
- Create New Post: a hyperlink that leads to the post creation page;
- Manage Posts: a hyperlink that leads to the post management page;
- Logout: a link button that would log out the current user.

5.1.1 Creating UserMenu Class

We create the UserMenu class to represent the logic part of the user menu portlet. The class is saved in the file /wwwroot/blog/protected/components/UserMenu.php which has the following content:

```php
Yii::import('zii.widgets.CPortlet');

class UserMenu extends CPortlet
{
    public function init()
    {
        $this->title=CHtml::encode(Yii::app()->user->name);
        parent::init();
    }
}```
protected function renderContent()
{
    $this->render('userMenu');
}

The UserMenu class extends from the CPortlet class from the zii library. It overrides both the init() method and the renderContent() method of CPortlet. The former sets the portlet title to be the name of the current user; the latter generates the portlet body content by rendering a view named userMenu.

Tip: Notice that we have to explicitly include the CPortlet class by calling Yii::import() before we refer to it the first time. This is because CPortlet is part of the zii project – the official extension library for Yii. For performance consideration, classes in this project are not listed as core classes. Therefore, we have to import it before we use it the first time.

5.1.2 Creating userMenu View

Next, we create the userMenu view which is saved in the file /wwwroot/blog/protected/components/views/userMenu.php:

<ul>
    <?php echo CHtml::link('Create New Post',array('post/create')); ?>
    <li> <?php echo CHtml::link('Manage Posts',array('post/admin')); ?>
    <li> <?php echo CHtml::link('Approve Comments',array('comment/index')) . ' (' . Comment::model()->pendingCommentCount . ')'; ?></li>
    <?php echo CHtml::link('Logout',array('site/logout')); ?>
</ul>

Info: By default, view files for a widget should be placed under the views subdirectory of the directory containing the widget class file. The file name must be the same as the view name.
5.2 Creating Tag Cloud Portlet

5.1.3 Using UserMenu Portlet

It is time for us to make use of our newly completed UserMenu portlet. We modify the layout view file /wwwroot/blog/protected/views/layouts/column2.php as follows:

```
......
<div id="sidebar">
    <?php if(!Yii::app()->user->isGuest) $this->widget('UserMenu'); ?></div>
......
```

In the above, we call the widget() method to generate and execute an instance of the UserMenu class. Because the portlet should only be displayed to authenticated users, we only call widget() when the isGuest property of the current user is false (meaning the user is authenticated).

5.1.4 Testing UserMenu Portlet

Let’s test what we have so far.

1. Open a browser window and enter the URL http://www.example.com/blog/index.php. Verify that there is nothing displayed in the side bar section of the page.

2. Click on the Login hyperlink and fill out the login form to login. If successful, verify that the UserMenu portlet appears in the side bar and the portlet has the username as its title.

3. Click on the 'Logout' hyperlink in the UserMenu portlet. Verify that the logout action is successful and the UserMenu portlet disappears.

5.1.5 Summary

What we have created is a portlet that is highly reusable. We can easily reuse it in a different project with little or no modification. Moreover, the design of this portlet follows closely the philosophy that logic and presentation should be separated. While we did not point this out in the previous sections, such practice is used nearly everywhere in a typical Yii application.

5.2 Creating Tag Cloud Portlet

Tag cloud displays a list of post tags with visual decorations hinting the popularity of each individual tag.
5.2.1 Creating TagCloud Class

We create the TagCloud class in the file /wwwroot/blog/protected/components/TagCloud.php. The file has the following content:

Yii::import('zii.widgets.CPortlet');

class TagCloud extends CPortlet
{
    public $title='Tags';
    public $maxTags=20;

    protected function renderContent()
    {
        $tags=Tag::model()->findTagWeights($this->maxTags);

        foreach($tags as $tag=>$weight)
        {
            $link=CHtml::link(CHtml::encode($tag), array('post/index','tag'=>$tag));
            echo CHtml::tag('span', array('class'=>'tag', 'style'=>"font-size:{$weight}pt"), $link)."\n";
        }
    }
}

Unlike the UserMenu portlet, the TagCloud portlet does not use a view. Instead, its presentation is done in the renderContent() method. This is because the presentation does not contain much HTML tags.

We display each tag as a hyperlink to the post index page with the corresponding tag parameter. The font size of each tag link is adjusted according to their relative weight among other tags. If a tag has higher frequency value than the other, it will have a bigger font size.

5.2.2 Using TagCloud Portlet

Usage of the TagCloud portlet is very simple. We modify the layout file /wwwroot/blog/protected/views/layouts/column2.php as follows,
5.3 Creating Recent Comments Portlet

In this section, we create the last portlet that displays a list of comments recently published.

5.3.1 Creating RecentComments Class

We create the RecentComments class in the file /wwwroot/blog/protected/components/RecentComments.php. The file has the following content:

```php
Yii::import('zii.widgets.CPortlet');

class RecentComments extends CPortlet
{
    public $title='Recent Comments';
    public $maxComments=10;

    public function getRecentComments()
    {
        return Comment::model()->findRecentComments($this->maxComments);
    }

    protected function renderContent()
    {
        $this->render('recentComments');
    }
}
```

In the above we invoke the findRecentComments method which is defined in the Comment class as follows,

```php
class Comment extends CActiveRecord
{
    ......

    public function findRecentComments($limit=10)
    {
```
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```
return $this->with('post')->findAll(array(
    'condition'=>$t.status='.self::STATUS_APPROVED,
    'order'=>$t.create_time DESC,
    'limit'=>$limit,
));
```

5.3.2 Creating recentComments View

The recentComments view is saved in the file /wwwroot/blog/protected/components/views/recentComments.php. It simply displays every comment returned by the `RecentComments: :getRecentComments()` method.

5.3.3 Using RecentComments Portlet

We modify the layout file /wwwroot/blog/protected/views/layouts/column2.php to embed this last portlet,

```
......
<
<div id="sidebar">

    <?php if(!Yii::app()->user->isGuest) $this->widget('UserMenu'); ?>

    <?php $this->widget('TagCloud', array(
        'maxTags'=>Yii::app()->params['tagCloudCount'],
    )); ?>

    <?php $this->widget('RecentComments', array(
        'maxComments'=>Yii::app()->params['recentCommentCount'],
    )); ?>

</div>
......
```
6.1 Beautifying URLs

The URLs linking various pages of our blog application currently look ugly. For example, the URL for the page showing a post looks like the following:

/ index.php?r=post/show&id=1&title=A+Test+Post

In this section, we describe how to beautify these URLs and make them SEO-friendly. Our goal is to be able to use the following URLs in the application:

1. /index.php/posts/yii: leads to the page showing a list of posts with tag yii;
2. /index.php/post/2/A+Test+Post: leads to the page showing the detail of the post with ID 2 whose title is A Test Post;
3. /index.php/post/update?id=1: leads to the page that allows updating the post with ID 1.

Note that in the second URL format, we include the post title in the URL. This is mainly to make the URL SEO friendly. It is said that search engines may also respect the words found in a URL when it is being indexed.

To achieve our goal, we modify the application configuration as follows,

```
return array(
    ..........'
    'components'=>array(
        ..........'
        'urlManager'=>array(
            'urlFormat'=>'path',
            'rules'=>array(
                ..........
            )
        )
    )
);```
In the above, we configure the urlManager component by setting its urlFormat property to be path and adding a set of rules. The rules are used by urlManager to parse and create the URLs in the desired format. For example, the second rule says that if a URL /index.php/posts/yii is requested, the urlManager component should be responsible to dispatch the request to the route post/index and generate a tag GET parameter with the value yii. On the other hand, when creating a URL with the route post/index and parameter tag, the urlManager component will also use this rule to generate the desired URL /index.php/posts/yii. For this reason, we say that urlManager is a two-way URL manager.

The urlManager component can further beautify our URLs, such as hiding index.php in the URLs, appending suffix like .html to the URLs. We can obtain these features easily by configuring various properties of urlManager in the application configuration. For more details, please refer to the Guide.

6.2 Logging Errors

A production Web application often needs sophisticated logging for various events. In our blog application, we would like to log the errors occurring when it is being used. Such errors could be programming mistakes or users' misuse of the system. Logging these errors will help us to improve the blog application.

We enable the error logging by modifying the application configuration as follows,
With the above configuration, if an error or warning occurs, detailed information will be logged and saved in a file located under the directory `/wwwroot/blog/protected/runtime`.

The `log` component offers more advanced features, such as sending log messages to a list of email addresses, displaying log messages in JavaScript console window, etc. For more details, please refer to the Guide.

### 6.3 Final Tune-up and Deployment

We are close to finish our blog application. Before deployment, we would like to do some tune-ups.

#### 6.3.1 Changing Home Page

We change to use the post list page as the home page. We modify the application configuration as follows,

```php
return array(
    ......
    'defaultController'=>'post',
    ......
);
```

**Tip:** Because `PostController` already declares `index` to be its default action, when we access the home page of the application, we will see the result generated by the `index` action of the post controller.

#### 6.3.2 Enabling Schema Caching

Because ActiveRecord relies on the metadata about tables to determine the column information, it takes time to read the metadata and analyze it. This may not be a problem during development stage, but for an application running in production mode, it is a total
waste of time if the database schema does not change. Therefore, we should enable the
schema caching by modifying the application configuration as follows,

```php
return array(
    ......
    'components'=>array(
    ......
    'cache'=>array(
        'class'=>'CDbCache',
    ),
    'db'=>array(
        'class'=>'system.db.CDbConnection',
        'connectionString'=>'sqlite:/wwwroot/blog/protected/data/blog.db',
        'schemaCachingDuration'=>3600,
    ),
    ),
);
```

In the above, we first add a cache component which uses a default SQLite database as the
caching storage. If our server is equipped with other caching extensions, such as APC, we
could change to use them as well. We also modify the db component by setting its
schemaCachingDuration property to be 3600, which means the parsed database schema
data can remain valid in cache for 3600 seconds.

### 6.3.3 Disabling Debugging Mode

We modify the entry script file `/wwwroot/blog/index.php` by removing the line defining
the constant `YII_DEBUG`. This constant is useful during development stage because it allows
Yii to display more debugging information when an error occurs. However, when the
application is running in production mode, displaying debugging information is not a
good idea because it may contain sensitive information such as where the script file is
located, and the content in the file, etc.

### 6.3.4 Deploying the Application

The final deployment process mainly involves copying the directory `/wwwroot/blog` to the
target directory. The following checklist shows every needed step:

1. Install Yii in the target place if it is not available;
2. Copy the entire directory `/wwwroot/blog` to the target place;
3. Edit the entry script file `index.php` by pointing the `$yii` variable to the new Yii
   bootstrap file;
4. Edit the file `protected/yiic.php` by setting the `$yiic` variable to be the new Yii `yiic.php` file;

5. Change the permission of the directories `assets` and `protected/runtime` so that they are writable by the Web server process.

### 6.4 Future Enhancements

#### 6.4.1 Using a Theme

Without writing any code, our blog application is already themeable. To use a theme, we mainly need to develop the theme by writing customized view files in the theme. For example, to use a theme named `classic` that uses a different page layout, we would create a layout view file `/wwwroot/blog/themes/classic/views/layouts/main.php`. We also need to change the application configuration to indicate our choice of the `classic` theme:

```php
return array(
    ......
    'theme'=> 'classic',
    ......
);
```

#### 6.4.2 Internationalization

We may also internationalize our blog application so that its pages can be displayed in different languages. This mainly involves efforts in two aspects.

First, we may create view files in different languages. For example, for the `index` page of `PostController`, we can create a view file `/wwwroot/blog/protected/views/post/zh_cn/index.php`. When the application is configured to use simplified Chinese (the language code is `zh_cn`), Yii will automatically use this new view file instead of the original one.

Second, we may create message translations for those messages generated by code. The message translations should be saved as files under the directory `/wwwroot/blog/protected/messages`. We also need to modify the code where we use text strings by enclosing them in the method call `Yii::t()`.

For more details about internationalization, please refer to the Guide.

#### 6.4.3 Improving Performance with Cache

While the Yii framework itself is very efficient, it is not necessarily true that an application written in Yii efficient. There are several places in our blog application that we can improve
the performance. For example, the tag cloud portlet could be one of the performance bottlenecks because it involves complex database query and PHP logic.

We can make use of the sophisticated caching feature provided by Yii to improve the performance. One of the most useful components in Yii is COutputCache, which caches a fragment of page display so that the underlying code generating the fragment does not need to be executed for every request. For example, in the layout file /wwwroot/blog/protected/views/layouts/column2.php, we can enclose the tag cloud portlet with COutputCache:

```php
<?php if($this->beginCache('tagCloud', array('duration'=>3600))) { ?>
    <?php $this->widget('TagCloud', array('maxTags'=>Yii::app()->params['tagCloudCount'])); ?>
<?php $this->endCache(); } ?>
```

With the above code, the tag cloud display will be served from cache instead of being generated on-the-fly for every request. The cached content will remain valid in cache for 3600 seconds.

6.4.4 Adding New Features

Our blog application only has very basic functionalities. To become a complete blog system, more features are needed, for example, calendar portlet, email notifications, post categorization, archived post portlet, and so on. We will leave the implementation of these features to interested readers.