COEN 168/268

Mobile Web Application Development

Ember Controllers

Peter Bergström (pbergstrom@scu.edu)

Santa Clara University

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http://emberjs.com/guides/controllers/

Controllers

What Are Controllers Used For in Ember?

- In Ember.js, controllers allow you to decorate your models with display logic.
- In general, your models will have properties that are saved to the server, while controllers will have properties that your app does not need to save to the server.

For example, if you were building a blog, you would have a `BlogPost` model that you would present in a `blog_post` template.

Your `BlogPost` model would have properties like:

- `title`
- `intro`
- `body`
- `author`

Your template would bind to these properties in the `blog_post` template:

```
1 <h1>{{title}}</h1>
2 <h2>by {{author}}</h2>
3
4 <div class='intro'>
5   {{intro}}
6 </div>
7 <hr>
8 <div class='body'>
9   {{body}}
10 </div>
```

- In this simple example, we don't have any display-specific properties or actions just yet.
- For now, our controller just acts as a pass-through (or "proxy") for the model properties.
- Remember that a controller gets the model it represents from its route handler.

However, let's say we want to add some interactivity like hiding and showing a section.

```
<h1>{{title}}</h1>
<h2>by {{author}}</h2>

<div class='intro'>
  {{intro}}
</div>
<hr>

{{#if isExpanded}}
  <button {{action 'toggleProperty' 'isExpanded'}}>Hide Body</button>
  <div class='body'>
   {{body}}
  </div>
{{else}}
  <button {{action 'toggleProperty' 'isExpanded'}}>Show Body</button>
{{/if}}
```

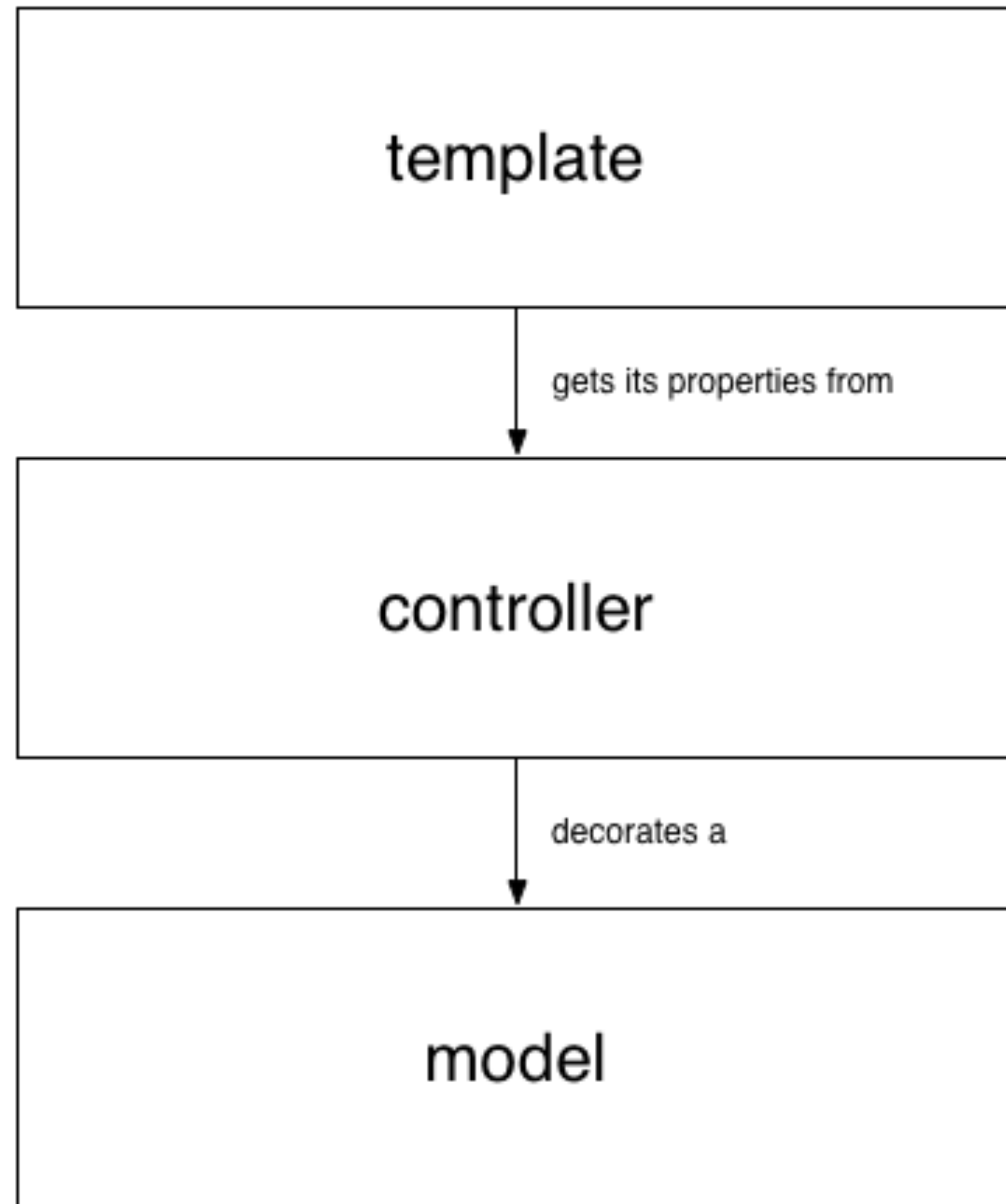
Where should this action and property be handled?

- You might think you should put this property on the model, but whether the body is expanded or not is strictly a display concern.
- Putting this property on the controller cleanly separates logic related to your data model from logic related to what you display on the screen.
- This makes it easy to unit-test your model without having to worry about logic related to your display creeping into your test setup.

A Note on Coupling

In Ember.js, templates get their properties from controllers, which decorate a model. This means that:

- Templates *know about* controllers and controllers *know about* models
- However, the reverse is not true!
- A model knows nothing about which (if any) controllers are decorating it, and controller does not know which views are presenting its properties.


template
gets its properties from
controller
decorates a
model

Separation of concerns are vital

- As far as a template is concerned, all of its properties come from its controller, and it doesn't need to know about the model directly.
- In practice, Ember.js will create a template's controller once for the entire application, but the controller's model may change throughout the lifetime of the application without requiring that the view knows anything about those mechanics.
- Makes testing simpler because you can test components separately

Representing Models

- Templates are always connected to controllers, not models.
- This makes it easy to separate display-specific properties from model specific properties, and to swap out the controller's model as the user navigates around the page.
- Ember.js provides controllers that *proxy* properties from their models so that you can say `{{name}}` in your template rather than `{{model.name}}`.
- An `Ember.ArrayController` proxies properties from an Array, and an `Ember.ObjectController` proxies properties

Iterating Over An `ArrayController`

- You can iterate directly over the controller using `{{#each controller}}`.
- This keeps the template from having to know about how the controller is implemented
- Makes isolation testing and refactoring easier.

Storing Application Properties

- Not all properties in your application need to be saved to the server.
- Any time you need to store information only for the lifetime of this application run, you should store it on a controller.

Ember.ObjectController

`Ember.ObjectController`

- Use `Ember.ObjectController` to represent a single model.
- To tell an `ObjectController` which model to represent, set its `model` property in your route's `setupController` method.
- When a template asks an `ObjectController` for the value of a property, the controller looks for a property with the same name on itself first before checking the model.

For example, imagine you are writing a music player. You have defined your `SongController` to represent the currently playing song.

```
1 App.SongController = Ember.ObjectController.extend({
2   soundVolume: 1
3 });
```

In your router, you set the `model` of the controller to the currently playing song:

```
1 App.SongRoute = Ember.Route.extend({
2   setupController: function(controller, song) {
3     controller.set('model', song);
4   }
5 });
```

In your template, you want to display the name of the currently playing song, as well as the volume at which it is playing.

```
1 <p>
2   <strong>Song</strong>: {{name}} by {{artist}}
3 </p>
4 <p>
5   <strong>Current Volume</strong>: {{soundVolume}}
6 </p>
```

- Because `name` and `artist` are persisted information, and thus stored on the model, the controller looks them up there and provides them to the template.
- `soundVolume`, however, is specific to the current user's session, and thus stored on the controller. The controller can return its own value without consulting the model.

Advantages of This Architecture

- Easy to get started by accessing the properties of the model via the object controller.
- If, however, you need to transform a model property for a template, there is a well-defined place to do so without adding view-specific concerns to the model.

For example, imagine we want to display the duration of the song:

```
1 <p>
2   <strong>Song</strong>: {{name}} by {{artist}}
3 </p>
4 <p>
5   <strong>Duration</strong>: {{duration}}
6 </p>
```

This is saved on the server as an integer representing the number of seconds, so our first attempt looks like this:

```
1 <p>
2   <strong>Song</strong>: 4 Minute Warning by Radiohead
3 </p>
4 <p>
5   <strong>Duration</strong>: 257
6 </p>
```

Since our users are humans and not robots, however, we'd like to display the duration as a formatted string.

This is very easy to do by defining a computed property on the controller which transforms the model's value into a human-readable format for the template:

```
1 App.SongController = Ember.ObjectController.extend({
2   duration: function() {
3     var duration = this.get('model.duration'),
4          minutes = Math.floor(duration / 60),
5          seconds = duration % 60;
6
7     return [minutes, seconds].join(':');
8   }.property('model.duration')
9 });
```

Now, the output of our template is a lot friendlier:

```
1 <p>
2   <strong>Song</strong>: 4 Minute Warning by Radiohead
3 </p>
4 <p>
5   <strong>Duration</strong>: 4:17
6 </p>
```

Ember.ArrayController

`Ember.ArrayController`

- Used represent an array of models.
- To tell an `ArrayController` which model to represent, set its `model` property in your route's `setupController` method.
- You can treat an `ArrayController` just like its underlying array.

An `Ember.ArrayController` Example

Imagine we want to display the current playlist. In our router, we setup our `SongsController` to represent the songs in the playlist:

```
1 App.SongsRoute = Ember.Route.extend({
2   setupController: function(controller, playlist) {
3     controller.set('model', playlist.get('songs'));
4   }
5 });
```

An `Ember.ArrayController` Example, Cont'd

In the `songs` template, we can use the `{{#each}}` helper to display each song:

```
1 <h1>Playlist</h1>
2
3 <ul>
4   {{#each}}
5     <li>{{name}} by {{artist}}</li>
6   {{/each}}
7 </ul>
```

`ArrayController` can collect aggregate info about the models it represents

For example, imagine we want to display the number of songs that are over 30 seconds long. We can add a new computed property called `longSongCount` to the controller:

```
1 App.SongsController = Ember.ArrayController.extend({
2   longSongCount: function() {
3     var longSongs = this.filter(function(song) {
4       return song.get('duration') > 30;
5     });
6     return longSongs.get('length');
7   }.property('@each.duration')
8 });
```

Now we can use this property in our template:

```
1 <ul>
2   {{#each}}
3     <li>{{name}} by {{artist}}</li>
4   {{/each}}
5 </ul>
6
7 {{longSongCount}} songs over 30 seconds.
```

Sorting

- The `Ember.ArrayController` uses the `Ember.SortableMixin` to allow sorting of content.
- There are two properties that can be set in order to set up sorting:

```
1  App.SongsController = Ember.ArrayController.extend({
2    sortProperties: ['name', 'artist'],
3    sortAscending: true // false for descending
4 });
```

Item Controller

- It is often useful to specify a controller to decorate individual items in the `ArrayController` while iterating over them.
- This can be done by creating an `ObjectController`:

```
1 App.SongController = Ember.ObjectController.extend({
2   fullName: function() {
3
4     return this.get('name') + ' by ' + this.get('artist');
5
6   }.property('name', 'artist')
7 });
```

Then, the `ArrayController` `itemController` property must be set to the decorated controller.

```
1 App.SongsController = Ember.ArrayController.extend({
2   itemController: 'song'
3 });
```

```
1 {{#each controller}}
2   <li>{{fullName}}</li>
3 {{/each}}
```

or you could setup the `itemController` directly in the template:

```
1 App.SongsController = Ember.ArrayController.extend({
});
```

```
1 {{#each controller itemController="song"}}
2   <li>{{fullName}}</li>
3 {{/each}}
```

Managing Dependencies Between Controllers

Managing Dependencies Between Controllers

Sometimes, especially when nesting resources, we find ourselves needing to have some kind of connection between two controllers.

```
1 App.Router.map(function() {
2   this.resource("post", { path: "/posts/:post_id" }, function() {
3     this.resource("comments", { path: "/comments" });
4   });
5 });
```

In the `/posts/:post_id` example...

If we visit a `/posts/1/comments` URL, our `Post` model will get loaded into a `PostController`'s model, which means it is not directly accessible in the `CommentsController`. We might however want to display some information about it in the `comments` template.

To be able to do this we define our `CommentsController` to need the `PostController` which has our desired `Post` model.

```
1 App.CommentsController = Ember.ArrayController.extend({
2   needs: "post"
3 });
```

This tells Ember that our `CommentsController` should be able to access its parent `PostController`, which can be done via `controllers.post` (either in the template or in the controller itself).

```
1 <h1>Comments for {{controllers.post.title}}</h1>
2
3 <ul>
4   {{#each comments}}
5     <li>{{text}}</li>
6   {{/each}}
7 </ul>
```

We can also create an aliased property to give ourselves a shorter way to access the `PostController` (since it is an `ObjectController`, we don't need or want the `Post` instance directly).

```
1 App.CommentsController = Ember.ArrayController.extend({
2   needs: "post",
3   post: Ember.computed.alias("controllers.post")
4 });
```

If you want to connect multiple controllers together, you can specify an array of controller names:

```
1 App.AnotherController = Ember.Controller.extend({
2   needs: ['post', 'comments']
3 });
```

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