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# Backbone.js on Rails

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## **1. Preface**

## **2. Getting up to speed**

### **2.1. Backbone.js online resources**

### **2.2. JavaScript online resources and books**

## **3. Introduction**

### **3.1. Why use Backbone.js**

### **3.2. When not to use Backbone.js**

### **3.3. Why not SproutCore, Cappuccino, Knockout.js, Spine, etc.**

## **4. Organization**

### **4.1. Backbone.js and MVC**

### **4.2. What goes where in MVC**

### **4.3. Namespacing your application**

## **5. Rails Integration**

### **5.1. Organizing your Backbone.js code in a Rails app**

When using Backbone.js in a Rails app, you'll have two primary kinds of Backbone.js-related assets: classes, and templates.

### **5.2. Rails 3.0 and prior**

With Rails 3.0 and prior, store your Backbone.js classes in `public/javascripts`:

```
public/  
  javascripts/  
    jquery.js  
    jquery-ui.js  
  models/  
    user.js  
    todo.js  
  routers/  
    users_router.js  
    todos_router.js  
  views/  
    users/  
      users_index.js  
      users_new.js  
      users_edit.js  
    todos/  
      todos_index.js
```

If you are using templates, we prefer storing them in `app/templates` to keep them separated from the server views:

```
app/  
  views/  
    pages/  
      home.html.erb  
      terms.html.erb  
      privacy.html.erb  
      about.html.erb  
  templates/  
    users/  
      index.jst  
      new.jst  
      edit.jst  
    todos/  
      index.jst  
      show.jst
```

On Rails 3.0 and prior apps, we use Jammit for packaging assets and precompiling templates:

<http://documentcloud.github.com/jammit/> <http://documentcloud.github.com/jammit/#jst>

### 5.2.1. A note on JSTs and Jammit

As applications are moving to Rails 3.1, they're also moving to Sprockets for the asset packager. Until then, many apps are using Jammit for asset packaging. One issue with Jammit we've encountered and worked around is that the JST template path can change when adding new templates. We have an open issue and workaround:

<https://github.com/documentcloud/jammit/issues/192>

## 5.3. Rails 3.1

Rails 3.1 introduces the asset pipeline:

[http://edgeguides.rubyonrails.org/asset\\_pipeline.html](http://edgeguides.rubyonrails.org/asset_pipeline.html)

which uses the Sprockets library for preprocessing and packaging assets:

<http://getsprockets.org/>

To take advantage of the built-in asset pipeline, organize your Backbone.js templates and classes in paths available to the asset pipeline. Classes go in `app/assets/javascripts/`, and templates go alongside, in `app/assets/templates/`:

```
app/  
  assets/  
    javascripts/  
      jquery.js  
    models/  
      todo.js  
    routers/  
      todos_router.js  
    views/  
      todos/  
        todos_index.js  
    templates/  
      todos/  
        index.jst.ejs  
        show.jst.ejs
```

Using Sprockets' preprocessors, we can use templates as before. Here, we're using the EJS template preprocessor to provide the same functionality as Underscore.js' templates. It compiles the `*.jst` files and makes them available to the `window.JST` function. Identifying the `.ejs` extension and invoking EJS to compile the templates is managed by Sprockets, and requires the `ejs` gem to be included in the application Gemfile.

Underscore.js templates: <http://documentcloud.github.com/underscore/#template>

EJS gem: <https://github.com/sstephenson/ruby-ejs>

Sprockets support for EJS: [https://github.com/sstephenson/sprockets/blob/master/lib/sprockets/ejs\\_template.rb](https://github.com/sstephenson/sprockets/blob/master/lib/sprockets/ejs_template.rb) === Converting your Rails models to Backbone.js-friendly JSON === Converting an existing page/view area to use Backbone.js === Automatically using the Rails authentication token

## **6. Views and Templates**

### **6.1. View explanation**

### **6.2. Templating strategy**

### **6.3. View helpers**

### **6.4. Form helpers**

### **6.5. Event binding**

### **6.6. How to use multiple views on the same model/collection**

### **6.7. Composed views**

### **6.8. Cleaning up: understanding binding and unbinding**

### **6.9. Internationalization**

## **7. Models and collections**

### **7.1. Naming conventions**

### **7.2. Nested resources**

### **7.3. Relationships**

### **7.4. Scopes and filters**

To filter a `Backbone.Collection`, like with Rails named scopes, define functions on your collections that return new collection instances, filtered by your criteria. A first implementation might look like this:

```
var Tasks = Backbone.Collection.extend({  
  model: Task,
```

```
url: '/tasks',

complete: function() {
  var filteredTasks = this.select(function(task) {
    return task.get('completed_at') !== null;
  });
  return new Tasks(filteredTasks);
}
});
```

Ideally, the filter functions will reuse logic already defined in your model class:

```
var Task = Backbone.Model.extend({
  isComplete: function() {
    return this.get('completed_at') !== null;
  }
});

var Tasks = Backbone.Collection.extend({
  model: Task,
  url: '/tasks',

  complete: function() {
    var filteredTasks = this.select(function(task) {
      return task.isComplete();
    });
    return new Tasks(filteredTasks);
  }
});
```

Going further, you can separate the two concerns here, and extract a *filtered* function:

```
var Task = Backbone.Model.extend({
  isComplete: function() {
    return this.get('completed_at') !== null;
  }
});

var Tasks = Backbone.Collection.extend({
  model: Task,
  url: '/tasks',

  complete: function() {
    return this.filtered(this.select(function(task) {
      return task.isComplete();
    }));
  },

  filtered: function(criteriaFunction) {
    return new Tasks(this.select(criteriaFunction));
  }
});
```

## 7.5. Sorting

The simplest way to sort `Backbone.Collection` is to define a comparator function:

```
var Tasks = Backbone.Collection.extend({
```

```
model: Task,
url: '/tasks',

comparator: function(task) {
  return task.dueDate;
}
});
```

If you'd like to provide more than one sort on your collection, you can use an approach similar to the filtered function above, and return a new `Backbone.Collection` whose `comparator` is overridden. Call `sort` to update the ordering on the new collection:

```
var Tasks = Backbone.Collection.extend({
  model: Task,
  url: '/tasks',

  comparator: function(task) {
    return task.dueDate;
  },

  byCreatedAt: function() {
    var sortedCollection = new Tasks(this.models);
    sortedCollection.comparator = function(task) {
      return task.createdAt;
    };
    sortedCollection.sort();
    return sortedCollection;
  }
});
```

Similarly, you can extract the reusable concern to another function:

```
var Tasks = Backbone.Collection.extend({
  model: Task,
  url: '/tasks',

  comparator: function(task) {
    return task.dueDate;
  },

  byCreatedAt: function() {
    return this.sortedBy(function(task) {
      return task.createdAt;
    });
  },

  byCompletedAt: function() {
    return this.sortedBy(function(task) {
      return task.createdAt;
    });
  },

  sortBy: function(comparator) {
    var sortedCollection = new Tasks(this.models);
    sortedCollection.comparator = comparator;
    sortedCollection.sort();
    return sortedCollection;
  }
});
```

## **7.6. Client/Server duplicated business logic**

## **7.7. Validations**

## **7.8. Synchronizing between clients**

# **8. Testing**

## **8.1. Full-stack integration testing**

## **8.2. Isolated unit testing**

# **9. The JavaScript language**

## **9.1. Model attribute types and serialization**

## **9.2. Context binding (JS `this`)**

## **9.3. CoffeeScript with Backbone.js**