

Please evaluate my talk via the mobile app!



INTERNATIONAL SOFTWARE DEVELOPMENT CONFERENCE

Using BadeRunnerJS to build Front-end JavaScript Apps that Scale

QCon London 2014

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BladeRunnerJS

@BladeRunnerJS



- What is a Large Scale front-end App?
- What are the signs of scaling?
- What are the solutions? (with demos)

What is a large-scale JavaScript app?

In my view, large-scale JavaScript apps are non-trivial applications requiring significant developer effort to maintain, where most heavy lifting of data manipulation and display falls to the browser.

-Addy Osmani, Patterns For Large-Scale JavaScript Application Architecture

Great. More detail please!

Large Codebase

More functionality === More code

Caplin Trader

- SDK:
 - ~1,000 JavaScript files
 - ~131,000 LoC
 - ~131 lines per file
 - ~650 test files
 - ~95,000 test LoC

- Getting Started Apps:
 - ~425 JavaScript files
 - ~50,000 LoC
 - ~117 lines per file
 - ~200 test files
 - ~21,000 test LoC

Complexity

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Gmail & Caplin Trader

- Large Single Page Apps (SPAs)
- Complex functionality
- Complex interactions
 - User
 - Technology
- Leave open all day









Who contributes to an app?

- Front-end devs
- Back-end devs
- Designers
- QA
- Infrastructure and release engineers
- Technical authors

People who are part of...

- Large teams
- Multiple teams
- Teams spread across an organisation
- Teams spread across multiple organisations

So, how do you ensure an application is maintainable?

- structure a massive codebase (js, css, html, i18n, images, config etc.)
- 2. an architecture for complex functionality and interaction (UI and other components)
- 3. make sure that all contributors can work in harmony
- 4. development must be a productive experience
- 5. ensure all these compliment each other

Seven signs of scaling

And the life

Dev Setup takes forever









Database

Realtime service





Server icon designed by aLf from the thenounproject.com

My App won't load!

- Run full application
- All back-end components running
- Lots of moving parts



Loading designed by Mateo Zlatar from the thenounproject.com

My App isn't working!

- Other contributors breaking functionality
- Code accessed and modified from elsewhere
- Dependency Analysis and out of order file concatenation



Finding assets is hard

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What does this code do?

- Inconsistent coding style
- Inconsistent code structure
- Side effects through unexpected overrides

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var MyObjDefinition = {
    property: 'thing',
    method: function() {
        return 'hello';
};
var myInstance = Object.create( MyObjDefinition );
function MyObjDefinition() {
    this.property = 'thing';
    this.method = function() {
        return 'hello';
    3
}
var myInstance = new MyObjDefinition();
function myObjDefinition() {
    this.property = 'thing';
}
myObjDefinition.prototype.method = function() {
    return 'hello':
};
```

Long App Reloads

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Have the tests finished yet?

- Having to run all the tests
- UI-based tests
- Continuous Integration...taking 8 hours!
- Bonus: Are these tests reliable?

Scaling Solutions

Goals

- Streamlined developer workflow
- Consistency
- Focus on building a single feature (in isolation)
- Scalable loosely-coupled application architecture
- Quality at its core (maintainability)

Developer Workflow



Building a single feature in isolation

Blades

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Blade Demo

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Double-click to edit a todo

Created by The BladeRunnerJS team

Part of TodoMVC

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Goals

- Streamlined developer workflow
- Consistency

• Focus on building a single feature (in isolation)

- Scalable loosely-coupled application architecture
- Quality at its core (maintainability)

Application Architecture

Requires an Architecture that...

- Allows complex interactions
- Allows components to be changed without side effects
 - At launch and during runtime
- Is easily extended
- Is easily tested
- Is easily maintained

Blades (again)

MVVM



Services

What is a service?

- Use services to access shared resources
 - Persistence Service
 - RESTful Service
 - Realtime Service
- Services registered and accessed via a ServiceRegistry
 - Dynamic Service Locator¹

1 <u>http://martinfowler.com/articles/injection.html#ADynamicServiceLocator</u>

Why use services?

- Single shared instance for accessing resources
- Functionality encapsulated behind an interface
- Loose-coupled communication
- Dependencies can be injected for different scenarios:
 - App
 - Workbench
 - Test

Services Demo

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Goals

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Simple Wins

- Consistency
 - Architecture
 - Coding style and structure
- Loose coupling: MVVM, Services & Interfaces
 - Facilitates testing
 - Can easily swap out implementations
- MVVM: Avoid testing the DOM

Test Demo

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*	What needs to be done?
V	Fake todo 1
V	Fake todo 2
v	Demo event hub working!
V	Be pleased!

Biggest Win

- Testing features in isolation
- Change view model and assert against mocked Service
- Inject mock service, make calls and assert View Model





Application End-to-End Tests

Tests driven by something like Selenium against the full in-browser client with all back-end services running.

Blade Functional Tests

Tests against a vertical slice of front-end application functionality via assertions against the View Model (MVVM) state and interactions with mocked service interfaces.

Unit Tests

Need Proof?

Our full suite Caplin Trader testing time went from

>8 Hours







Goals

- Streamlined developer workflow
 - Consistency
- Focus on building a single feature (in isolation)
- Scalable loosely-coupled application architecture
- Quality at its core (maintainability)



- BladeRunnerJS toolkit: Streamline developer
 workflow
- Blades: Build features in isolation (grouping assets together)
- Services: loose coupled communication e.g. EventHub
- Quality: Test units (classes), features (ViewModel < > Service) & keep DOM testing to a minimum.

BRJS at OCon

- BladeRunnerJS (BRJS) is a new open source
- v0.4 released today (used in demos)
- We're on 5th floor, Booth 28 (next to Google)
- Come have a chat, even just about the concepts

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