

Backend Workshop

MARIE CHATFIELD

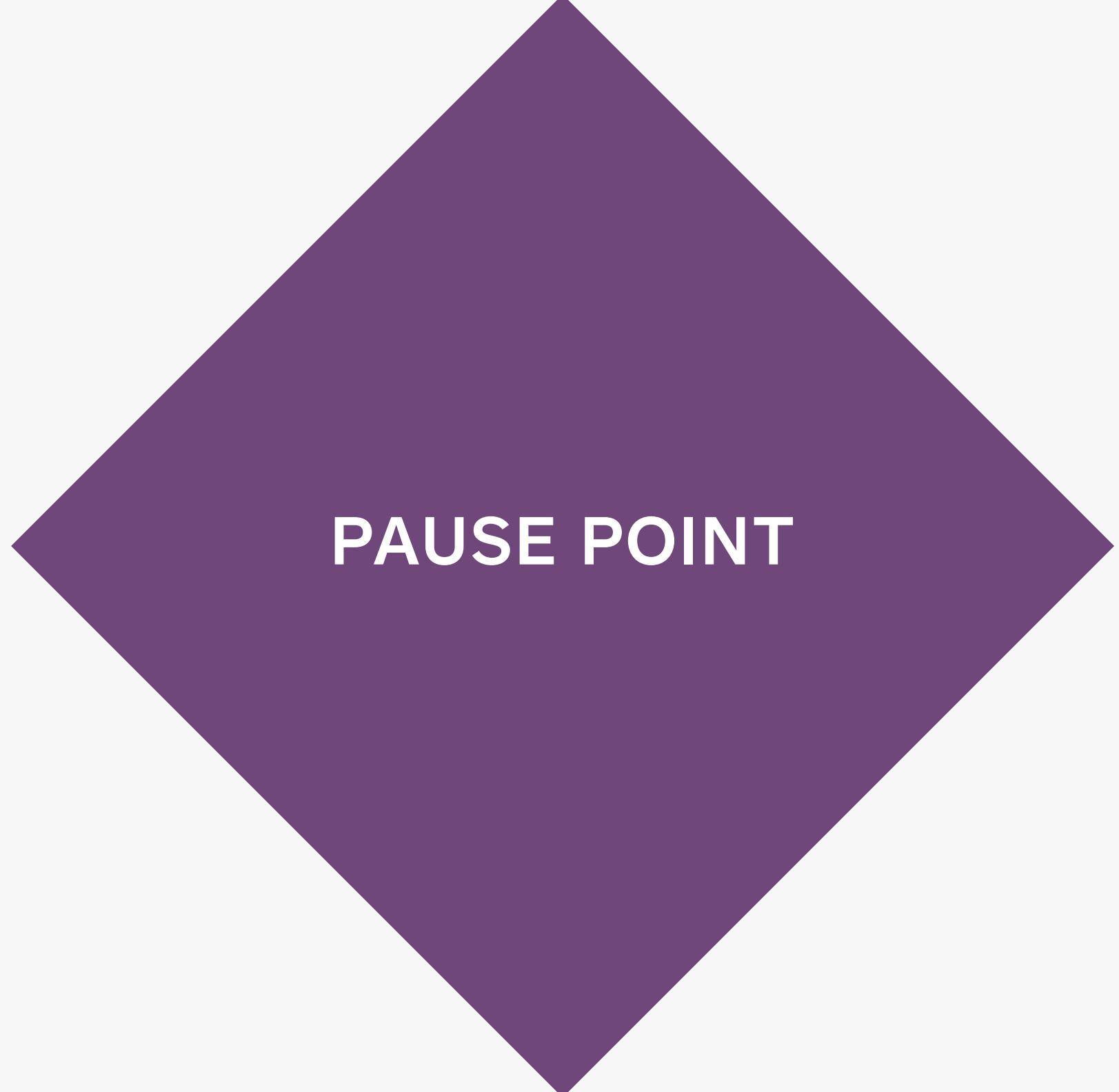
@MARIECHATFIELD

Follow along with tutorial:

<https://github.com/mchat/tutorials>

Sign up for free account:

<https://www.firebaseio.com/>



PAUSE POINT

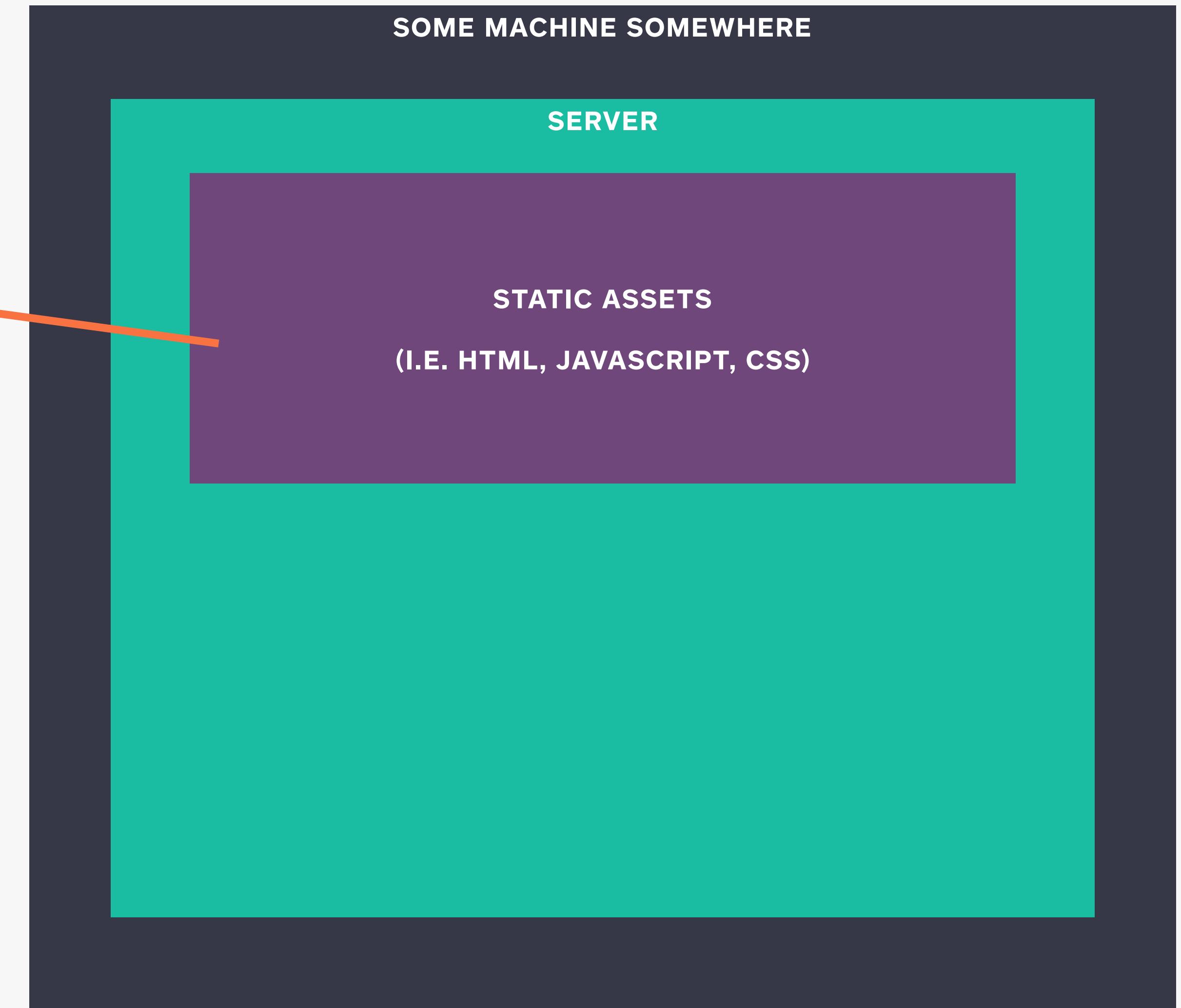
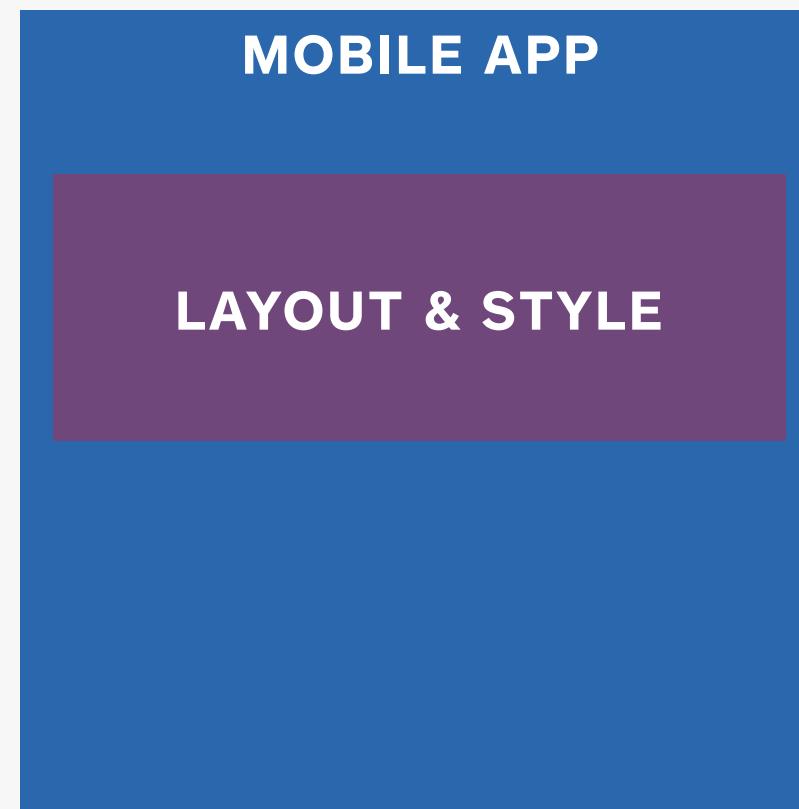
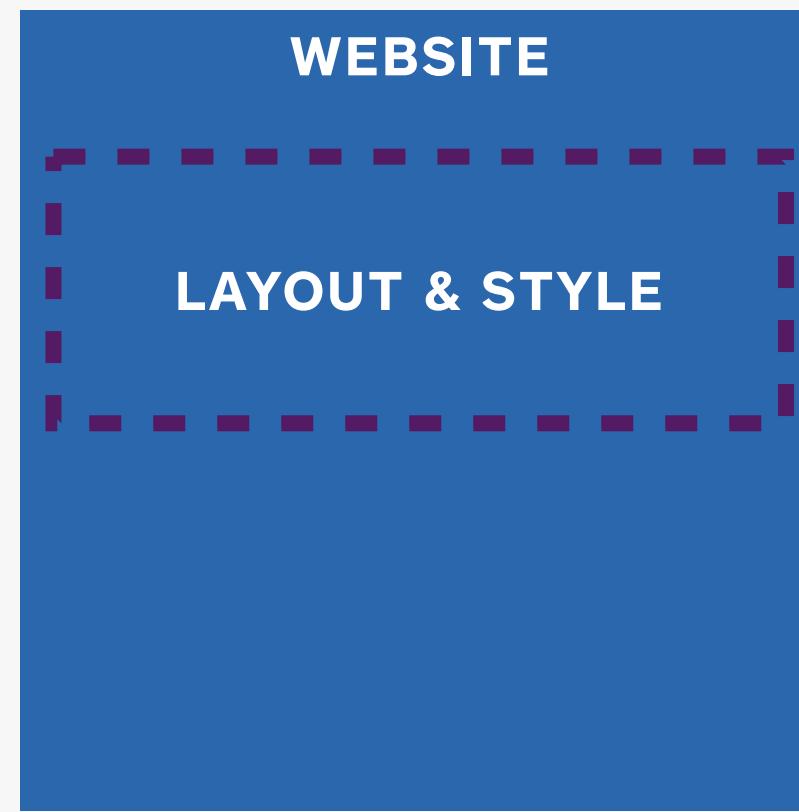
What is a backend and why do I need one?

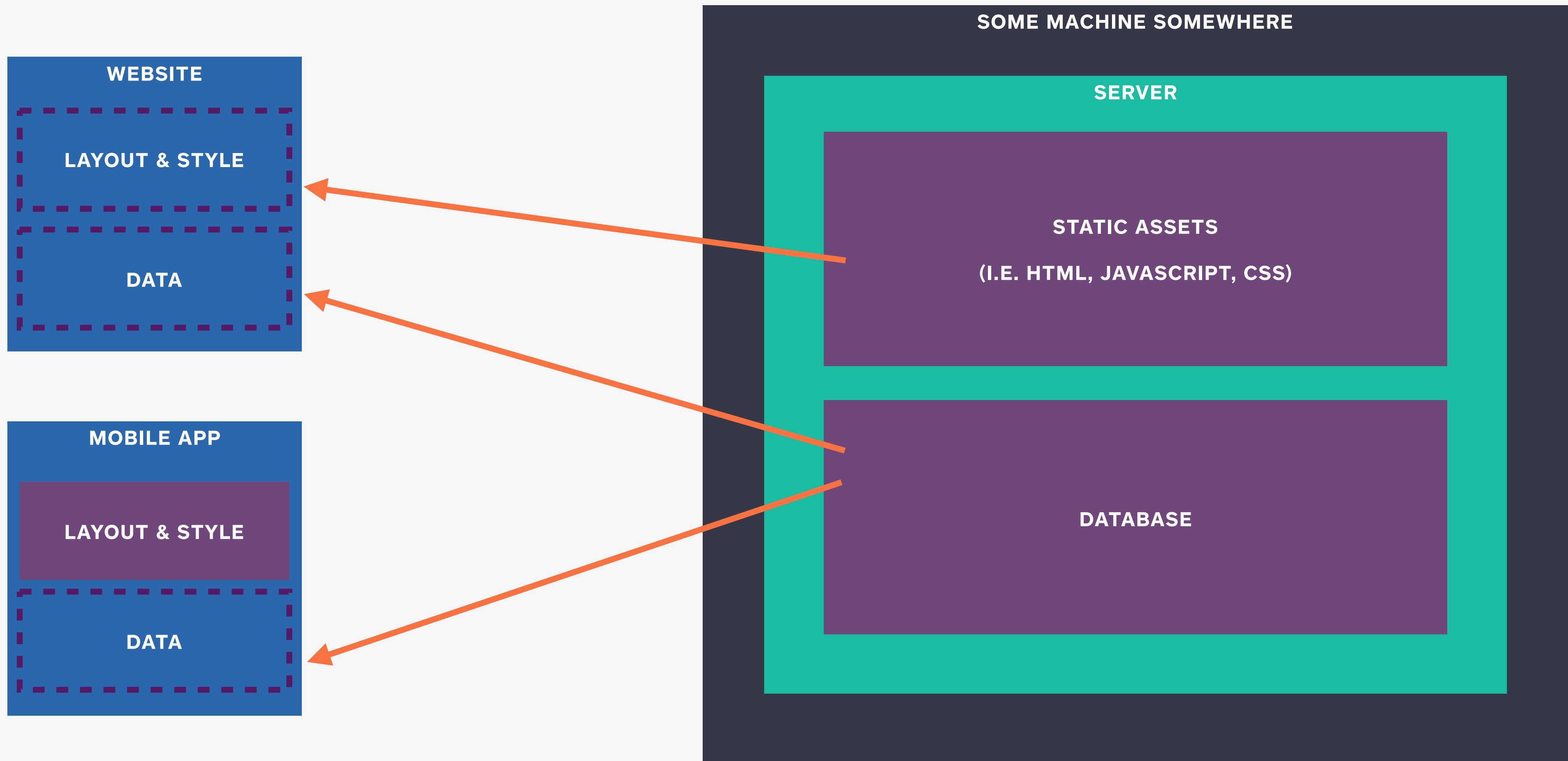
WEBSITE

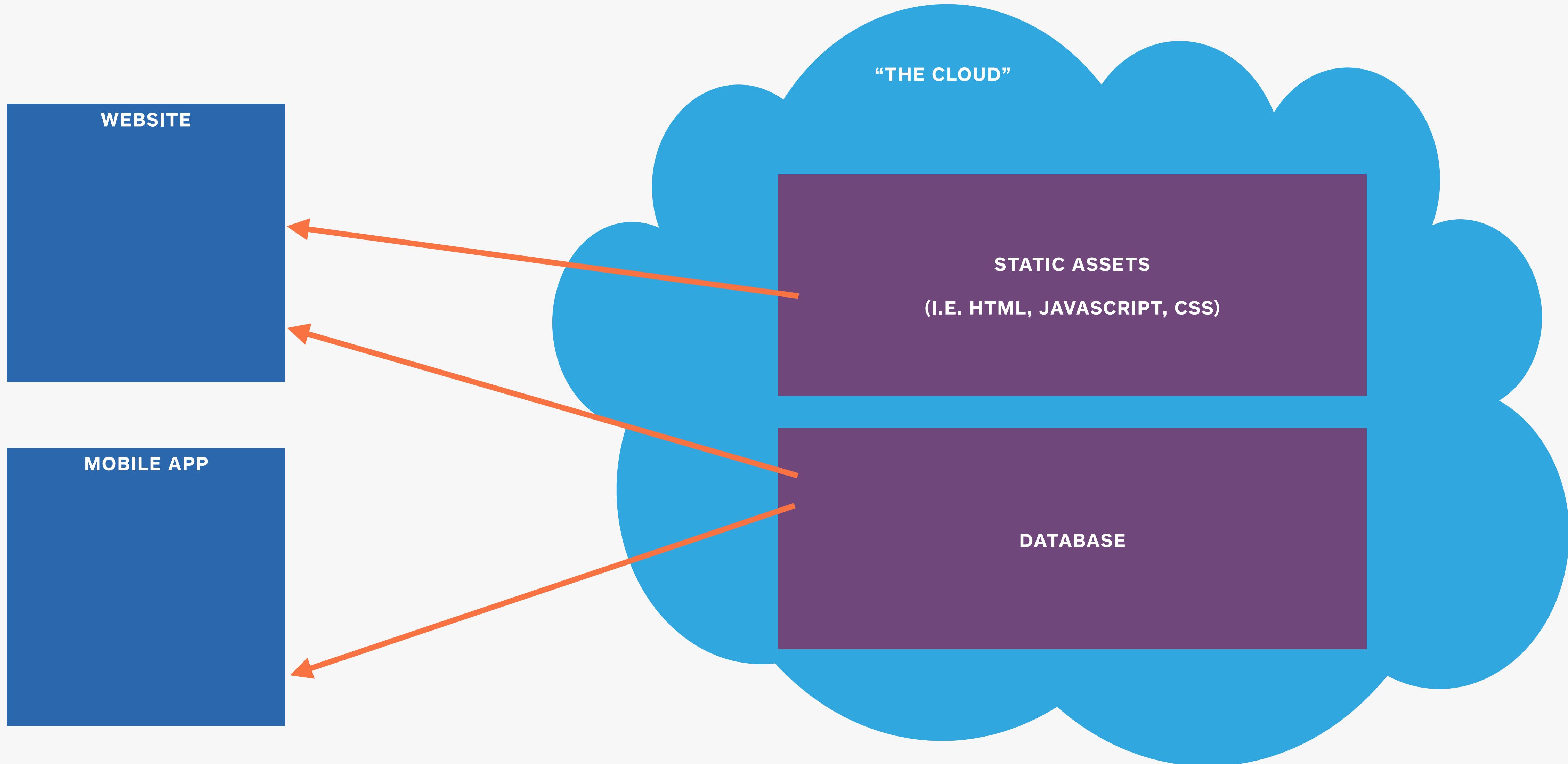
MOBILE APP

SOME MACHINE SOMEWHERE

SERVER







X

Welcome to Firebase

Your account has been created successfully!

Take a look at these resources to help you get started.

5 min. tutorial

Quickstarts

Examples

API Docs

APP NAME

APP URL

CREATE NEW APP

MY FIRST APP 

DEVELOPMENT ONLY - FREE PLAN

 vivid-fire-3995.firebaseio.com

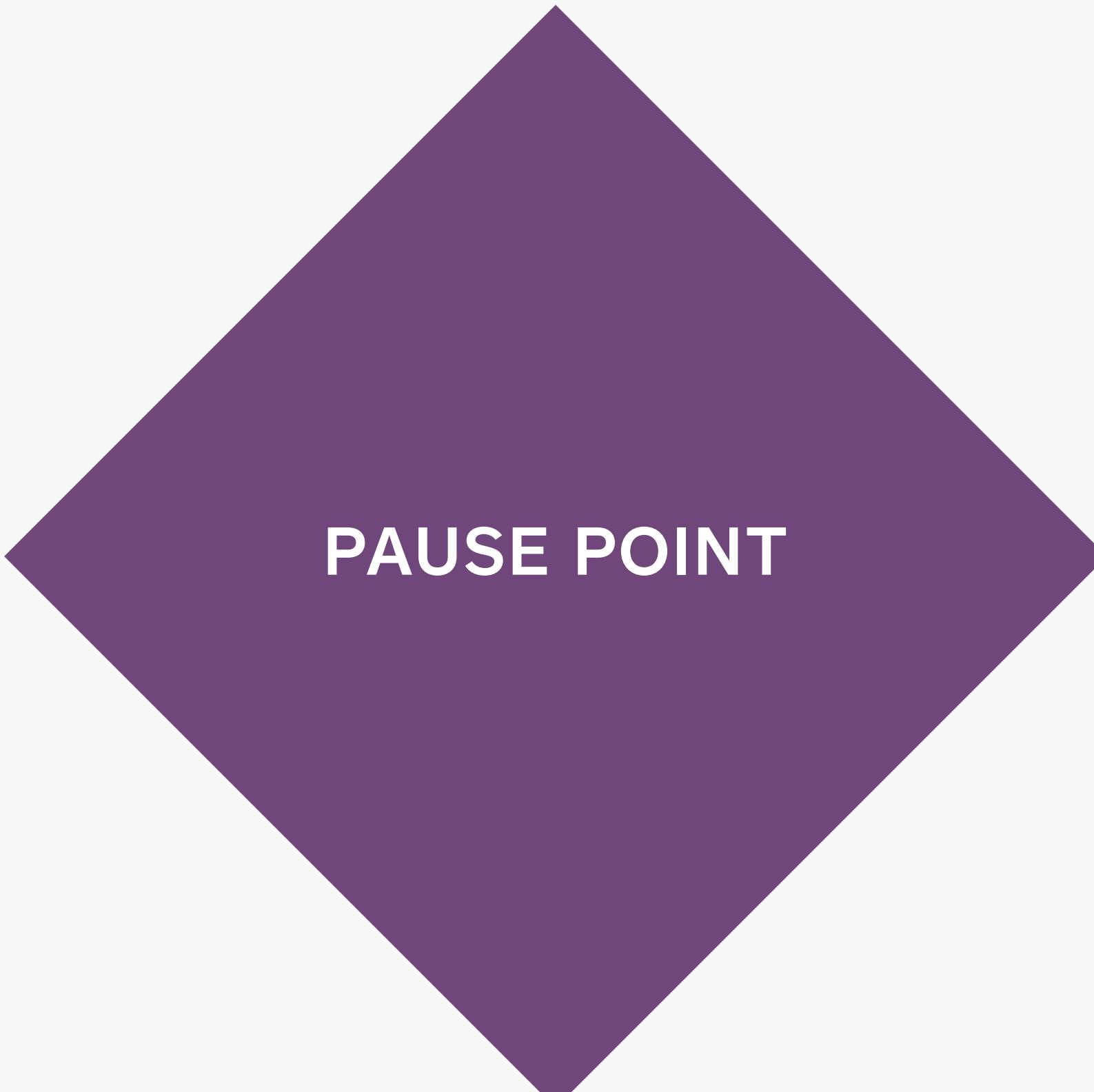
 Set up Hosting

[Manage App](#) [Upgrade Plan](#)

Add a collaborator 

VIVID-FIRE-3995

vivid-fire-3995: null  



PAUSE POINT

What is JSON?

Data Type

Example

Strings

"just a string"

Booleans

TRUE

Numbers

101

Arrays

["this is an array", "with strings", "and numbers", 2]

Objects

```
{  
  "this_is_a_key": "this is a value",  
  "keys can also point to other objects": {  
    "or arrays": [  
      1,  
      2  
    ]  
  }  
}
```

Transform JSON string into a Javascript object

```
1 // Give keys names without spaces and you can reference them
2 // using dot notation
3 var json_string = '{ "name": "marie", "user_id": 54871 }';
4 var user = JSON.parse(json_string);
5 console.log(user.name, user.user_id); // output: marie, 54871
6
7 // Give keys names with strings and you can reference them
8 // using array notation
9 var json_string = '{ "this is a silly name for a key": "but it works" }';
10 var example = JSON.parse(json_string);
11 console.log(example["this is a silly name for a key"]); // output: but it works
```

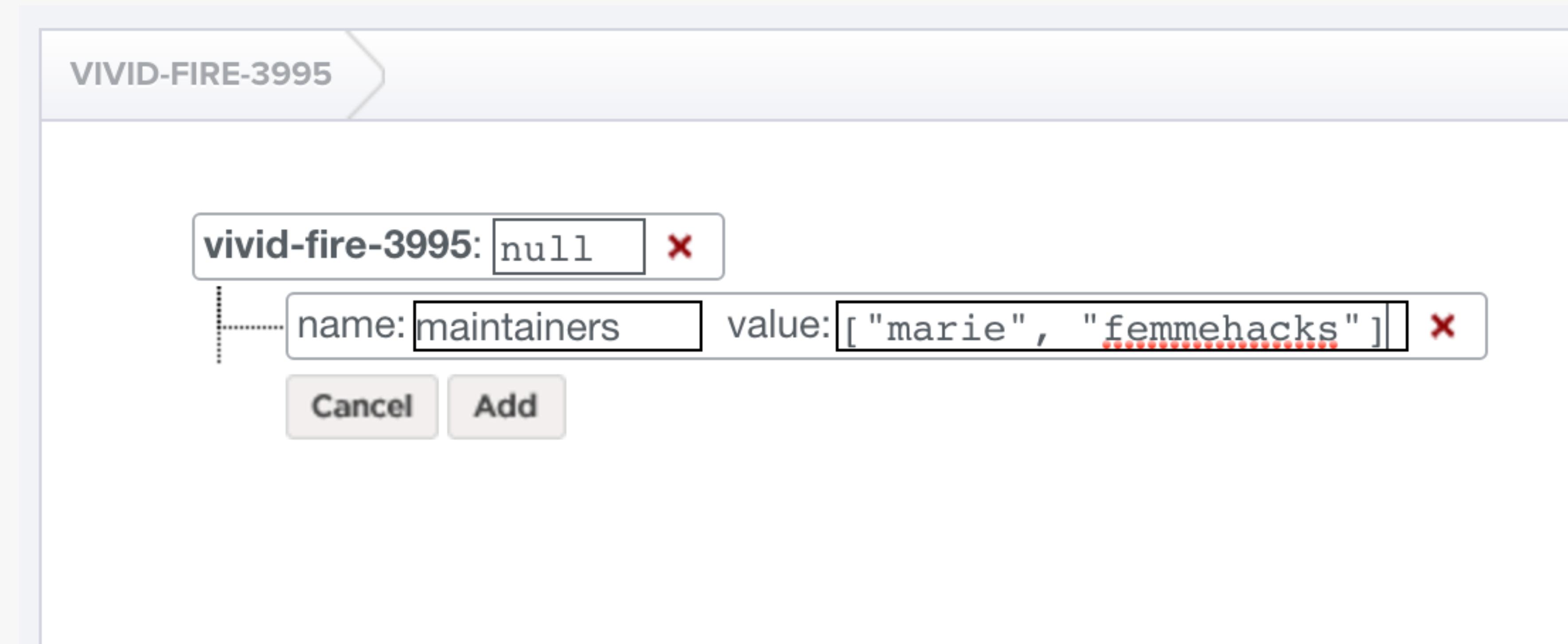
```
1 {  
2   "your-firebase-app": {  
3     "maintainers": [  
4       "marie",  
5       "femmehacks"  
6     ]  
7   }  
8 }
```

YOUR-FIREBASE-APP

MAINTAINERS

MARIE

FEMMEHACKS



name: maintainers

value: ["marie", "femmethacks"]

VIVID-FIRE-3995

vivid-fire-3995

- maintainers

0: "marie"

1: "femmethacks"

Talks You Should Watch

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Chimamanda Ngozi Adichie:
The danger of a single story

 Chimamanda Ngozi Adichie: **The danger of a single story** · TEDGlobal 2009 · 18:49 · Filmed Jul 2009

44 subtitle languages  View interactive transcript

 Watch later  Favorite  Download  Rate

Share this idea      9,907,056 Total views  Share this talk and track your influence!

Our lives, our cultures, are composed of many overlapping stories. Novelist Chimamanda Adichie tells the story of how she found her authentic cultural voice — and warns that if we hear only a single story about another person or country, we risk a critical misunderstanding.



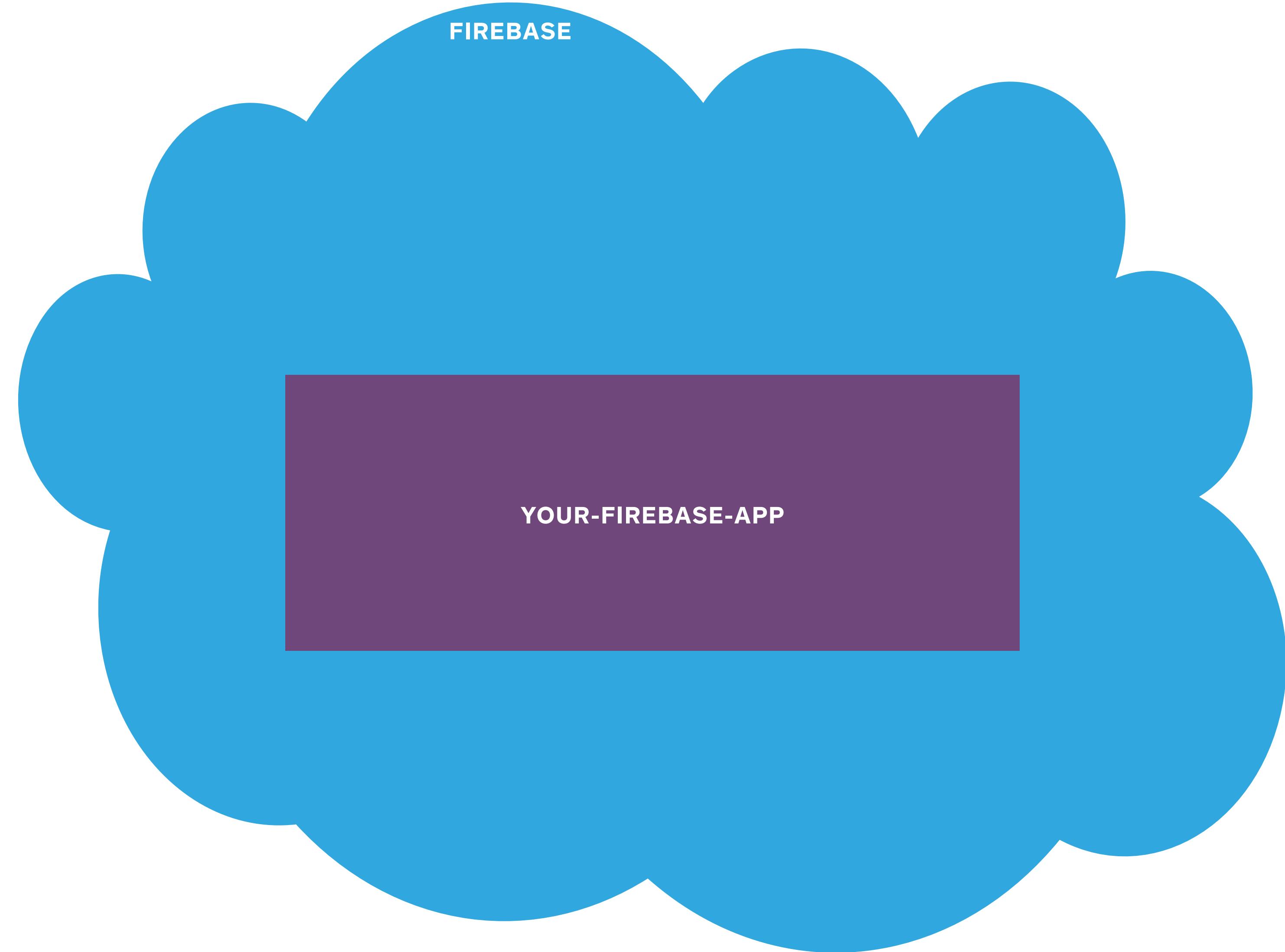
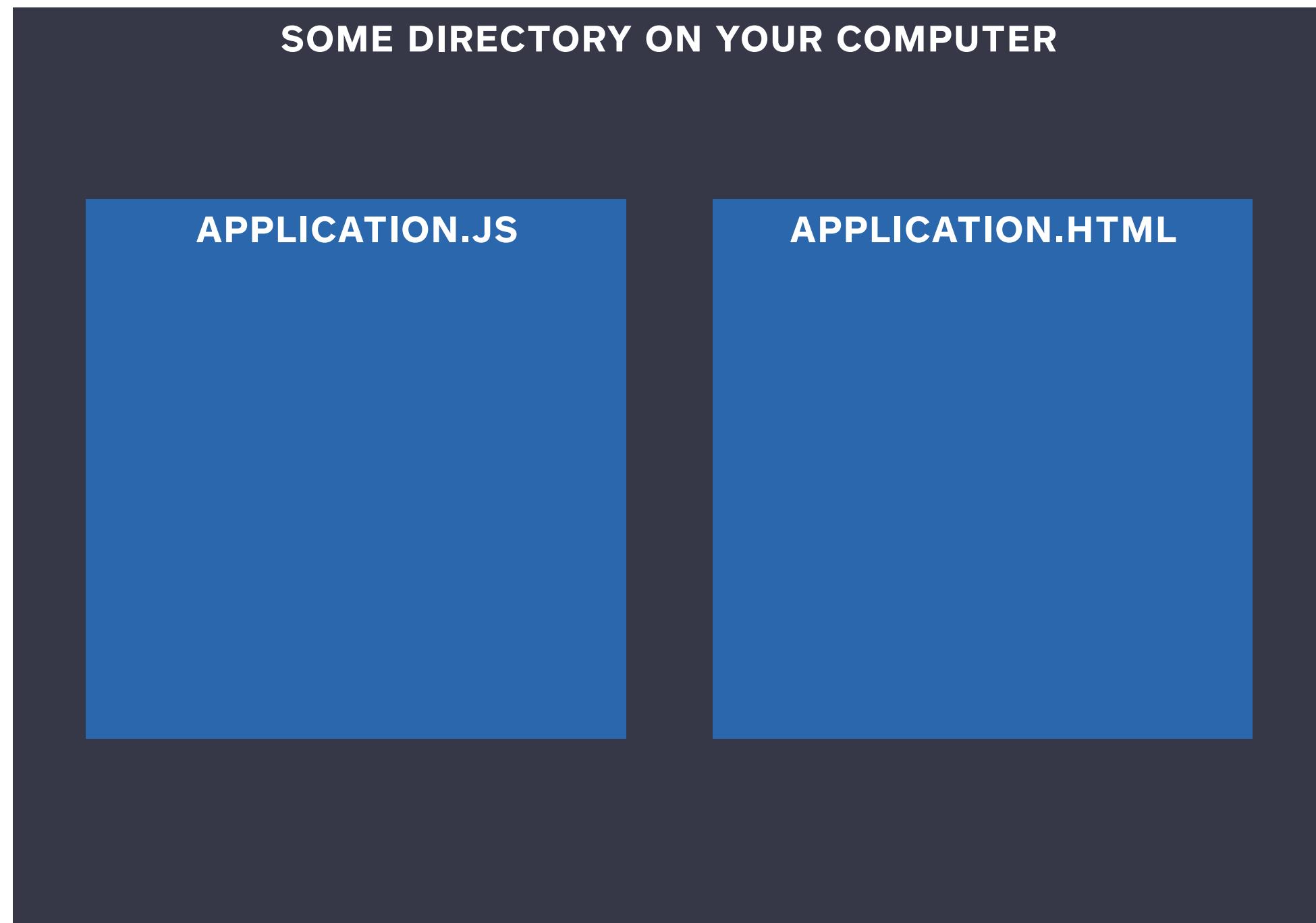
Watch the first night of TED2016 **live in cinemas!**

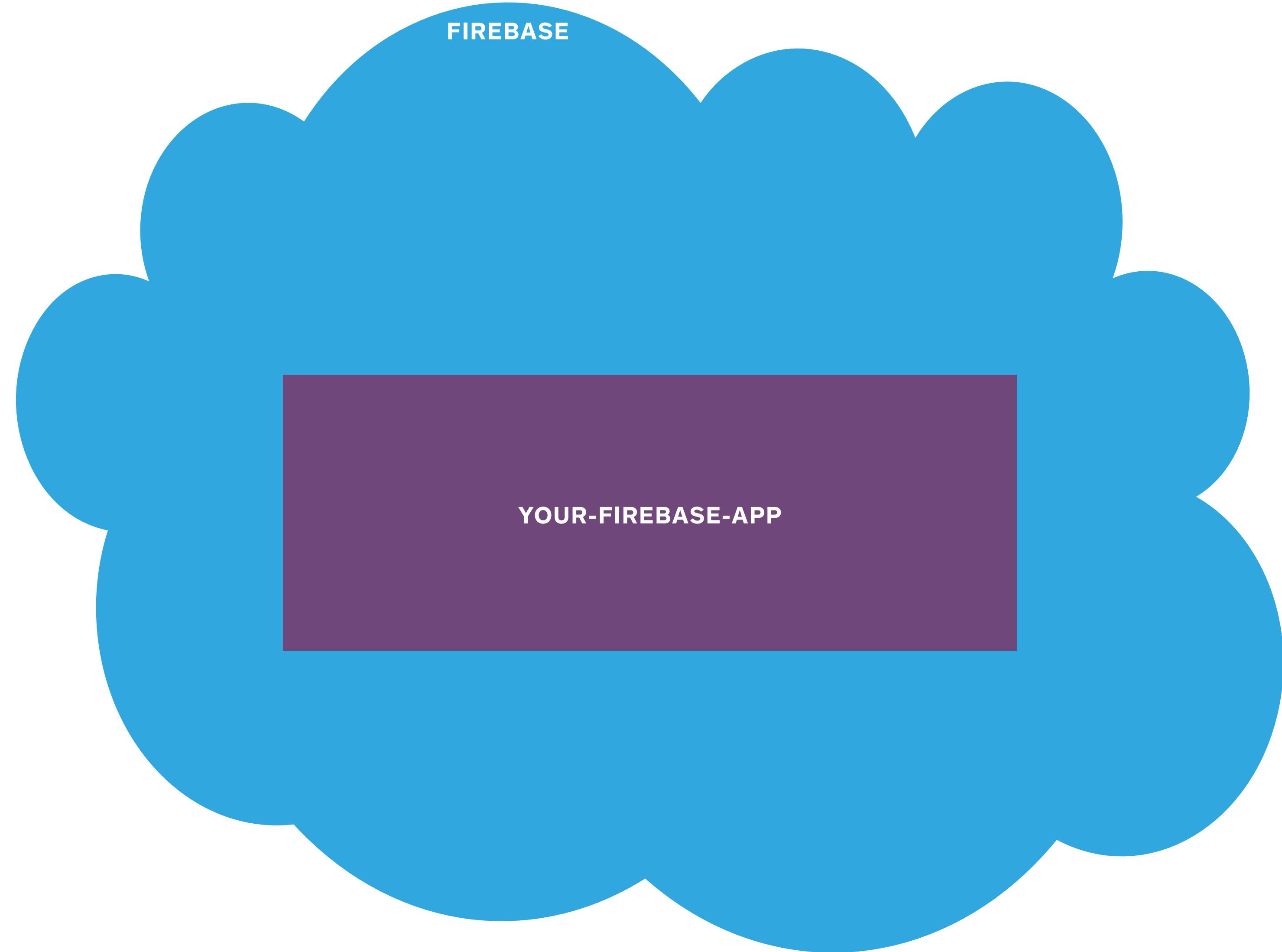
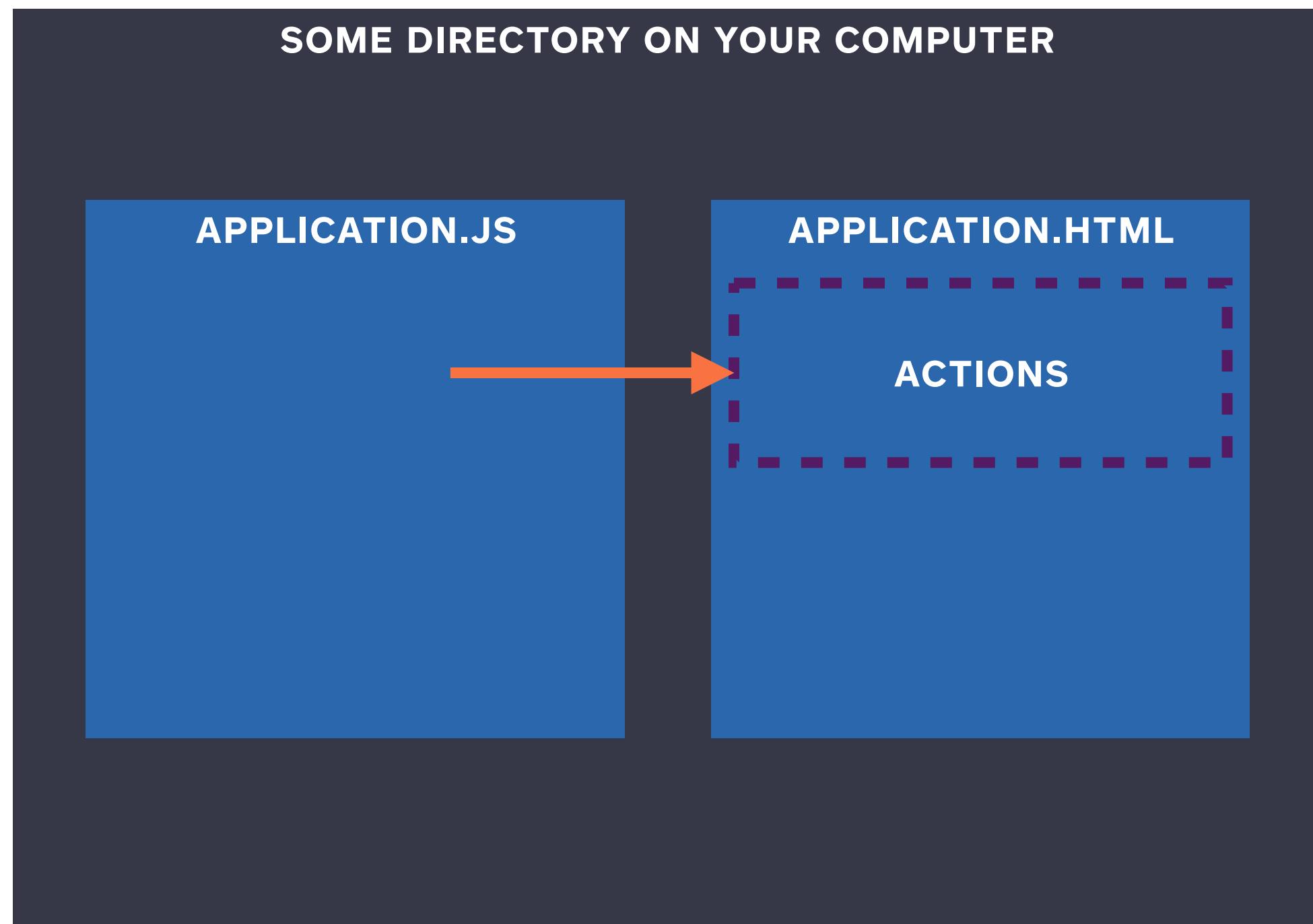
https://www.ted.com/talks/chimamanda_adichie_the_danger_of_a_single_story

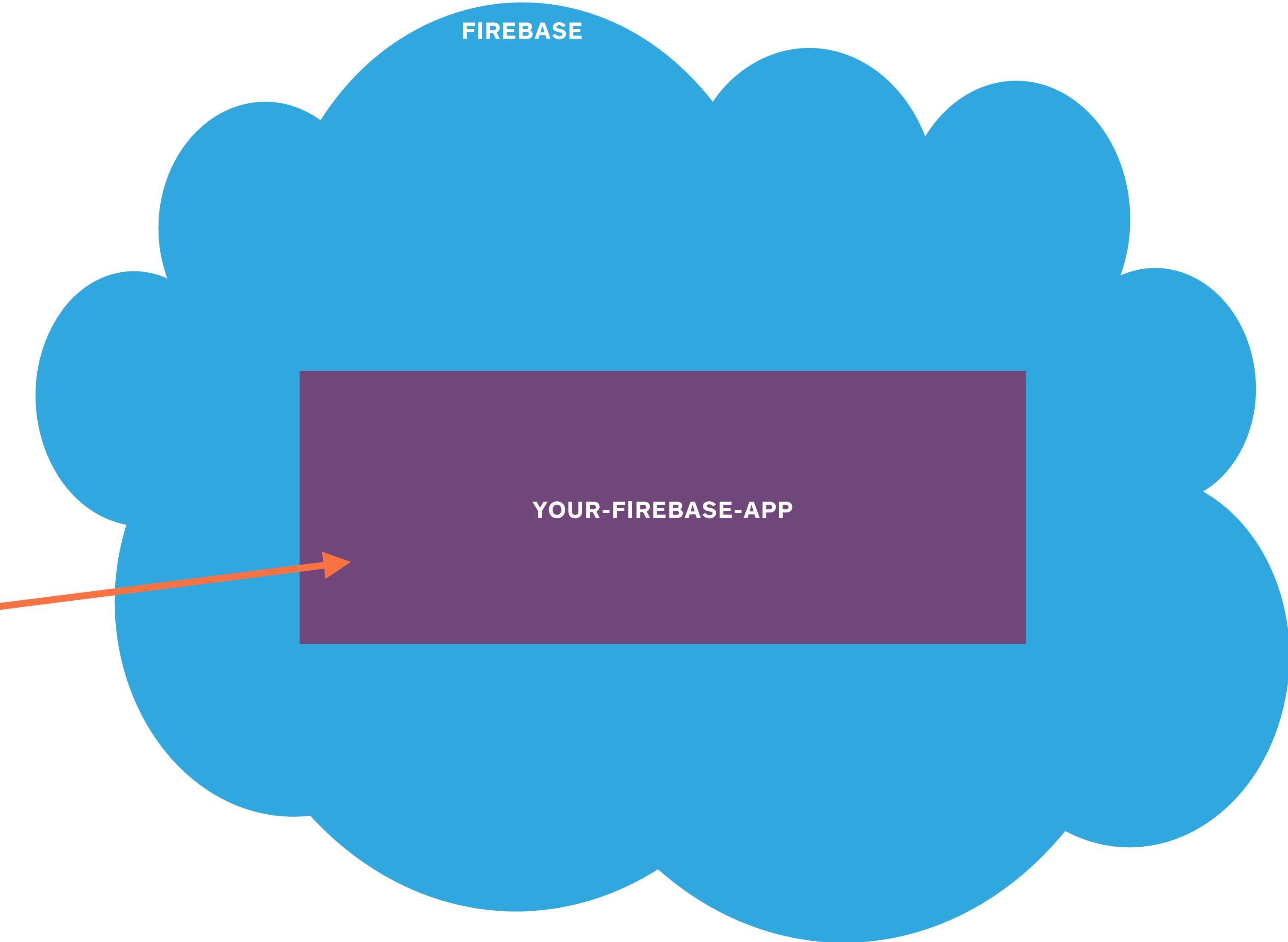
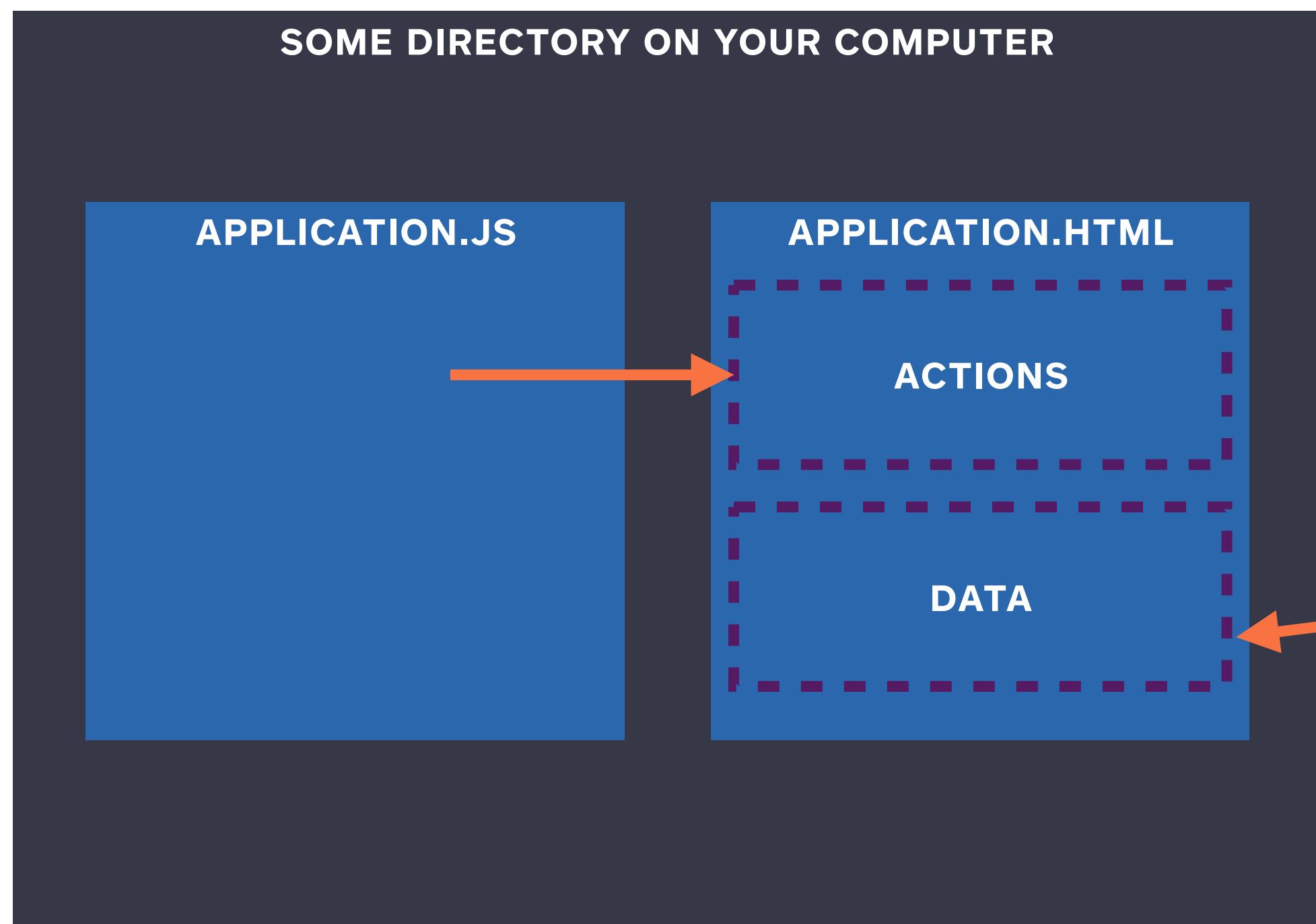
RECOMMENDATIONS

UNIQUE_ID	TITLE
	PRESENTER
	LINK
ANOTHER_UNIQUE_ID	TITLE
	PRESENTER
	LINK

```
1 "recommendations": {  
2   "unique_id": {  
3     "title": "The danger of a single story",  
4     "presenter": "Chimamanda Ngozi Adichie",  
5     "link": "https://www.ted.com/talks/chimamanda_adichie_the_danger_of_a_single_story"  
6   }  
7 }
```







application.html

```
1 <html>
2   <head>
3     <!-- Load the Firebase Library before loading the body. -->
4     <script src="https://cdn.firebaseio.com/js/client/2.4.0.firebaseio.js"></script>
5   </head>
6
7   <body>
8     <!-- Load the application script, which will save data to our Firebase app. -->
9     <script src="application.js"></script>
10
11    <!-- Honestly, we don't need this but otherwise this page is totally blank
12        and it's kind of hard to tell that it's already loaded. -->
13    <h1>Hello world!</h1>
14  </body>
15 </html>
```

application.js

```
1 // TODO: Replace with your Firebase app
2 var myFirebaseApp = "REPLACE-ME-WITH-YOUR-FIREBASE-APP-NAME";
3
4 // Reference to your entire Firebase database
5 var myFirebase = new Firebase("https://" + myFirebaseApp + ".firebaseio.com/");
6
7 // Get a reference to the recommendations object of your Firebase.
8 // Note: this doesn't exist yet. But when we write to our Firebase using
9 // this reference, it will create this object for us!
10 var recommendations = myFirebase.child("recommendations");
11
12 // Push our first recommendation to the end of the list and assign it a
13 // unique ID automatically.
14 recommendations.push({
15   "title": "The danger of a single story",
16   "presenter": "Chimamanda Ngozi Adichie",
17   "link": "https://www.ted.com/talks/chimamanda_adichie_the_danger_of_a_single_story"
18 });
```

Hello world!

PATH_TO_YOUR_LOCAL_DIR/application.html

VIVID-FIRE-3995

vivid-fire-3995

 └ maintainers

 └ 0: "marie"

 └ 1: "femmehacks"

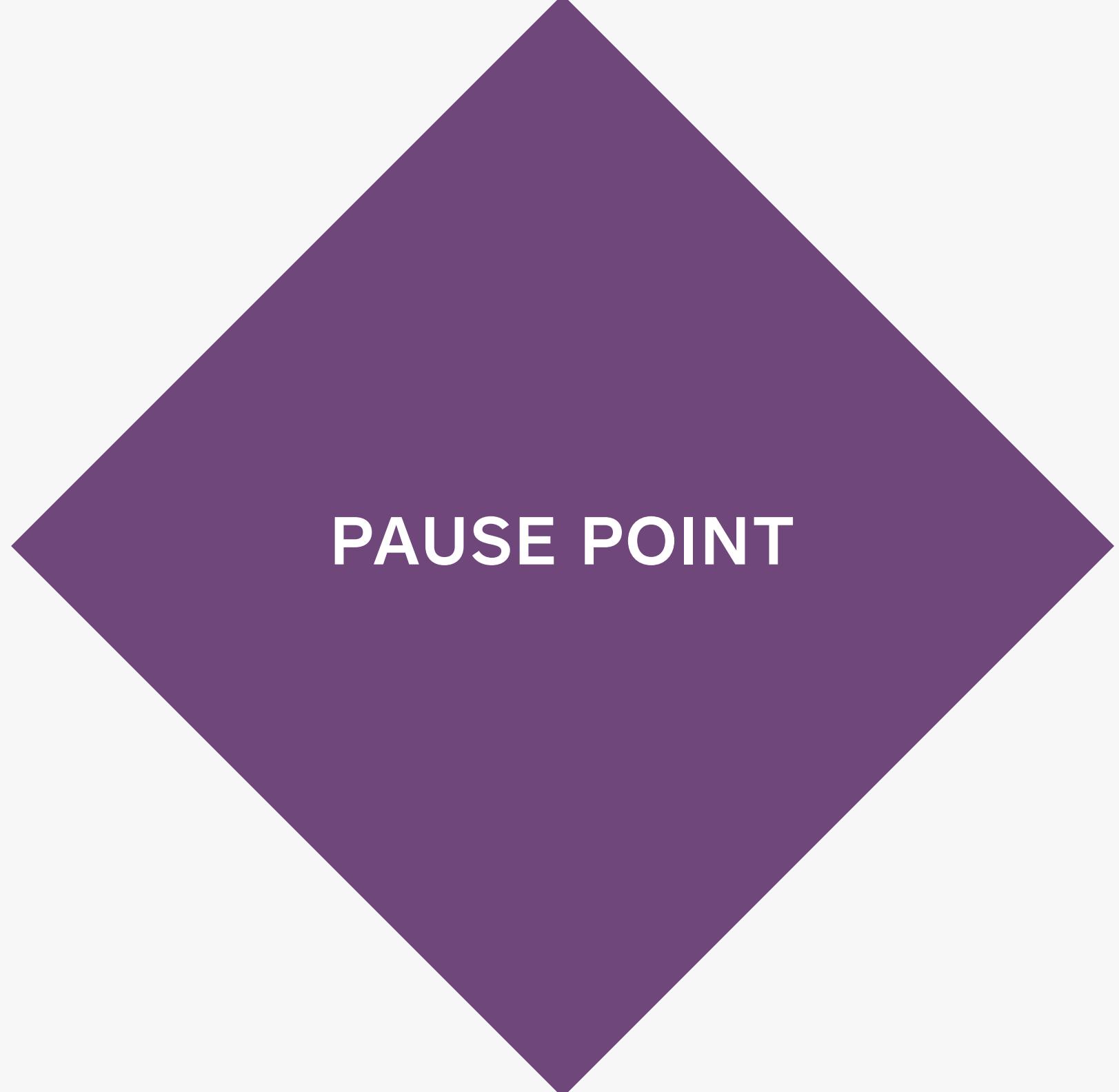
 └ recommendations

 └ -KA3ASkQXzynnbFBCbjr

 └ link: "https://www.ted.com/talks/chimamanda_adichie_th.."

 └ presenter: "Chimamanda Ngozi Adichie"

 └ title: "The danger of a single story"



PAUSE POINT

You just wrote data to a database in the cloud!

```
vivid-fire-3995
  maintainers
    0: "marie"
    1: "femmehacks"
  recommendations
    -KA3ASkQXzynnbFBCbjr
      link: "https://www.ted.com/talks/chimamanda_adichie_th..
      presenter: "Chimamanda Ngozi Adichie"
      title: "The danger of a single story"
    -KA3B-YrkQdgKSIQTf5i
      link: "https://www.ted.com/talks/chimamanda_adichie_th..
      presenter: "Chimamanda Ngozi Adichie"
      title: "The danger of a single story"
```

application.html

```
1 <html>
2   <head>
3     <!-- Load the Firebase library before loading the body. --&gt;
4     &lt;script src="https://cdn.firebaseio.com/js/client/2.4.0.firebaseio.js"&gt;&lt;/script&gt;
5
6     <!-- Load the jQuery library, which we'll use to manipulate HTML elements with Javascript. --&gt;
7     &lt;script src="https://code.jquery.com/jquery-2.2.0.min.js"&gt;&lt;/script&gt;
8
9     <!-- Load Bootstrap stylesheet, which will is CSS that makes everything prettier and also responsive (aka will work on all devices of all sizes). --&gt;
10    &lt;link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/css/bootstrap.min.css" integrity="sha384-1q8mTJOASx8j1Au+a5WDVnPi2lkFfwwEAa8hDDjZlpLegxhjVME1fgjWPgmkzs7" crossorigin="anonymous"&gt;
11  &lt;/head&gt;
12
13  &lt;body&gt;
14    <!-- Load the application script, which will save data to our Firebase app when we click the button. --&gt;
15    &lt;script src="application.js"&gt;&lt;/script&gt;
16
17    &lt;div class="container"&gt;
18      &lt;h1&gt;Talks You Should Watch&lt;/h1&gt;
19
20      &lt;h3&gt;Submit a Talk&lt;/h3&gt;
21
22      &lt;form id="recommendationForm"&gt;
23        &lt;div class="form-group"&gt;
24          &lt;label for="talkTitle"&gt;Title&lt;/label&gt;
25          &lt;input class="form-control" id="talkTitle" placeholder="Title of the talk"&gt;
26        &lt;/div&gt;
27
28        &lt;div class="form-group"&gt;
29          &lt;label for="talkPresenter"&gt;Presenter&lt;/label&gt;
30          &lt;input class="form-control" id="talkPresenter" placeholder="Name of the presenter"&gt;
31        &lt;/div&gt;
32
33        &lt;div class="form-group"&gt;
34          &lt;label for="talkLink"&gt;Link&lt;/label&gt;
35          &lt;input type="url" class="form-control" id="talkLink" placeholder="Link to a recording of the talk"&gt;
36        &lt;/div&gt;
37
38        <!-- When you click this button, trigger the submit event on this form. --&gt;
39        &lt;button type="submit" class="btn btn-default"&gt;Submit&lt;/button&gt;
40      &lt;/form&gt;
41    &lt;/div&gt;
42  &lt;/body&gt;
43 &lt;/html&gt;</pre>
```

application.html

```
6  <!-- Load the jQuery library, which we'll use to manipulate HTML elements  
    with Javascript. -->  
7  <script src="https://code.jquery.com/jquery-2.2.0.min.js"></script>  
8  
9  <!-- Load Bootstrap stylesheet, which will is CSS that makes everything  
    prettier and also responsive (aka will work on all devices of all sizes). -->  
10 <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.6...">
```

application.html

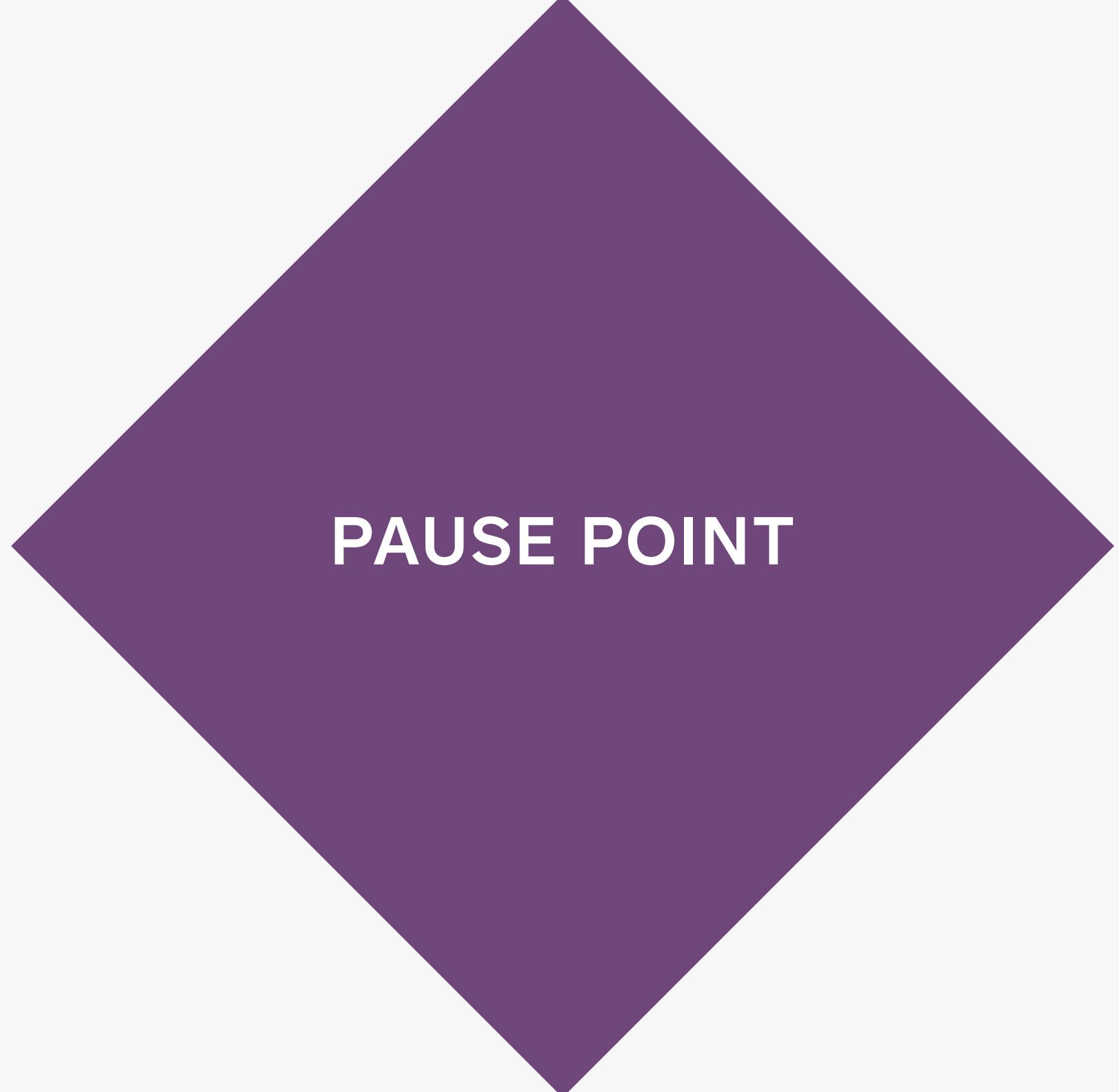
```
22 <form id="recommendationForm">
23   <div class="form-group">
24     <label for="talkTitle">Title</label>
25     <input class="form-control" id="talkTitle"
26       placeholder="Title of the talk">
27   </div>
28
29   <div class="form-group">
30     <label for="talkPresenter">Presenter</label>
31     <input class="form-control" id="talkPresenter"
32       placeholder="Name of the presenter">
33   </div>
34
35   <div class="form-group">
36     <label for="talkLink">Link</label>
37     <input type="url" class="form-control" id="talkLink"
38       placeholder="Link to a recording of the talk">
39   </div>
40
41   <!-- When you click this button, trigger the submit event on this form. -->
42   <button type="submit" class="btn btn-default">Submit</button>
43 </form>
```

application.js

```
1 // TODO: Replace with your Firebase app
2 var myFirebaseApp = "REPLACE-ME-WITH-YOUR-FIREBASE-APP-NAME";
3
4 // Reference to the recommendations object in your Firebase
5 var recommendations = new Firebase("https://" + myFirebaseApp + ".firebaseio.com/recommendations");
6
7 // Save a new recommendation to the database, using the input in the form
8 var submitRecommendation = function () {
9
10    // Get input values from each of the form elements
11    var title = $("#talkTitle").val();
12    var presenter = $("#talkPresenter").val();
13    var link = $("#talkLink").val();
14
15    // Push a new recommendation to the database using those values
16    recommendations.push({
17      "title": title,
18      "presenter": presenter,
19      "link": link
20    });
21  };
22
23 // When the window is fully loaded, call this function.
24 // Note: because we are attaching an event listener to a particular HTML element
25 // in this function, we can't do that until the HTML element in question has
26 // been loaded. Otherwise, we're attaching our listener to nothing, and no code
27 // will run when the submit button is clicked.
28 $(window).load(function () {
29
30   // Find the HTML element with the id recommendationForm, and when the submit
31   // event is triggered on that element, call submitRecommendation.
32   $("#recommendationForm").submit(submitRecommendation);
33
34 });
```

application.js

```
4 // Reference to the recommendations object in your Firebase
5 var recommendations = new Firebase("https://" + myFirebaseApp +
6                                     ".firebaseio.com/recommendations");
7
8 // Save a new recommendation to the database, using the input in the form
9 var submitRecommendation = function () {
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12    var title = $("#talkTitle").val();
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14    var link = $("#talkLink").val();
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17    recommendations.push({
18      "title": title,
19      "presenter": presenter,
20      "link": link
21    });
22  };
```



PAUSE POINT

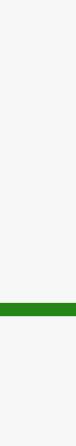
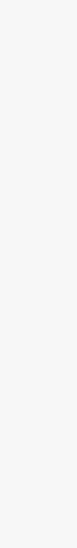
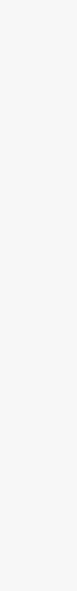
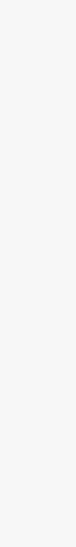
What is asynchronous code execution?

ORIGINAL FUNCTION

interesting stuff

**DO SOMETHING
COOL**

OTHER FUNCTION



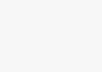
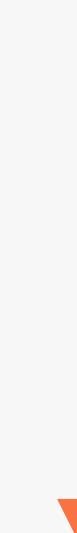
ORIGINAL FUNCTION

DO SOMETHING
COOL

OTHER FUNCTION

interesting stuff

DOING SOMETHING ELSE
OVER HERE
(WILL EVENTUALLY GET
BACK TO YOU)



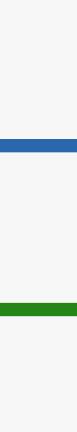
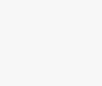
ORIGINAL FUNCTION

OTHER FUNCTION

DOING SOMETHING ELSE
OVER HERE
(WILL EVENTUALLY GET
BACK TO YOU)

interesting stuff

DO SOMETHING
COOL



application.js

```
23 // When the window is fully loaded, call this function.  
24 // Note: because we are attaching an event listener to a particular HTML element  
25 // in this function, we can't do that until the HTML element in question has  
26 // been loaded. Otherwise, we're attaching our listener to nothing, and no code  
27 // will run when the submit button is clicked.  
28 $(window).load(function () {  
29  
30     // Find the HTML element with the id recommendationForm, and when the submit  
31     // event is triggered on that element, call submitRecommendation.  
32     $("#recommendationForm").submit(submitRecommendation);  
33  
34 }) ;
```

Talks You Should Watch

Submit a Talk

Title**Presenter****Link**

Talks You Should Watch

Submit a Talk

Title

Hacking Spacetime for a Successful Career

Presenter

Brandon Hays

Link

<http://confreaks.tv/videos/rubyconf2015-hacking-spacetime-for-a-successful-career>

Submit

recommendations**-KA3ASkQXzynnbFBCbjr**

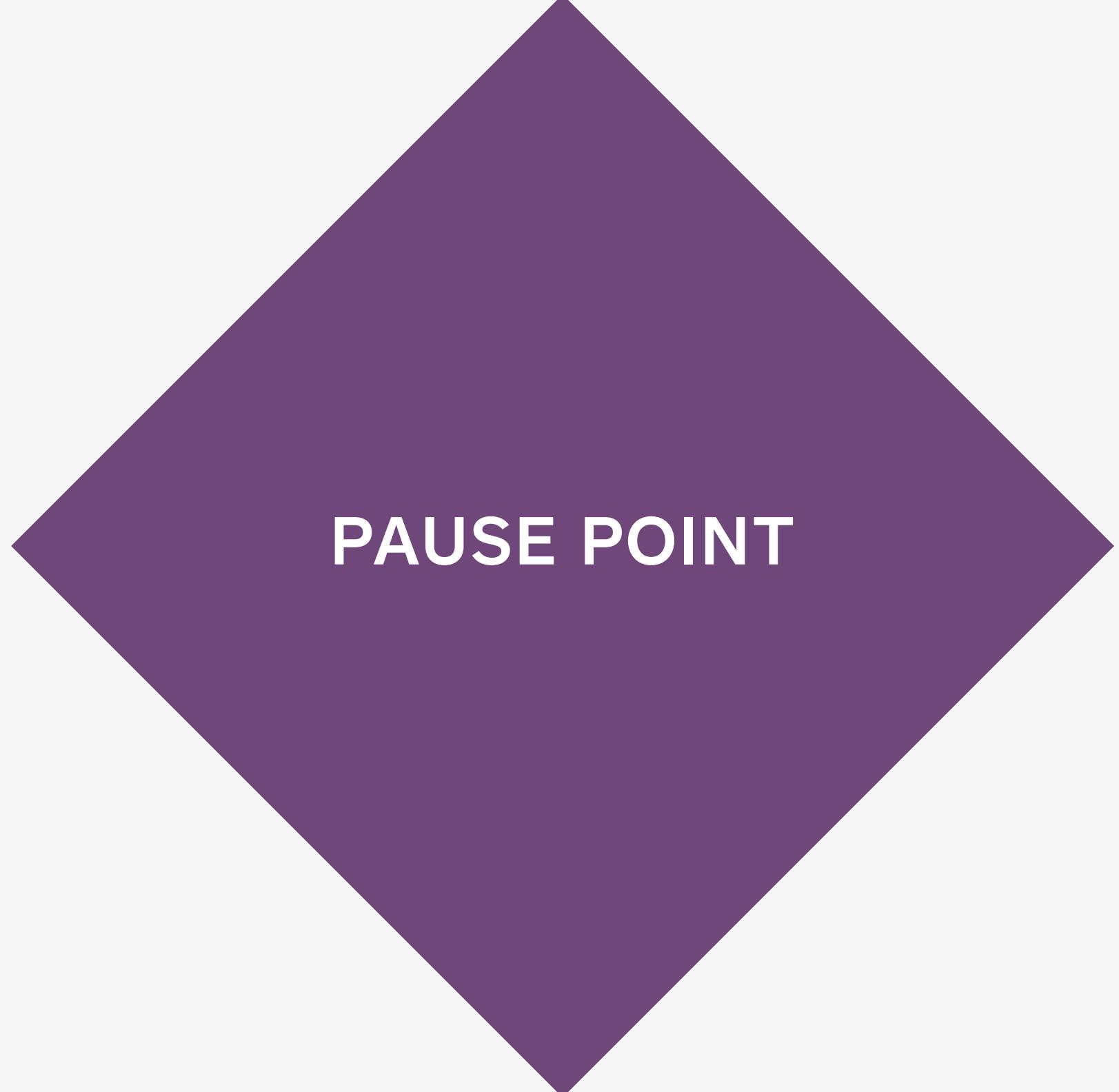
- link:** "https://www.ted.com/talks/chimamanda_adichie_th.."
- presenter:** "Chimamanda Ngozi Adichie"
- title:** "The danger of a single story"

-KA3B-YrkQdgKSIQTf5i

- link:** "https://www.ted.com/talks/chimamanda_adichie_th.."
- presenter:** "Chimamanda Ngozi Adichie"
- title:** "The danger of a single story"

-KA3SHjEZdw7UnjOjYv1

- link:** "http://confreaks.tv/videos/rubyconf2015-hacking.."
- presenter:** "Brandon Hays"
- title:** "Hacking Spacetime for a Successful Career"



PAUSE POINT

You just wrote user-generated data to the cloud!

application.html

```
1 <html>
2   <head>
3     <!-- Load the Firebase library before loading the body. --&gt;
4     &lt;script src="https://cdn.firebaseio.com/js/client/2.4.0.firebaseio.js"&gt;&lt;/script&gt;
5
6     <!-- Load the jQuery library, which we'll use to manipulate HTML elements with Javascript. --&gt;
7     &lt;script src="https://code.jquery.com/jquery-2.2.0.min.js"&gt;&lt;/script&gt;
8
9     <!-- Load Bootstrap stylesheet, which will make everything prettier and also responsive (aka will work on all devices of all sizes). --&gt;
10    &lt;link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/css/bootstrap.min.css" integrity="sha384-1q8mTJOASx8j1Au+a5WDVnPi2lkFfwwEAa8hDDjZlpLegxhjVME1fgjWPGmkzs7" crossorigin="anonymous"&gt;
11  &lt;/head&gt;
12
13 &lt;body&gt;
14   <!-- Load the application script, which will save data to our Firebase app when we click the button. --&gt;
15   &lt;script src="application.js"&gt;&lt;/script&gt;
16
17   &lt;div class="container"&gt;
18     &lt;h1&gt;Talks You Should Watch&lt;/h1&gt;
19
20     &lt;h3&gt;Last Talk Proposed&lt;/h3&gt;
21
22     &lt;table class="table table-striped"&gt;
23       &lt;thead&gt;
24         &lt;tr&gt;
25           &lt;th&gt;Title&lt;/th&gt;
26           &lt;th&gt;Presenter&lt;/th&gt;
27           &lt;th&gt;Link&lt;/th&gt;
28         &lt;/tr&gt;
29       &lt;/thead&gt;
30       &lt;tbody&gt;
31         &lt;tr&gt;
32           &lt;!-- This is empty for now, but it will be filled out by an event handler in application.js with the most recent recommendation data from Firebase. --&gt;
33           &lt;td id="title"&gt;&lt;/td&gt;
34           &lt;td id="presenter"&gt;&lt;/td&gt;
35           &lt;td&gt;&lt;a id="link" target="_blank"&gt;&lt;/a&gt;&lt;/td&gt;
36         &lt;/tr&gt;
37       &lt;/tbody&gt;
38     &lt;/table&gt;
39
40     &lt;h3&gt;Submit a Talk&lt;/h3&gt;
41
42     &lt;form id="recommendationForm"&gt;
43       &lt;div class="form-group"&gt;
44         &lt;label for="talkTitle"&gt;Title&lt;/label&gt;
45         &lt;input class="form-control" id="talkTitle" placeholder="Title of the talk"&gt;
46       &lt;/div&gt;
47
48       &lt;div class="form-group"&gt;
49         &lt;label for="talkPresenter"&gt;Presenter&lt;/label&gt;
50         &lt;input class="form-control" id="talkPresenter" placeholder="Name of the presenter"&gt;
51       &lt;/div&gt;
52
53       &lt;div class="form-group"&gt;
54         &lt;label for="talkLink"&gt;Link&lt;/label&gt;
55         &lt;input type="url" class="form-control" id="talkLink" placeholder="Link to a recording of the talk"&gt;
56       &lt;/div&gt;
57
58       &lt;!-- When you click this button, trigger the submit event on this form. --&gt;
59       &lt;button type="submit" class="btn btn-default"&gt;Submit&lt;/button&gt;
60     &lt;/form&gt;
61   &lt;/div&gt;
62 &lt;/body&gt;
63 &lt;/html&gt;</pre>
```

application.html

```
20    <h3>Last Talk Proposed</h3>
21
22    <table class="table table-striped">
23        <thead>
24            <tr>
25                <th>Title</th>
26                <th>Presenter</th>
27                <th>Link</th>
28            </tr>
29        </thead>
30        <tbody>
31            <tr>
32                <!-- This is empty for now, but it will be filled out by an event handler
33                    in application.js with the most recent recommendation data
34                    from Firebase. -->
35                <td id="title"></td>
36                <td id="presenter"></td>
37                <td><a id="link" target="_blank"></a></td>
38            </tr>
39        </tbody>
40    </table>
```

application.js

```
1 // TODO: Replace with your Firebase app
2 var myFirebaseApp = "REPLACE-ME-WITH-YOUR-FIREBASE-APP-NAME";
3
4 // Reference to the recommendations object in your Firebase
5 var recommendations = new Firebase("https://" + myFirebaseApp + ".firebaseio.com/recommendations");
6
7 // Save a new recommendation to the database, using the input in the form
8 var submitRecommendation = function () {
9
10    // Get input values from each of the form elements
11    var title = $("#talkTitle").val();
12    var presenter = $("#talkPresenter").val();
13    var link = $("#talkLink").val();
14
15    // Push a new recommendation to the database using those values
16    recommendations.push({
17      "title": title,
18      "presenter": presenter,
19      "link": link
20    });
21  };
22
23 // Get the single most recent recommendation from the database and
24 // update the table with its values. This is called every time the child_added
25 // event is triggered on the recommendations Firebase reference, which means
26 // that this will update EVEN IF you don't refresh the page. Magic.
27 recommendations.limitToLast(1).on('child_added', function(childSnapshot) {
28   // Get the recommendation data from the most recent snapshot of data
29   // added to the recommendations list in Firebase
30   recommendation = childSnapshot.val();
31
32   // Update the HTML to display the recommendation text
33   $("#title").html(recommendation.title)
34   $("#presenter").html(recommendation.presenter)
35   $("#link").html(recommendation.link)
36
37   // Make the link actually work and direct to the URL provided
38   $("#link").attr("href", recommendation.link)
39 });
40
41 // When the window is fully loaded, call this function.
42 // Note: because we are attaching an event listener to a particular HTML element
43 // in this function, we can't do that until the HTML element in question has
44 // been loaded. Otherwise, we're attaching our listener to nothing, and no code
45 // will run when the submit button is clicked.
46 $(window).load(function () {
47
48   // Find the HTML element with the id recommendationForm, and when the submit
49   // event is triggered on that element, call submitRecommendation.
50   $("#recommendationForm").submit(submitRecommendation);
51
52});
```

tutorials.firebaseio/code_samples/v3/application.js

application.js

```
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```

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Presenter

Kronda Adair

Link

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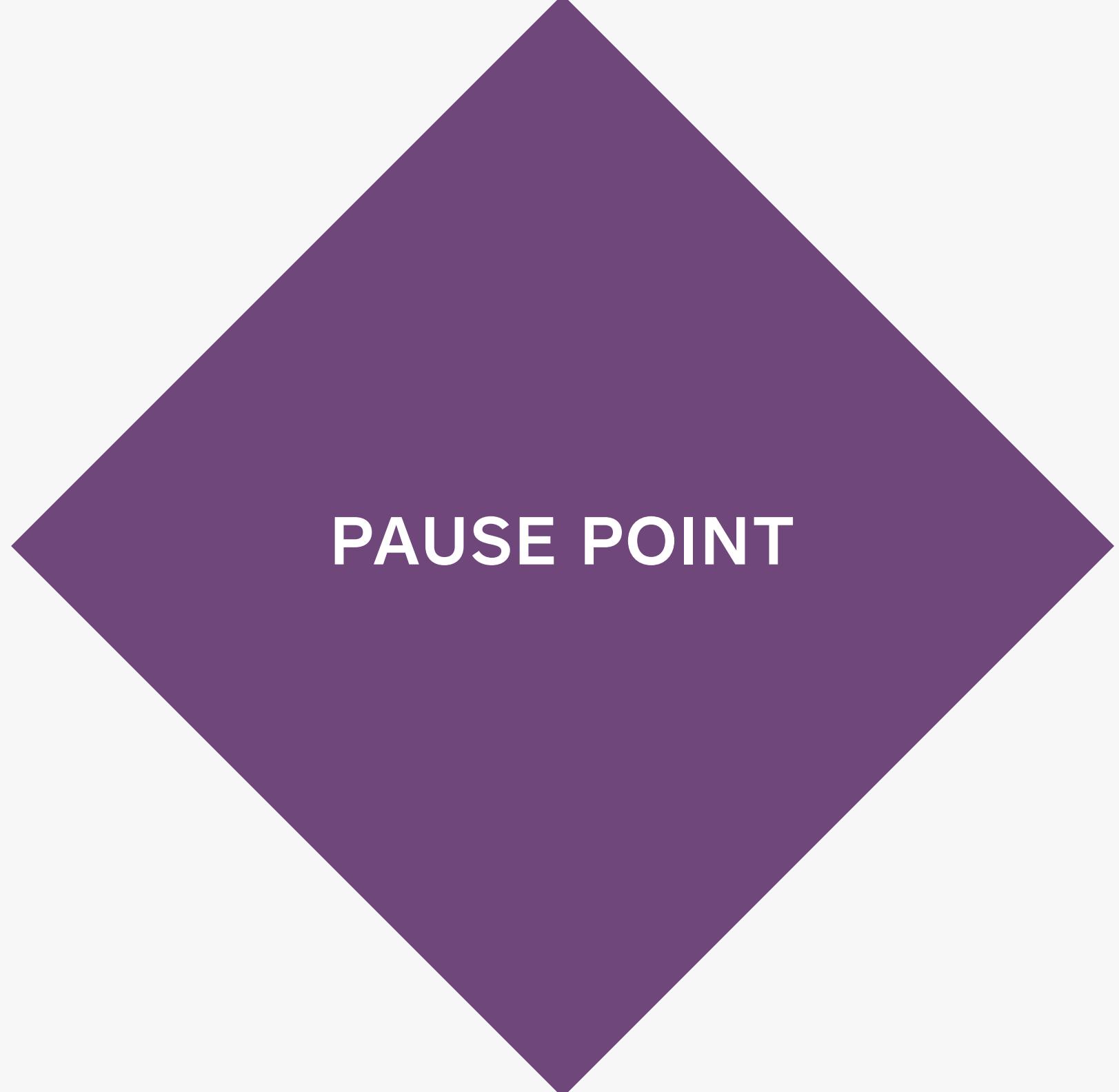
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