

Stop Battling the Mundane

The Why and How of TypeScript



Cleveland JavaScript Meetup
June 19, 2017

Thanks to



LISTEN.
THINK.
SOLVE.SM

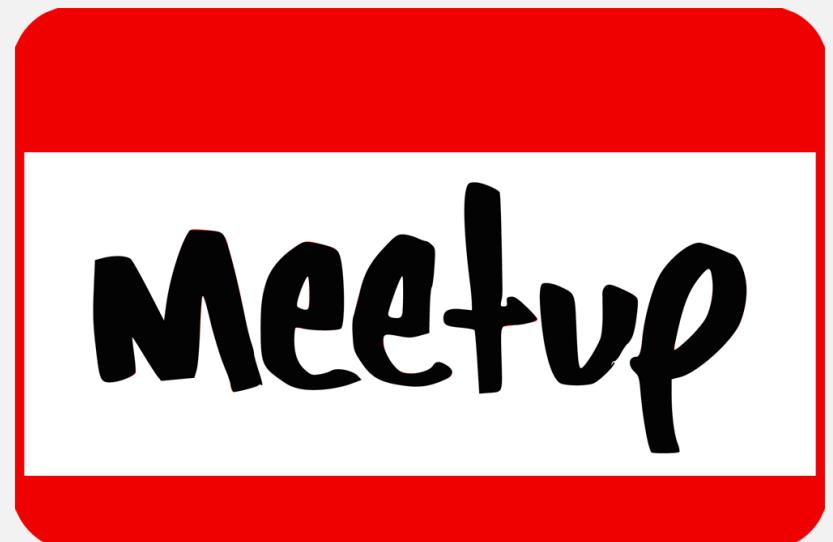
HOUSEKEEPING

Bathrooms

Food

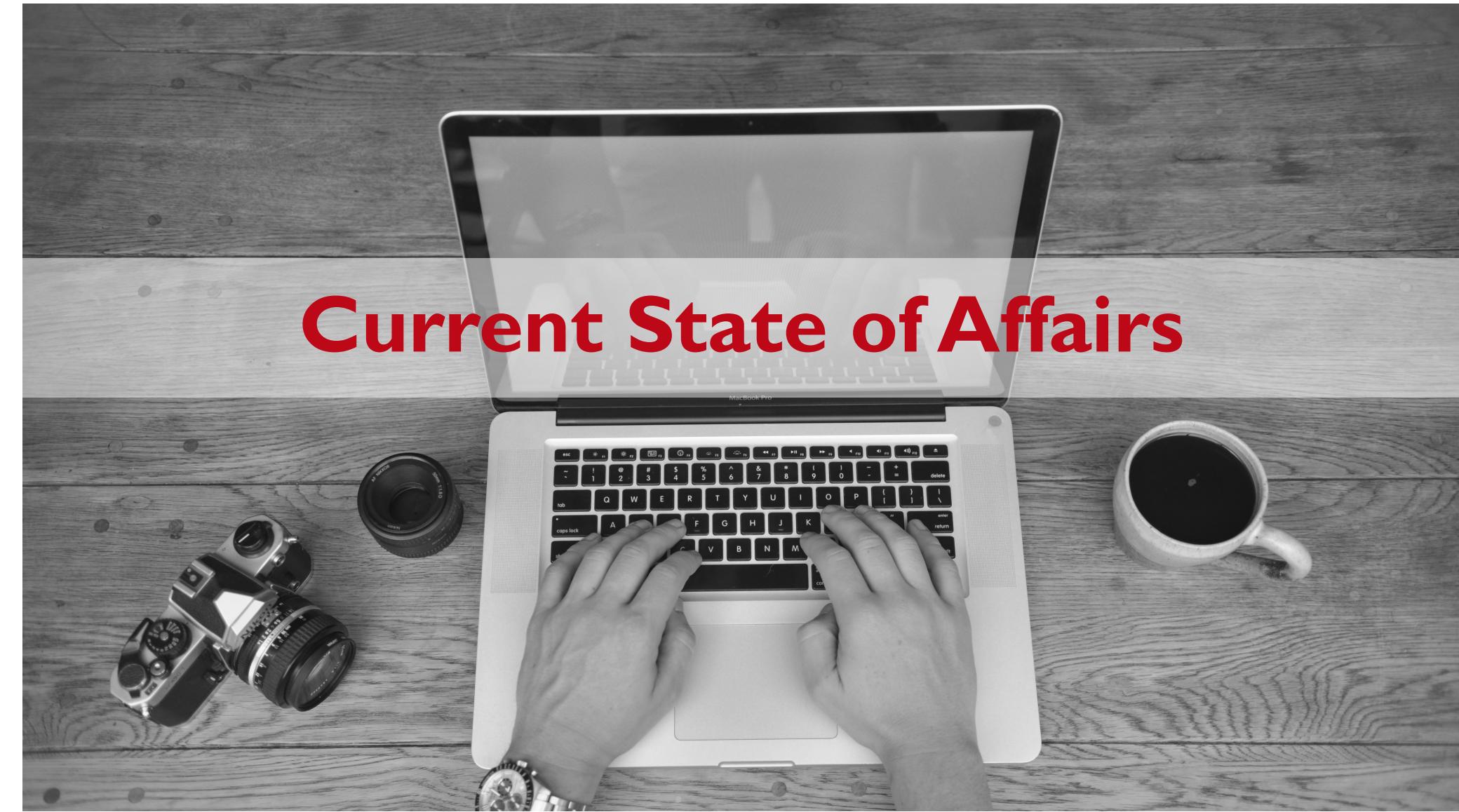
Vote for sessions on [meetup.com](https://www.meetup.com)

Call for presenters





Current State of Affairs





A Day in the Life



BEGIN.





com·pile

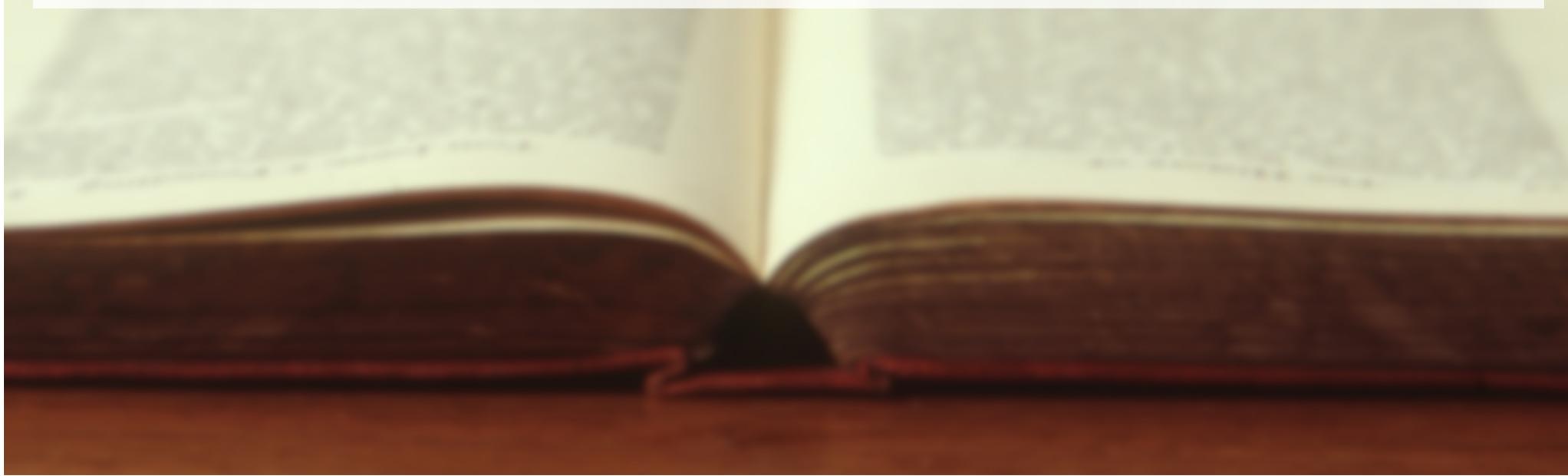
/kəm'pīl/ 

verb

1. produce (something, especially a list, report, or book) by assembling information collected from other sources.

"the local authority must compile a list of taxpayers"

synonyms: [assemble](#), put together, make up, [collate](#), [compose](#), [organize](#), arrange; [More](#)





Documentation

A black and white photograph of a knight in full armor, including a helmet and chainmail, holding a sword.

Lack of
encapsulation,
destroyer of “flow”

```
4 /**
5  * Says hello.
6  * @param {String} name a name
7  * @return {String}      a greeting for 'name'
8 */
9 function sayHelloTo( name ) {
10    const toSay = `Hello, ${name}!`;
11
12    return toSay;
13 }
14
15 /**
16  * Adds all the values in an array.
17  * @param {Array} arr an array of numbers
18  * @return {Number}   the sum of all the array values
19 */
20 const addArray = arr => {
21    const result = arr.reduce((a, b) => a + b, 0);
22
23    return result;
```





Refactoring

Debugging



! 0/6 Execution error: Something went wrong when exe
[TypeError: Thursday is not a function]

✖ ► Uncaught TypeError: a.foo is not a function
at <anonymous>:1:3
✖ ► Uncaught TypeError: Cannot read property 'bar' of undefined
at <anonymous>:1:6

The screenshot shows a browser's developer tools open to the 'Console' tab. The console interface includes a toolbar with icons for search, refresh, and copy, followed by tabs for Elements, Console, Sources, Network, Timeline, Profiles, Resources, Security, and Audits. Below the tabs is a dropdown menu for frame selection and a checkbox for 'Preserve log'. The main area displays a list of error messages in red text. At the bottom, there is a scroll bar.

Message	File	Line
✖ Failed to load resource: net::ERR_UNKNOWN_URL_SCHEME	http://travisbklein.com/freezeframe.js-master/src/js/vendor/jquery-2.1.4.js	
✖ Uncaught ReferenceError: jQuery is not defined	freezeframe.min.js:1	
✖ Uncaught TypeError: freezeframe is not a function	traviss-amazing-site-b0831e.webflow.io/:9	
✖ Uncaught SyntaxError: Unexpected token >	traviss-amazing-site-b0831e.webflow.io/:16	



TS

Interfaces Union types
Enums Strict null checking
ESNext features String literal types
iterators, generators Discriminated unions
async/await Structural subtyping
Generics Indexed types
Decorators Mapped types
Nullable types & more...
Intersection types



TS

- Improved:**
- Unit testing
 - Refactoring
 - Documentation
 - Debugging

ONE WAY

Build with tsc

- Use `--allowJs`
- Passthrough

Check select JS files

- Add `// @ts-check` to the top of files
- Add type definitions for dependencies

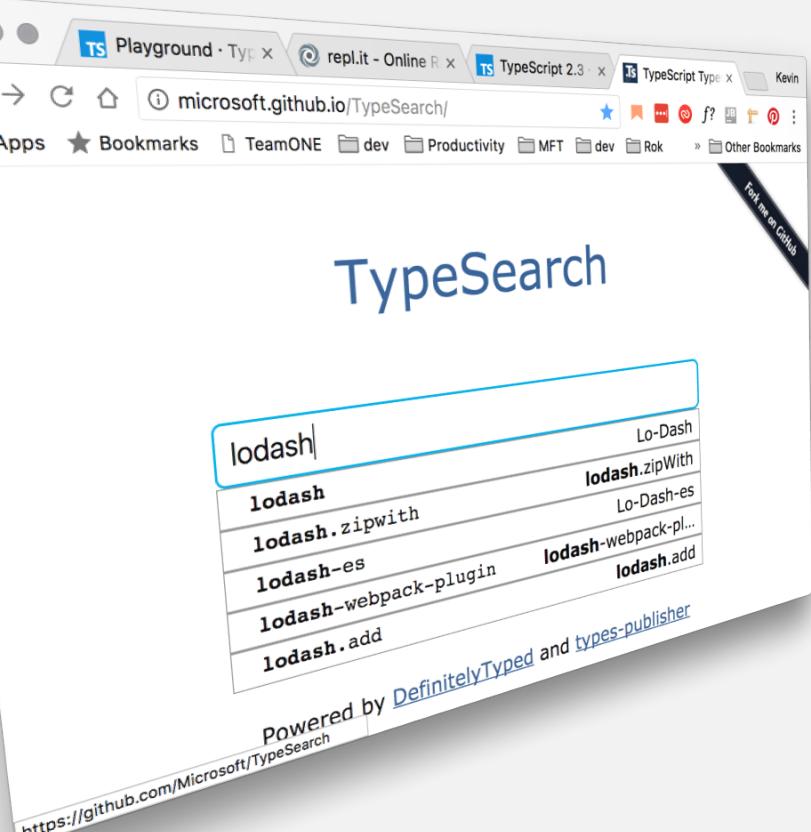
Check all JS files

- Use tsc's `--checkJs`
- Ignore specific files with `// @ts-nocheck`

Convert to TS

- Add types
- Leverage TS & ESNext features

Type Definitions



- Have a .d.ts extension
- Search for types at:
<http://microsoft.github.io/TypeSearch/>
- To install:
`npm install @types/<package_name>`
- tsc will by default search node_modules/@types for *.d.ts files
- For example:
`npm install @types/node`

Let's Create a TS Project

1

```
$ mkdir ts-sample
$ cd ts-sample
$ git init          # optional
$ npm init
$ npm install -save-dev typescript
$ ./node_modules/.bin/tsc --init
```

2

```
1 // greeter.ts
2
3 class Greeter {
4
5     private _greeting: string;
6
7     constructor(greeting: string) {
8         this._greeting = greeting;
9     }
10
11    public greet() {
12        return "Hello, " + this._greeting;
13    }
14 }
15
16 let greeter: Greeter = new Greeter("world");
17 console.log(greeter.greet());
18
```

3

```
$ tsc
```

4

```
$ npm install --save lodash
$ npm install --save-dev @types/lodash
```

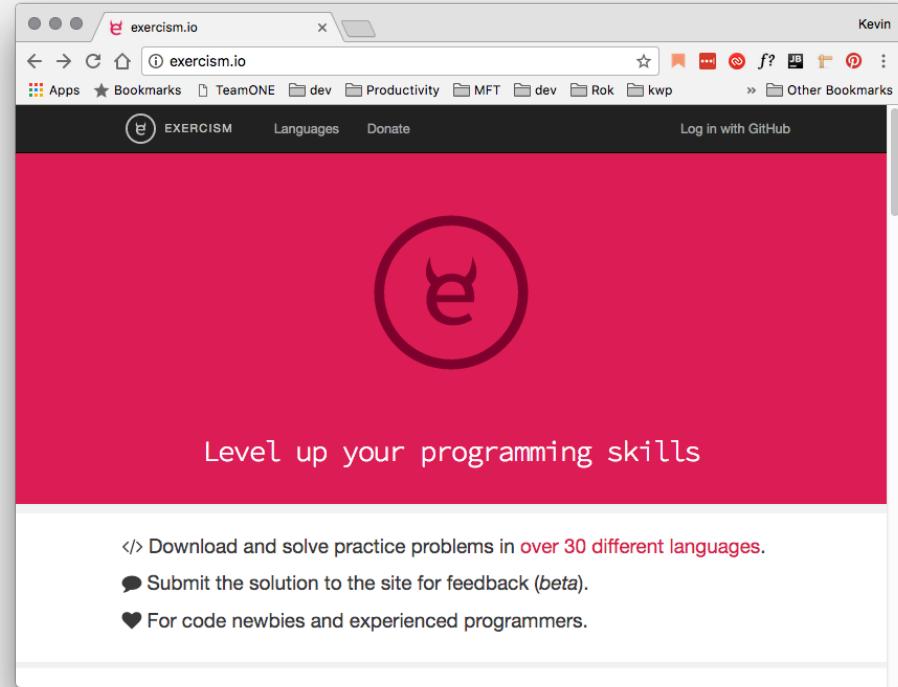
Let's Hack

1

Use new project to experiment
with TypeScript

2

<http://exercism.io/>



References

[TypeScript Docs](#)

[TypeScript Types Search](#)

[TypeScript Playground](#)

[Exercism \(TypeScript\)](#)