TypeScript

will finally bring peace to your troubled soul

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TypeScript

JavaScript + types

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"Dynamic typing": The belief that you can't explain to a computer why your code works, but you can keep track of it all in your head.

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```
navigator.geolocation.getCurrentPosition(function onSuccess(position) {
  var lat = position.latitude;
  var long = position.longitude;

  var lastUpdated = Date.parse(position.timestamp);
  var now = new Date();
  var positionIsCurrent = now.getYear() === lastUpdated.getYear();

  if (positionIsCurrent) {
    var div = document.createElement("div");
    div.class = "message";
    div.style = "width: 100%; height: 100px; background-color: red;";
    div.text = "Up to date position: " + lat + ", " + long;
    document.body.append(div);
  } else {
    var messageDivs = document.querySelectorAll("div.message");
    messageDivs.forEach(function (message) {
      message.style.display = false;
    });
  }
}, { enableHighAccuracy: "never" });
```

Type Inference

Type Annotation

```
var y: number;
y = 1; // compiles
y = "hello"; // won't compile: "Type 'string' is not assignable to type number"
```

```
function sayHelloTo(name: string): string {
  return "hello " + name;
}

var message = sayHelloTo("Tim"); // message inferred as string
var result: number = sayHelloTo("everybody"); // won't compile
message = sayHelloTo({name: "Tim"}); // won't compile
```

Type Annotation

```
var callback: (e: Event) => boolean;
```

```
var person: { name: string, age: number };
```

```
var lotsOfStrings: string[];
```

```
var stringOrNumber: string|number;
```

```
var noIdea: any;
```

Interfaces

```
var greeter: { hello: (name: string) => string, bye: (name: string) => string, language: string };
```

```
interface Greeter {
  hello(name: string): string;
  bye(name: string): string;

  language: string;
}

var greeter: Greeter;
```

Classes

```
class Greeter {
  hello(name: string): string {
    return "hi " + name;
  }

  bye(name: string): string {
    return "bye " + name;
  }

  language = "English";
}

var greeter: Greeter = new Greeter();
```

```
var Greeter = (function () {
  function Greeter() {
    this.language = "English";
  }
  Greeter.prototype.hello = function (name) {
    return "hi " + name;
  };
  Greeter.prototype.bye = function (name) {
    return "bye " + name;
  };
  return Greeter;
})();
var greeter = new Greeter();
```

Optional Typing

ES2015 (ES6)

Arrow functions `(x) => x * 2`

Destructuring `var {a, b} = {a:1, b:2}`

Spread operator `var xs = [1, 2, ...iterable, 5, 6];`

For/of `for (var x of [1, 2, 3}) { ... }`

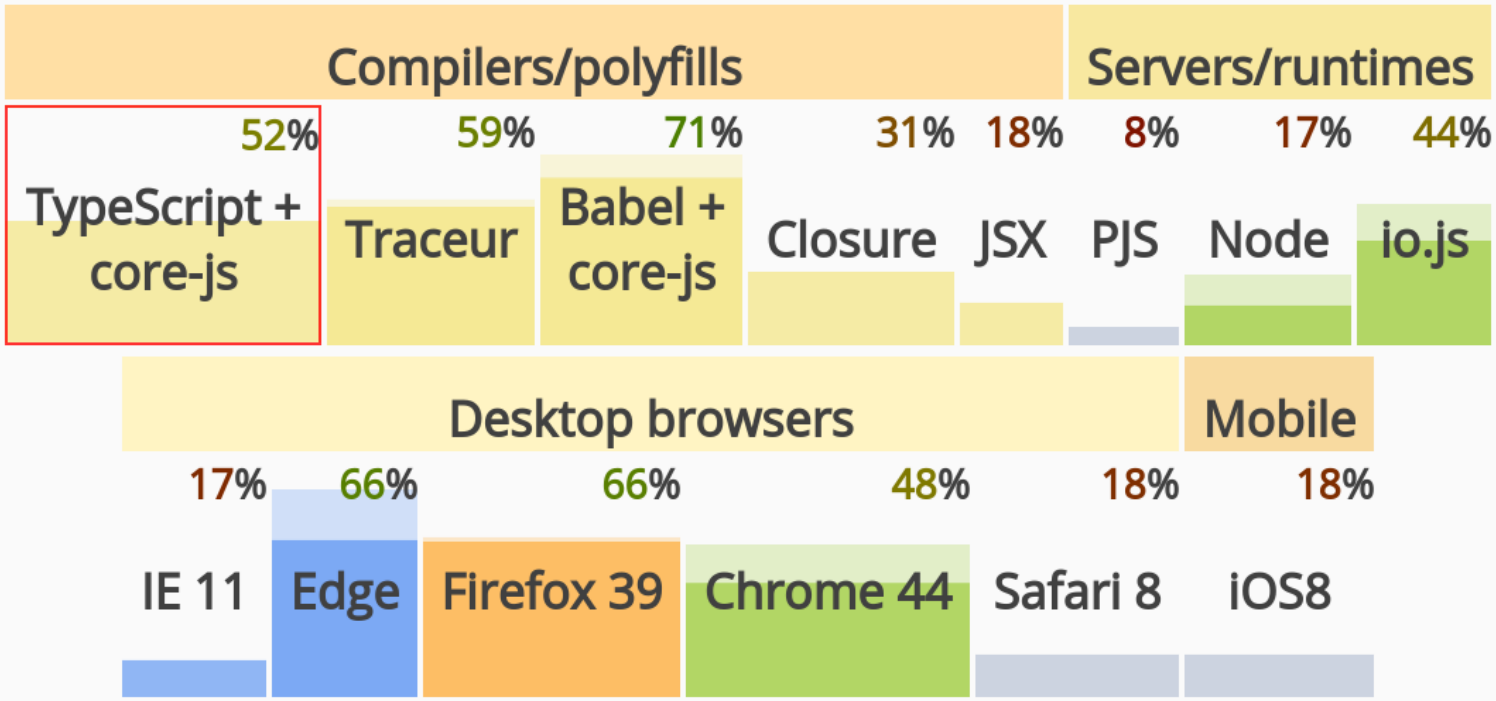
Symbols `var s = Symbol("mySymbol")`

Let/const `let x = 1; const y = "hi"`

Template strings `y = `hello ${myVar}``

And ES2015 modules, classes, promises, default parameters, unicode support, ES7 decorators, and more...

ES2015 Compatibility



(See kangax.github.io/compat-table/es6/ for full details)

ES2015 Backward compatibility

```
var f = (x, y) => x * y

var {a, b} = {a:1, b:2}

var iterable = [3, 4];
var abc = [1, 2, ...iterable, 5, 6];

for (var i of abc) {
  f(i, 10);
}


let x = 1;
const y = "hi"

var z = `hello ${y}`
```

```
var f = function (x, y) { return x * y; };

var _a = { a: 1, b: 2 }, a = _a.a, b = _a.b;

var iterable = [3, 4];
var abc = [1, 2].concat(iterable, [5, 6]);

for (var _i = 0; _i < abc.length; _i++) {
  var i = abc[_i];
  f(i, 10);
}

var x = 1;
var y = "hi";

var z = "hello " + y;
```

TypeScript Roadmap

ES2015 Generators

More powerful types: local types, intersection types, generic aliases

More powerful classes: 'extends' expressions, abstract classes

JSX support

Async/await

Built-in module bundling

And more...

(See github.com/Microsoft/TypeScript/wiki/Roadmap for full details)

Downsides

Compile step

Occasional type wrangling

Could be more ambitious

Other options

Closure compiler

Flow

Babel

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