

So how does Babel even work?

Henry Zhu

How does it work?

As a compiler

As an open source project

As part of the JS community

Compiler?

Magic.

# Compiler?

High lvl -> Low lvl  
C -> Assembly

Transpiler?

JavaScript to JavaScript

# How is Babel a compiler?

# Let's create the JSX transform to find out!



← → C ⓘ babeljs.io/repl2#?babili=false&browsers=&build=&builtIns=false&circleciRepo=&code\_lz=EoUwhgxgLglg8gWQHQCcQDsAmIUoBQABIQDwAWAjAHwASIANvQPY

**BABEL** Learn ES2015 Docs ▾ Try it out Blog FAQ Q Donate Forum

**Settings**

- Evaluate
- Line Wrap
- Minify
- Prettify

```
1 ReactDOM.render(  
2   <h1>Hello, world!</h1>,  
3   document.getElementById('root')  
4 );
```

```
1 'use strict';  
2  
3 ReactDOM.render(React.createElement(  
4   'h1',  
5   null,  
6   'Hello, world!'  
7 ), document.getElementById('root'));
```



# Henry Zhu

@left\_pad

Maintaining @babeljs; just a volunteer in  
the JS community 😊. @Behance,  
@Adobe. Soli Deo Gloria 🙌

📍 New York, NY

🔗 [github.com/hzoo](https://github.com/hzoo)

# JSX ?



**Jason Miller**  

@\_developit Follows you

Creator of [@preactjs](#), a 3kb react alternative: [preactjs.com](#). Keeper of the bytes, remover of the features.  
[github.com/developit](#)

📍 Dundas, Ontario, Canada

🔗 [jasonformat.com](#)

“XML-like expression  
compiled to a function call” - Jason

```
<div id="one">  
| Hello  
</div>
```

React.createElement(  
 "div",  
 { id: "one" },  
 "Hello"  
);

```
graph LR; A["<div id='one'>"] --> B["React.createElement("div", { id: 'one' }, 'Hello')"]; A --> C["</div>"]
```

# Babel ?



**Kent C. Dodds**  
@kentcdodds

Following



Replies to @jedschmidt @left\_pad @dan\_abramov

**Babel : JavaScript :: jQuery : HTML**

Or

**Babel : AST :: jQuery : DOM**

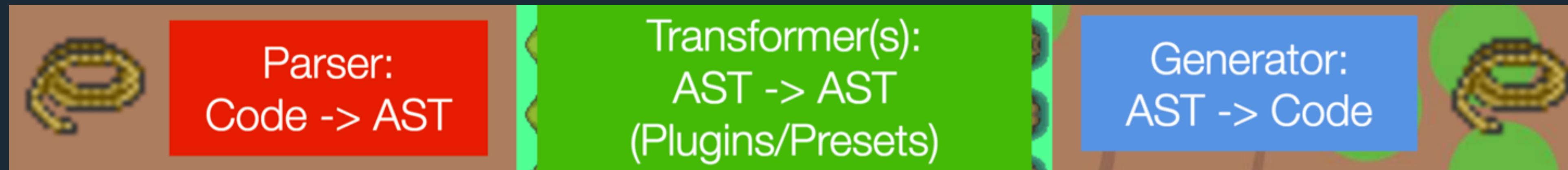
3:58 PM - 16 May 2017

AST ?

Abstract syntax tree

# Babel as Compiler

babylon



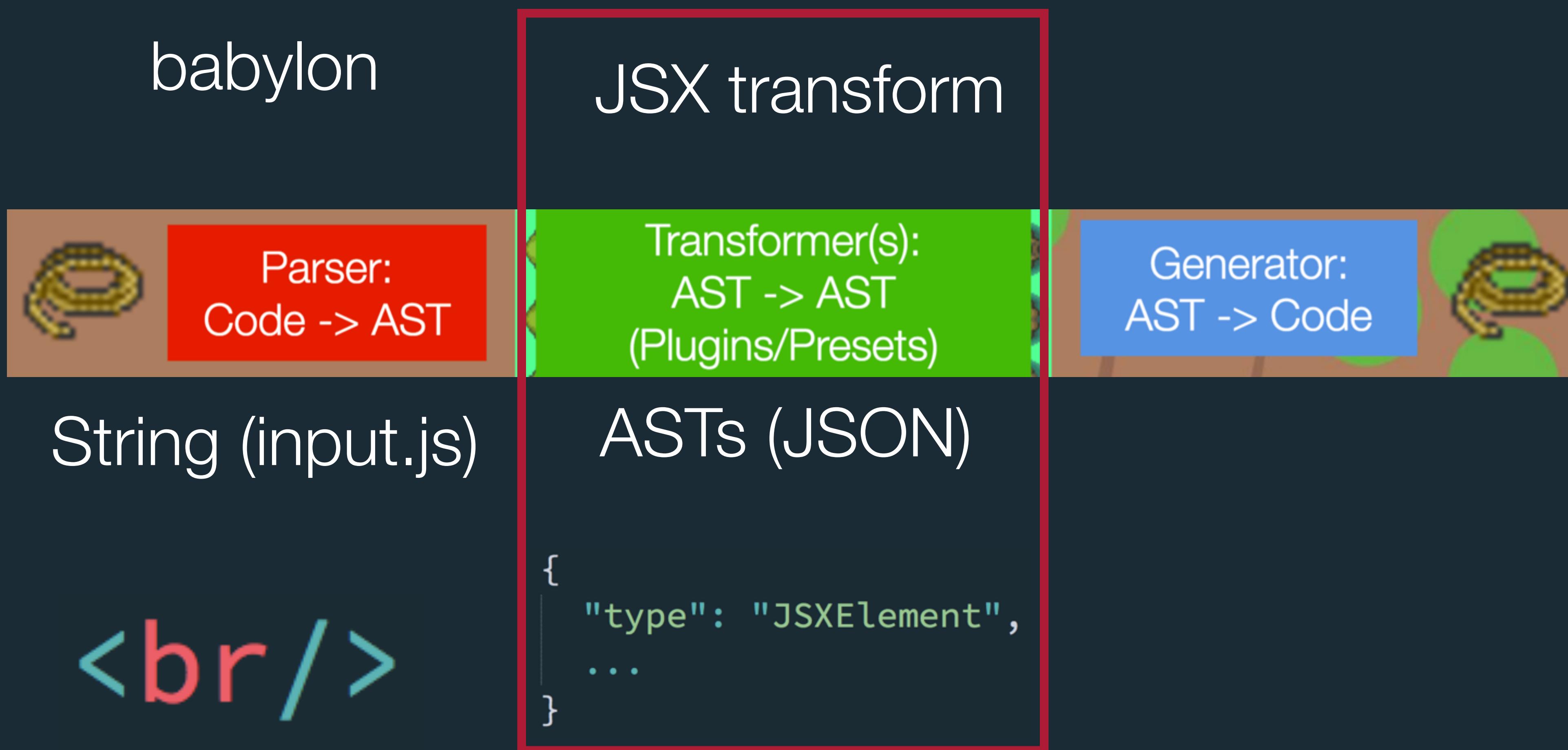
String (input.js)

<br />

# #1: Parsing

h → {  
  "type": "Identifier",  
  "name": "h"  
}

# Babel as Compiler



## #2: Transformation

h



```
{  
  "type": "Identifier",  
  "name": "h"  
}  
  
↓  
  
{  
  "type": "Identifier",  
  "name": "rocket"  
}
```

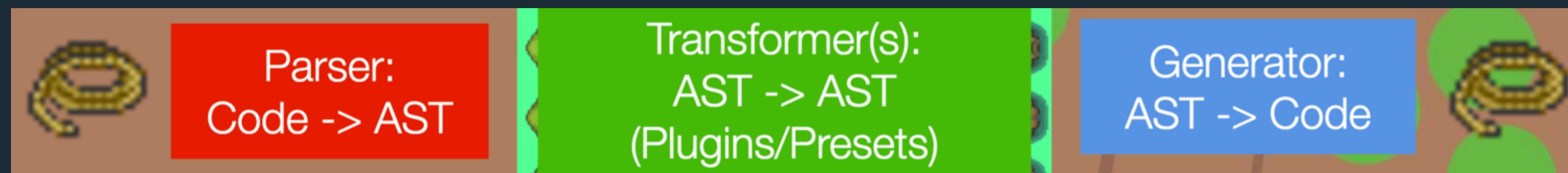
A JSON object transformation diagram. The top part shows the original state: an object with a single key-value pair where the type is "Identifier" and the name is "h". A downward arrow points to the bottom part, which shows the transformed state: an object with a single key-value pair where the type is "Identifier" and the name is "rocket". The name value "rocket" contains the rocket ship icon from the previous image.

# Babel as Compiler

babylon

JSX transform

babel-generator  
prettier



String (input.js)

<br/>

```
{  
  "type": "JSXElement",  
  ...  
}
```

ASTs (JSON)

String (output.js)

h('br');

# #3 Printing

```
{  
  "type": "Identifier",  
  "name": "🚀"  
}
```



Babel: a tool to manipulate ASTs

# ASTExplorer.net



**Felix Kling**

@fkling42 Follows you

JavaScript and web development  
enthusiast, UIE @ FB

📍 Bay Area, CA

🔗 [github.com/fkling](https://github.com/fkling)

Maybe I should just make  
my own compiler now? 🤔

“it’s more than  
what meets the eye”

```
// custom components
<A></A>
// attributes
<a a="1'"></a>
// attributes with an expression
<a a={a}></a>
// attributes without a value default to true
<a a></a>
// children
<div><div></div></div>
// children with `JSXText`
<div>a</div>
// children with `JSXExpressionContainer`
<div>{a}</div>
// throw on `JSXNamespacedName`
<a:b></a:b>
// handle `JSXSpreadAttribute`
<a {...b}></a>
// handle `this.x` as a `JSXIdentifier`
<this.C></this.C>
// handle `JSXMemberExpression`
<A.B></A.B>
// handle whitespace in attributes or `JSXText`
<div>
| <div></div>
</div>
// handle `JSXEmptyExpression`
<a>{}</a>
// option for a different pragma:
h(), React.createElement()
```

How does it work?

As a compiler

As an open source ~~project~~  
community

As part of the JS community

5:00 pm

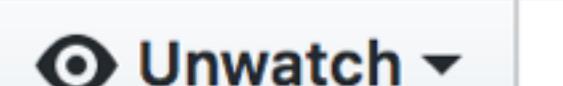


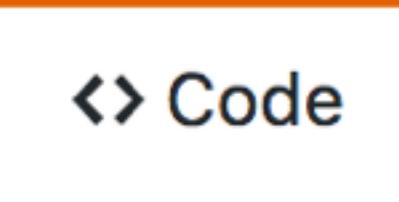
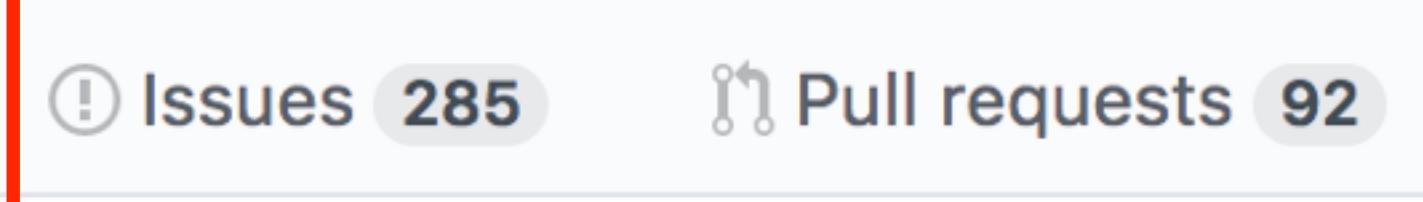
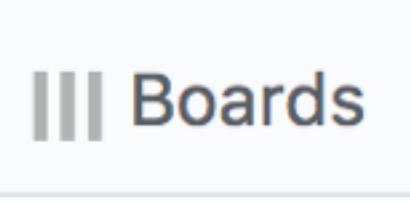
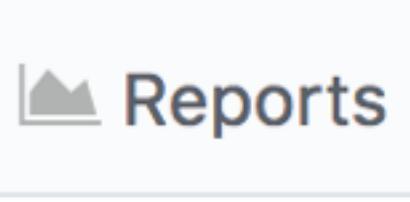
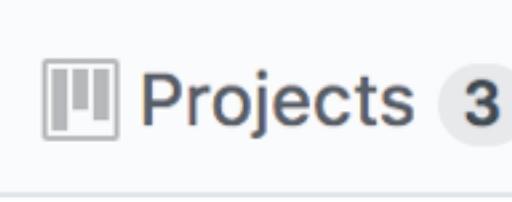
**Max Stoiber**

I want you to contribute to open source

# Success in Open Source?

 [babel / babel](#) 

 698  22,261  2,039

  Pull requests 92    Wiki Insights ▾

 Babel is a compiler for writing next generation JavaScript. <https://babeljs.io/> 

[babel](#) [javascript](#) [ast](#) [compiler](#) [flavortown](#) [Manage topics](#)

 8,228 commits  20 branches  552 releases  377 contributors  MIT



Tweets

746

Following

22

Followers

25.3K

Likes

120

**Tweets**

**Tweets & replies**

**Media**

## Babel

@babeljs Follows you

Official account of Babel, the community driven compiler for writing next generation JavaScript. Join us: slack.babeljs.io, babeljs.io/users

📍 Flavortown

🔗 babeljs.io

📅 Joined January 2015

⌚ Born on September 28

⬇️ Pinned Tweet

**Babel** @babeljs · 10 Dec 2016

If you're thinking Babel is awesome now, know that it will be so much greater with your help! Let's work together on this 🤝

**Henry Zhu@ReactRally** @left\_pad

The State of Babel

babeljs.io/blog/2016/12/0...



16

71



 npm install babel-core

how? learn more



hzoo published a week ago

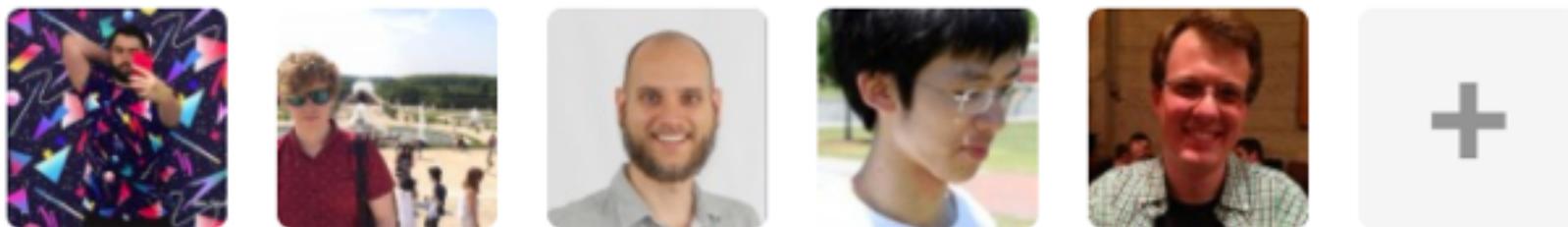
6.26.0 is the latest of 249 releases

[github.com/babel/babel/tree/master/package...](https://github.com/babel/babel/tree/master/package...)

[babeljs.io](http://babeljs.io)

MIT 

## Collaborators [edit](#)



## Stats

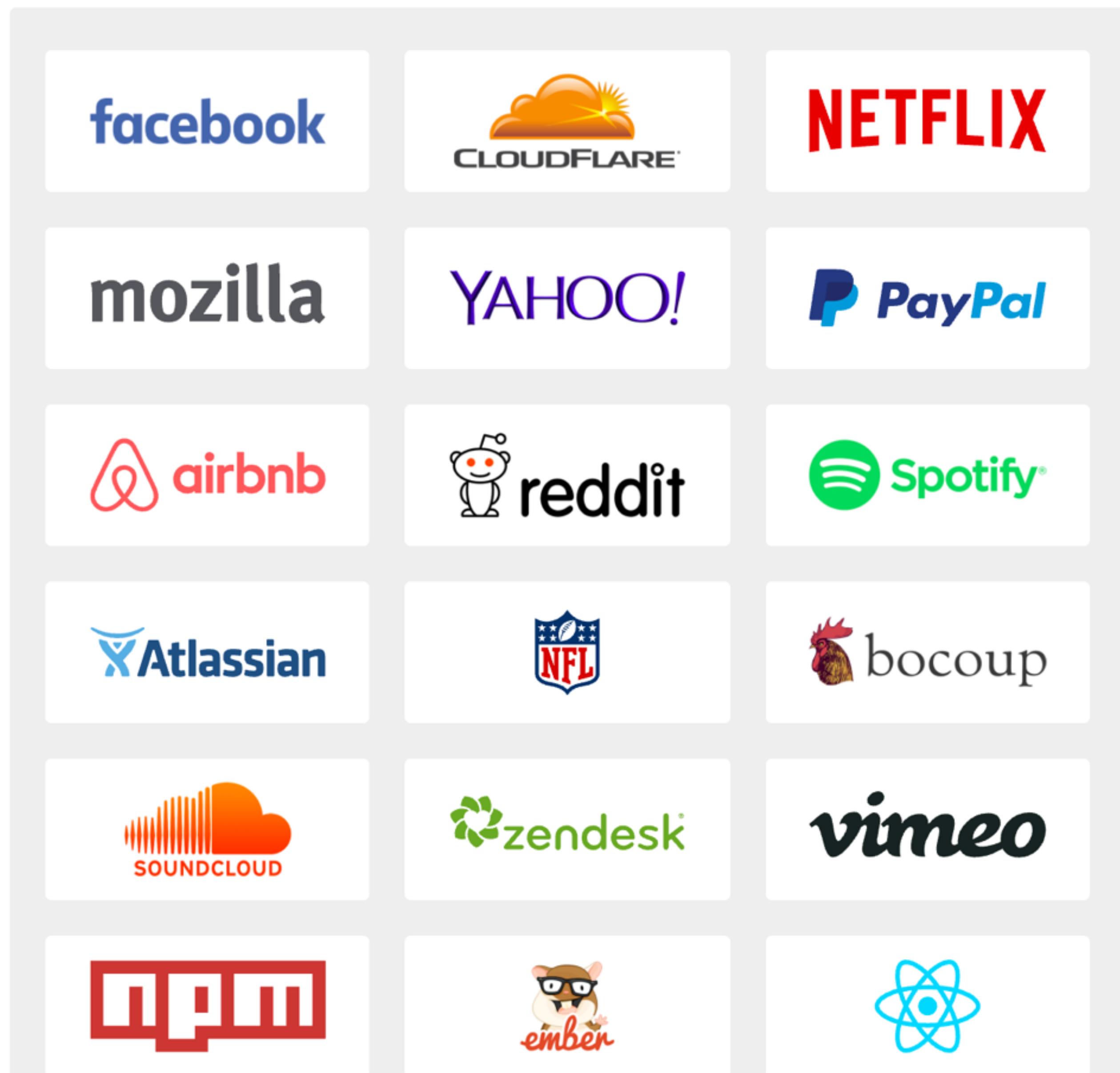
444,097 downloads in the last day

2,420,453 downloads in the last week

9,517,647 downloads in the last month

## See who's using Babel

Logos are added by company representatives. These companies may or may not be using Babel on their main web properties, but they're definitely using it somewhere in their organizations :)

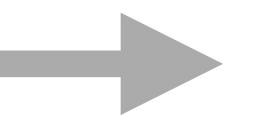


Metrics can hurt us

20k stars

9m downloads/month

Used by FB, etc



“Must be a full funded company”

“Must be maintained by  
the top companies that use it”

“Must have thousands of contributors”

“Must need to make a perfect PR”

“Must be extremely complicated”

“Must never make mistakes”

What ~~I've learned~~ I'm learning  
as a maintainer

# Build character

We should be able to export pure ES6+ and not have to pre-compile dependencies at this point, it's 2017.

There should be a simple switch that says "I KNOW WHAT I'M DOING, PLEASE TRANSPILE/COMPILE EVERYTHING I GIVE YOU" without having to fiddle with `ignore` and `only` regex globs or what have you.

ES6+ IS HERE!  
IT IS TIME!

This problem just cost us 4 man-days.

# Read people's minds

The screenshot shows a messaging application with a light gray background. At the top, there is a large, semi-transparent watermark-like text "Read people's minds" in black font. Below this, the message feed starts with a message from an anonymous user (indicated by a black square icon) at 10:29 AM, which has a star icon next to it. The message content is "joined #discussion". The next message is from another anonymous user at 10:30 AM, stating "babel-node script.js // SyntaxError: Unexpected token import". Finally, a message from a user named "Henry Zhu" (represented by a small profile picture of a person with glasses) at 11:24 AM, with the text "um". The messages are displayed in a clean, modern style with a white background for each message card.

10:29 AM ☆

joined #discussion

10:30 AM

babel-node script.js // SyntaxError: Unexpected token import

Henry Zhu 11:24 AM

um

# Empathy

Very unfortunate that this actually trivial change is not being implemented.

# Make hard decisions: naming

The image shows two GitHub comment cards from user **hzoo**. The top card is for the commit `babel-minify`, and the bottom card is for the commit `babili`. Both cards show the same reaction counts: 324 upvotes, 9 downvotes, 9 neutral reactions, 16 trophy reactions, and 15 hearts.

**hzoo commented on Aug 29, 2016 • edited**

`babel-minify`

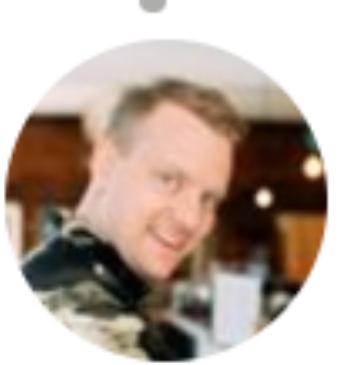
324 9 9 16 15

**hzoo commented on Aug 29, 2016**

`babili`

34 97 5 3 15 10

# Work less



**Wes Bos** 🔥 ✅

@wesbos

Following



Replying to @mxstbr @\_danchenkov

I wouldn't be surprised if @left\_pad is a robot

9:30 AM - 12 Jan 2017

# Become a Robot



hzoo commented on Jul 11

Owner



Hey @JamesHenry! We really appreciate you taking the time to report an issue. The collaborators on this project attempt to help as many people as possible, but we're a limited number of volunteers, so it's possible this won't be addressed swiftly.

If you need any help, or just have general Babel or JavaScript questions, we have a vibrant Slack community that typically always has someone willing to help. You can sign-up [here](#) for an invite.



JamesHenry commented on Jul 11

Member



All hail robot @hzoo 🤖 😊



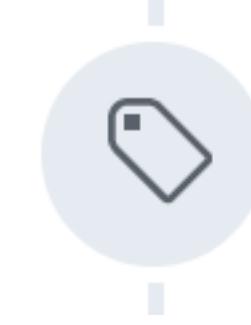
1

# Humility

His whole effort, therefore, will be to get the man's mind off the subject of his own value altogether. He would rather the man thought himself a great architect or a great poet and then forgot about it, than that he should spend much time and pains trying to think himself a bad one. Your efforts to instil either vainglory or false modesty into

(Screwtape Letters)

# Deal with imposter syndrome



**hzoo** added the `-\_(ツ)_/-` label on Mar 18

# Confidence

“being ok with making mistakes”

How does it work?

As an open source project

As part of the JS community

As a compiler

What's the future of JavaScript?



Rach Smith   
@rachsmithtweets

Follow



4:14 PM - 1 Aug 2017

155 Retweets 468 Likes



Developers

?

TC39

Developers

Babel

TC39



## Decorators Stage 2 Parsing #587

[Edit](#)
Merged

hzoo merged 14 commits into babel:master from peey:decorators-stage-2 just now


[Conversation 25](#)
[Commits 14](#)
[Files changed 48](#)

+1,572 -4



peey Peeyush Kushwaha - commented  
5 days ago • edited


[First PR 2 in this repo](#)
[Member](#)

[Pipeline](#)


Closed

[Reviewers](#)


existentialism ✓

Kovensky ✓

jridgewell ✓

littledan ✓

hzoo ✓

diervo ✓

bakkot ✓

Q	A
Bug fix?	no
Breaking change?	no
New feature?	yes
Deprecations?	no
Spec compliance?	yes
Tests added/pass?	yes

D€

TC39

- TC39 Members we can assign as reviewers!
- Currently read-only access, can ask ...



19 members

But “summer” is almost over

<http://babeljs.io/blog/2017/08/09/babel-and-summer-of-code>

# What about the future?



**Sven SAULEAU**

@svensauleau

Following

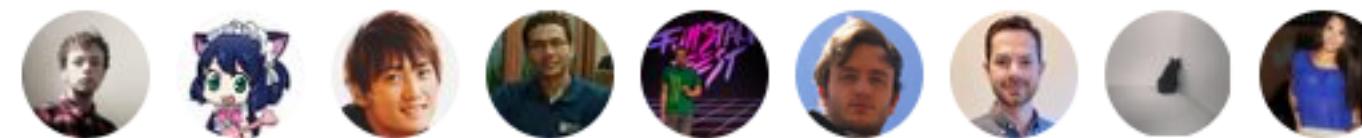


So cool 😎! Optional Chaining just landed in  
[@babeljs](https://github.com/babel/babel/pull/5903). [github.com/babel/babel/pu...](https://github.com/babel/babel/pull/5903)

```
obj?.prop          // optional property access
obj?.[expr]        // ditto
func?(...args)     // optional function or method call
new C?(...args)    // optional constructor invocation
```

12:29 PM - 27 Jun 2017

338 Retweets 510 Likes



What if Babel “dies”?

OSS being just unpaid volunteers  
hurts everyone



**Andrew Levine** @drewml · Jul 6

2018: Henry retires from software and opens up his own KBBQ restaurant, in the process getting his own show on the Food Network

1

1

1

1



**Brian Ng** @existentialism · Jul 6

Except in true Henry fashion, he offers to help out with too many shows, and winds up hosting all of them.

2

1

2

1



**Brian Ng** @existentialism · Jul 6

In a twist of fate, the new highest rated show is Henry and Guy Fieri's Diners, Drive Ins, and KBBQ!

1

1

1

1

Code doesn't matter, people do

Just show up

We'll walk with you.

# Thank you!



**Henry Zhu@ReactRally**

@left\_pad



maintaining oss can be a burden; helping people can be a burden. But it doesn't always have to be - when we ourselves are filled we can give

10:46 PM - 10 Aug 2017

---

2 Retweets 24 Likes

