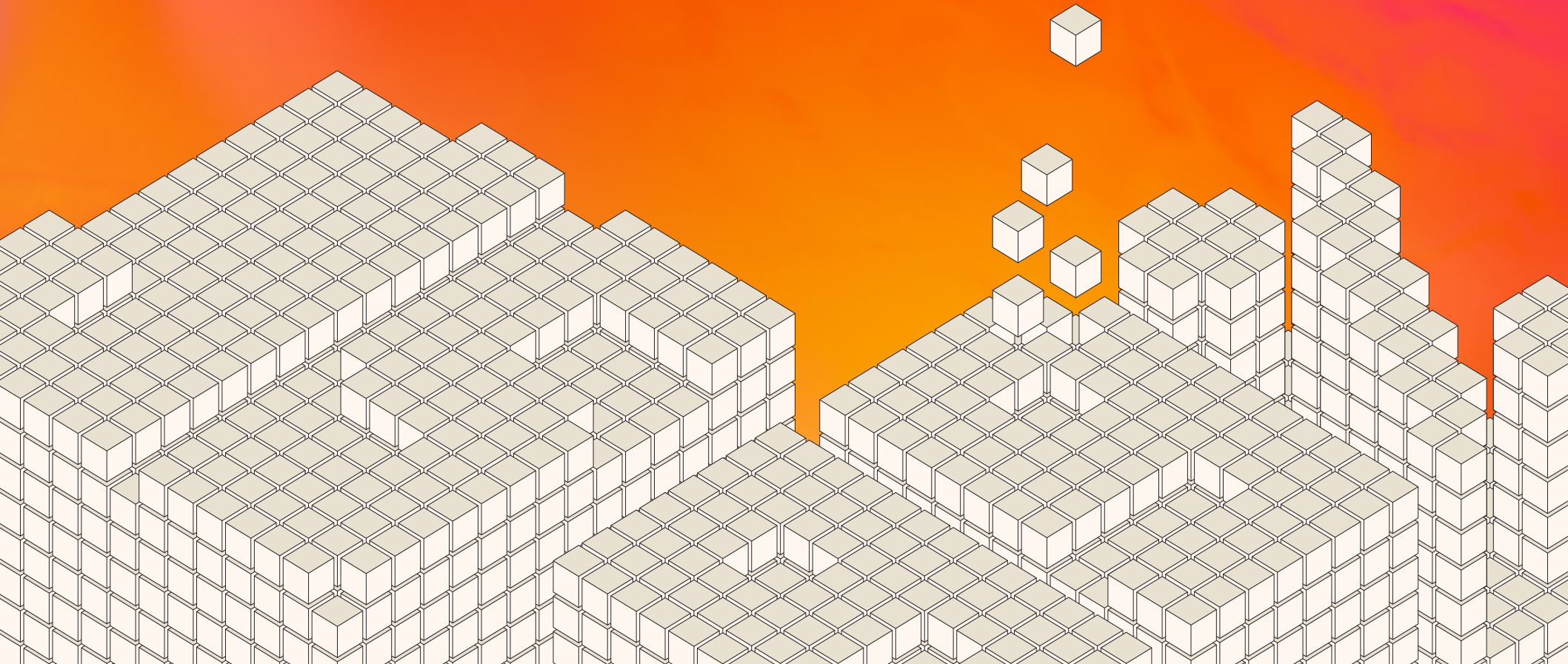# Enterprise JavaScript in 2019

Essential trends and analysis

11 million users and growing fast

In January 2018, we ran our first-ever user survey and were blown away by the response. We combined the results with our extensive logs of npm Registry activity, and produced a number of widely-read presentations and articles, including npm's **2018 in Review and Predictions for 2019**. This year, over 33,000 respondents took part, more than twice as many as last year.
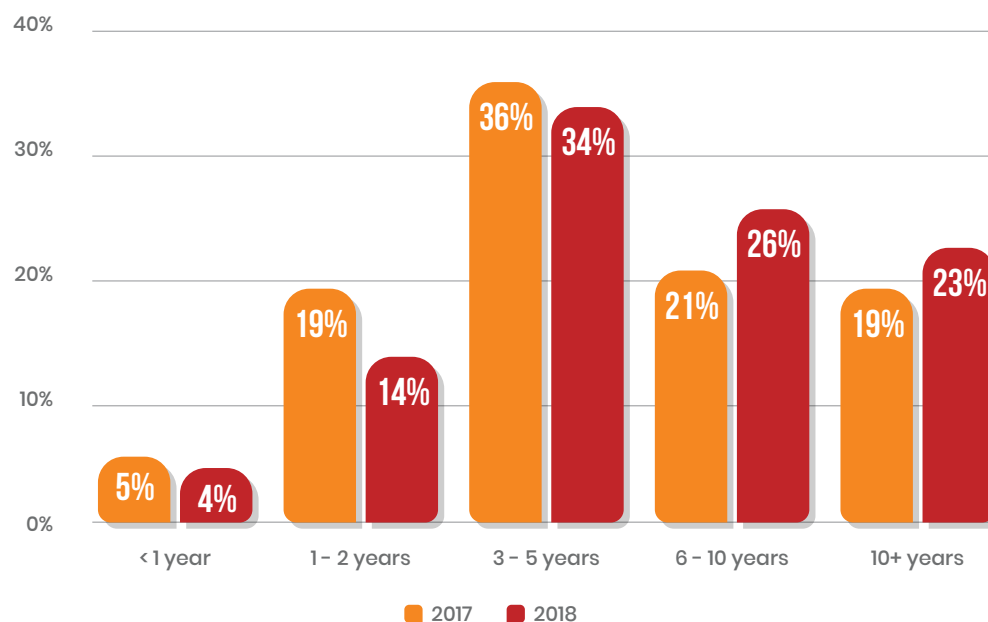
The survey and its analysis were very popular — too many businesses using JavaScript clearly have no idea what their developers are doing or how to empower them. We were happy to provide this much-needed context from our vantage point at the center of the wider JavaScript ecosystem. With this year's survey containing twice as many respondents, we're hoping to get even more insights than last year, as well as provide the start of year-over-year trends.

A more sophisticated user base

The biggest trend in this year's survey was a broad demographic change that showed up over and over in all our other results: npm users are becoming, on average, more experienced with npm and with JavaScript. The first sign of this was our question specifically on how long users have been using JavaScript, which we ran in both 2017 and 2018's surveys. Overall, the percentage of users who have been using JavaScript for more than 5 years went from 40% to 49%, a shift of more than 1 million users into that category.

How long have you been using JavaScript?
percentage of npm survey respondents

| Category	2017	2018
< 1 year	5%	4%
1 - 2 years	19%	14%
3 - 5 years	36%	34%
6 - 10 years	21%	26%
10+ years	19%	23%

Legend: ■ 2017   ■ 2018

99%

of JavaScript developers will use npm in 2019

In 2017, more than half of npm's users had been using it for less than 2 years. In 2018, this was true for only a little over a third of our users. In fact, there are so many experienced users that this year we added a new category.

How long have you been using code from npm?

percentage of npm survey respondents
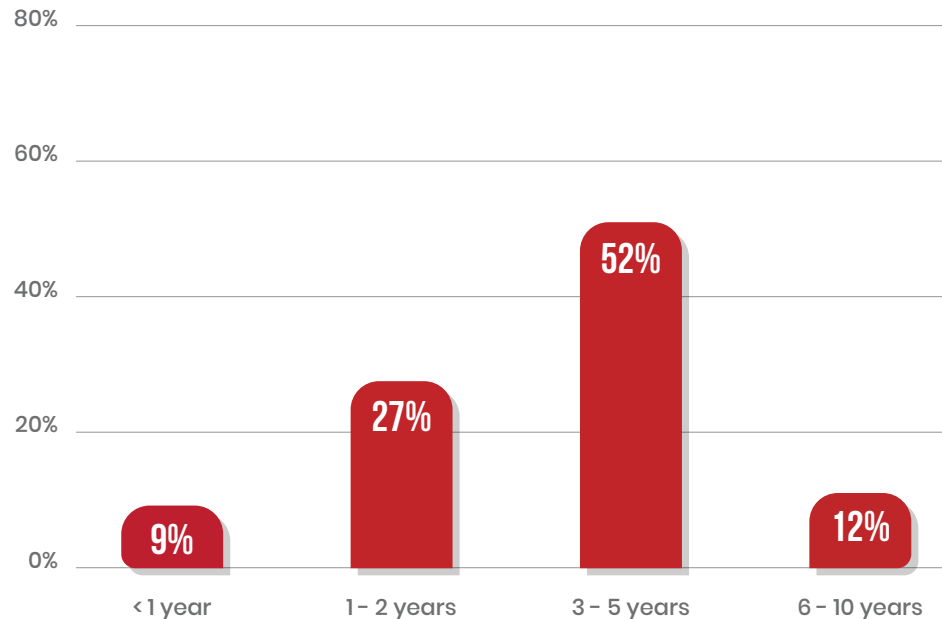
Conclusion

Growing more experienced both in JavaScript in general and npm in particular, npm's user base is more sophisticated than in the past. This reflects an explosion in npm usage that started 5 years ago, creating a demographic "bulge" that is now beginning to flatten out as npm adoption reaches saturation of the JavaScript developer community.

The data points to a second conclusion: as the percentage of users new to JavaScript and new to npm get closer together, it appears that existing JavaScript devs have finished adopting npm and new JavaScript devs all learn npm at the same time they learn JavaScript. Last year we believed about 85% of JavaScript devs use npm and by the end of 2019 we believe this number will reach 99%.

83%

of developers are concerned about the security of open source code

Developers are increasingly concerned about the security of open source code

It's no secret that in 2018 npm doubled down on our role as a provider of security solutions to the world of open source JavaScript, providing our npm audit service as well as deeper solutions to npm Enterprise customers. We also spent a lot of the year speaking at conferences, appearing on podcasts and writing blog posts about the state of JavaScript security to raise awareness. Our efforts are paying off, with more developers waking up to the risks as well as the benefits of open source JavaScript.

Are you concerned the OSS code you use is secure?
percentage of npm survey respondents

| Response	2017	2018
Yes	77%	83%
No	23%	17%

Legend: 2017, 2018
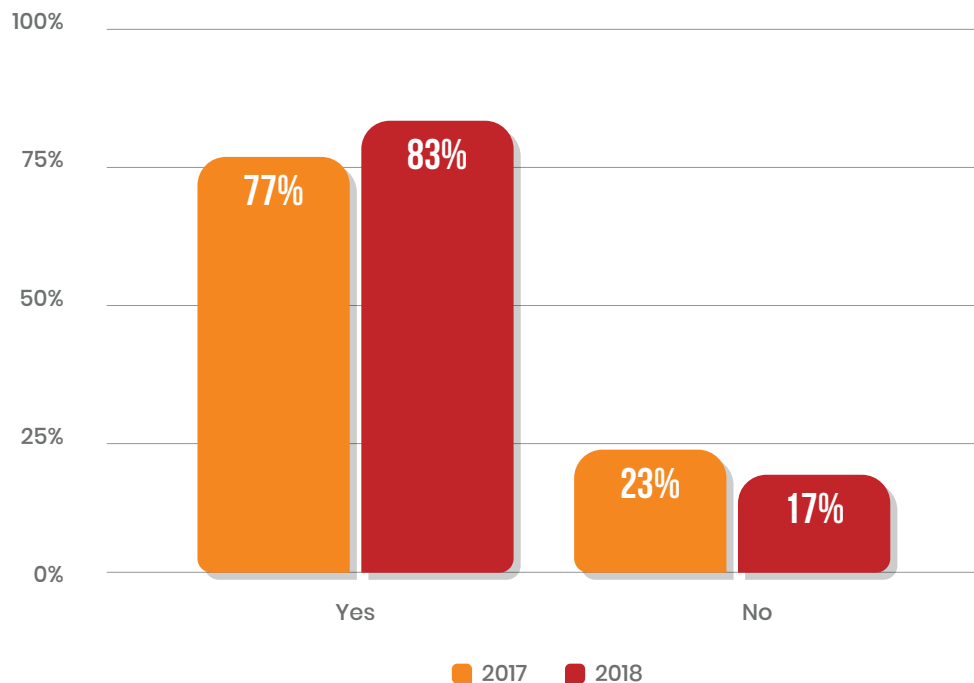
46%

of developers use code scanning tools like npm audit

The number of npm users concerned about the security of the open source code they use jumped by 8% from 2018 to 2019, reflecting both our efforts and our more sophisticated user base. We asked developers what methods they use to secure their OSS code.

What methods do you use to ensure the security of your code?

percentage of npm survey respondents

	Code review	Scanning	Audits	None
2017	69%	39%	17%	24%
2018	76%	46%	23%	23%
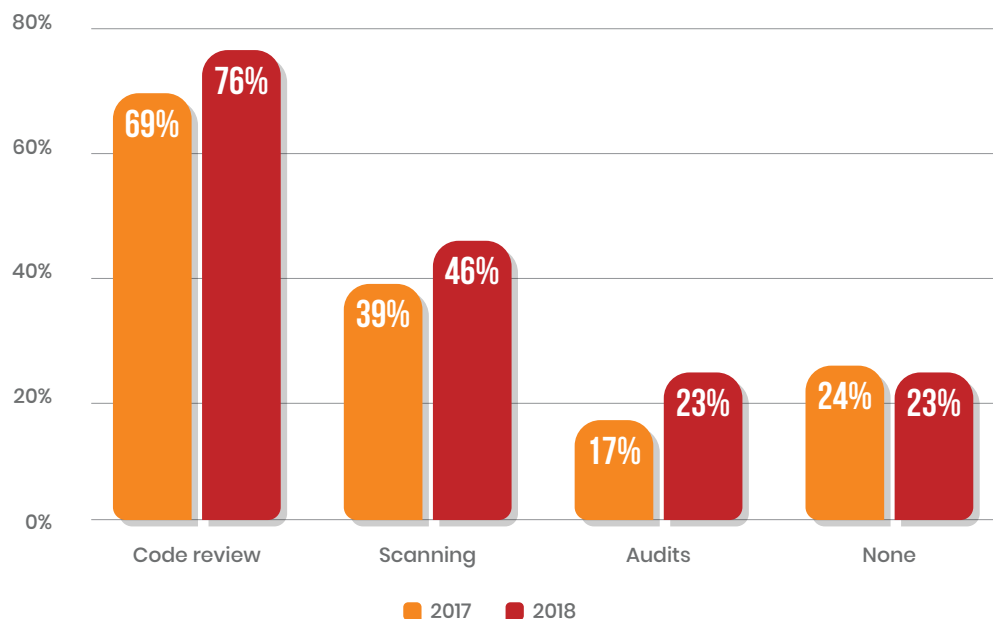
Conclusion

The most popular method for securing open source code was code review, practiced by 76% of developers, up from 69% last year. Automated code scans, like those provided by npm audit, are popular with 46% of developers. Third-party code audits also rose, to 23% of developers. But 23% of respondents still employ none of these methods.

In 2019, npm will be rolling out additional security solutions to both npm Enterprise customers and the larger npm community, and we will continue to raise awareness of how we can help everyone write safer JavaScript without creating barriers to existing development flows.

Key finding: licensing is a major factor in package use

In our conversations with major enterprises in the last few years, we noticed that a common concern was package licensing and compliance: companies don't want to be using software they're not entitled to use, for both moral and legal reasons. After gathering anecdotal evidence of this trend, we decided to ask our survey users about it, and the results were surprising.

A huge 58% of npm users said that the license of a package impacts their decision to use it, indicating that the compliance issue is of concern to a much greater portion of our user base than we expected. But is this concern about licenses just amongst devs, or are restrictions on licenses enforced by companies? We asked that too, and were again surprised: 55% of developers who care about licensing are prohibited from using certain licenses by their companies.

Does a npm package license impact your decision to use it?

percentage of npm survey respondents

Yes
58%

No
42%
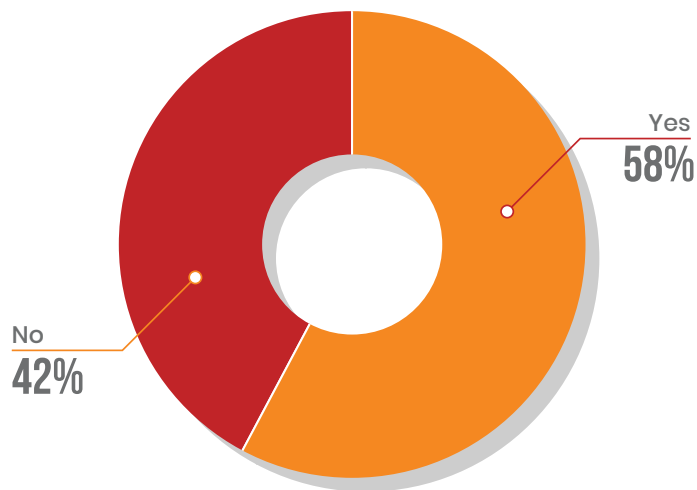
Does your company prevent/prohibit you from using certain licenses?

percentage of npm survey respondents for whom licensing is an issue
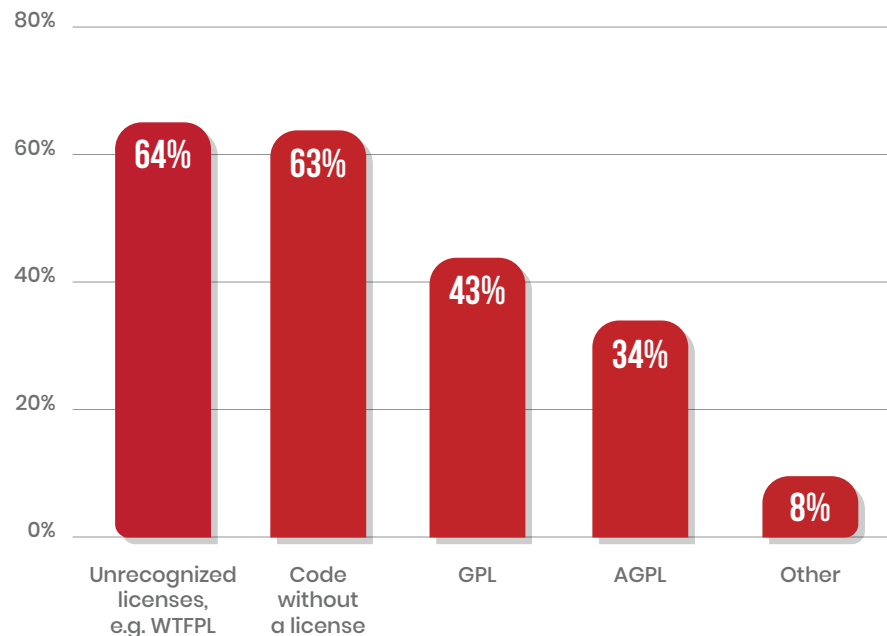
Yes
55%

No
45%
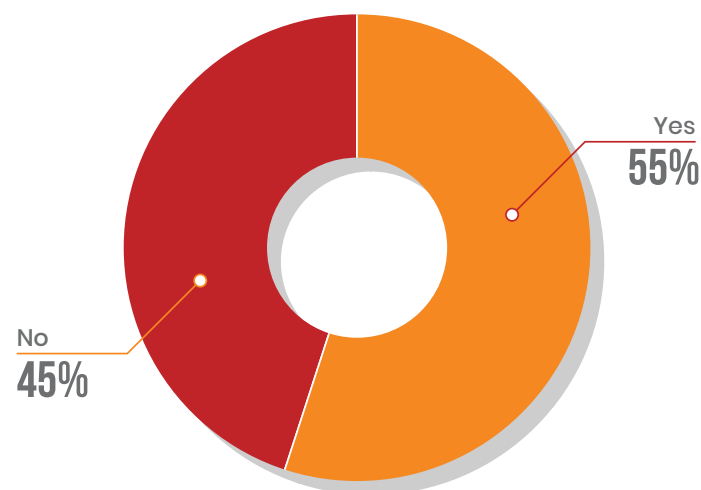
29% of npm users are prohibited from using certain licenses

With a surprising 29% of npm users prohibited from using certain licenses, npm will be accelerating our plans to release features in npm Enterprise that help users track and manage the licenses in use in their applications. We also dug deeper and asked developers which licenses specifically would be likely to cause a problem with their employer:

What licenses does your company prevent you from using?

percentage of npm survey respondents prevented from using certain licenses

License	Percentage
Unrecognized licenses, e.g. WTFPL	64%
Code without a license	63%
GPL	43%
AGPL	34%
Other	8%

Conclusion

While it's no surprise to see concerns about GPL and AGPL code, it was a surprise to see that a bigger concern was code without a license, or code with a non-standard license. Preventing unlicensed code and code with hostile licenses into your code base is clearly a concern for our maturing user base, and npm intends to respond to this need.

46%

of JavaScript devs are building native mobile and desktop apps

JavaScript: for the web, but not just for the web

We've known for a while that npm's dominant use-case is people building web applications: 97% of npm users are building applications for browsers, with 74% targeting mobile browsers. We also found 77% of developers were writing server-side code, i.e. Node.js. We also found a surprising 46% of developers write code for native apps, running in desktop and mobile environments. Another 13% write JavaScript for embedded devices, aka "IoT".

Where does your JavaScript run?
percentage of npm survey respondents

Browsers	97%
Servers	77%
Native apps	46%
Embedded devices	13%
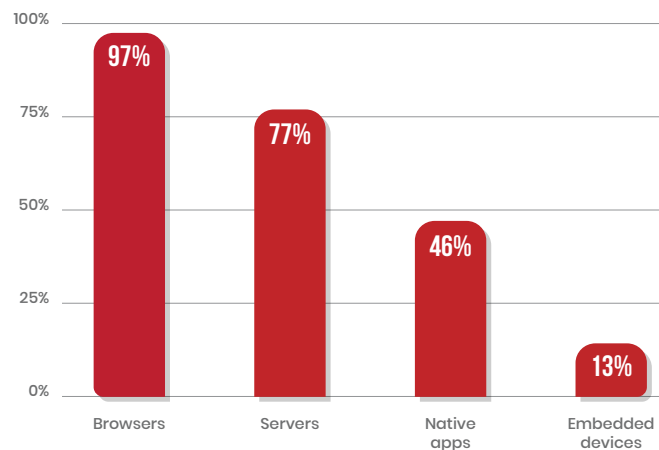
Conclusion

JavaScript has broken out of the browser and become a general purpose programming language, put to all the same uses as other programming languages. In particular, JavaScript has become a major force in the mobile app development world. A number of popular desktop applications such as Slack are written in JavaScript, so we'll be watching to see how the native app development community within npm grows.
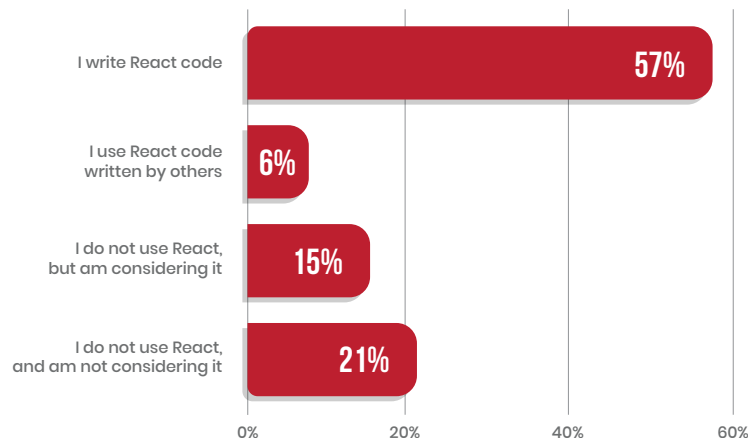
63%

of npm users are using React, the most popular framework ever

Last year we reported that 60% of survey respondents were using React and this year that number has risen to 63%. We knew that React would be a force this year, so we asked a few deeper questions to determine how engaged its users were.

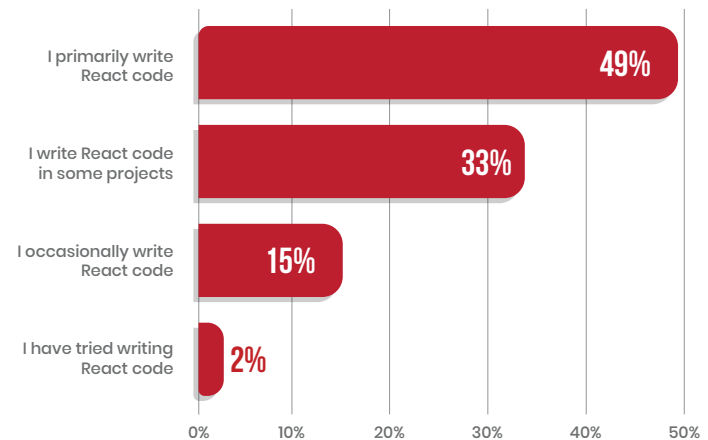### How would you characterize your React usage?
percentage of npm survey respondents

I write React code — **57%**
I use React code written by others — **6%**
I do not use React, but am considering it — **15%**
I do not use React, and am not considering it — **21%**

0%   20%   40%   60%

Our first interesting new data point was that an additional 15% of developers who are not yet using React are considering doing so, suggesting there is still room for React's growth to continue. Within the 57% of respondents who said they are already writing React code, we asked a further question to find out how often they were doing so – are they casual users or committed React developers?

How often do you write React code?
percentage of npm survey respondents who write React code

I primarily write React code — **49%**
I write React code in some projects — **33%**
I occasionally write React code — **15%**
I have tried writing React code — **2%**

0%   10%   20%   30%   40%   50%

Within React developers, fully half say they primarily write React. If you include the "some" group, then 82% of React developers write it sometimes or mostly, which means 47% of all npm developers are writing React some or most of the time.

Conclusion

Within npm's enormous user base there are approximately 5 million React developers worldwide. There has never been a JavaScript framework this popular before, and it is more than twice as popular as the next-biggest framework, Angular.
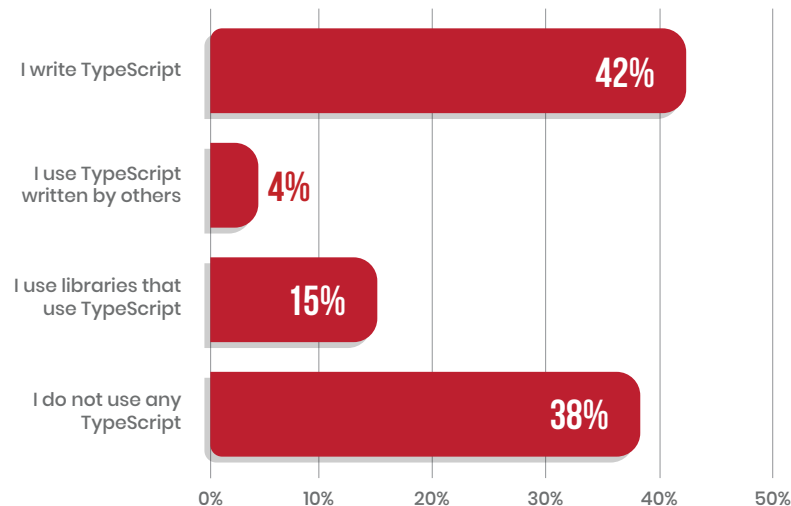
62%

of npm users reported that they use TypeScript

TypeScript has become a major community within JavaScript

One of the biggest surprises of last year's survey was TypeScript: 46% of respondents said they used TypeScript! Since "using" TypeScript is a question with some ambiguity, we went deeper with more questions in this year's survey.

This year, the number reporting TypeScript usage was even higher: 62%. However, a significant 15% of developers don't write TypeScript themselves, but use third-party libraries that use TypeScript. This shouldn't be a surprise – the popular Angular framework is 90% TypeScript, and Ember and even React feature some TypeScript in their code base these days.

How would you characterize your usage of TypeScript?
percentage of npm survey respondents

Usage	Percentage
I write TypeScript	42%
I use TypeScript written by others	4%
I use libraries that use TypeScript	15%
I do not use any TypeScript	38%

Still, 42% of developers report that they write TypeScript themselves, and within that group 86% said they write it sometimes or primarily.

Conclusion

Overall, **36% of npm users are writing TypeScript some or most of the time**. That a third of the users in the JavaScript community are writing a totally new flavor of JavaScript should make everyone sit up and take notice.

33%

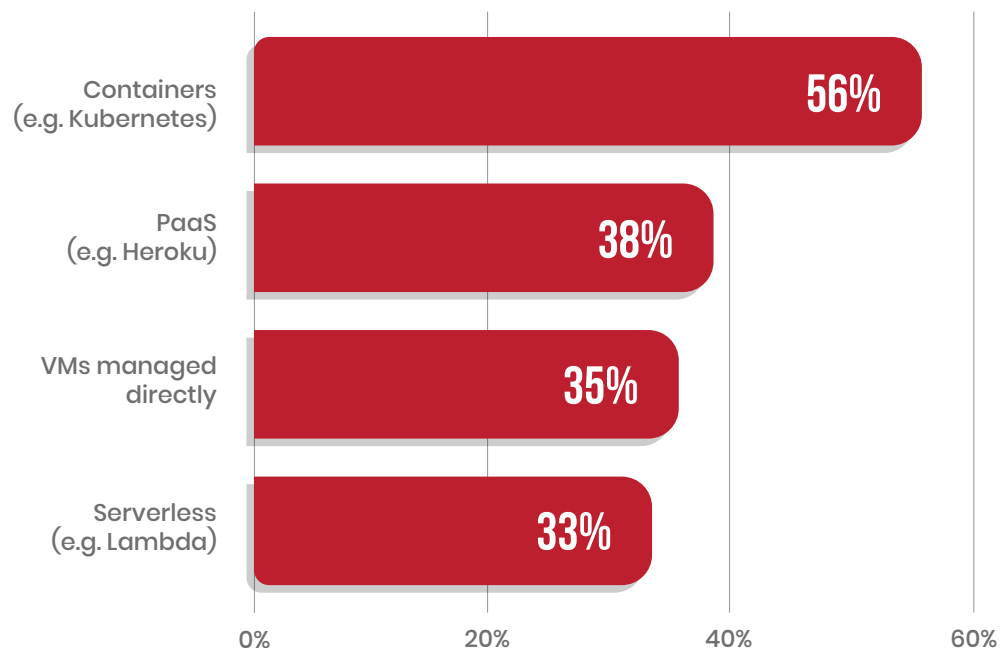## of npm users deploy serverless code

What's new?

In addition to digging deeper into existing trends, we went searching for new technologies our user base might be adopting. JavaScript is famous for being full of early adopters, so we were not disappointed to discover that npm's user base has already leaped onto some newer trends.

Serverless is big

We know that 77% of npm users deploy server-side code. This year we also asked them what methods they used to do so. Most developers use multiple methods, but we were surprised to discover that fully 33% of developers are using the still relatively new "serverless" technique, also known as Cloud Functions or Lambdas. Less surprisingly, containers such as Kubernetes were the most popular single method for deploying code in 2019.

How do you deploy your JavaScript?
percentage of npm survey respondents

Category	Percentage
Containers (e.g. Kubernetes)	56%
PaaS (e.g. Heroku)	38%
VMs managed directly	35%
Serverless (e.g. Lambda)	33%

72%

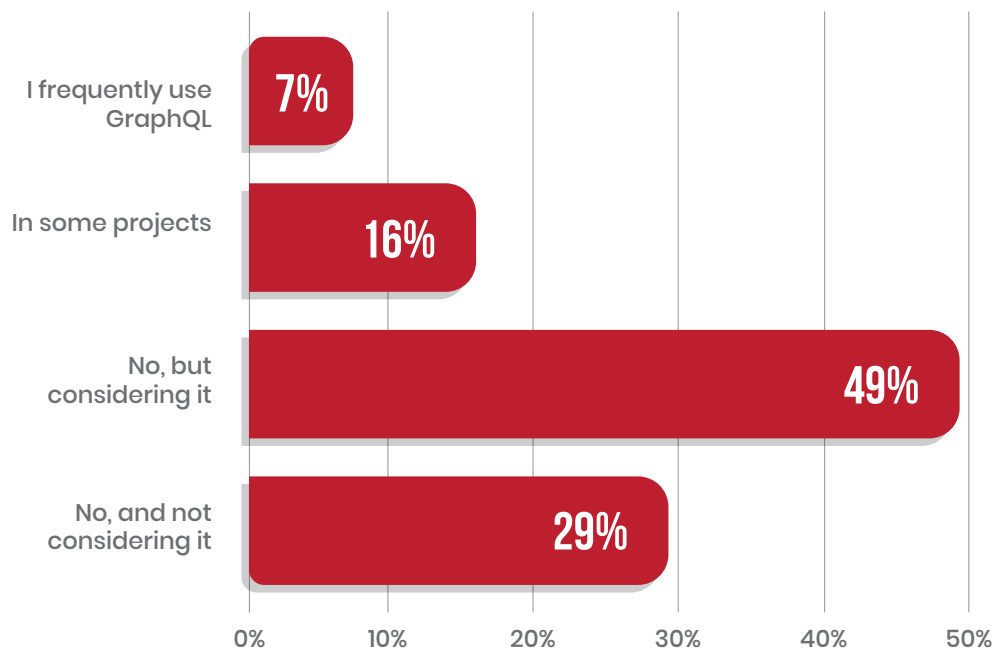## of all npm users are using or considering using GraphQL in 2019

GraphQL

If you read our posts about last year's survey, you'll know that one of our predictions for 2019 was that GraphQL was going to become a big deal. We anticipated this trend in our survey data and asked more questions.

As we already knew, GraphQL has comparatively low adoption: only 7% of developers use it frequently, though 23% of developers use it at least some of the time. We don't have data from last year that shows exactly what kind of growth this represents, but we did ask developers this year if they were considering adopting GraphQL. The answer was huge: fully **49% of all npm users are considering using GraphQL in 2019.**

Do you use GraphQL?
percentage of npm survey respondents

Category	Percentage
I frequently use GraphQL	7%
In some projects	16%
No, but considering it	49%
No, and not considering it	29%

npm

54%

## of npm users are considering using WebAssembly

WebAssembly

In the latter half of 2018 we became very interested in the potential WebAssembly (aka WASM) holds for the future of JavaScript and npm. Modules written in WebAssembly can interoperate seamlessly with existing npm modules written in JavaScript, which holds great potential for bringing in existing libraries written in other languages. We asked our users if they were similarly excited, though we tempered our expectations knowing WASM is still a very early tech.

While only 3% of npm developers report themselves to be actively using WASM in 2018, a massive 54% are paying attention and interested in its potential. This is a very strong sign for WebAssembly's adoption in 2019 and beyond.

Have you heard of WebAssembly?
percentage of npm survey respondents

Yes, using it	3%
Yes, interested in using it	54%
Yes, not interested in using	21%
No	22%

0%   20%   40%   60%
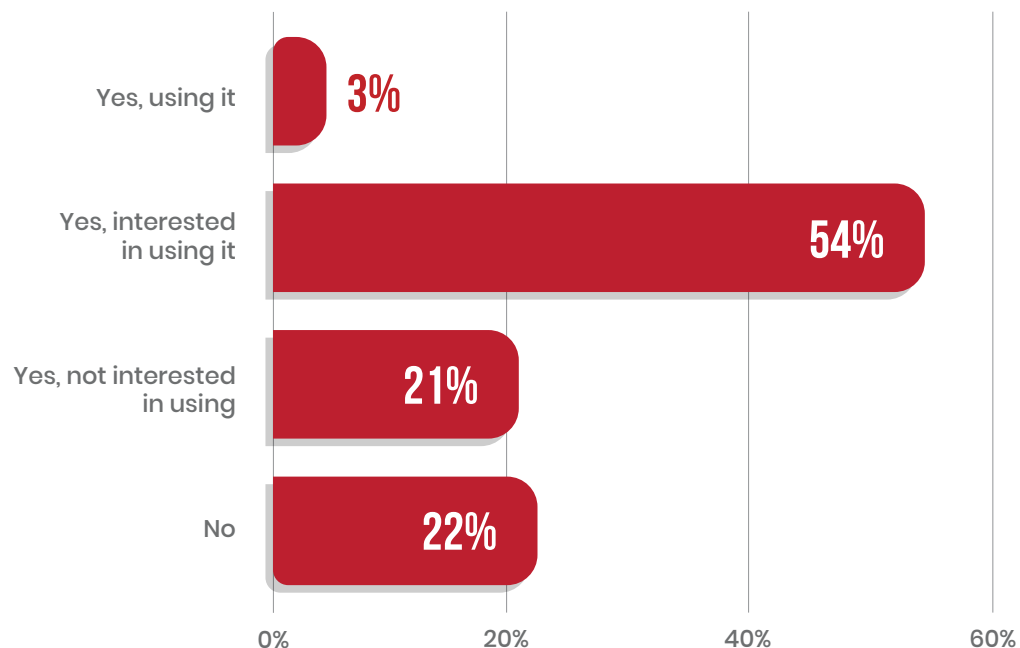
More to come

This initial peek into our survey data is just a taste of the analysis that we plan to provide to the JavaScript community. We'll be digging deeper into the initial survey and sending follow-up surveys to specific groups within the user base who volunteered to answer additional questions. We're extremely excited about where JavaScript is going to go in 2019 and enthusiastic about finding out what we can do to help developers get there.

About npm

npm, Inc. manages the world's largest collection of reusable code and empowers over 11,000,000 JavaScript developers with industry-leading tools and services. With solutions that support the secure use of packages across teams and enterprises, npm reduces friction and increases efficiency across the software development lifecycle. From individuals to large organizations, npm helps developers maximize the power of open source software. Founded in 2014, npm, Inc. is funded by True Ventures, Bessemer Venture Partners, and Sutter Hill Ventures, and is based in Oakland, CA. To learn more, visit npmjs.com