



illionx

Global Knowledge.®

Module – Comparison of Frontend Frameworks

Peter Kassenaar –
info@kassenaar.com

WORLDWIDE LOCATIONS

BELGIUM CANADA COLOMBIA DENMARK EGYPT FRANCE IRELAND JAPAN KOREA MALAYSIA MEXICO NETHERLANDS NORWAY QATAR
SAUDI ARABIA SINGAPORE SPAIN SWEDEN UNITED ARAB EMIRATES UNITED KINGDOM UNITED STATES OF AMERICA

Contents of this module

- Introduction, “*why frontend frameworks?*”
- Similarities
- Differences
- Current popularity
- Ecosystem
- General structure of frontend applications
- Tooling
- Summary

The background of the image is a photograph of Earth at night, taken from space. It shows the curvature of the planet against a dark sky. City lights are visible as glowing yellow and white spots, primarily concentrated in coastal and urban areas. Cloud formations appear as white and greyish-blue streaks across the dark blue oceans and continents.

Internet

World wide web

Albert Heijn: boodschappen doen [x](#)

ah.nl

Inloggen [▼](#) Producten Bonus Recepten Winkels Acties Klantenservice Meer [▼](#)

Zoeken naar.. [🔍](#) Online bestellen [🛒 0](#)

Koopzegels in de winkel of bij je online bestelling?

Meld je aan met de AH app >

Tot 6% rente

Heineken Original Pilsener 5.98
2=1

Dr. Oetker Ristorante pizza salami 2.25
3 VOOR 5.00

AH Hummus 2.00
2 VOOR 3.39

Page Origineel schoon toilettpapier 11.79
VOOR 11.79

Vanish Oxi Advance Multi Power

Ontdek nu de nieuwe formule! >

MULTI POWER

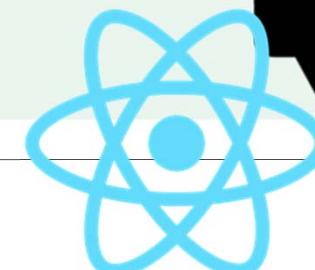
Vlekverwijdering zelfs in KUD WATER
Herstelt KLEUREN
Vernieuwt sterke GEUREN

Maak elk uur kans op een bon voor de horeca

Bekijk de actie >

#HELP DE HORECA

Like button





Versturen Ontvangen Zakelijke Oplossingen Webshop Service & Contact

Peter ▾



Geen postzegel bij de hand?

Gebruik de postzegelcode!

Lees meer



Volg je pakket



Postcode zoeken



Versturen



PostNL-punt

Barcode of niet-thuiscode

Barcode (3S of KG)

Land van de ontvanger

Nederland

Postcode

1234AB

Zoeken



Nu tot 5 maanden korting

+ 12 maanden gratis Ziggo Sport Totaal of Movies & Series XL

Vergelijk pakketten



Producten

Alles-in-



>

Internet &

>



Service

Storingen

>

Wifi verbeteren

>



Veelgezocht

Aanbiedingen

>

Gigabit

>

Goal

*High level overview of
frontend frameworks and
the landscape*

Prerequisites

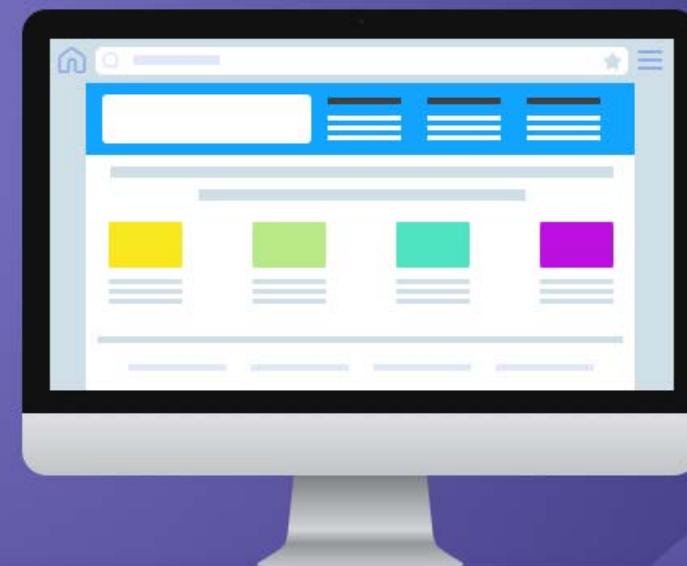
*Some knowledge of
HTML, CSS, JavaScript
websites in general
Developing & debugging in a
browser*

Focus on web apps / -sites here

WEB APPLICATION

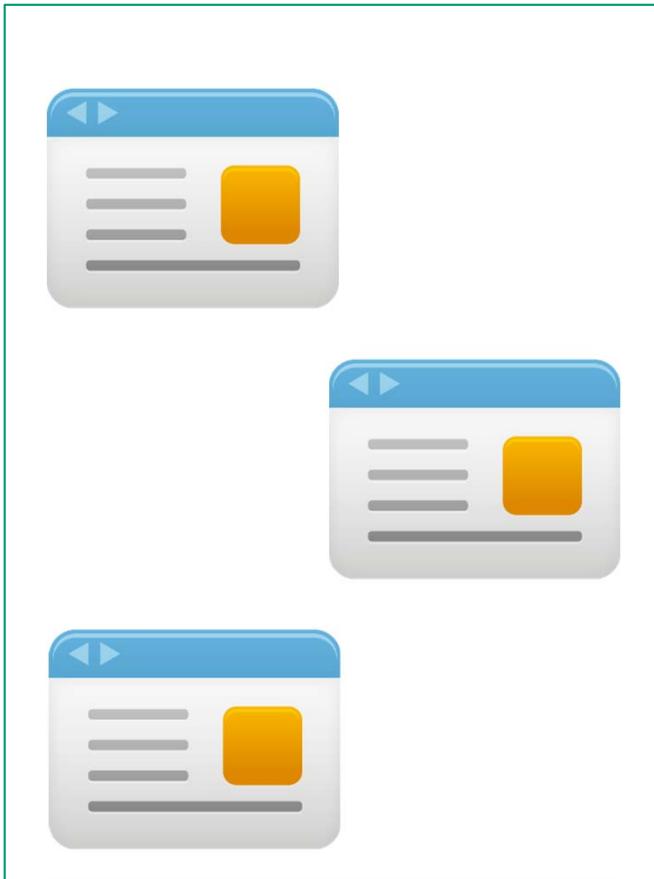


WEBSITE



VS

Previous generation (ca. 1995 - 2012)



Separate (enhanced) web pages

Index.html

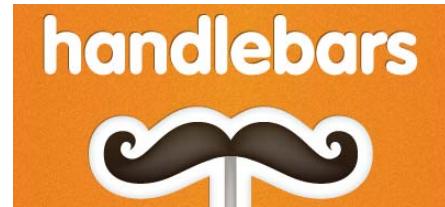
Contact.html

Products.html

...

Old school web apps

HTML + templates



Data Binding



Routing



DOM-manipulation



Mobile development



...

“The Frankenstein Framework”



Current generation (ca. 2012 - ...)



Integrated, **framework**
approach:

Templating

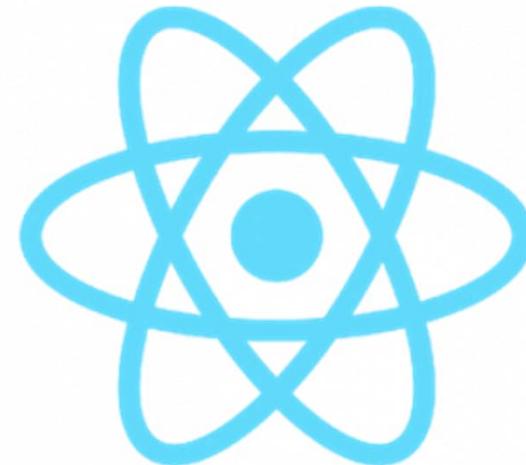
Scripting

Data binding

Routing

...

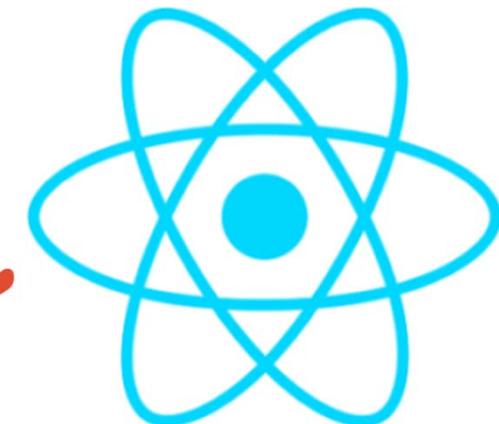
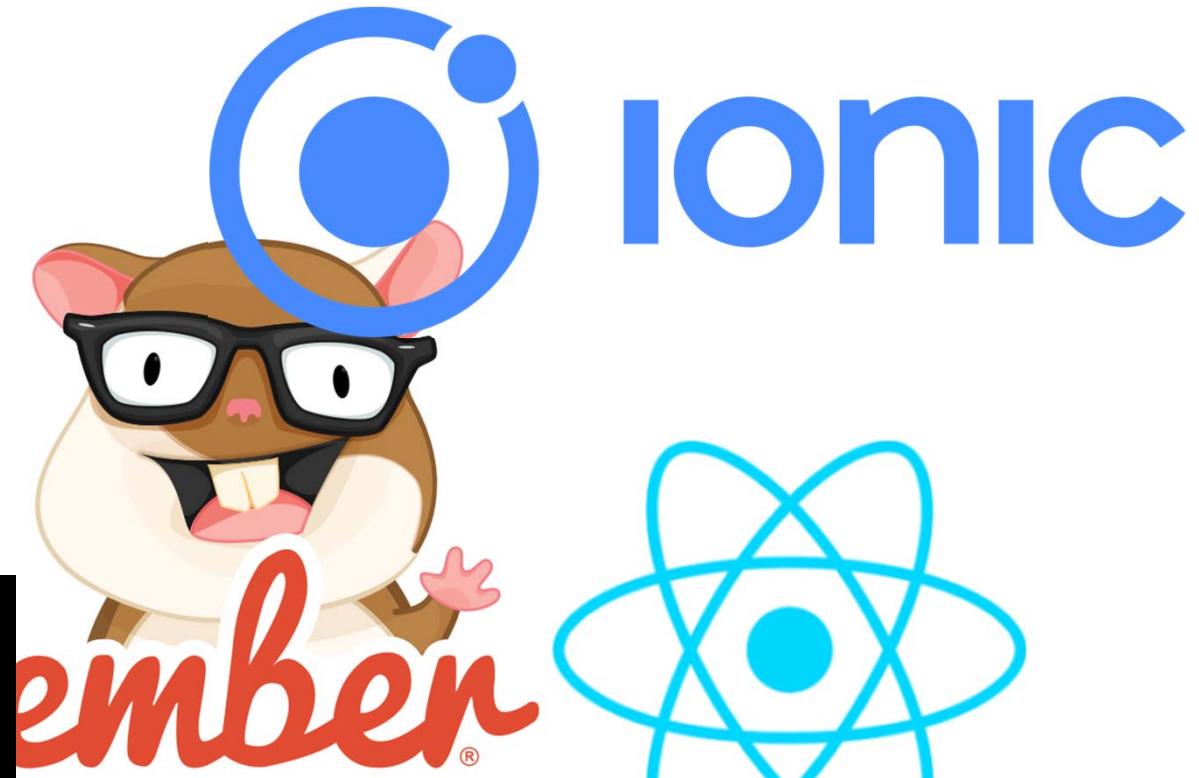
Front-end Frameworks – the big four



But wait... there's more



SVELTE



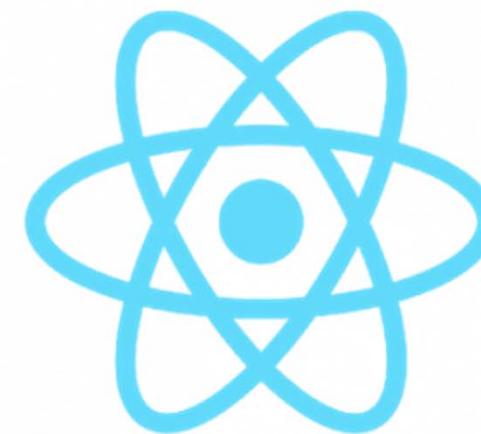
React Native



WEBCOMPONENTS

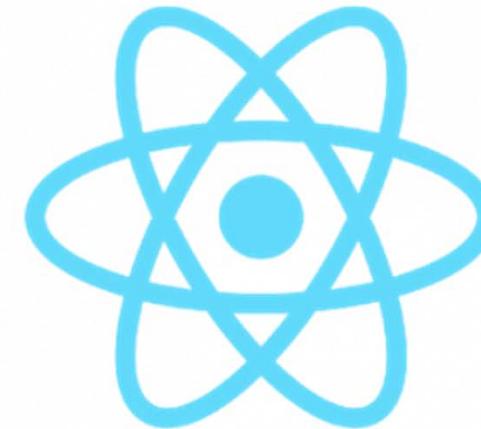
ionic

Focus



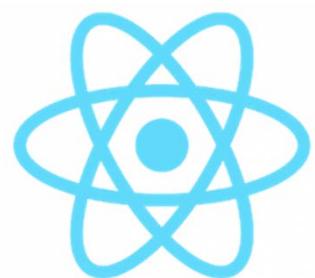
React

Similarities



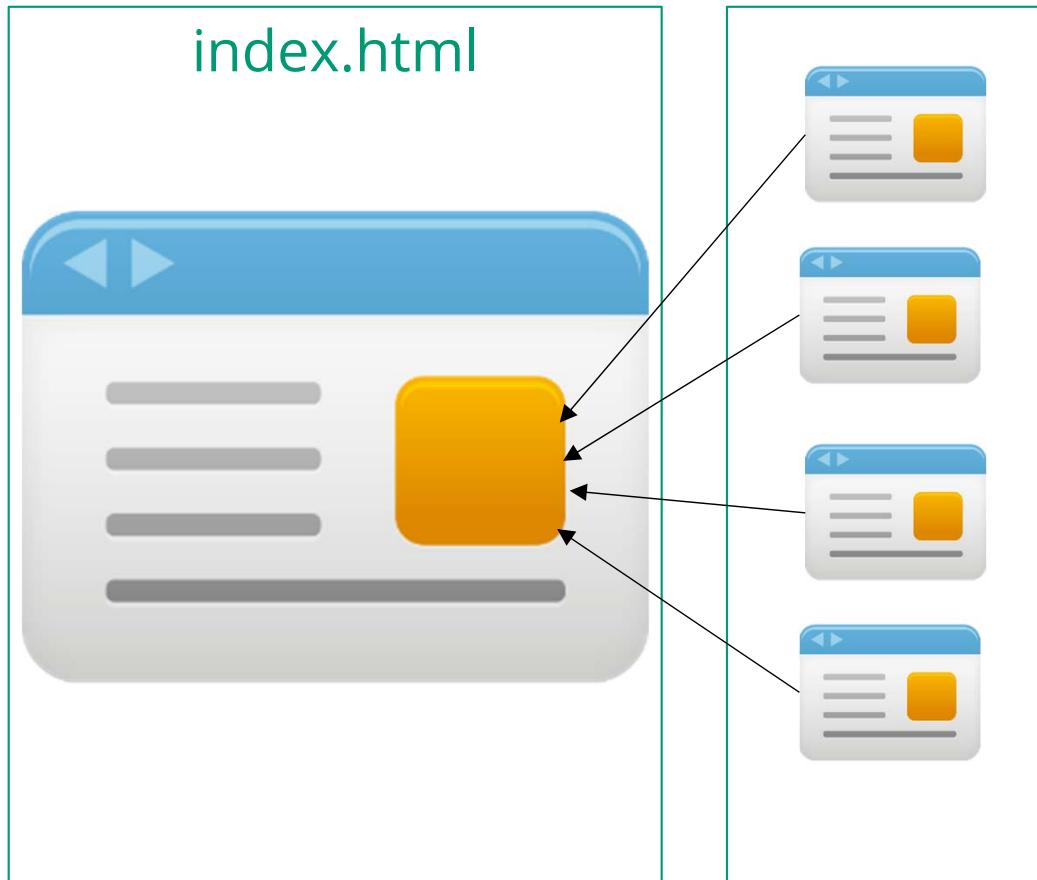
React

*All frameworks have a **surprisingly**
similar point of departure*



1. Single Page Applications

Single Page Applications

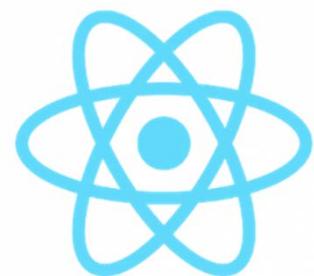


Single `index.html`

Framework is responsible
for loading components,
data, routing, etc...

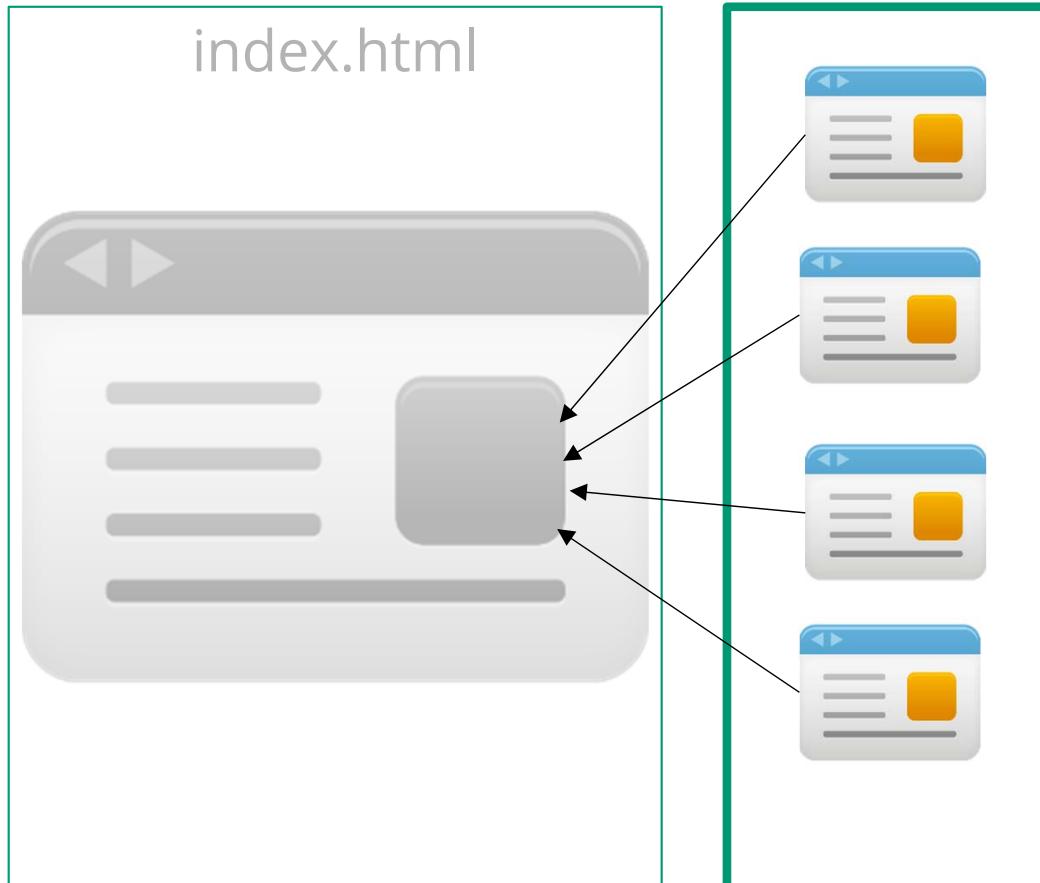
Projected inside `index.html`

In reality: not a “single
page”, but dozens of files!



2. Components

Single Page Applications



Single index.html

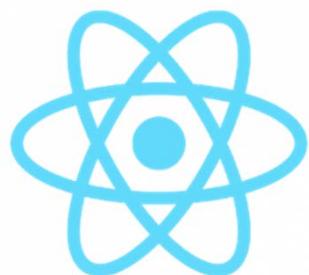
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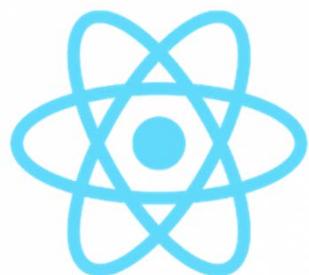
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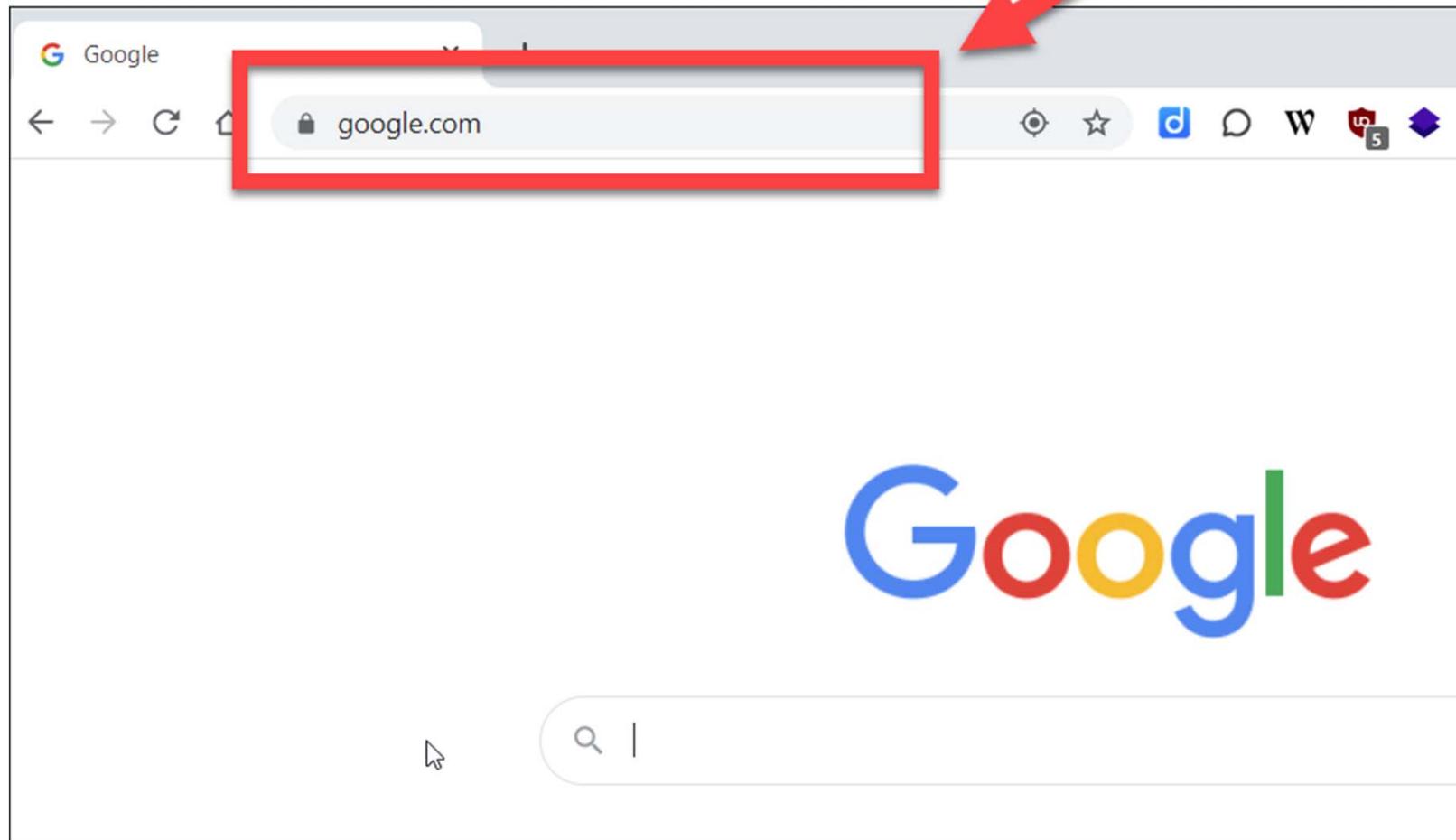


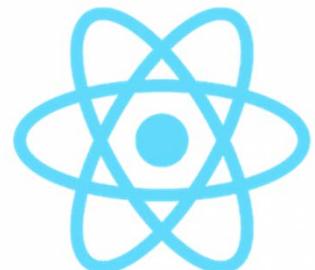
3. Data binding, Props, Events



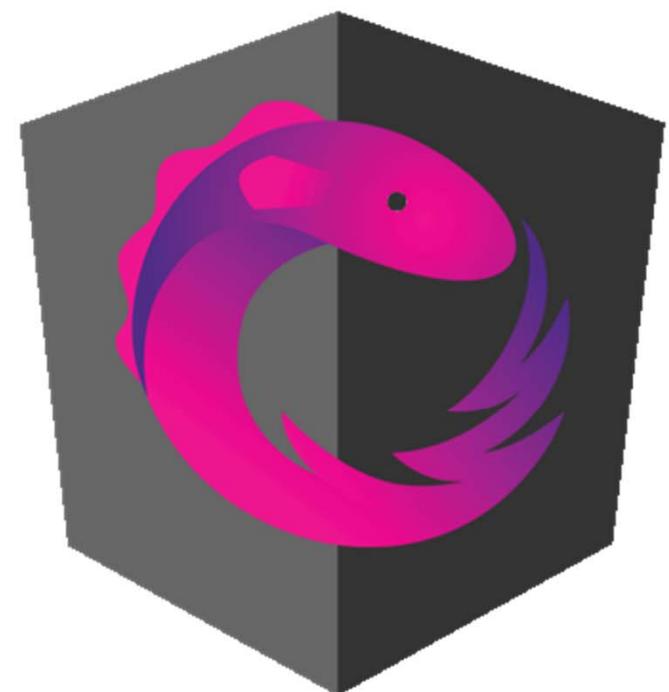


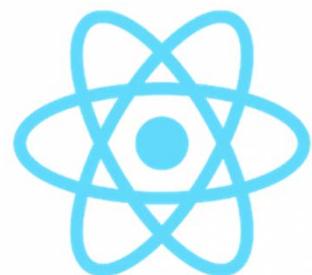
4. Routing





5. State management





6. Testing

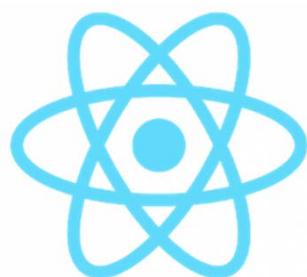




7. Huge ecosystem



8. Huge community



9. High adaptation rate

Ecosystem



Community

This screenshot shows the GitHub repository page for `facebook/react`. The repository has 13,345 commits, 82 branches, and 131 tags. The master branch is selected. Recent contributions include:

- `.circleci`: Add new test cli (#19184) - 10 days ago
- `.codesandbox`: chore: Build react-dom/server in codesandbox CI (#18679) - 3 months ago
- `.github`: Fix spelling errors and typos (#19138) - 20 days ago
- `fixtures`: make link https (#19147) - 6 days ago
- `packages`: Fix Flow from #19239 (#19242) - 4 days ago
- `scripts`: Fork legacy-events folder into react-dom and react-native (...) - 5 days ago
- `.editorconfig`: https link to editorconfig.org (#18421) - 3 months ago
- `.eslintignore`: Import React DevTools v4 - 10 months ago
- `.eslintrc`: Rename Flight to Transport (#18808) - 2 months ago

This screenshot shows the Stack Overflow search results for the tag `[angular]`. There are 223,157 questions tagged with angular. Some top questions include:

- How to remove Mat-form-field-wrapper from Mat-form-field? (Free 30 Day Trial)
- Angular Apollo: Error: GraphQL error: Unknown argument "username" on field "AuthLogin" of type "Mutation"
- I have this error on my angular app, using apollo for graphql ERROR Error: GraphQL error: Unknown argument "username" on field "AuthLogin" of type "Mutation".

This screenshot shows the Medium publication page for `vue.js`. It features a story by Luis Elizondo titled "Why we moved from Angular 2 to Vue.js (and why we didn't choose React)". The story has 184 upvotes and was published on Aug 31, 2017. The page also displays a sidebar with tags like Vue.js, JavaScript, Vue, Web Development, Front End Development, React, Programming, Vuex, Laravel, Nodejs, and a reading list.

This screenshot shows the DEV community page. A post by Peter Kassenaar says "Thank you!" with a heart icon. Another post by Siddharth Ajmera announces a "successful India-wide Angular Fundamentals Workshop with ngGirls". The page also features a sidebar for Listings, a feed of posts, and a sidebar for education topics like "Level Up Your Writing Skills in English products" and "Odin - The Programmable, Observable and Distributed Job Scheduler collabs".

Adaptation rate



Log In · Signup for Free

EN DE FR ES Русский 한국어 日本語 简体中文

builtWith Tools ▾ Features ▾ Plans & Pricing Customers Resources ▾

Website, Tech, Keyword **Lookup**

Find out what websites are Built With

Enter a website address, a technology name or a keyword **Lookup**

Lead Generation

Build lists of websites from our database of 42,380+ web technologies

Home / All Live Afterpay Sites / Technologies

All Live Afterpay Sites 

Export Advanced Filter

<https://builtwith.com/>

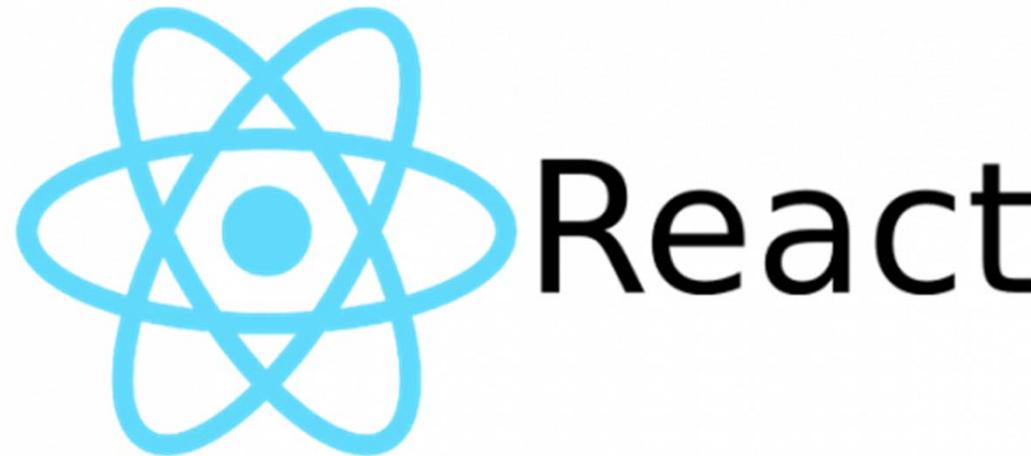
Differences (apart from syntax)



Point of departure: *HTML template*,
enhanced with framework specific tags
and attributes

Aim: *one-stop-shop* / solution

Differences



Point of departure: **JavaScript**, **JavaScript**,
JavaScript (JSX)

Build-all-yourself, possible **elective stress**

Differences



SVELTE

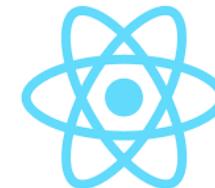
Point of departure: no framework

in the browser

Compile all code to plain JavaScript

Frameworks vs. Libraries

- Framework (Angular, Vue)
- Concise (less code)
- Template centered
- Separate files
- Non-standard
(html, elements, shadow DOM)
- Community backing
(except Angular)
- React, Svelte: Library
- Explicit (more coding)
- JavaScript Centered
- Single File
- Non standard (JSX, shadow
DOM)
- Corporate backing (React)



SVELTE



ANGULAR

FEATURES

DOCS

RESOURCES

EVENTS

BLOG

Search



One framework.
Mobile & desktop.

GET STARTED

#NGCONF2020

Join us for ng-conf
April 1st-3rd, 2020

LEARN MORE



DEVELOP ACROSS ALL PLATFORMS

Learn one way to build applications with Angular and reuse your code and abilities to build apps for any deployment target. For web, mobile web, native mobile and native

Angular – Created by Google

facebook

 React

Docs

Tutorial

Blog

Community

Search

v16.13.0

 Languages

[GitHub](#)

React

A JavaScript library for building user interfaces

[Get Started](#)

[Take the Tutorial >](#)

Declarative

React makes it painless to create interactive UIs. Design simple views for each state in your application, and React will efficiently update and render just the right components when your data

Component-Based

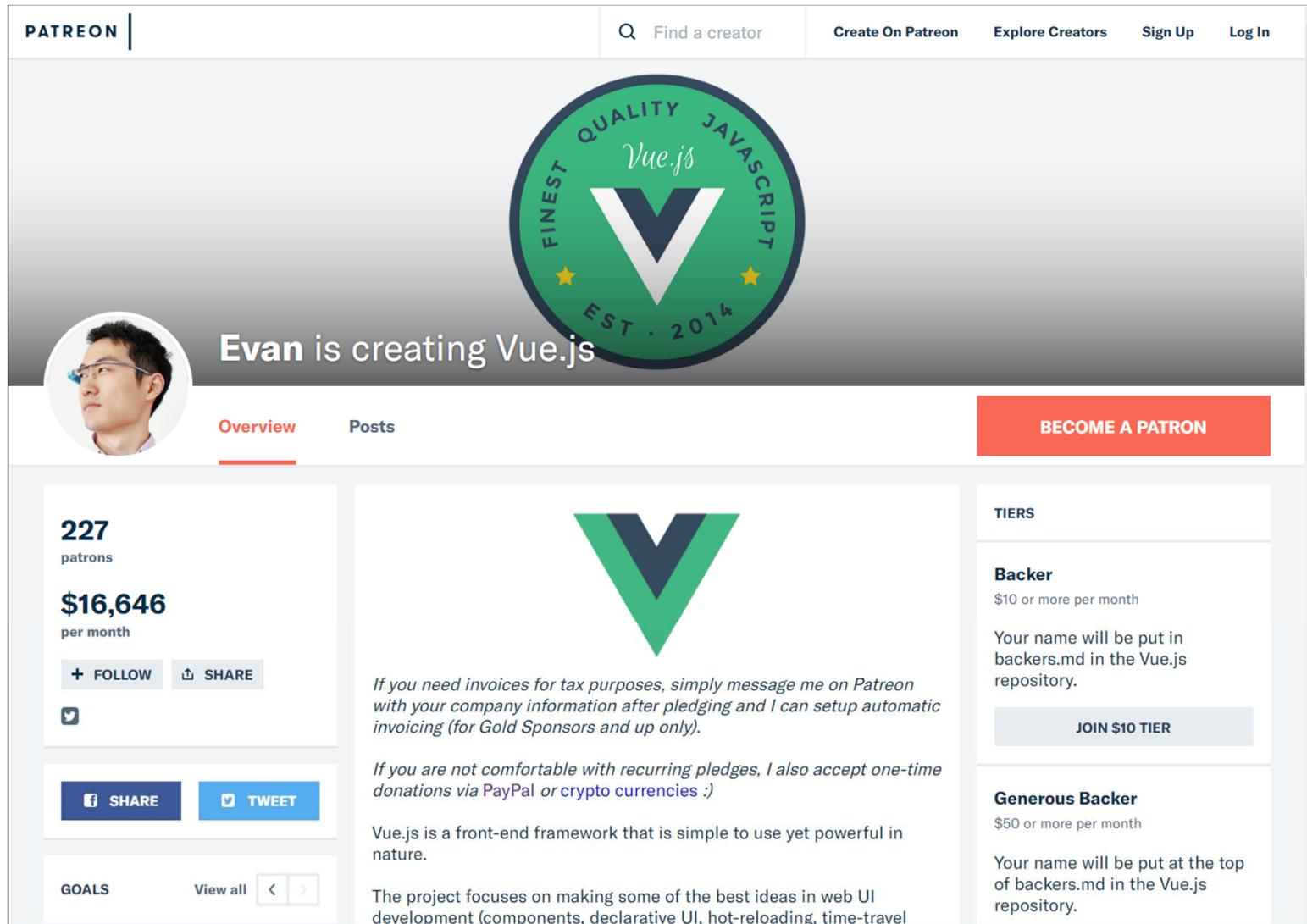
Build encapsulated components that manage their own state, then compose them to make complex UIs.

Learn Once, Write Anywhere

We don't make assumptions about the rest of your technology stack, so you can develop new features in React without rewriting existing code.

React – Created by Facebook

Vue.js – Created by Evan You



The screenshot shows the Vue.js creator profile on Patreon. At the top, there's a large green circular badge with a white 'V' logo in the center. The badge has the words 'FINEST QUALITY JAVASCRIPT' around the top and 'EST. 2014' at the bottom. Below the badge, a portrait of Evan You is shown, with the text 'Evan is creating Vue.js'. The main stats are 227 patrons and \$16,646 per month. There are buttons for 'OVERVIEW' (highlighted in red) and 'POSTS'. On the right, there's a large orange 'BECOME A PATRON' button. To the right of the stats, there are sections for 'TIERS' (Backer, Generous Backer), each with a description and a 'JOIN \$10 TIER' button. The 'Backer' tier is described as \$10 or more per month, with the name put in backers.md in the Vue.js repository. The 'Generous Backer' tier is described as \$50 or more per month, with the name put at the top of backers.md.

PATREON | Find a creator Create On Patreon Explore Creators Sign Up Log In

Evan is creating Vue.js

Overview Posts BECOME A PATRON

227 patrons

\$16,646 per month

+ FOLLOW SHARE

SHARE TWEET

GOALS View all < >

If you need invoices for tax purposes, simply message me on Patreon with your company information after pledging and I can setup automatic invoicing (for Gold Sponsors and up only).

If you are not comfortable with recurring pledges, I also accept one-time donations via PayPal or crypto currencies :)

Vue.js is a front-end framework that is simple to use yet powerful in nature.

The project focuses on making some of the best ideas in web UI development (components, declarative UI, hot-reloading, time-travel

TIERS

Backer
\$10 or more per month
Your name will be put in backers.md in the Vue.js repository.
[JOIN \\$10 TIER](#)

Generous Backer
\$50 or more per month
Your name will be put at the top of backers.md in the Vue.js repository.

No backing from company with deep pockets – all crowd funded

Svelte – Created by Rich Harris

The screenshot shows the official Svelte website. At the top, there's a navigation bar with links to Tutorial, Docs, Examples, REPL, Blog, FAQ, SvelteKit, and a search icon. Below the navigation is a large, stylized orange hand-drawn style letter 'S' logo.

The main content area features three prominent cards:

- Write less code**: Build boilerplate-free components using languages you already know – HTML, CSS and JavaScript. [learn more →](#)
- No virtual DOM**: Svelte compiles your code to tiny, framework-less vanilla JS – your app starts fast and stays fast. [learn more →](#)
- Truly reactive**: No more complex state management libraries – Svelte brings reactivity to JavaScript itself.

Below these cards, a section explains what Svelte is: "Svelte is a radical new approach to building user interfaces. Whereas traditional frameworks like React and Vue do the bulk of their work in the browser, Svelte shifts that work into a *compile step* that happens when you build your app." It also includes a command-line snippet: `npx degit svelte`.

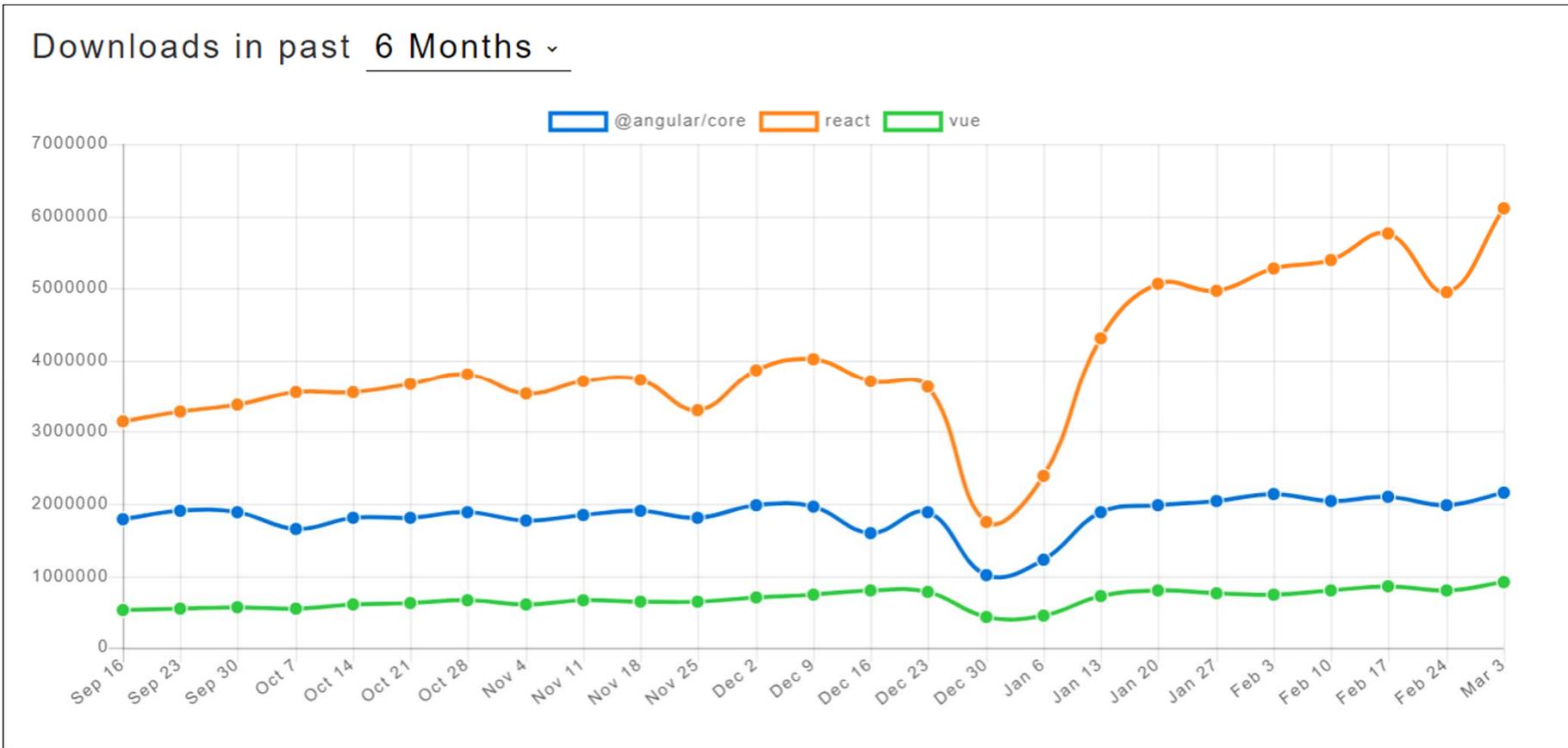
On the right side of the page, there's a video player showing a video of Rich Harris. The video title is "devtools FM #15". The video frame shows Rich Harris smiling and wearing headphones. A callout box in the bottom right corner of the video frame displays his name: "Rich Harris" and "Svelte, Rollup".



Popularity

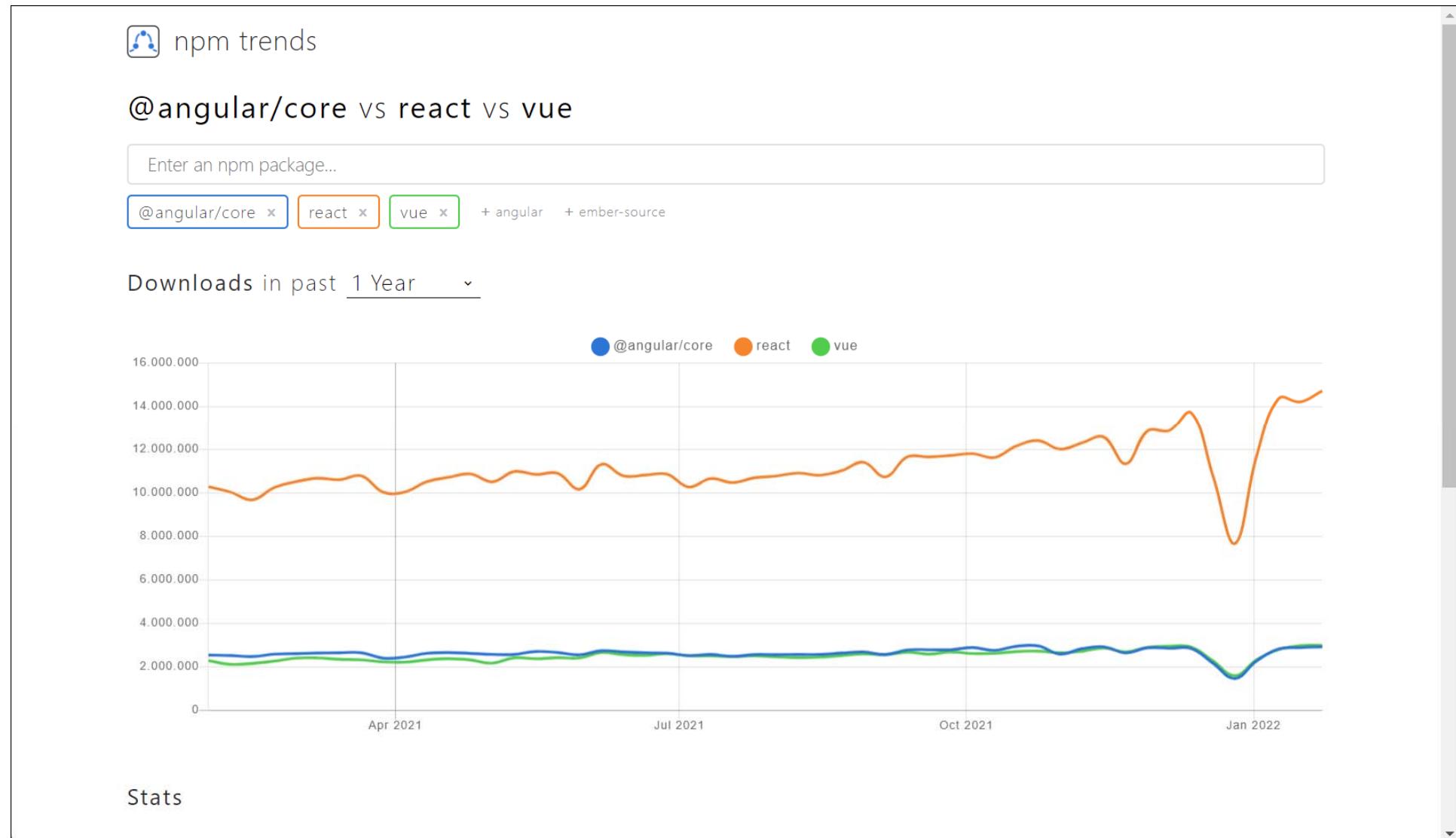
Which framework has the largest user/developer base?

A 2019 comparison



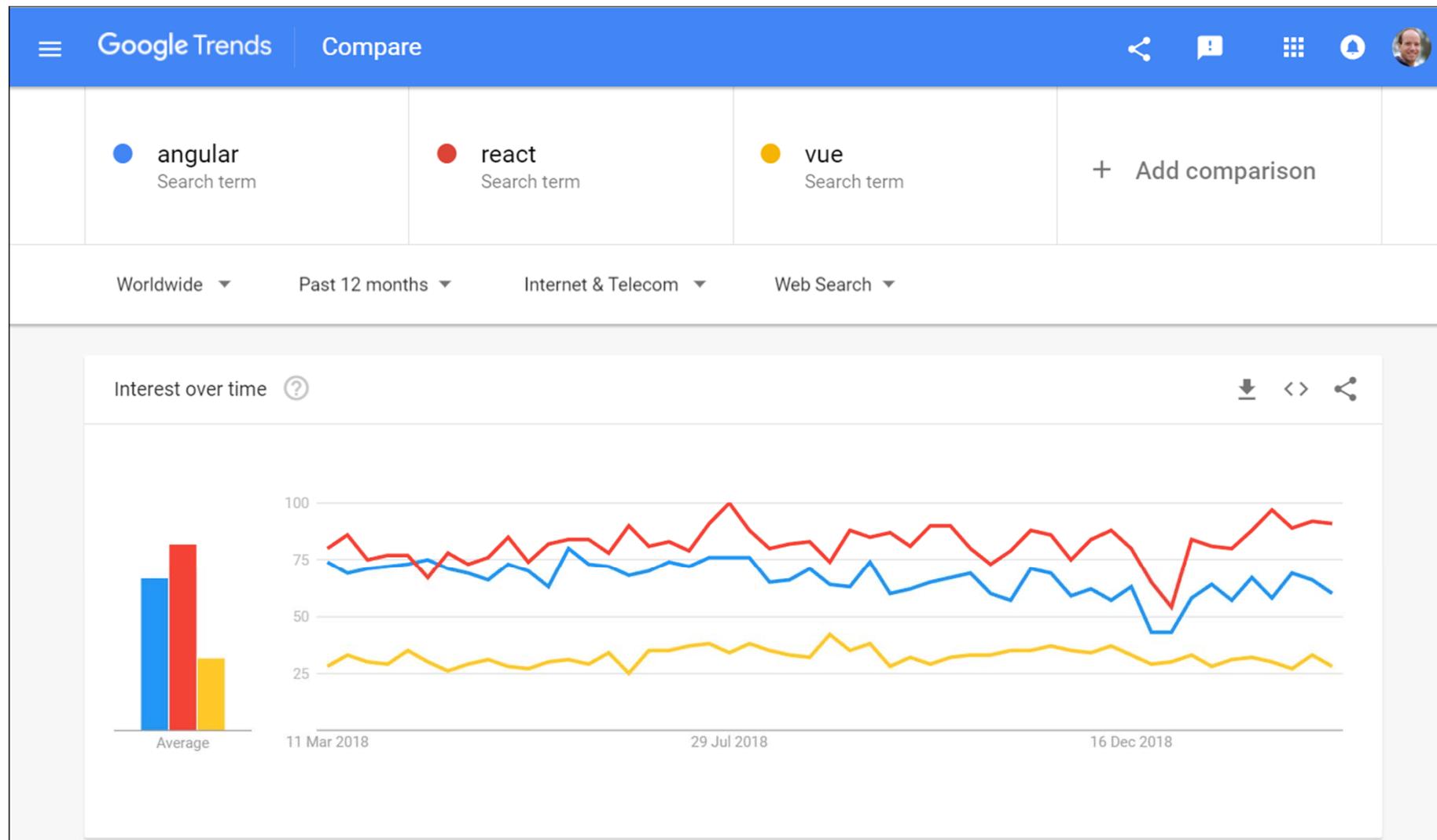
[@angular/core-vs-react-vs-vue](https://www.npmtr...)

A 2022 comparison



<https://www.npmtrends.com/@angular/core-vs-react-vs-vue>

Google Trends



<https://trends.google.com/trends/explore?cat=13&q=angular,react,vue>

Giststar rankings

Gitstar Ranking Users Organizations Repositories GitHub username Search Sign in with GitHub

Repositories Ranking

1 2 3 ... >

1. freeCodeCamp/freeCodeCamp	★ 298396
2. vuejs/vue	★ 129161
3. twbs/bootstrap	★ 128833
4. facebook/react	★ 124937
5. tensorflow/tensorflow	★ 123450
6. EbookFoundation/free-programming-books	★ 118765
7. sindresorhus/awesome	★ 99459
8. d3/d3	★ 83265
51. zeit/next.js	★ 35904
52. moment/moment	★ 35598
53. nodejs/node-v0.x-archive	★ 35577
54. ionic-team/ionic	★ 35555
55. typicode/json-server	★ 35389
56. mrdoob/three.js	★ 35013
57. rust-lang/rust	★ 34749
58. shadowsocks/shadowsocks-windows	★ 34747

<https://gitstar-ranking.com/repositories>

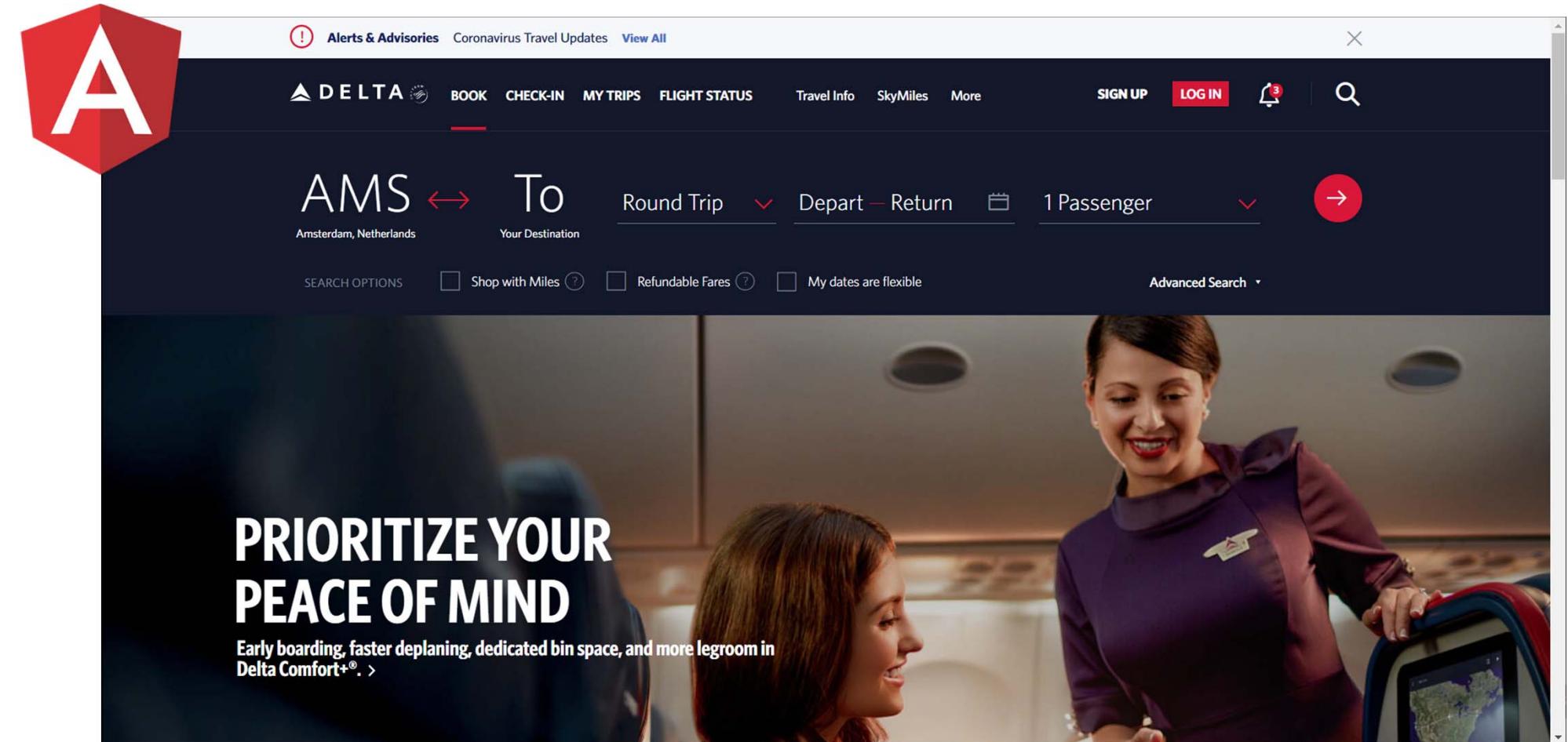
“Vue is used by Alibaba, Baidu, Nintendo, GitLab, L’Oréal and many others”



The screenshot shows the homepage of madewithvuejs.com. At the top, there's a navigation bar with 'Collection' and 'Blog' buttons, a 'CATEGORIES' dropdown, and social media links for LinkedIn and Twitter, along with a 'SUBMIT A PROJECT' button. Below the navigation is a large logo consisting of a green and white 'V' inside a circular compass-like frame. The text 'made with `vue.js`' is displayed below the logo. A prominent banner at the bottom of the page announces a 'CYBER MONDAY @ Creative Tim: 30 Templates for 90% off!' with a 'GET IT' button. Below this banner is a project card for 'My Nintendo'. The card features a red header with the 'My Nintendo' logo and a 'Get started with My Nintendo!' call-to-action. It includes two buttons: 'Create account' and 'Sign in'. At the bottom of the card, it says 'by Armin & Melanie'. To the right of the card, there's descriptive text: 'My Nintendo Reward System for Nintendo accounts', the hashtags '#Websites #WebApps', and a view count of '2.810'. Below this card is another project card for 'Vue FilePond', described as 'A handy FilePond adapter', with a view count of '2.810'.

<https://madewithvuejs.com/>

“Angular is used by Delta Airlines, Google, Mercedes Benz and more”



The screenshot shows the official website of Delta Air Lines. In the top-left corner, there is a large, prominent red Angular logo. The rest of the page follows the standard dark-themed design of the Delta website, including the navigation bar with links for Alerts & Advisories, Coronavirus Travel Updates, Book, Check-in, My Trips, Flight Status, Travel Info, SkyMiles, More, Sign Up, Log In, and a search bar. The main search area displays a flight from AMS (Amsterdam, Netherlands) to an unspecified destination. Below the search fields are several filter options: SEARCH OPTIONS, Shop with Miles, Refundable Fares, and My dates are flexible, along with an Advanced Search link. A large promotional banner at the bottom features a smiling flight attendant in uniform interacting with a passenger, with the text "PRIORITIZE YOUR PEACE OF MIND" and a description of the benefits of Delta Comfort+.

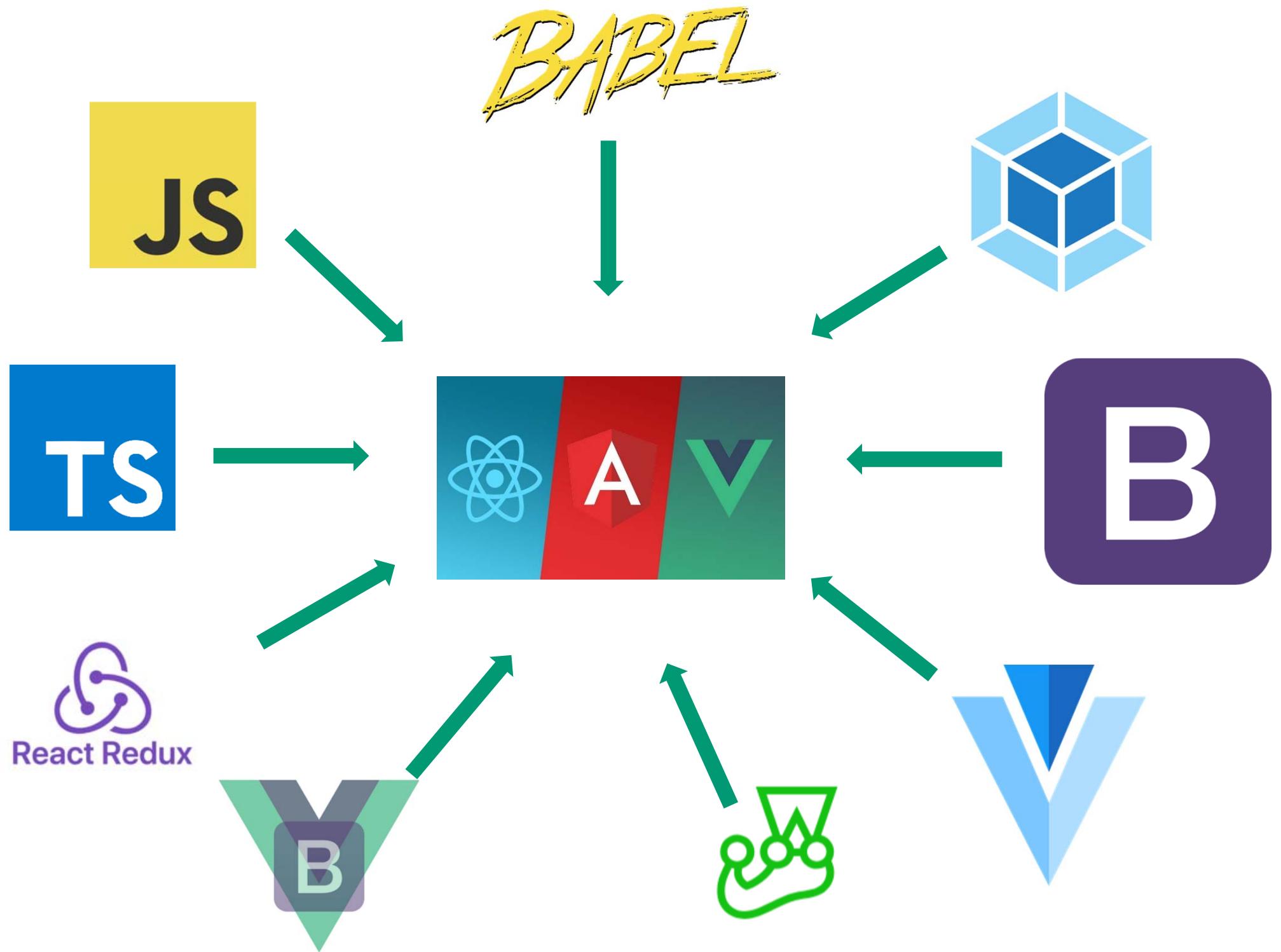
“React is used by many Fortune 500 companies, including Airbnb, BBC, Instagram and Dropbox”

The screenshot shows the Dropbox web interface at [dropbox.com/h](https://www.dropbox.com/h). On the left, there's a sidebar with icons for Home, Files, Paper, Transfer (Beta), and Showcase. A large React logo icon is overlaid on the left side of the main content area. The main area displays a 'Home' folder with four sub-folders: 'kassenaar' (slides), 'Oefeningen' (cursus), 'JavaScript 101' (Fronteers), and another 'kassenaar' (slides). Below this is a 'Starred' section with a note about starring items for easy access, followed by a 'Recent' section containing a file named '10- React Fundamentals - introduction.pptx' which was edited 19 mins ago. On the right, there are buttons for 'Create new file', 'Upload files', 'Upload folder', 'New shared folder', and 'Create Paper doc'. A 'Search' bar and a user profile icon are also present.



The Frontend ecosystem

Frameworks are not isolated/not living on an island

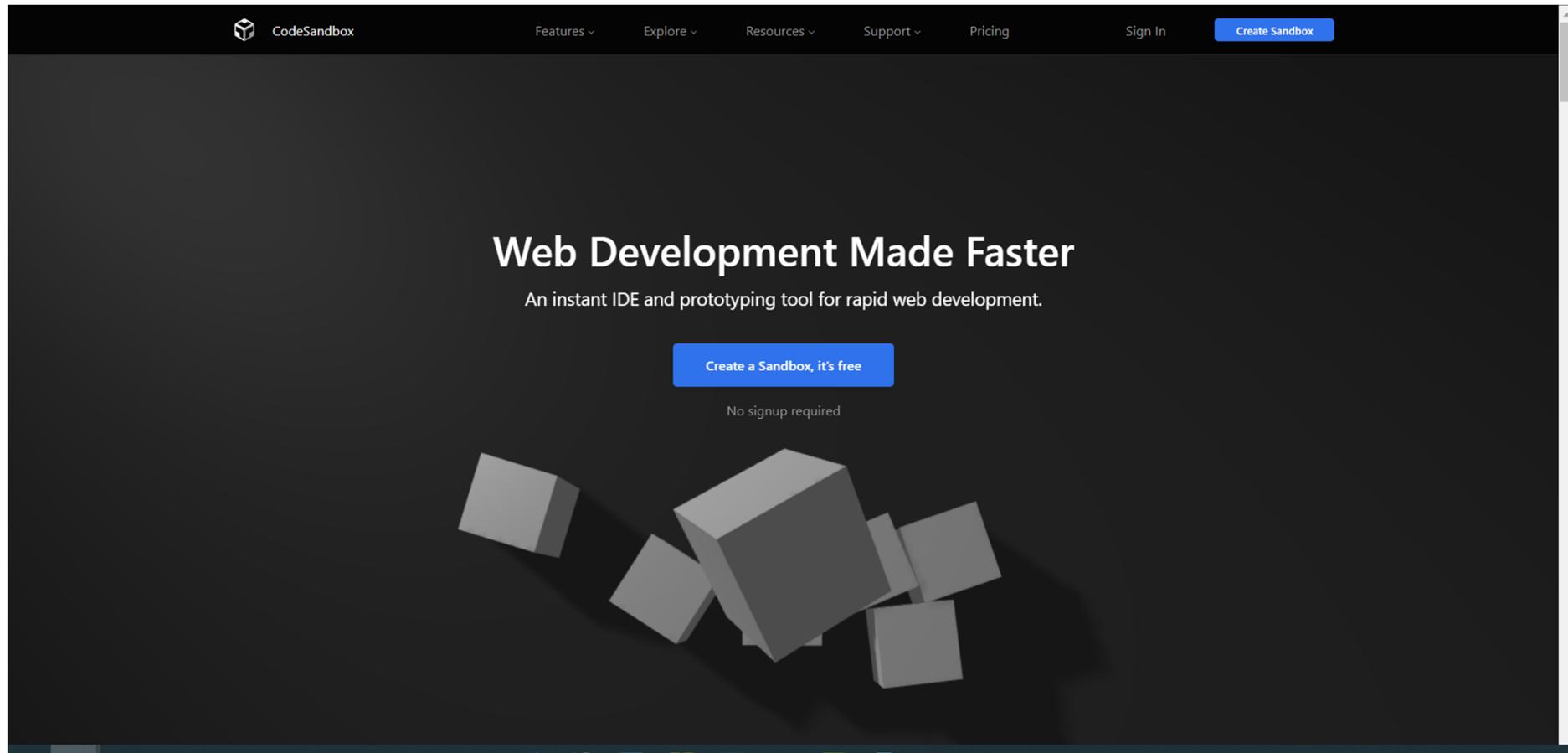


Additional services, options, etc.

The image displays four separate web application interfaces arranged in a grid-like layout:

- Amplify Framework**: An orange-themed landing page featuring the text "The foundation for your cloud-powered mobile & web apps". It includes a "GET STARTED" button and icons for Apple, Android, and global connectivity.
- Cloudinary**: A dark-themed landing page with the Cloudinary logo and navigation links for "About", "Blog", and "Contact". It also features "SOLUTIONS" and "PRICING" sections.
- Vue Mastery**: A light blue-themed landing page for learning Vue.js. It features the "Vue Mastery" logo and navigation links for "Courses" and "Pricing". The main headline reads "The ultimate guide for Vue".
- CodeSandbox**: A dark-themed landing page for an online code editor. It features the "CodeSandbox" logo and the tagline "The online code editor for Web". It includes a prominent "OPEN EDITOR" button and a "EXPLORE EXAMPLES" link.

Codesandbox.io



Online prototyping and development tool –
develop in the cloud, no installation necessary

Visual Studio | Marketplace

Sign in 

Visual Studio Visual Studio Code Azure DevOps Subscriptions Build your own Publish extensions

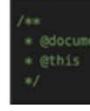
Extensions for the Visual Studio family of products

Search Visual Studio Code extensions 

Featured

 Formatting Toggle tombonnike  347K FREE	 Browser Preview Kenneth Auchenberg  232K FREE	 Better Align wwm  141K FREE	 GitHub Theme GitHub  47.8K FREE	 Deno denoland  20.3K FREE	 Azure Static Web App Microsoft  1.2K FREE
--	--	---	--	--	--

Trending this week

 Opencv Snippets	 Caché Relationship Cr	 Pylance	 Document This	 Which Key	 Flutter Preview
--	--	--	--	--	--

<https://marketplace.visualstudio.com/vscode>

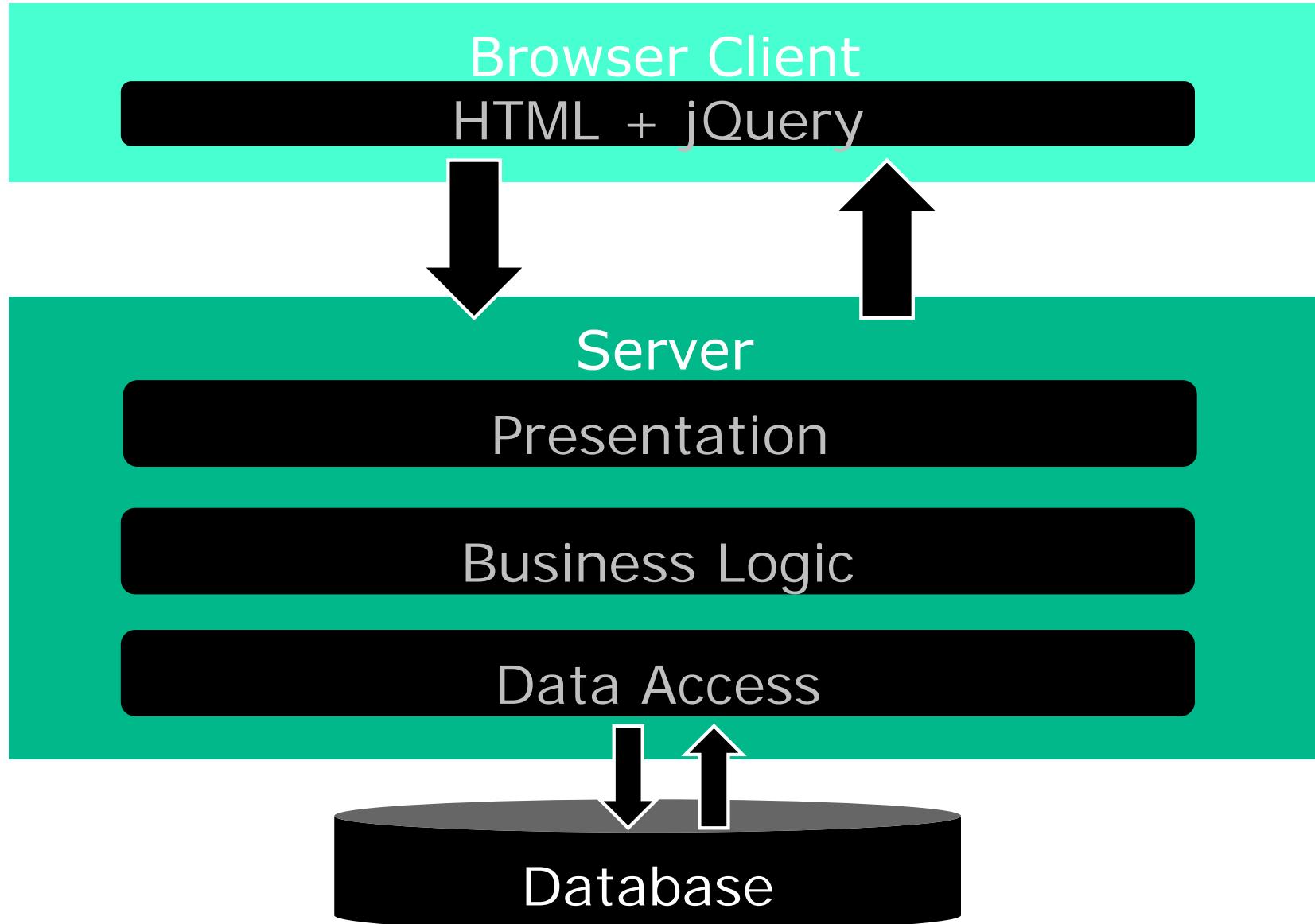
And more....



Framework application structure

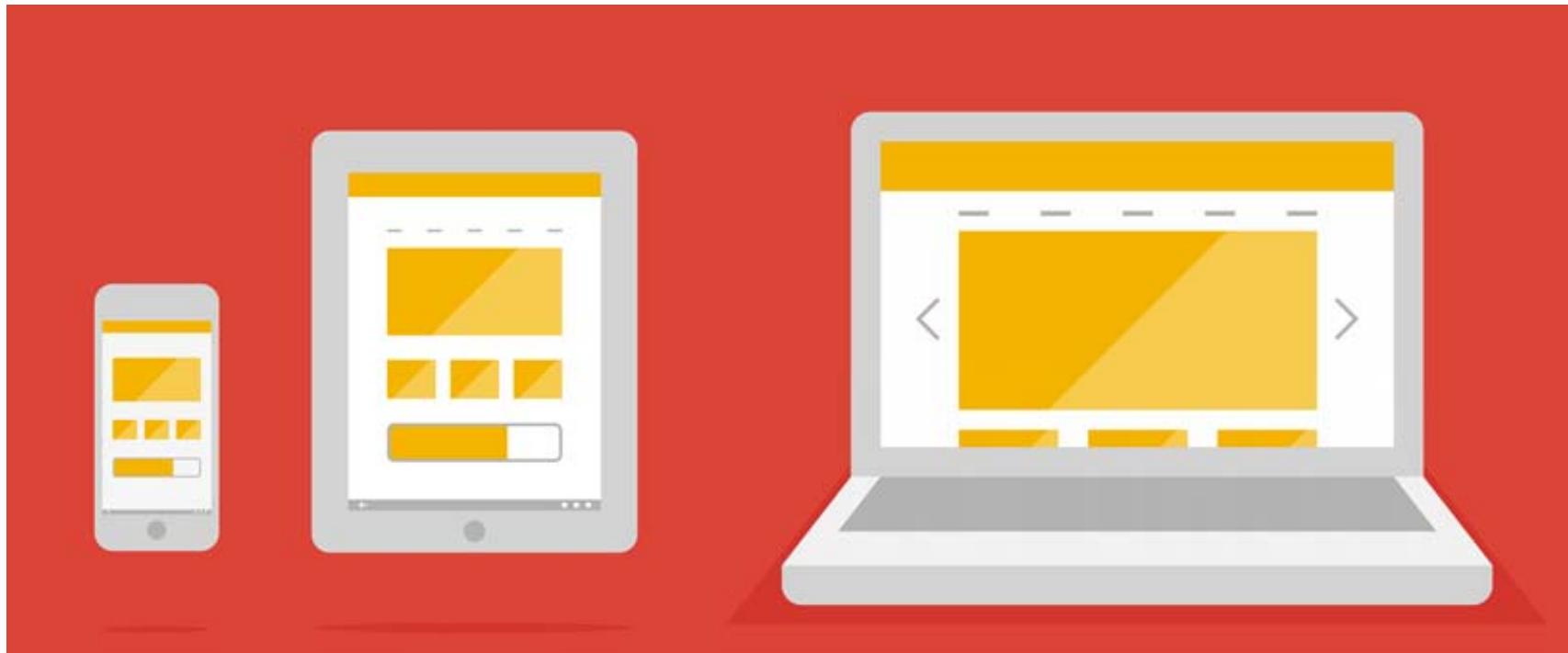
Getting a conceptual understanding of the SPA
architecture

Conventional Web app (ca. 2005 – 2015)

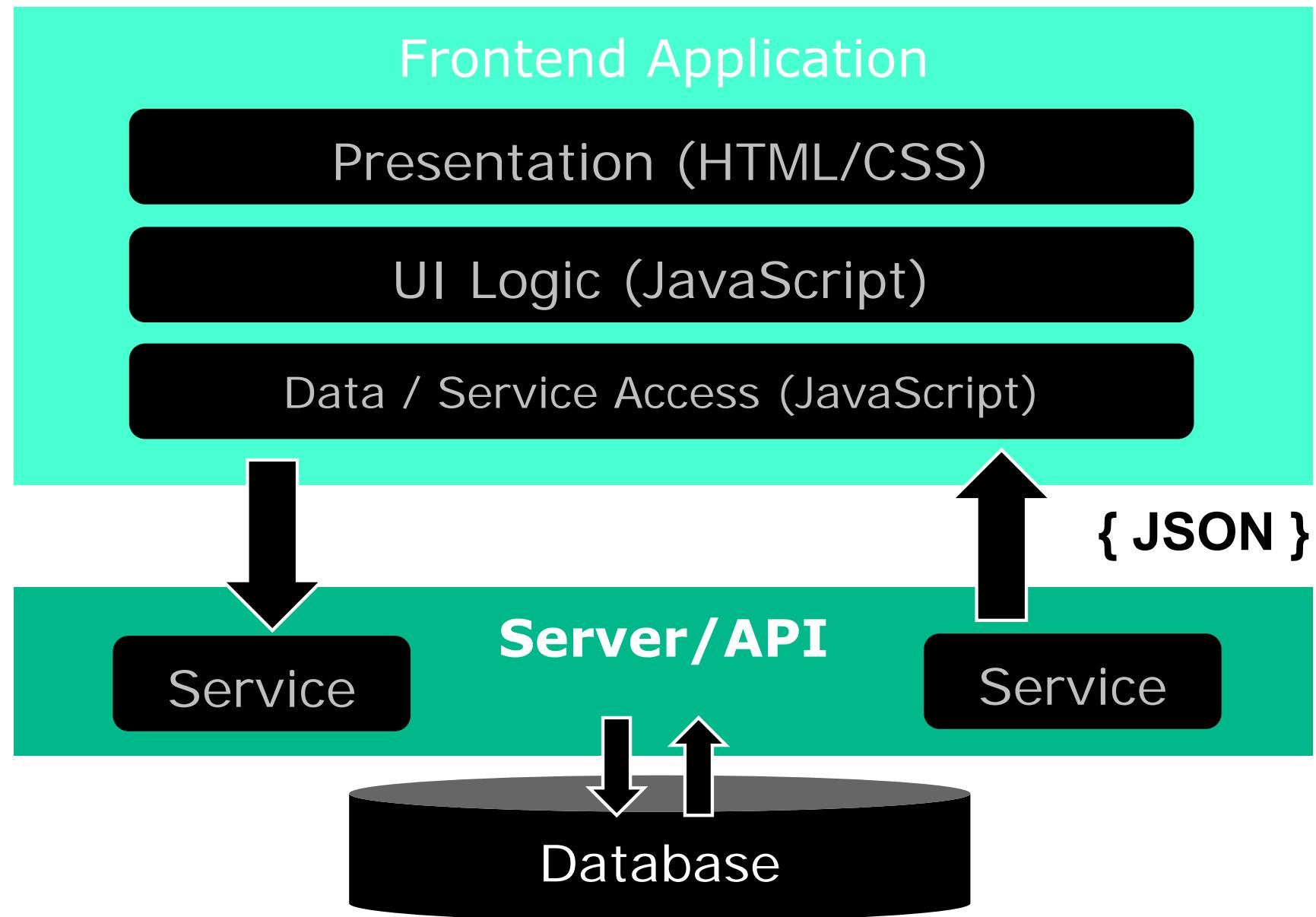


The world is changing...

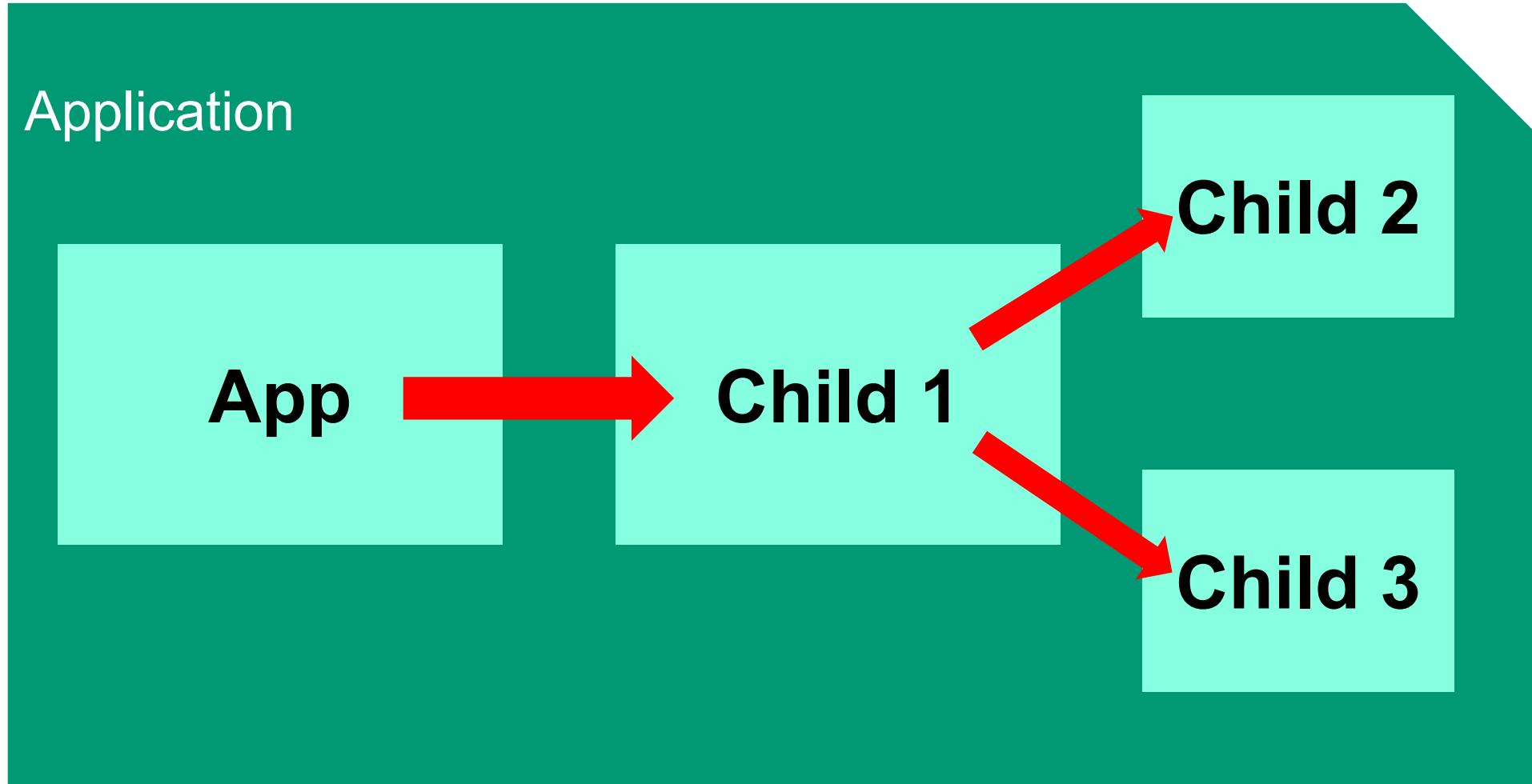
Since ca. 2010 – the growing needs for web
applications on **different form factors**



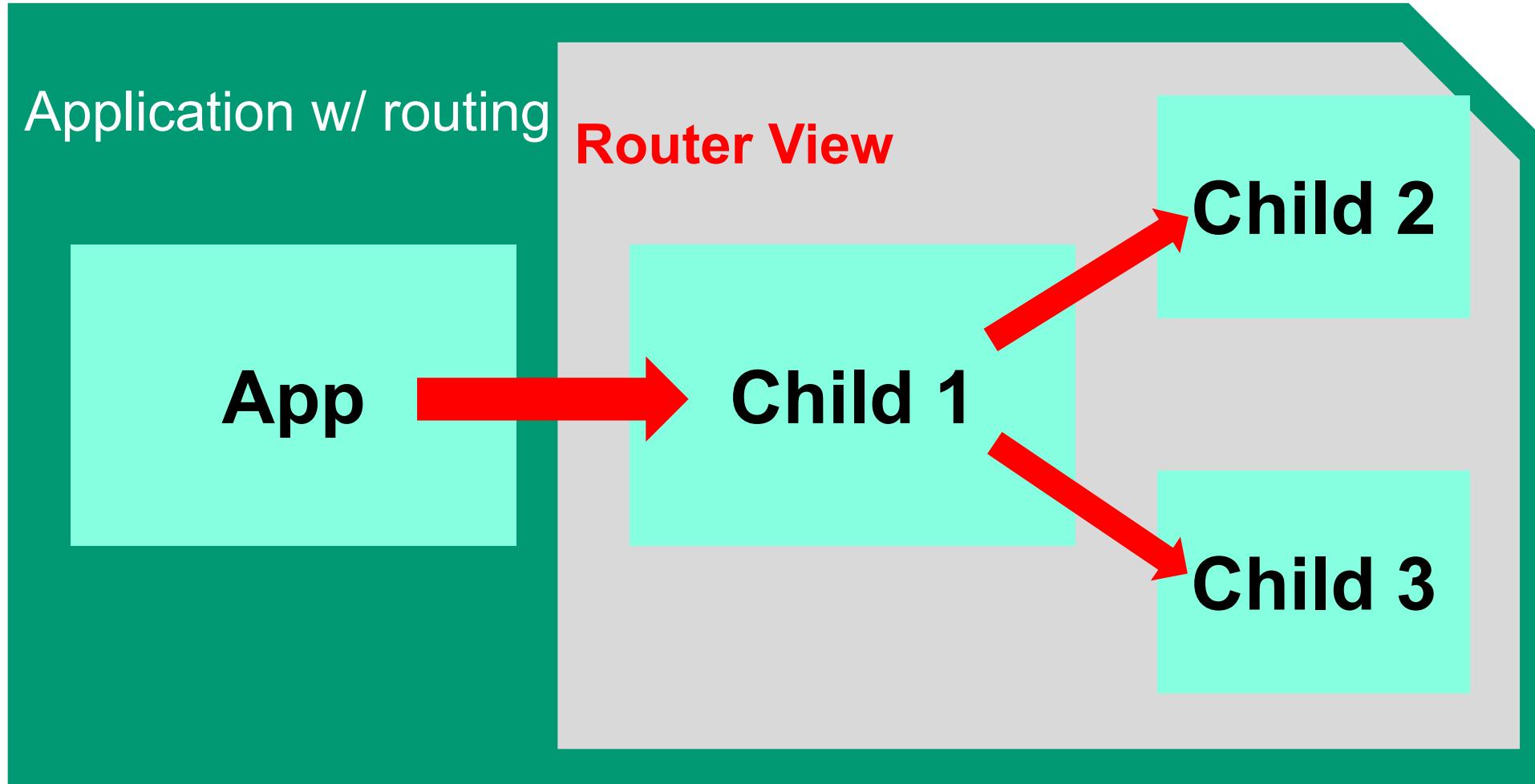
Single Page Applications



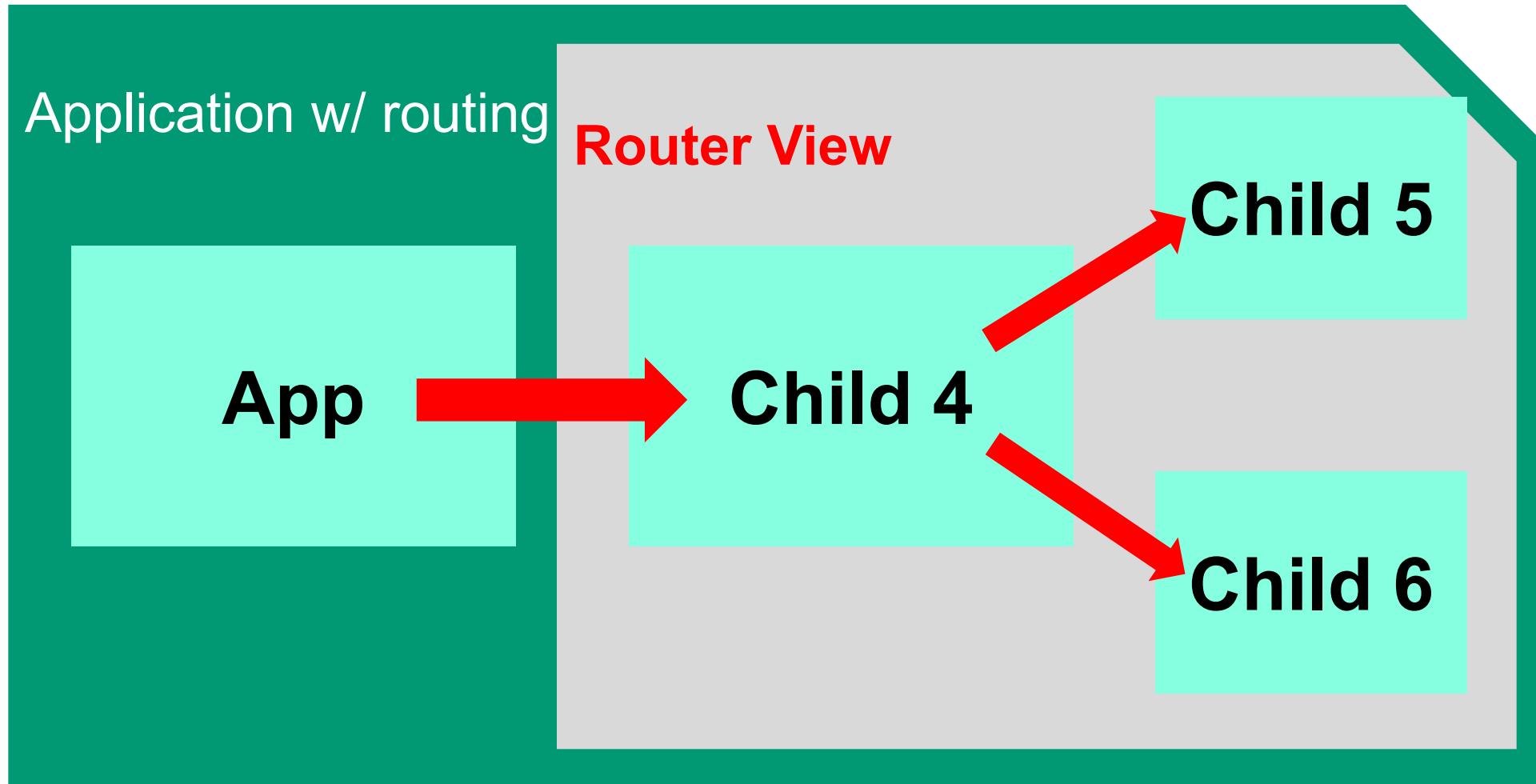
Built on components



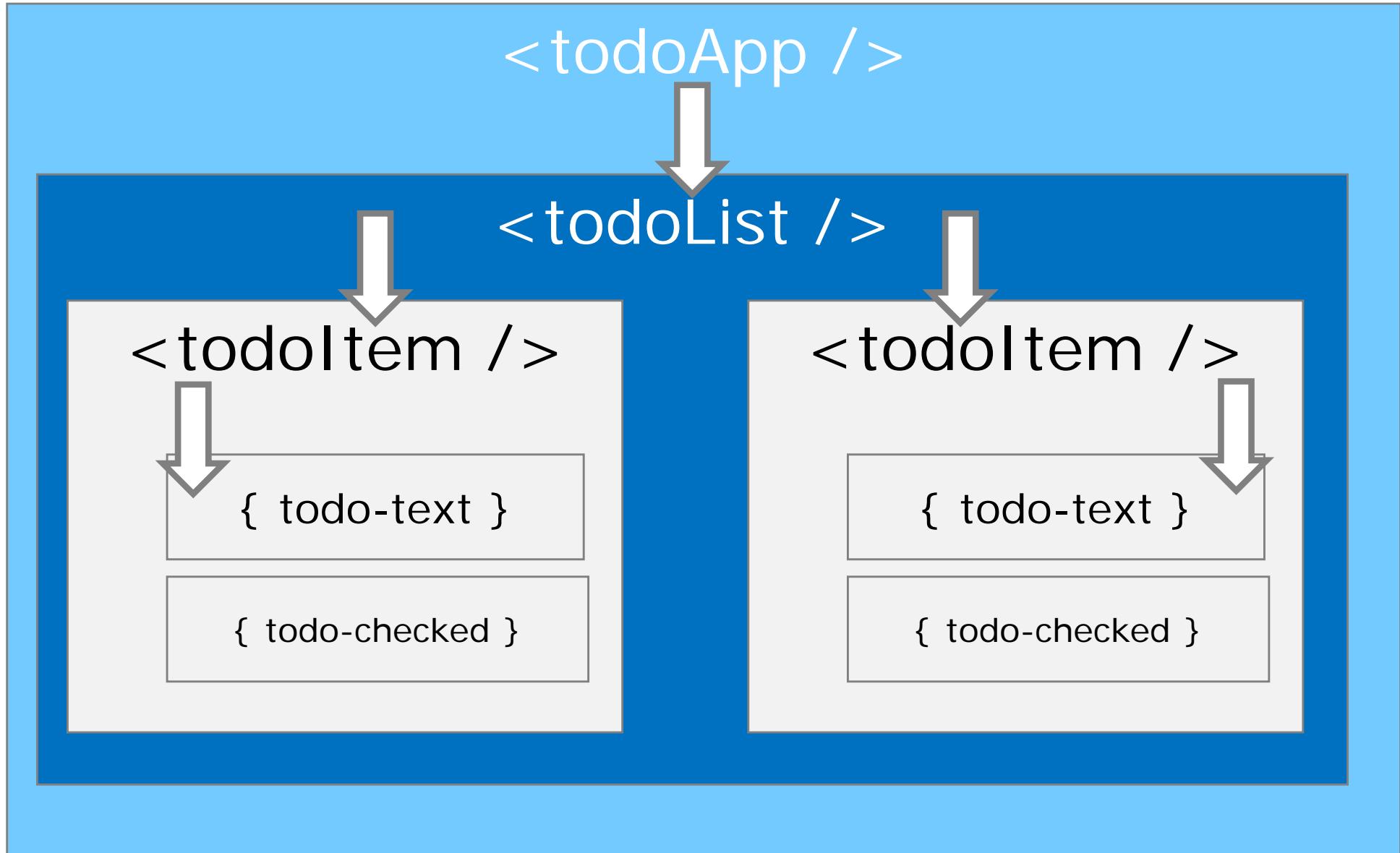
When using routing



As the URL changes, content gets updated

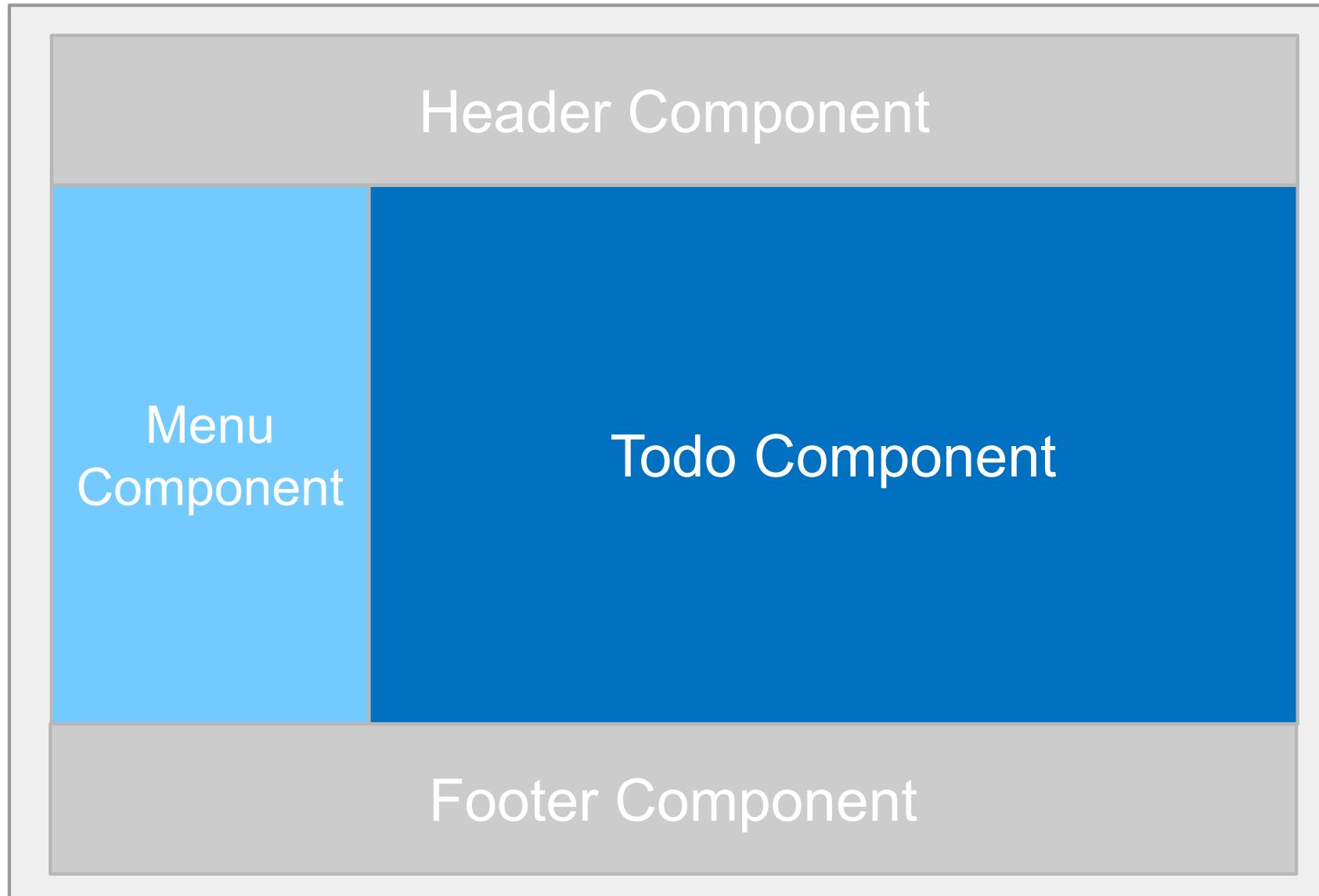


SPA & component structure



*“A Single Page
Application is a tree
of components”*

Components – visual representation



Summary

- Introduction, “*why frontend frameworks?*”
- Similarities
- Differences
- Current popularity
- Ecosystem
- General structure of frontend applications



Tooling

Necessary and popular tools for every frontend developer

Contents

- Prerequisites : node.js and git
- Editor
- CLI tools
- Browser Devtools
- Transpiling tools
- Linting tools
- Bundlers
- IDE Extensions



Photo by [Stijn Kleerebezem](#) on [Unsplash](#)

Git

The screenshot shows the official Git website at <https://git-scm.com/downloads>. The main navigation menu includes links for About, Documentation, Downloads (selected), GUI Clients, Logos, and Community. A sidebar promotes the "Pro Git book". The central content area features a "Downloads" section with links for Mac OS X, Windows, and Linux/Unix. To the right, a large image of a Mac monitor displays the latest source release version 2.19.2, with a "Download 2.19.0 for Mac" button. Below the download section, there's a note about older releases and the GitHub repository. The bottom half of the page contains sections for "GUI Clients" (describing built-in tools like git-gui and gitk) and "Logos" (offering various Git logo formats). A terminal window at the bottom shows the command "git --version" being run, with the output "git version 2.17.2 (Apple Git-113)" highlighted with a red oval.

git --fast-version-control

About

Documentation

Downloads

GUI Clients

Logos

Community

The entire [Pro Git book](#) written by Scott Chacon and Ben Straub is available to [read online for free](#). Dead tree versions are available on [Amazon.com](#).

Downloads

Mac OS X Windows

Linux/Unix

Older releases are available and the [Git source repository](#) is on GitHub.

GUI Clients

Git comes with built-in GUI tools (`git-gui`, `gitk`), but there are several third-party tools for users looking for a platform-specific experience.

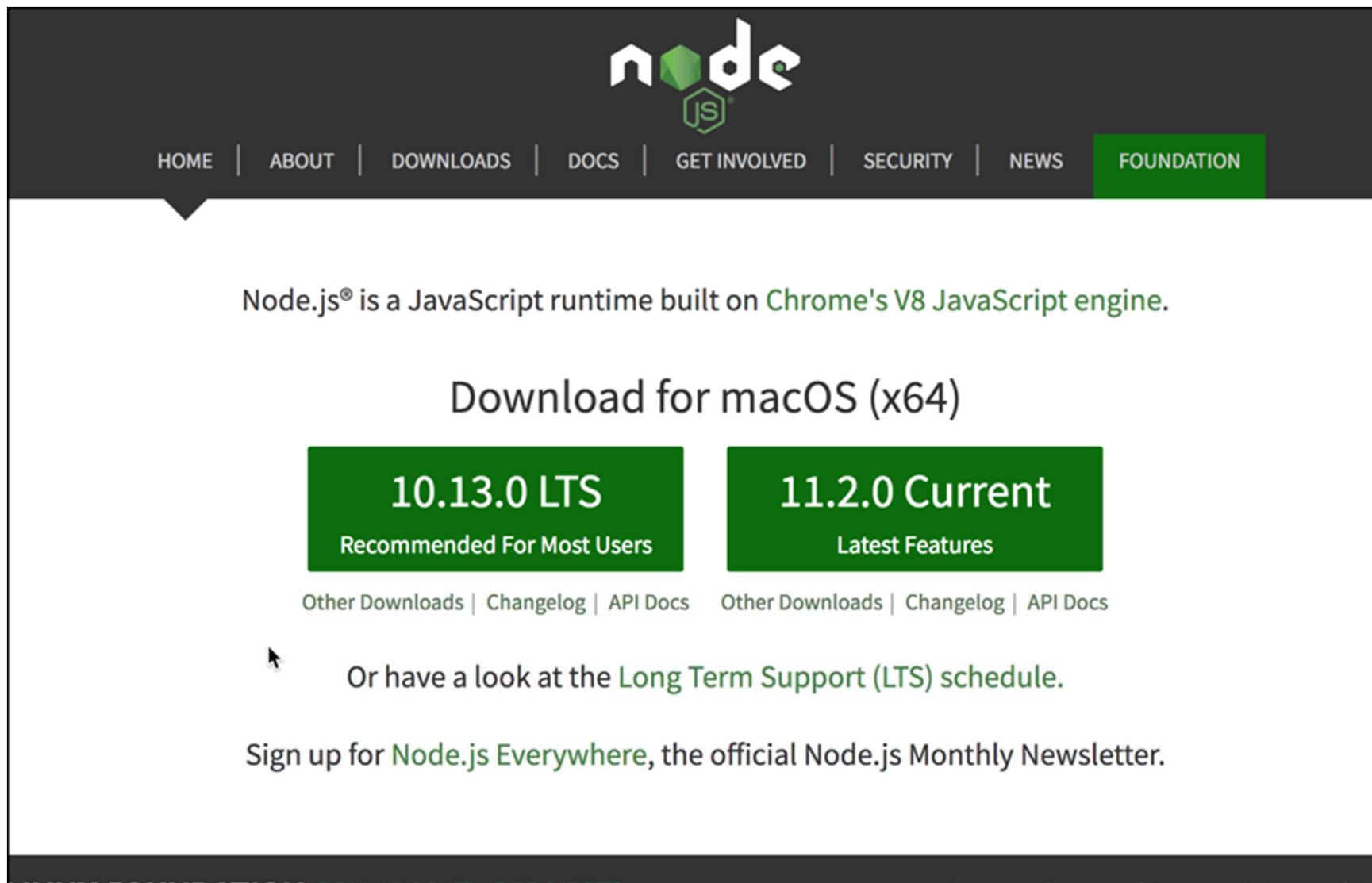
Logos

Various Git logos in PNG (bitmap) and EPS (vector) formats are available for use in online and print projects.

Last login: Mon Nov 26 13:28:50 on ttys011
MacBook-Pro:~ PeterKassenaar\$ git --version
git version 2.17.2 (Apple Git-113)
MacBook-Pro:~ PeterKassenaar\$

PeterKassenaar

Node.js



The screenshot shows the official Node.js website. At the top is a dark navigation bar with the Node.js logo and links for HOME, ABOUT, DOWNLOADS, DOCS, GET INVOLVED, SECURITY, NEWS, and FOUNDATION. The FOUNDATION link is highlighted with a green background. Below the navigation is a large white section containing text and download buttons. The text reads: "Node.js® is a JavaScript runtime built on Chrome's V8 JavaScript engine." Below this is a heading "Download for macOS (x64)". Two green rectangular buttons are displayed side-by-side: the left one is labeled "10.13.0 LTS" and "Recommended For Most Users"; the right one is labeled "11.2.0 Current" and "Latest Features". At the bottom of this section are links for "Other Downloads | Changelog | API Docs" for each button. A mouse cursor is visible pointing towards the "LTS" button. Further down, there is a bullet point followed by the text "Or have a look at the Long Term Support (LTS) schedule." and a link to "Node.js Everywhere".

Node.js® is a JavaScript runtime built on Chrome's V8 JavaScript engine.

Download for macOS (x64)

10.13.0 LTS
Recommended For Most Users

11.2.0 Current
Latest Features

Other Downloads | Changelog | API Docs Other Downloads | Changelog | API Docs

Or have a look at the [Long Term Support \(LTS\) schedule](#).

Sign up for [Node.js Everywhere](#), the official Node.js Monthly Newsletter.

<https://nodejs.org/en/>

Check & install

The image shows a composite of two screenshots. On the left is a 'Command Prompt' window with the following text:

```
C:\Users\Gebruiker>node --version  
v12.4.0
```

The command `node --version` is highlighted with a red rectangle, and a red arrow points from this rectangle to the Node.js download page on the right.

On the right is a screenshot of the Node.js website's 'Downloads' section. The page has a dark header with the Node.js logo and navigation links: HOME, ABOUT, DOWNLOADS, DOCS, GET INVOLVED, SECURITY, CERTIFICATION, and NEWS. Below the header is a green bar with tabs for 'LTS' (Recommended For Most Users) and 'Current' (Latest Features). Under the LTS tab, there are links for 'Windows Installer' (node-v12.18.2-x64.msi), 'macOS Installer' (node-v12.18.2.pkg), and 'Source Code' (node-v12.18.2.tar.gz). Under the Current tab, there is a table showing binary distributions for Windows, macOS, Linux, and ARM platforms, with 32-bit and 64-bit options. At the bottom of the table is a link to the source code tarball: node-v12.18.2.tar.gz.

	32-bit	64-bit
Windows Installer (.msi)	node-v12.18.2-x64.msi	
Windows Binary (.zip)	node-v12.18.2.zip	
macOS Installer (.pkg)	node-v12.18.2.pkg	
macOS Binary (.tar.gz)	node-v12.18.2.tar.gz	
Linux Binaries (x64)		
Linux Binaries (ARM)		
Source Code	node-v12.18.2.tar.gz	

<https://nodejs.org/en/download/>

NPM

Command Prompt

```
C:\Users\Gebruiker>npm --version
6.14.1
```

C:\Users\Gebruiker>

docs home contact support npm.community npmjs.com

CLI documentation > CLI commands

- > [access](#) Set access level on published packages
- > [adduser](#) Add a registry user account
- > [audit](#) Run a security audit
- > [bin](#) Display npm bin folder
- > [bugs](#) Bugs for a package in a web browser maybe
- > [build](#) Build a package
- > [bundle](#) REMOVED
- > [cache](#) Manipulates packages cache
- > [ci](#) Install a project with a clean slate
- > [completion](#) Tab Completion for npm
- > [config](#) Manage the npm configuration files
- > [dedupe](#) Reduce duplication
- > [deprecate](#) Deprecate a version of a package
- > [dist-tag](#) Modify package distribution tags
- > [docs](#) Docs for a package in a web browser maybe
- > [doctor](#) Check your environments
- > [edit](#) Edit an installed package
- > [explore](#) Browse an installed package
- > [help-search](#) Search npm help documentation

<https://docs.npmjs.com/cli-documentation/cli>



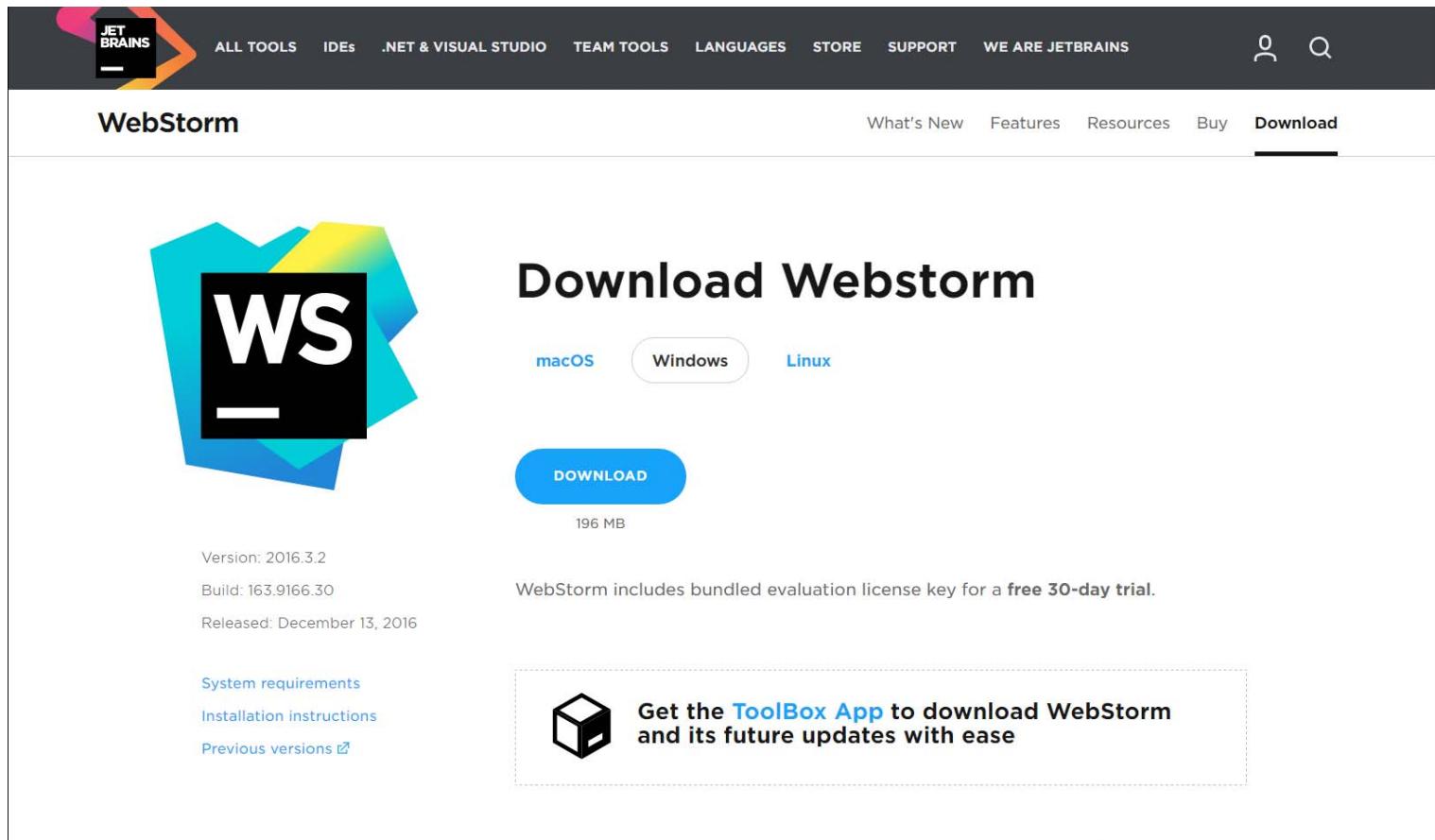
Editors

Where do you write your code?

WebStorm

30-day trial – not free after that period.

But you're very productive, very fast!

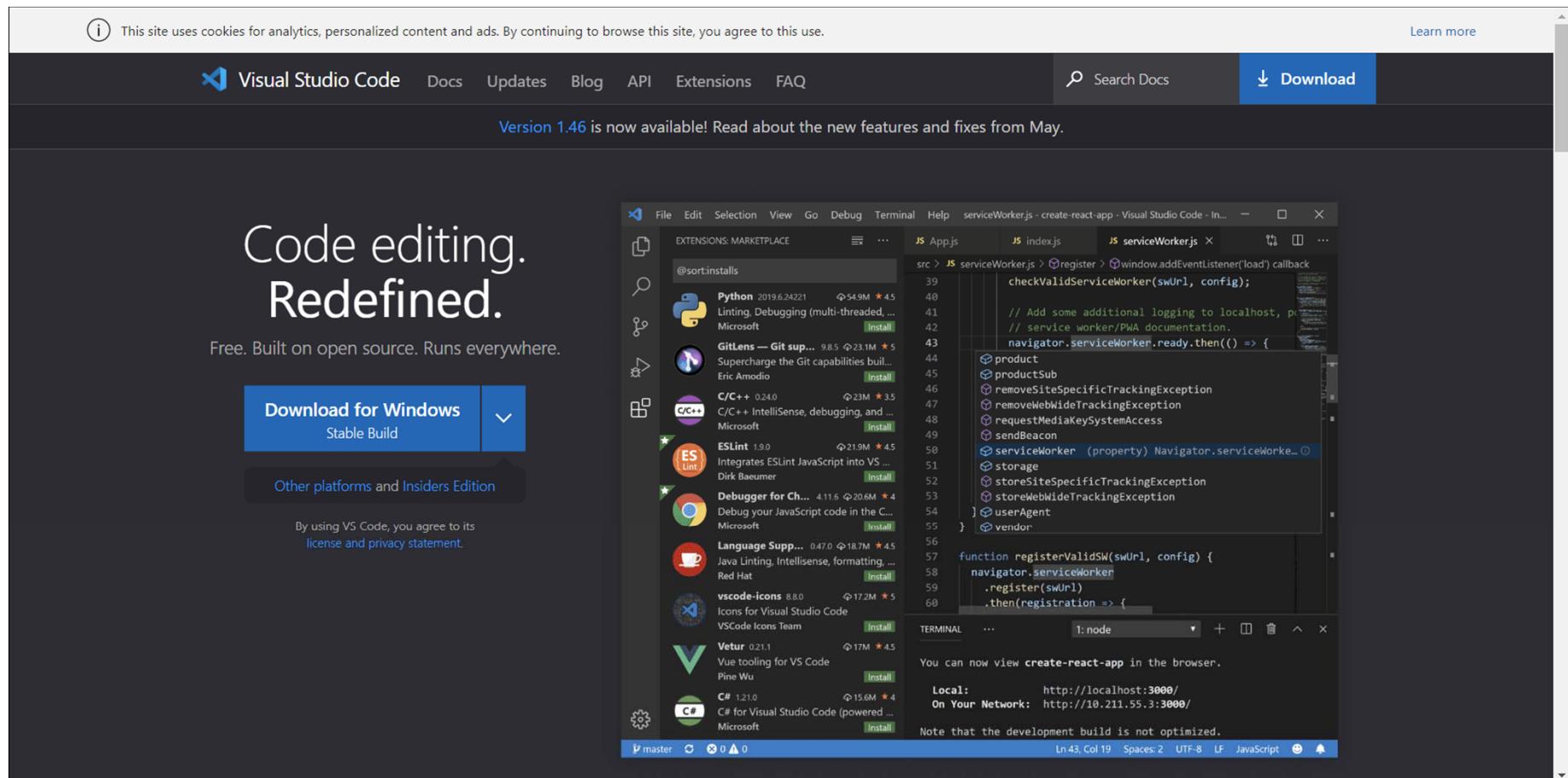


The screenshot shows the 'Download' section of the WebStorm product page. At the top, there's a navigation bar with links for 'ALL TOOLS', 'IDEs', '.NET & VISUAL STUDIO', 'TEAM TOOLS', 'LANGUAGES', 'STORE', 'SUPPORT', and 'WE ARE JETBRAINS'. Below the navigation is a search bar and a user account icon. The main content area has a heading 'WebStorm' and a sub-heading 'Download Webstorm'. It features a large 'WS' logo icon. Below the logo, there are download links for 'macOS', 'Windows' (which is highlighted in a blue box), and 'Linux'. A prominent blue 'DOWNLOAD' button is centered below these links. To the left of the download links, there are release details: 'Version: 2016.3.2', 'Build: 163.9166.30', and 'Released: December 13, 2016'. To the right, a note states 'WebStorm includes bundled evaluation license key for a free 30-day trial.' At the bottom of the page, there are links for 'System requirements', 'Installation instructions', and 'Previous versions'.

www.jetbrains.com/webstorm/download/

Visual Studio Code

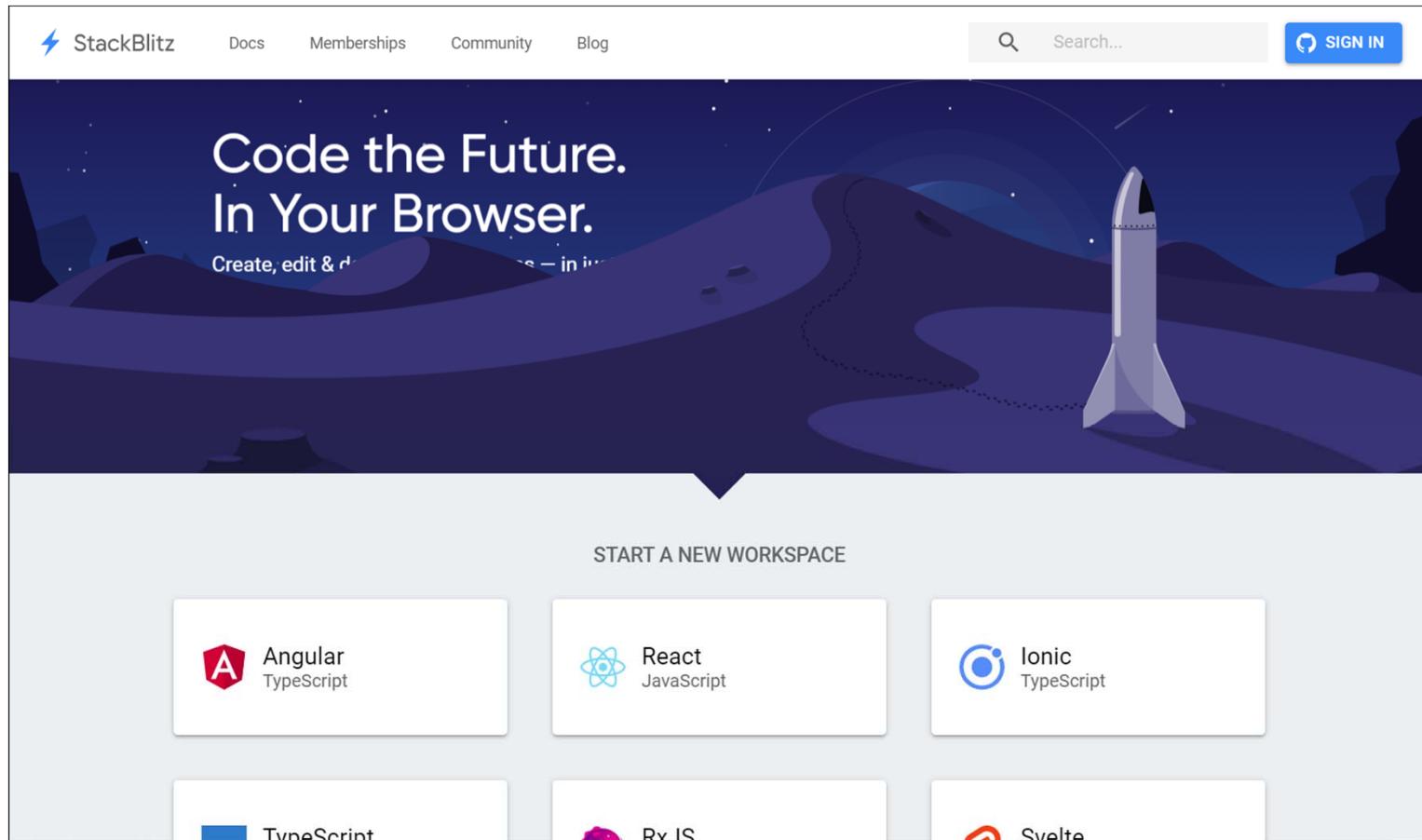
- Free alternative – very popular!
- Lots of extensions available



code.visualstudio.com/download

StackBlitz

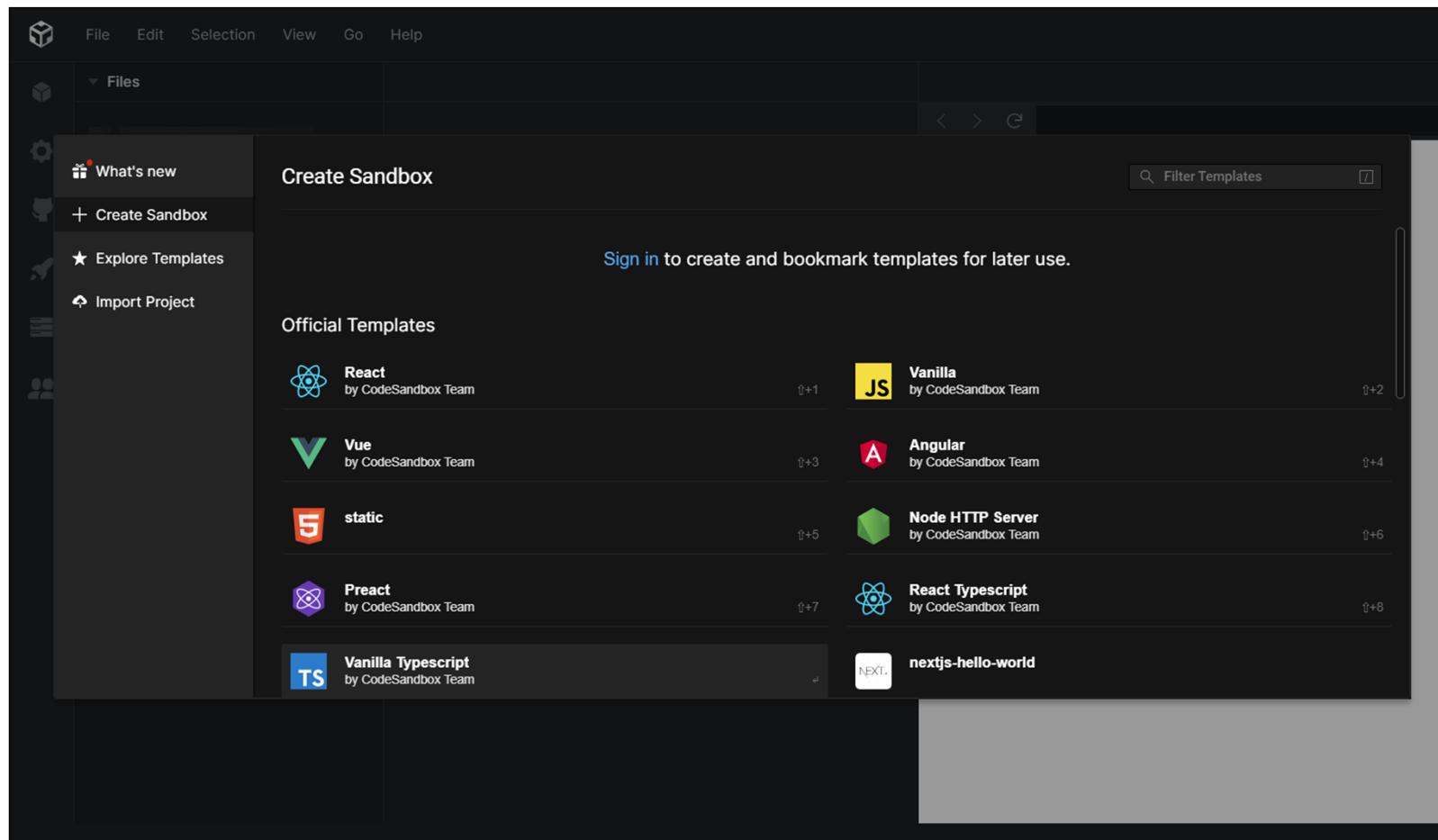
- Online editor, code in the browser – no installation necessary
- Lots of frameworks: Angular, React, Ionic, and more



<https://stackblitz.com/>

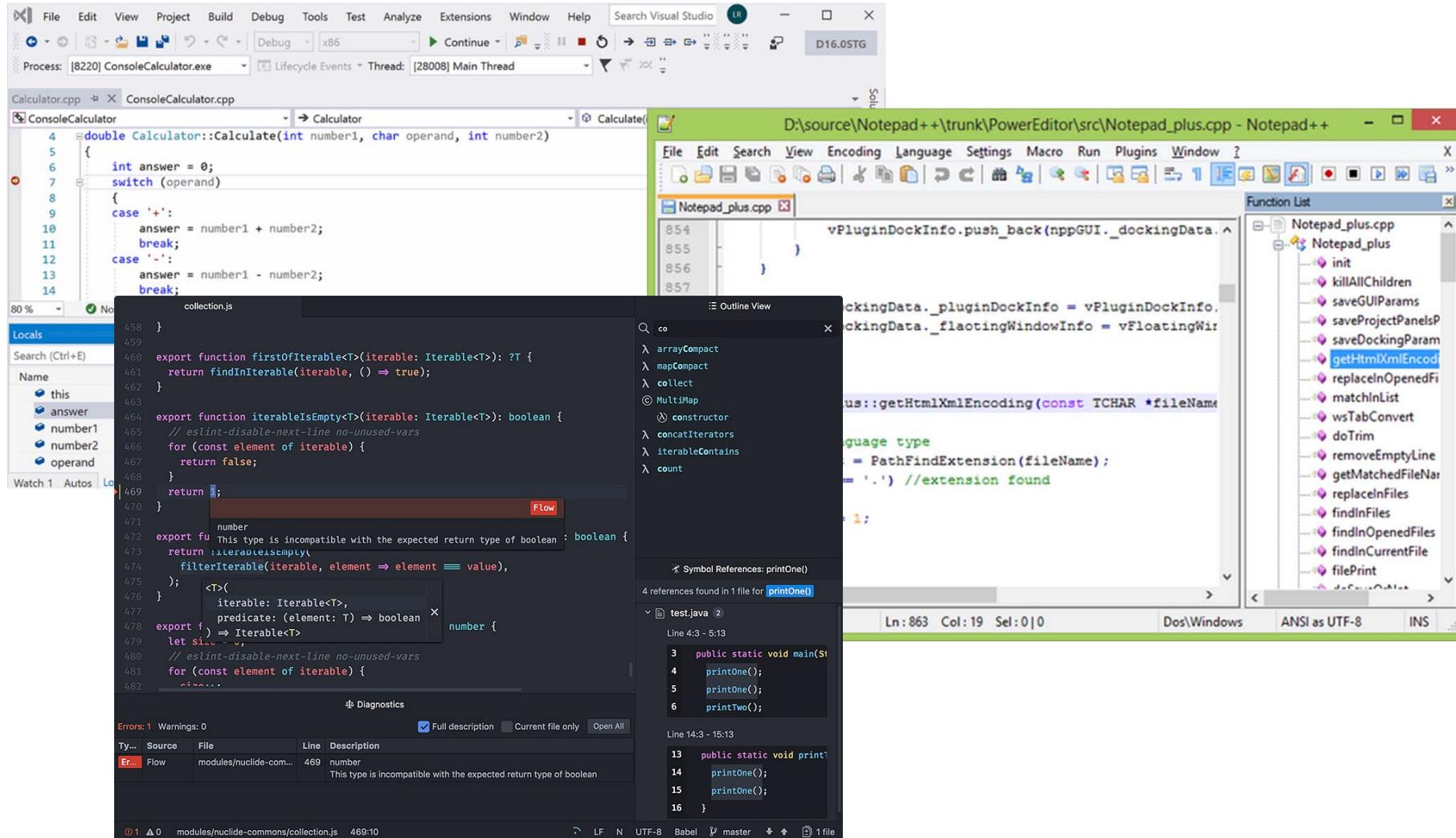
CodeSandbox

- Online editor – no installation necessary
- Based on VS Code, also with Angular, React, Ionic, and more



<https://codesandbox.io/s/>

Other options



Visual Studio, Notepad++, Atom, Sublime Text, Eclipse, IntelliJ, ...



Framework CLI tools

The Command Line Interface for frameworks

Framework CLI's

- Always – based on Node.js
- Scaffold new projects
- Add routing, add components (sometimes)
- Add State management and so on
- Answer prompts when creating a new project

```
npm install -g @[framework]/cli
```

Vue CLI

Vue CLI 3 

Guide Config Reference Plugin Dev Guide ▾ Plugins ▾ Changelog ▾ Languages ▾ GitHub ▾



Vue CLI 3

 Standard Tooling for Vue.js Development

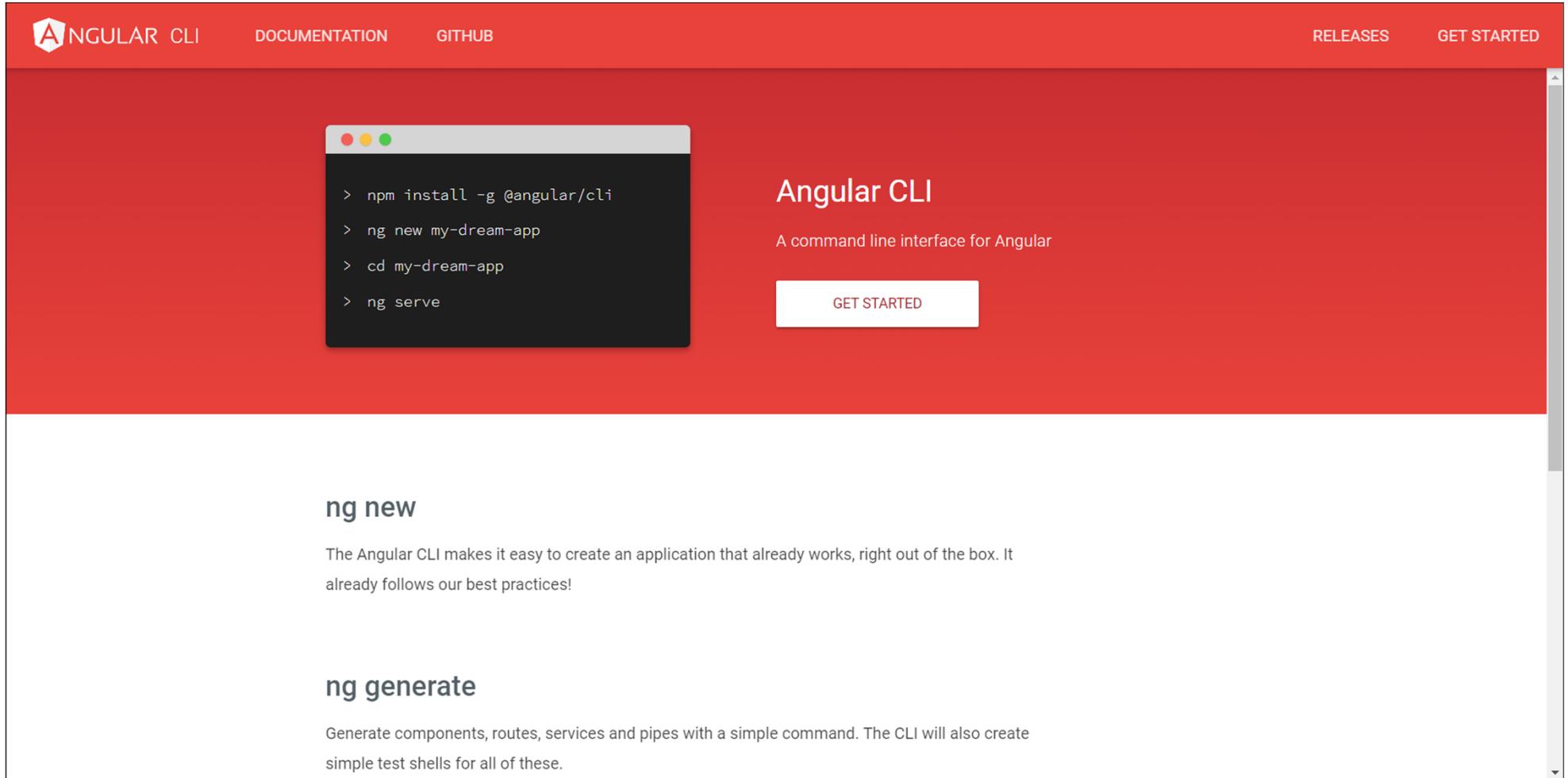
[Get Started →](#)

cli.vuejs.org

Small Demo



Angular CLI



The screenshot shows the Angular CLI homepage with a red header bar. The header contains the Angular CLI logo, navigation links for DOCUMENTATION, GITHUB, RELEASES, and GET STARTED, and a search bar.

The main content area features a dark-themed terminal window showing command-line instructions:

```
> npm install -g @angular/cli  
> ng new my-dream-app  
> cd my-dream-app  
> ng serve
```

To the right of the terminal window, the text "Angular CLI" is displayed in large white font, followed by a subtitle "A command line interface for Angular" and a "GET STARTED" button.

Below the terminal window, there are two sections:

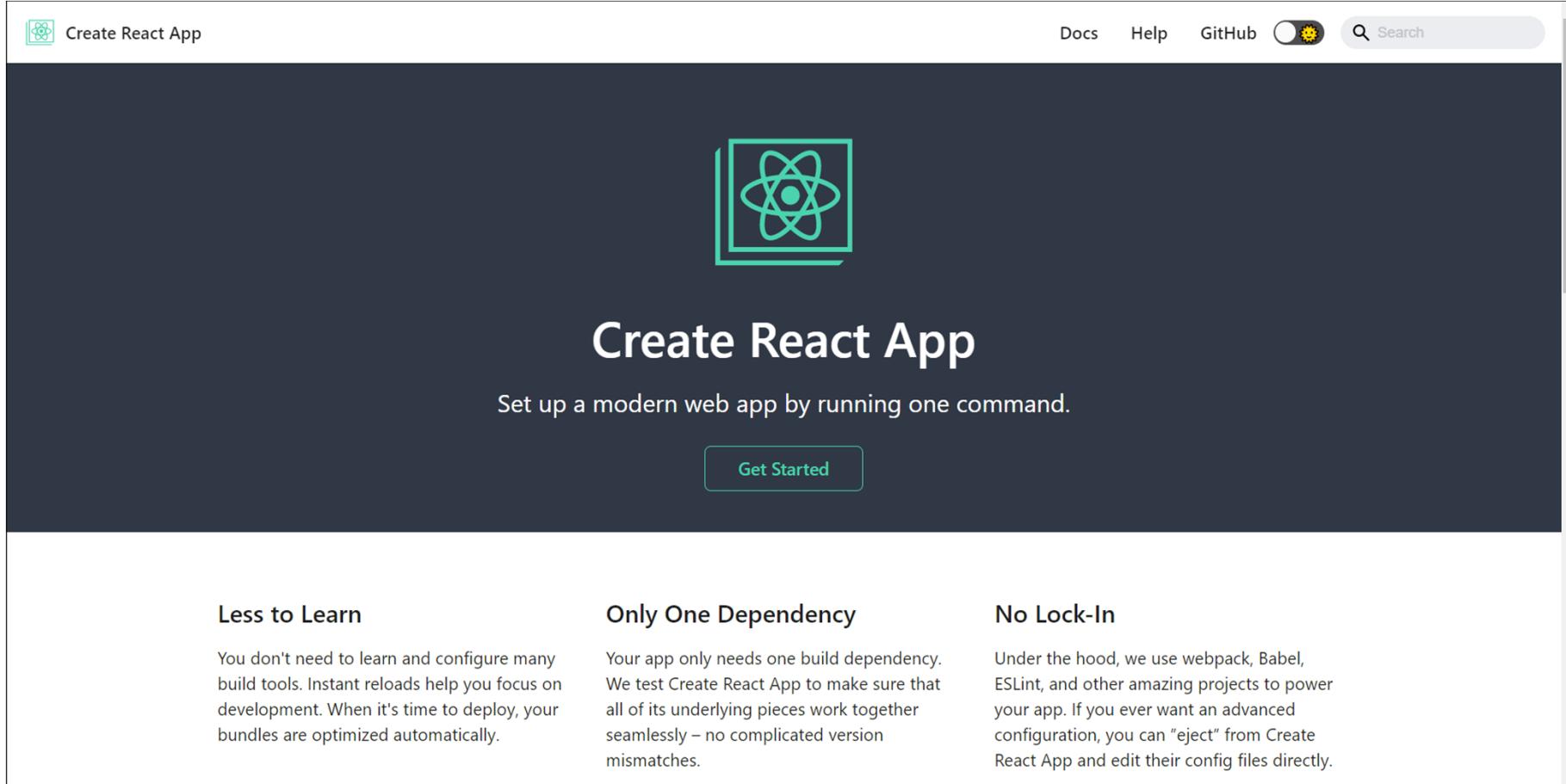
- ng new**
The Angular CLI makes it easy to create an application that already works, right out of the box. It already follows our best practices!
- ng generate**
Generate components, routes, services and pipes with a simple command. The CLI will also create simple test shells for all of these.

cli.angular.io

Small Demo



React CLI

A screenshot of the Create React App website. The header features the "Create React App" logo and name, navigation links for "Docs", "Help", "GitHub", and a search bar. The main section has a dark background with a central atom icon. The title "Create React App" is displayed in large white font, followed by the subtitle "Set up a modern web app by running one command." Below this is a "Get Started" button. The footer contains three sections: "Less to Learn", "Only One Dependency", and "No Lock-In", each with descriptive text. At the bottom right is the URL "create-react-app.dev".

Create React App

Docs Help GitHub 🔍 Search



Create React App

Set up a modern web app by running one command.

[Get Started](#)

Less to Learn

You don't need to learn and configure many build tools. Instant reloads help you focus on development. When it's time to deploy, your bundles are optimized automatically.

Only One Dependency

Your app only needs one build dependency. We test Create React App to make sure that all of its underlying pieces work together seamlessly – no complicated version mismatches.

No Lock-In

Under the hood, we use webpack, Babel, ESLint, and other amazing projects to power your app. If you ever want an advanced configuration, you can "eject" from Create React App and edit their config files directly.

create-react-app.dev

Small Demo



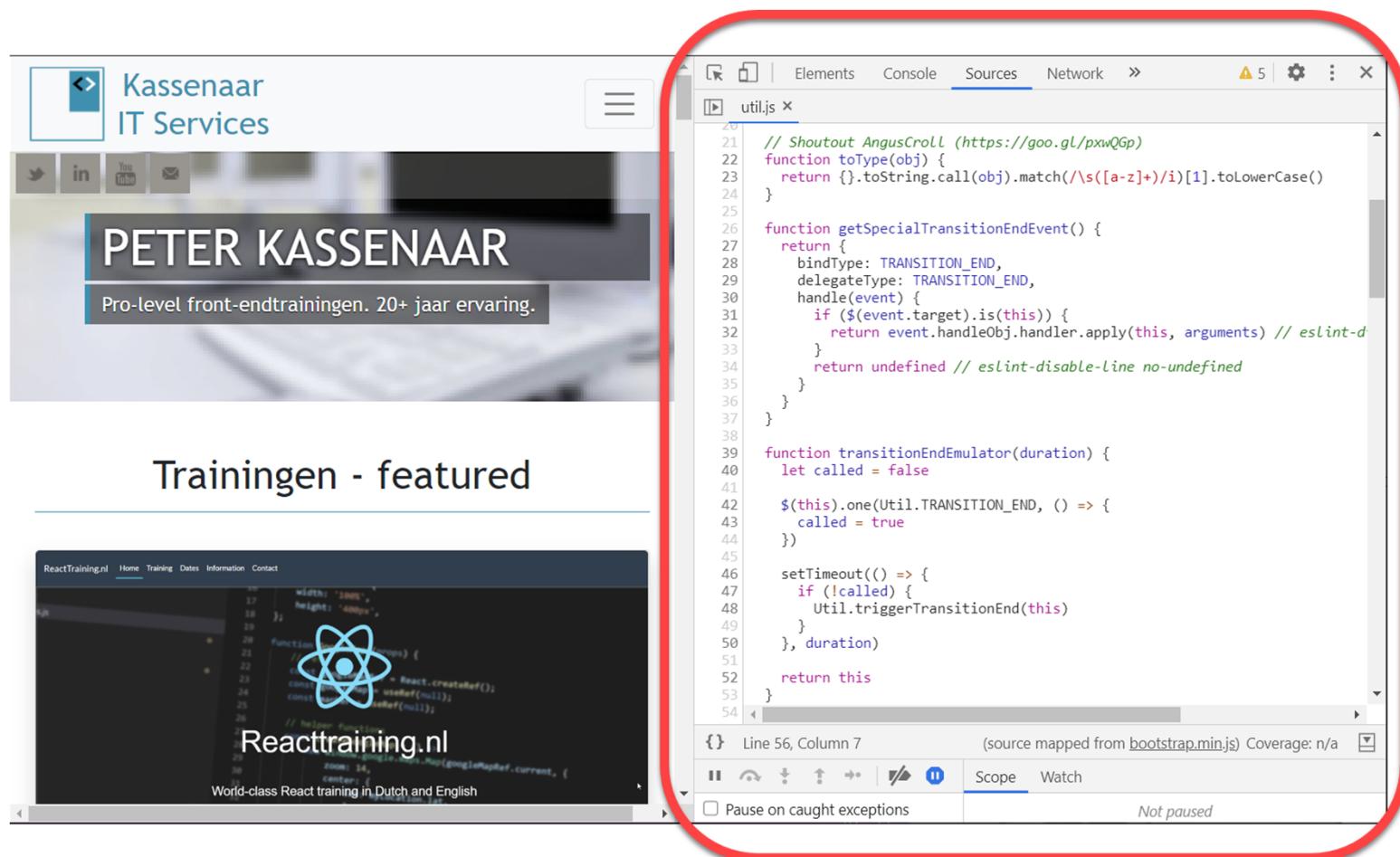


Framework Devtools

Debugging your applications in the browser

Debugging tools

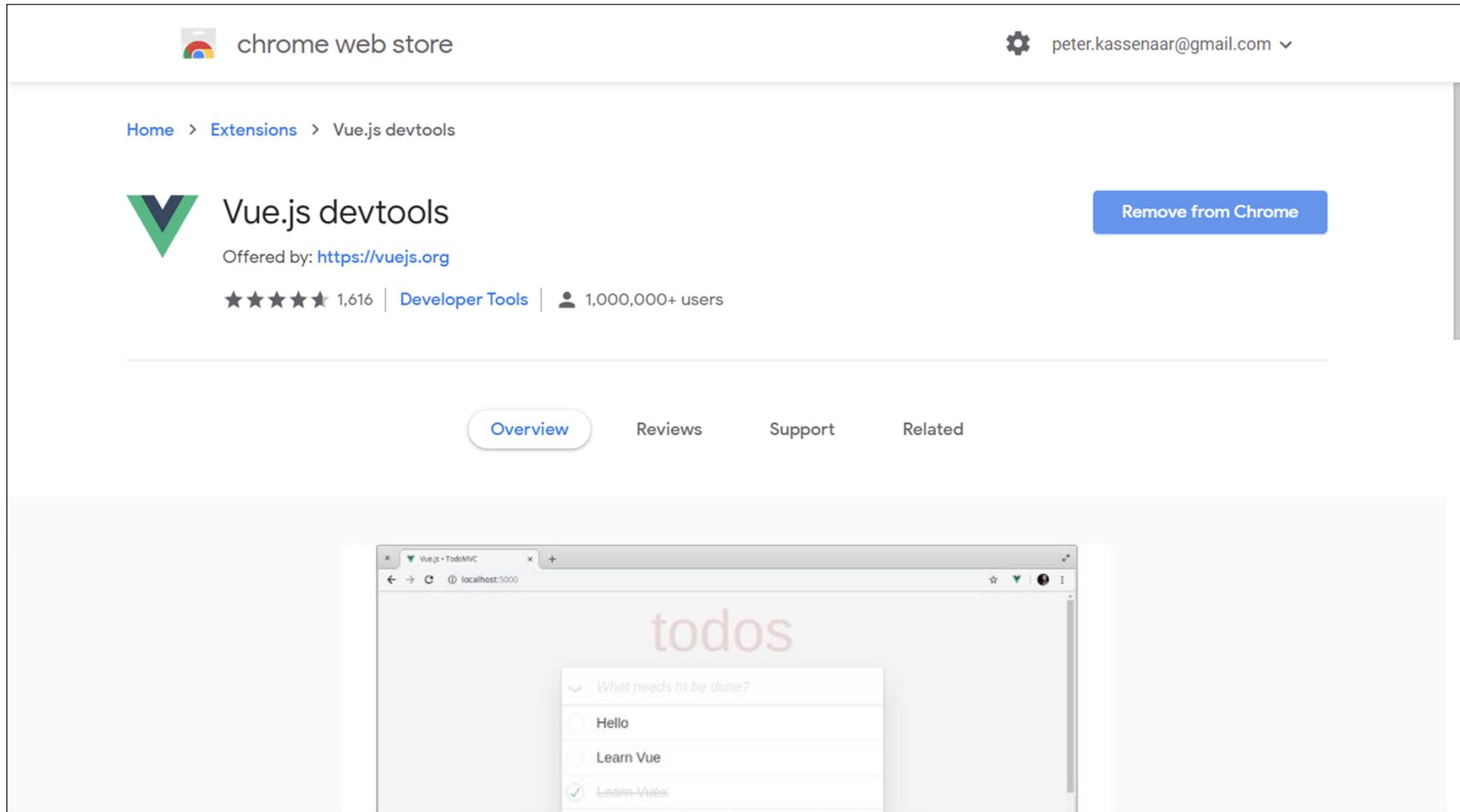
- Debugging in the browser: F12, or rightclick, Inspect Element
- Use the tabs Elements, Console and Sources



Small Demo

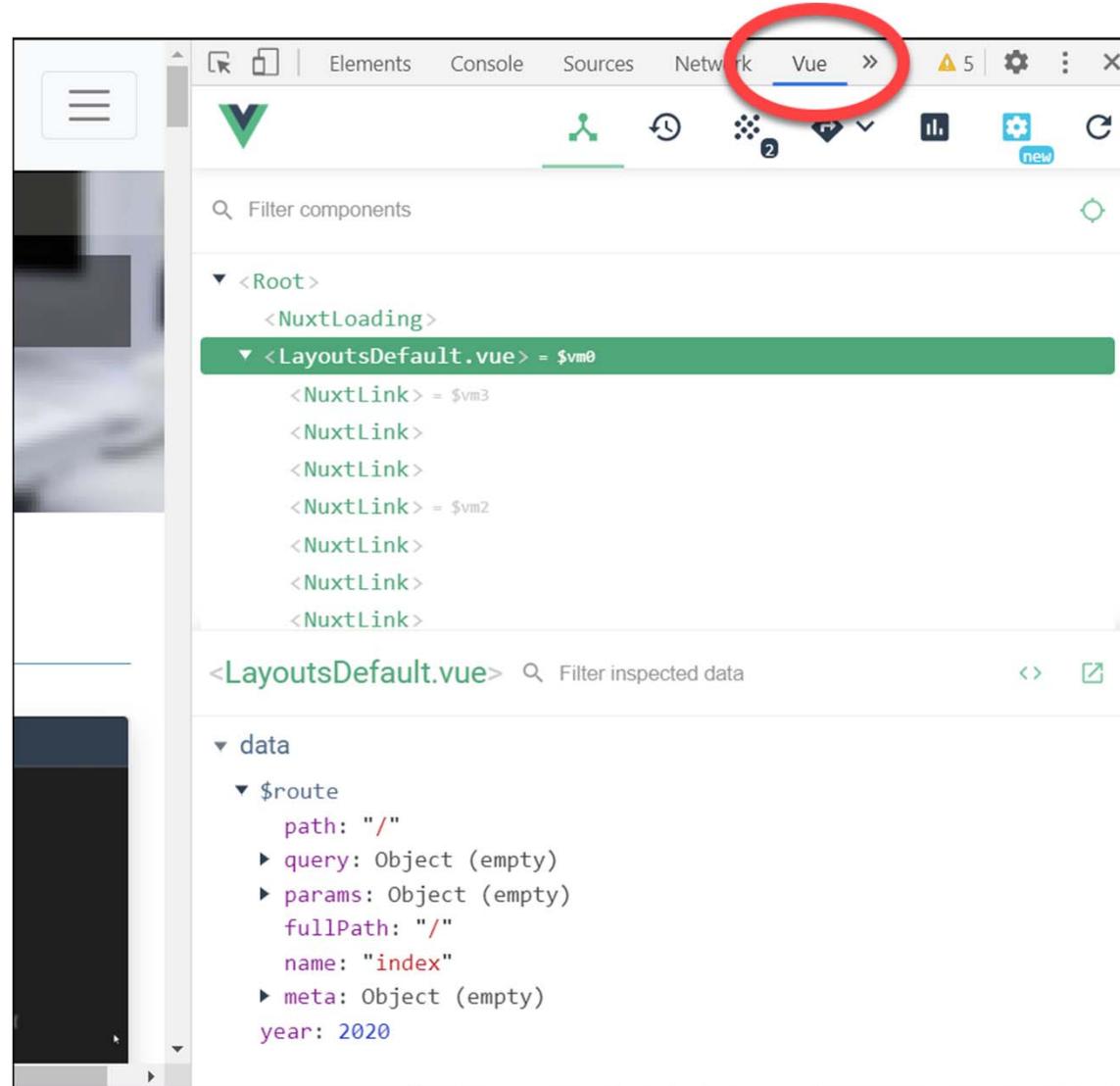


Chrome Extensions: Vue Devtools



Extra tab in Chrome Devtools, inspect Vue project

Using Vue Devtools



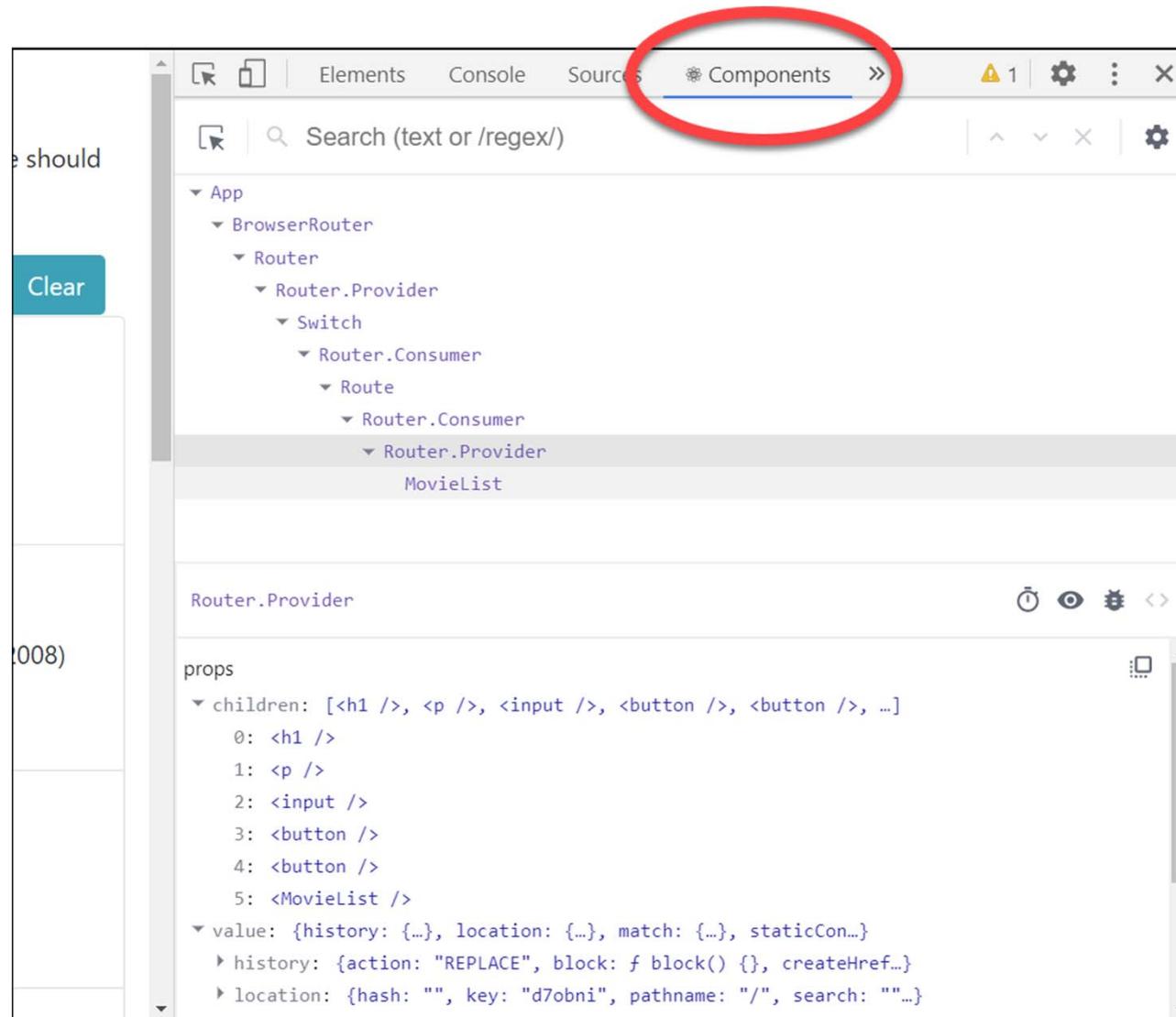
Small Demo



React Developer Tools

The screenshot shows the Chrome Web Store page for the "React Developer Tools" extension. At the top, there's a header with the Chrome logo and "chrome web store". To the right is a user profile icon with the email "peter.kassenaar@gmail.com". Below the header, the breadcrumb navigation shows "Home > Extensions > React Developer Tools". The main content area features the extension's icon (a blue atom symbol), its name "React Developer Tools", and the offerer "Offered by: Facebook". It also displays a rating of "★★★★★ 1,256" and "Developer Tools" and "2,000,000+ users". On the right side of this section is a blue "Remove from Chrome" button. Below this, there are tabs for "Overview" (which is selected and highlighted with a rounded rectangle), "Reviews", "Support", and "Related". A large preview window shows a screenshot of the developer tools interface. The interface has a header with the word "todos" and a "Try React DevTools" button. Below the header is a "TodoTextInput" component with a green border. At the bottom of the interface is a toolbar with icons for Elements, Sources, Console, Components (which is underlined in blue), Profiler, Performance, Network, and other developer tool tabs.

Using React Developer Tools



Small Demo



Augury

ANGULAR AUGURY

GUIDES

RESOURCES

CHANGE LOG

INSTALL ON CHROME

INSTALL ON FIREFOX



Angular Augury

A Chrome and Firefox Dev Tools extension for debugging Angular applications.

INSTALL ON CHROME

INSTALL ON FIREFOX

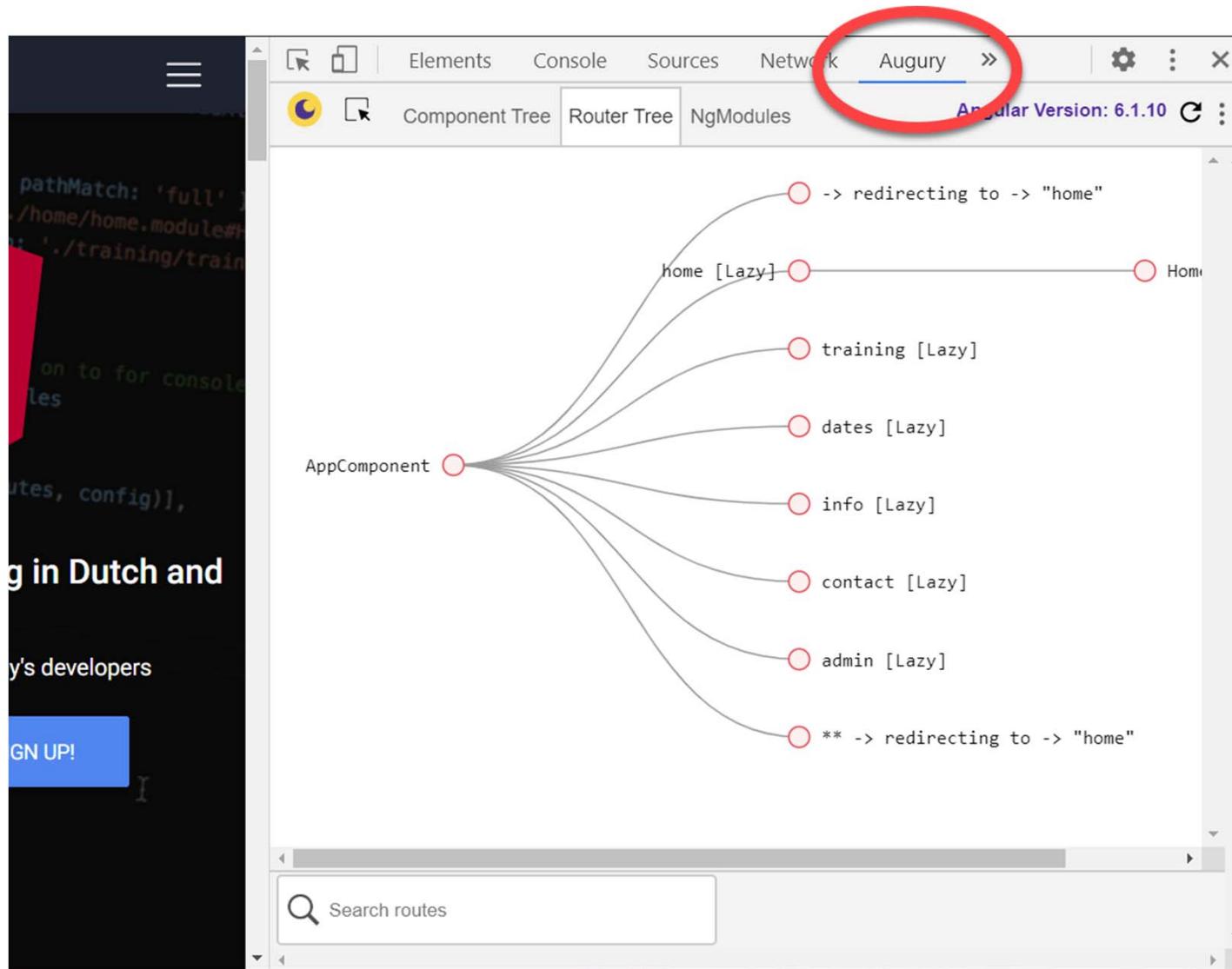
What is Augury

Augury is the most used Developer Tool extension for debugging and profiling Angular applications inside the Google Chrome and Mozilla Firefox browsers.

Why Use Augury?

<https://augury.rangle.io/>

Using Augury for Angular



Small Demo





More Tooling

Tools that are often installed alongside your framework of choice

Linting Tools

- Improving code quality
- “*lint, or a linter, is a tool that analyzes source code to flag programming errors, bugs, stylistic errors, and suspicious constructs.*”
- ESLint
- TSLint (now deprecated)
- CSSLint...

ESLint

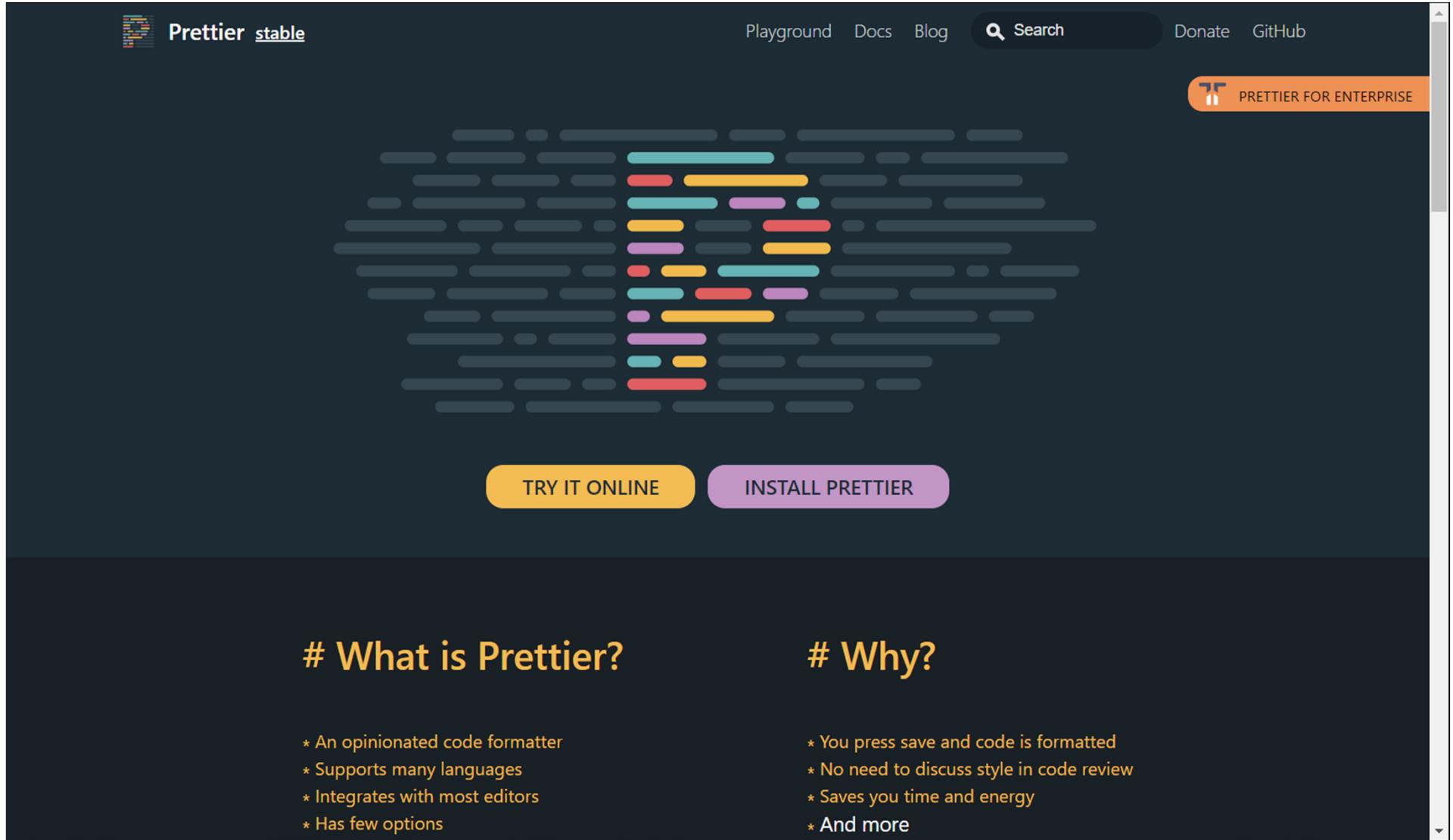
The screenshot shows the ESLint website's feature selection interface and its homepage. On the left, a terminal-like interface displays the following text:

```
? Please pick a preset: Manually select features
? Check the features needed for your project: (Press <space> to select, <a> to toggle all, <i>
(*) Babel
( ) TypeScript
( ) Progressive Web App (PWA) Support
( ) Router
( ) Vuex
( ) CSS Pre-processors
>(*) Linter / Formatter
( ) Unit Testing
( ) E2E Testing
```

The right side shows the ESLint homepage with a dark purple header featuring the ESLint logo, a search bar, and navigation links for User guide, Developer guide, Blog, Demo, and About. A banner at the top of the page reads "Black Lives Matter. Donate to the Equal Justice Initiative." Below the header, the word "ESLint" is prominently displayed in large white letters, followed by the tagline "Find and fix problems in your JavaScript code". A "Get Started" button is visible. The main content area is divided into three sections: "Find Problems", "Fix Automatically", and "Customize", each with descriptive text.

<https://eslint.org/>

Prettier



The screenshot shows the official Prettier website. At the top, there's a dark header bar with the Prettier logo (a colorful bar icon) and the word "stable". To the right are links for "Playground", "Docs", "Blog", a search bar with the placeholder "Search", "Donate", and "GitHub". Below the header is a large, abstract graphic composed of many horizontal bars in various colors (teal, yellow, purple, red) on a dark background. In the center of this graphic are two buttons: "TRY IT ONLINE" (yellow) and "INSTALL PRETTIER" (purple). Below the graphic, the page has a dark background with white text. On the left, under the heading "# What is Prettier?", there's a bulleted list: "An opinionated code formatter", "Supports many languages", "Integrates with most editors", and "Has few options". On the right, under the heading "# Why?", there's another bulleted list: "You press save and code is formatted", "No need to discuss style in code review", "Saves you time and energy", and "And more". At the bottom right, there's a green link: <https://prettier.io/>.

What is Prettier?

- * An opinionated code formatter
- * Supports many languages
- * Integrates with most editors
- * Has few options

Why?

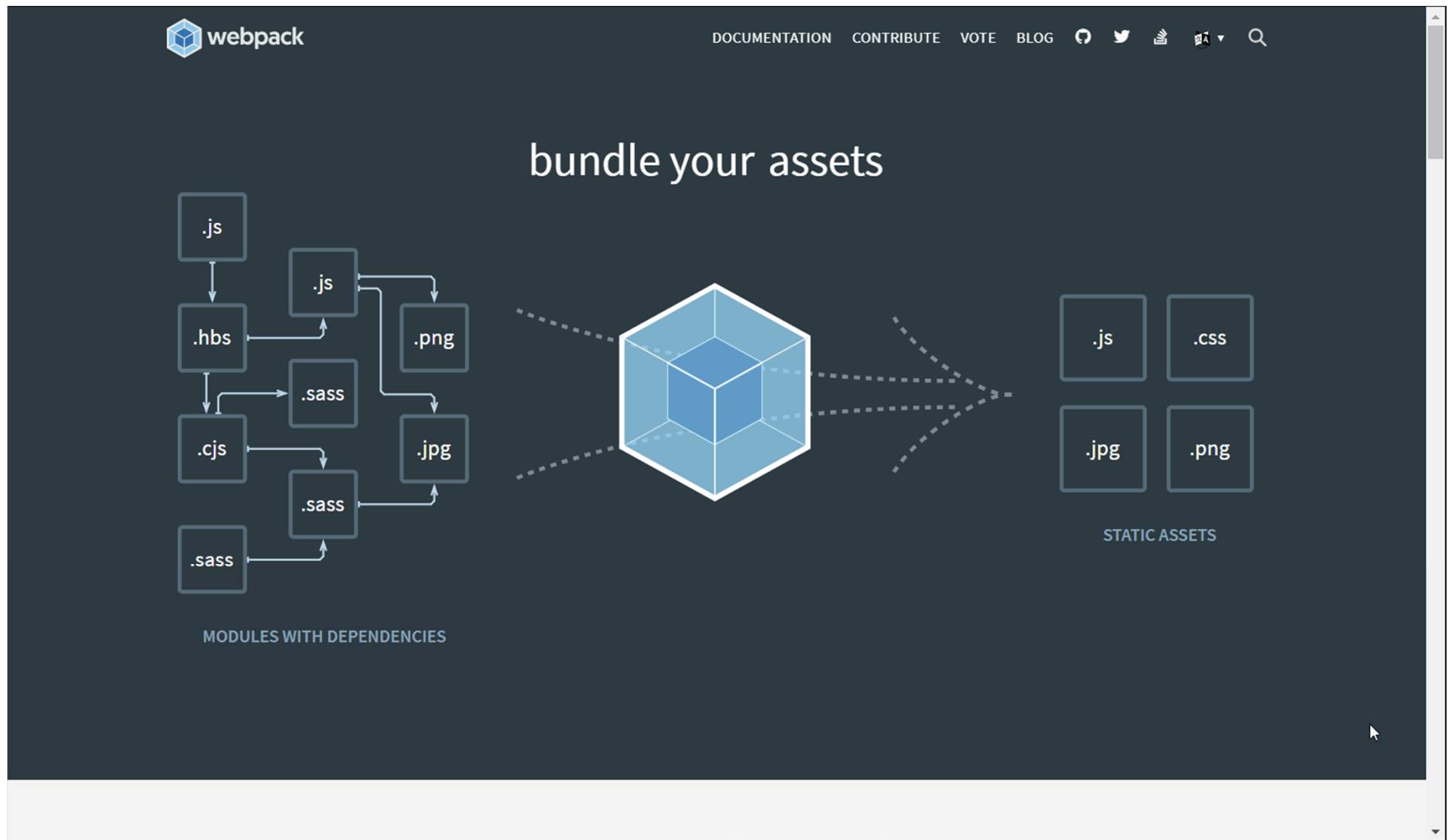
- * You press save and code is formatted
- * No need to discuss style in code review
- * Saves you time and energy
- * And more

<https://prettier.io/>

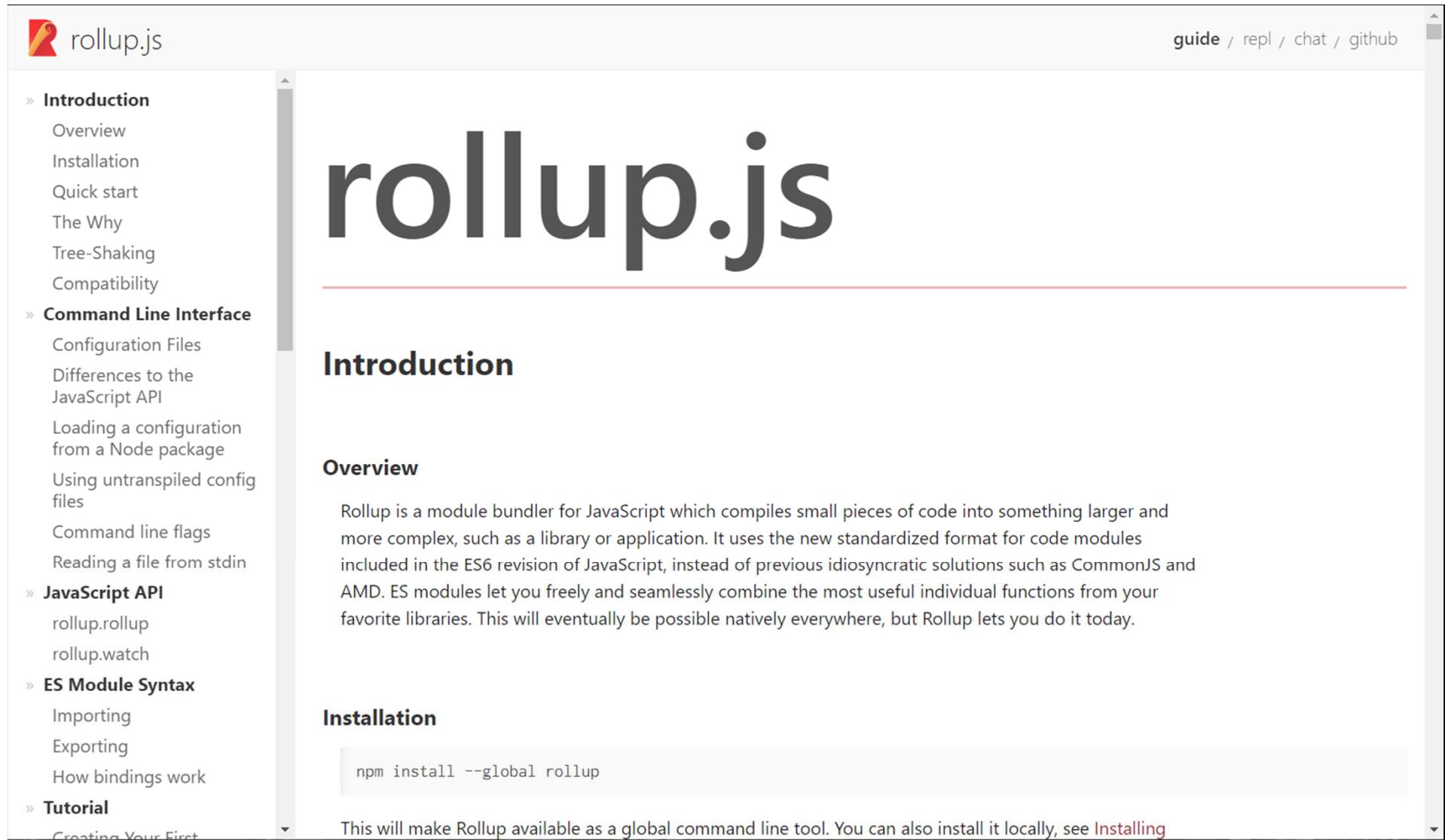
Small Demo



Bundling Tools



rollup.js



The screenshot shows the official rollup.js documentation page. At the top left is the rollup.js logo (a stylized orange 'R'). To its right are links for 'guide', 'repl', 'chat', and 'github'. On the far right is a vertical scrollbar.

The main content area features a large, bold title 'rollup.js' centered above a horizontal red line. To the left of the title is a sidebar containing navigation links:

- » **Introduction**
 - Overview
 - Installation
 - Quick start
 - The Why
 - Tree-Shaking
 - Compatibility
- » **Command Line Interface**
 - Configuration Files
 - Differences to the JavaScript API
 - Loading a configuration from a Node package
 - Using untranspiled config files
 - Command line flags
 - Reading a file from stdin
- » **JavaScript API**
 - rollup.rollup
 - rollup.watch
- » **ES Module Syntax**
 - Importing
 - Exporting
 - How bindings work
- » **Tutorial**
 - Creating Your First

Introduction

Overview

Rollup is a module bundler for JavaScript which compiles small pieces of code into something larger and more complex, such as a library or application. It uses the new standardized format for code modules included in the ES6 revision of JavaScript, instead of previous idiosyncratic solutions such as CommonJS and AMD. ES modules let you freely and seamlessly combine the most useful individual functions from your favorite libraries. This will eventually be possible natively everywhere, but Rollup lets you do it today.

Installation

```
npm install --global rollup
```

This will make Rollup available as a global command line tool. You can also install it locally, see [Installing](#)

Parcel

Note: This page covers Parcel 1, the documentation for Parcel 2 is being worked on here: v2.parceljs.org

 PARCEL

Search... English GitHub 🛍 Store

GETTING STARTED

-  Getting Started
-  Assets
-  Transforms
-  Debugging

FEATURES

-  Code Splitting
-  Hot Module Replacement
-  Production
-  CLI
-  Recipes
-  Environment Variables
-  Module Resolution

ASSET TYPES

-  JavaScript
-  ReasonML



Getting Started

Parcel is a web application bundler, differentiated by its developer experience. It offers blazing fast performance utilizing multicore processing, and requires zero configuration.

First install Parcel using Yarn or npm:

Yarn:

```
yarn global add parcel-bundler
```

npm:

```
npm install -g parcel-bundler
```

Create a package.json file in your project directory using:

```
yarn init -y
```

or

```
npm init -y
```

Parcel can take any type of file as an entry point, but an HTML or JavaScript file is a good place to start. If you link your main JavaScript file in the HTML using a relative path, Parcel will also bundle it for you and update the references with a URL to the output file

<https://parceljs.org/>



Transpiling tools

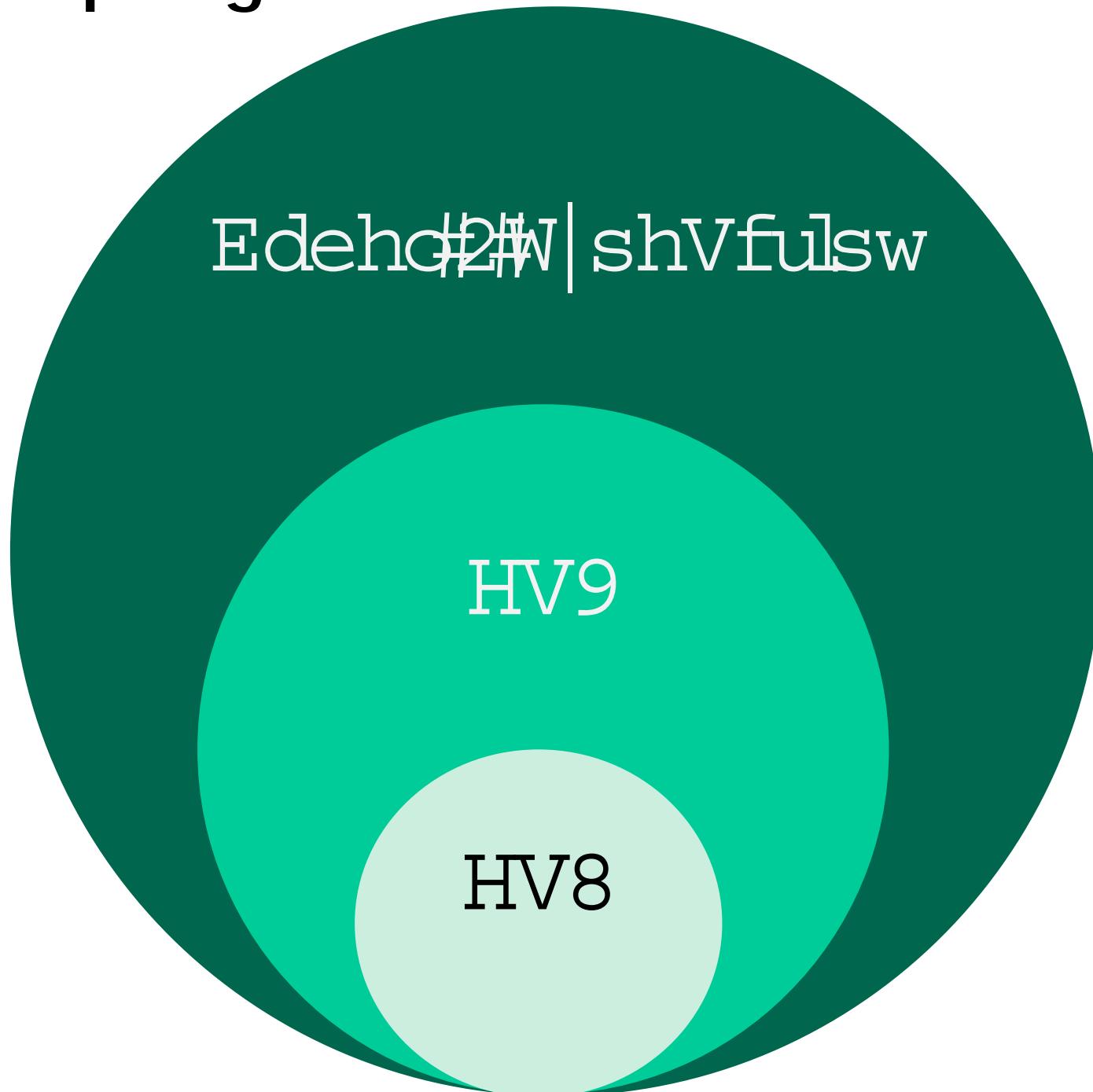
Moderne code omzetten naar 'oldskool' code en Type Safety

Transpiling – Babel and TypeScript

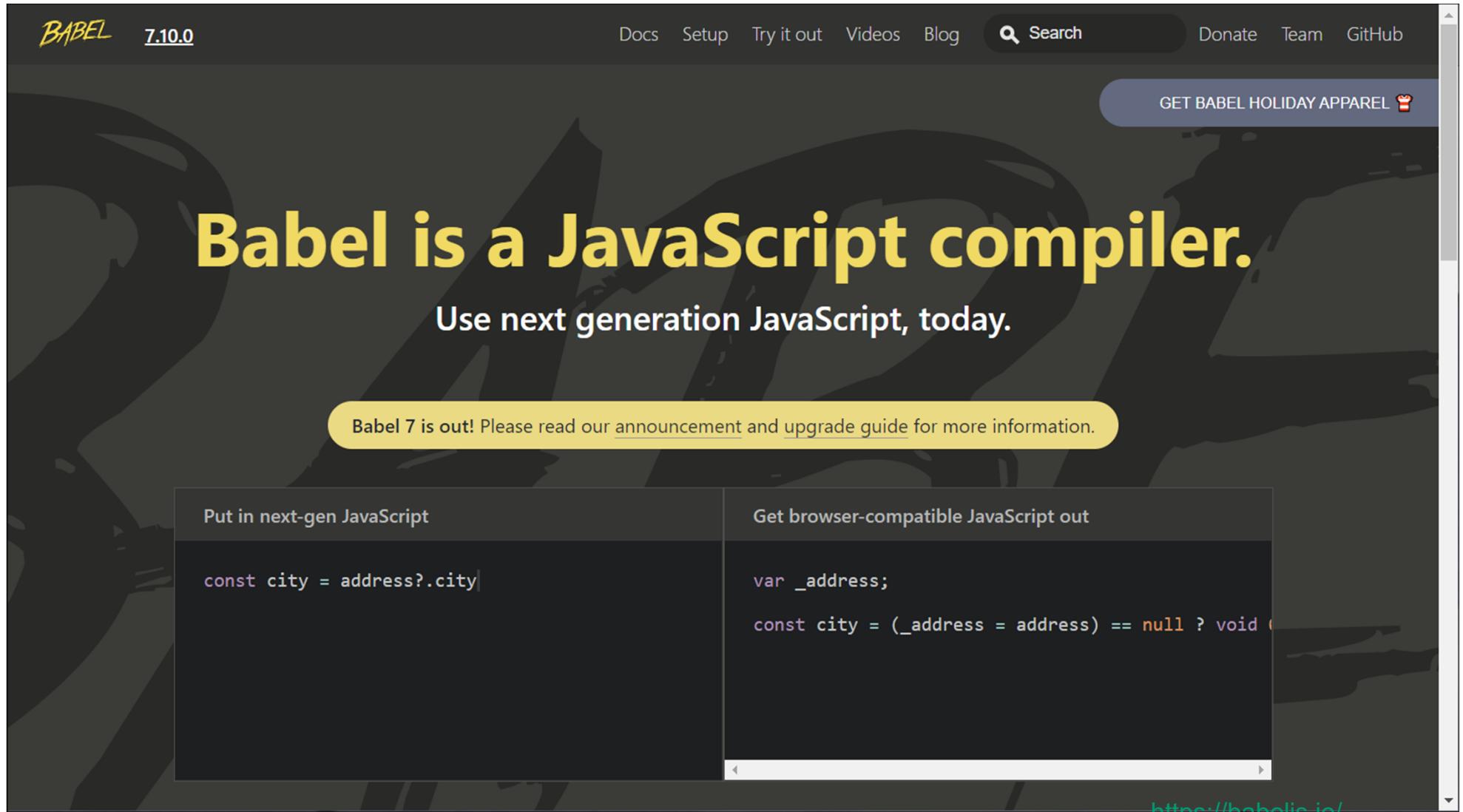
BABEL



On transpiling



Babel



The screenshot shows the Babel website homepage. At the top, there's a dark header bar with the Babel logo and version 7.10.0. To the right are links for Docs, Setup, Try it out, Videos, Blog, a search bar, and navigation links for Donate, Team, and GitHub. A prominent call-to-action button says "GET BABEL HOLIDAY APPAREL". The main title "Babel is a JavaScript compiler." is displayed in large, bold, yellow font. Below it, a subtitle "Use next generation JavaScript, today." is shown in white. A yellow callout box contains the text "Babel 7 is out! Please read our [announcement](#) and [upgrade guide](#) for more information." On the left, a code editor window shows the input "const city = address?.city" and its output "var _address; const city = (_address = address) == null ? void 0 : _address.city". On the right, another code editor window shows the input "const city = address?.city" and its output "var _address; const city = (_address = address) == null ? void 0 : _address.city". At the bottom right, there's a link to the Babel website: <https://babeljs.io/>.

BABEL 7.10.0

Docs Setup Try it out Videos Blog Search

Donate Team GitHub

GET BABEL HOLIDAY APPAREL

Babel is a JavaScript compiler.

Use next generation JavaScript, today.

Babel 7 is out! Please read our [announcement](#) and [upgrade guide](#) for more information.

Put in next-gen JavaScript

```
const city = address?.city
```

Get browser-compatible JavaScript out

```
var _address;
const city = (_address = address) == null ? void 0 : _address.city
```

<https://babeljs.io/>

TypeScript

The screenshot shows the official TypeScript website. At the top, there's a blue header bar with the "TypeScript" logo, a search bar, and navigation links for "Download", "Docs", "Handbook", "Community", "Playground", and "Tools". Below the header, a red banner contains the text: "Note: we are testing out the new v2 site over the weekend, if we have missed something you rely on please file issues on [microsoft/TypeScript-Website](#)".

The main content area features a large dark blue sidebar on the left with white text. It includes the title "Typed JavaScript at Any Scale.", a subtitle "TypeScript extends JavaScript by adding types.", a note about TypeScript saving time by catching errors, and information about its cross-platform support and open-source status.

The main content area has a dark background with a central white code editor window. The code editor shows a snippet of TypeScript:

```
const user = {  
    firstName: "Angela",  
    lastName: "Davis",  
    role: "Professor"  
}  
  
console.log(user.name)
```

A red error message highlights the line `console.log(user.name)` with the text: "Property 'name' does not exist on type '{ firstName: string; lastName: string; role: string; }'".

Below the code editor, a blue button says "TypeScript validates your JavaScript ahead of time" and a "Next" button with a right-pointing arrow.

At the bottom of the page, a dark footer bar contains the text "TypeScript 3.9 is now available, 4.0 is currently in beta." and two buttons: "Try in your browser" and "Install locally".

In the bottom right corner, the question "What is TypeScript?" is followed by a link: <https://www.typescriptlang.org/>.

TypeScript in frameworks

- TypeScript adds a **typing system** to JavaScript
- TypeScript compiles to **plain JavaScript** – and catches errors upfront
- **Angular** – mandatory
- **Vue** – opt-in
- **React** – opt-in



I DE Extensions

Enhance your editor with the extention and plug-ins you need

IDE Extensions for VS Code

Visual Studio | Marketplace Sign in 

Visual Studio Visual Studio Code Azure DevOps Subscriptions Build your own Publish extensions

Extensions for the Visual Studio family of products

Search Visual Studio Code extensions 

Featured

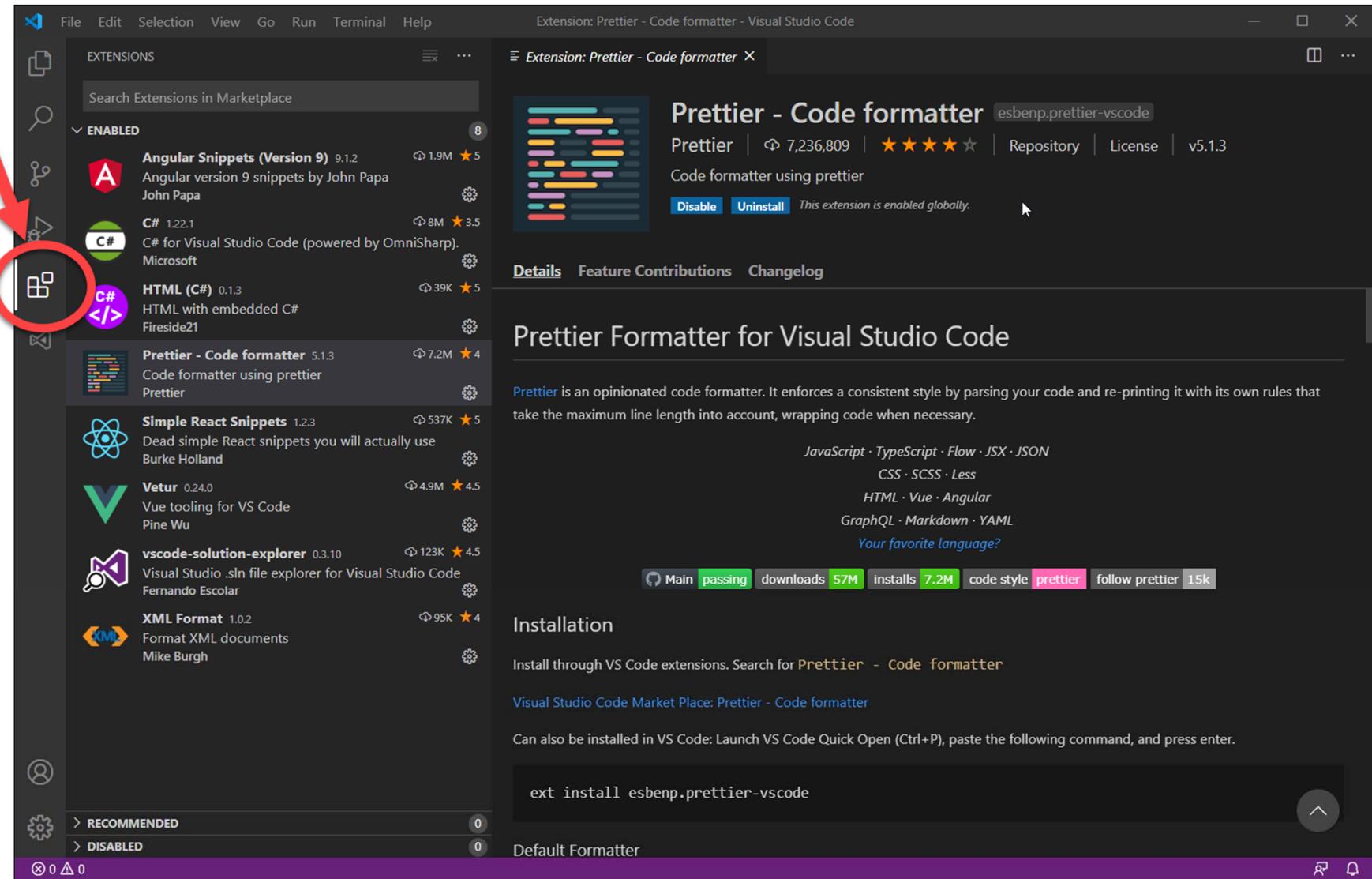
 Formatting Toggle tombonniike  347K FREE	 Browser Preview Kenneth Auchenber  232K FREE	 Better Align wwm  141K FREE	 GitHub Theme GitHub  47.8K FREE	 Deno denoland  20.3K FREE	 Azure Static Web App Microsoft  1.2K FREE
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Trending this week

 OpenCV Snippets	 Caché Relationship Cr	 Pylance	 Document This	 Which Key	 Flutter Preview
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<https://marketplace.visualstudio.com/vscode>

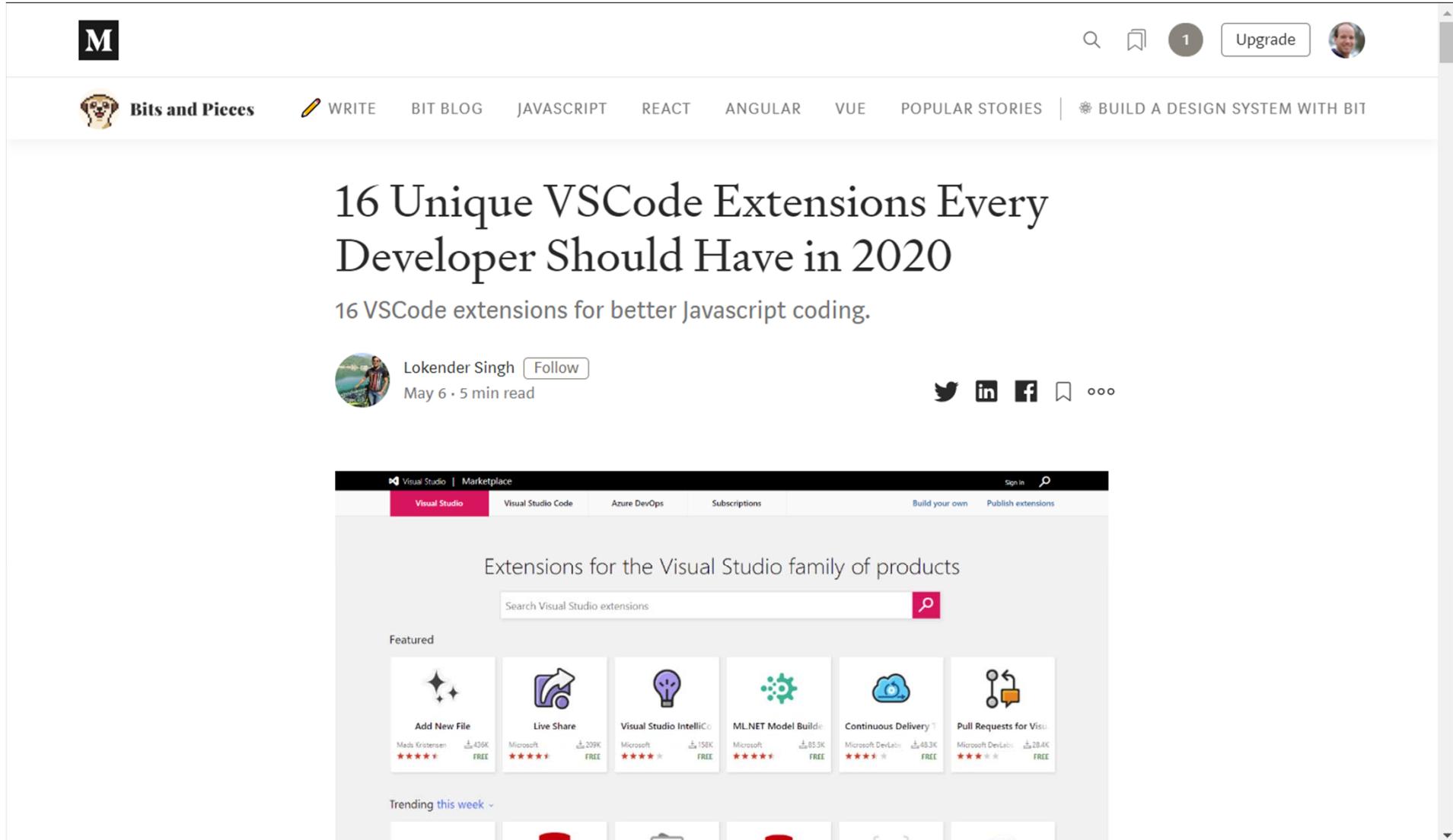
Install from the editor



Popular extensions

- Vue – [Vetur](#)
- Angular – [Angular Snippets](#) by John Papa
- React – [Simple React Snippets](#) by Burke Holland
- Overall
 - [Prettier](#) – code formatting
 - [GitLens](#) – track git changes
 - [Live Share](#) – collaborate on projects

More VS Code extensions



The screenshot shows a blog post titled "16 Unique VSCode Extensions Every Developer Should Have in 2020". The post is by Lokender Singh and has a 5-minute read time. It includes social sharing icons for Twitter, LinkedIn, Facebook, and a copy link button. Below the post is a screenshot of the Visual Studio Marketplace homepage, showing featured extensions like "Add New File", "Live Share", and "Visual Studio IntelliCo".

16 Unique VSCode Extensions Every Developer Should Have in 2020

16 VSCode extensions for better Javascript coding.

Lokender Singh [Follow](#)
May 6 · 5 min read

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Visual Studio | Marketplace

Extensions for the Visual Studio family of products

Search Visual Studio extensions

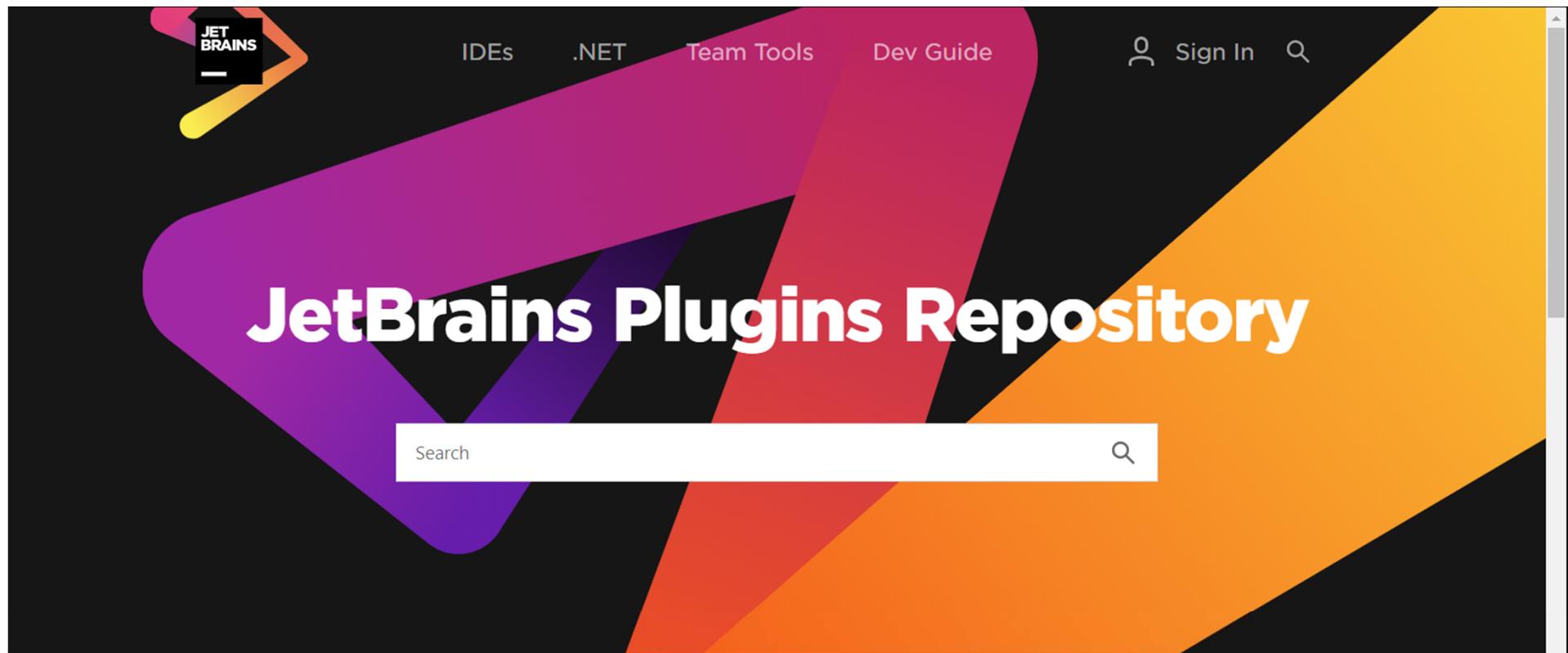
Featured

- Add New File
- Live Share
- Visual Studio IntelliCo
- ML.NET Model Builder
- Continuous Delivery
- Pull Requests for Visual Studio

Trending this week

<https://blog.bitsrc.io/16-unique-vscode-extensions-every-developer-should-have-in-2020-c4dcdb74506a>

WebStorm Plugins



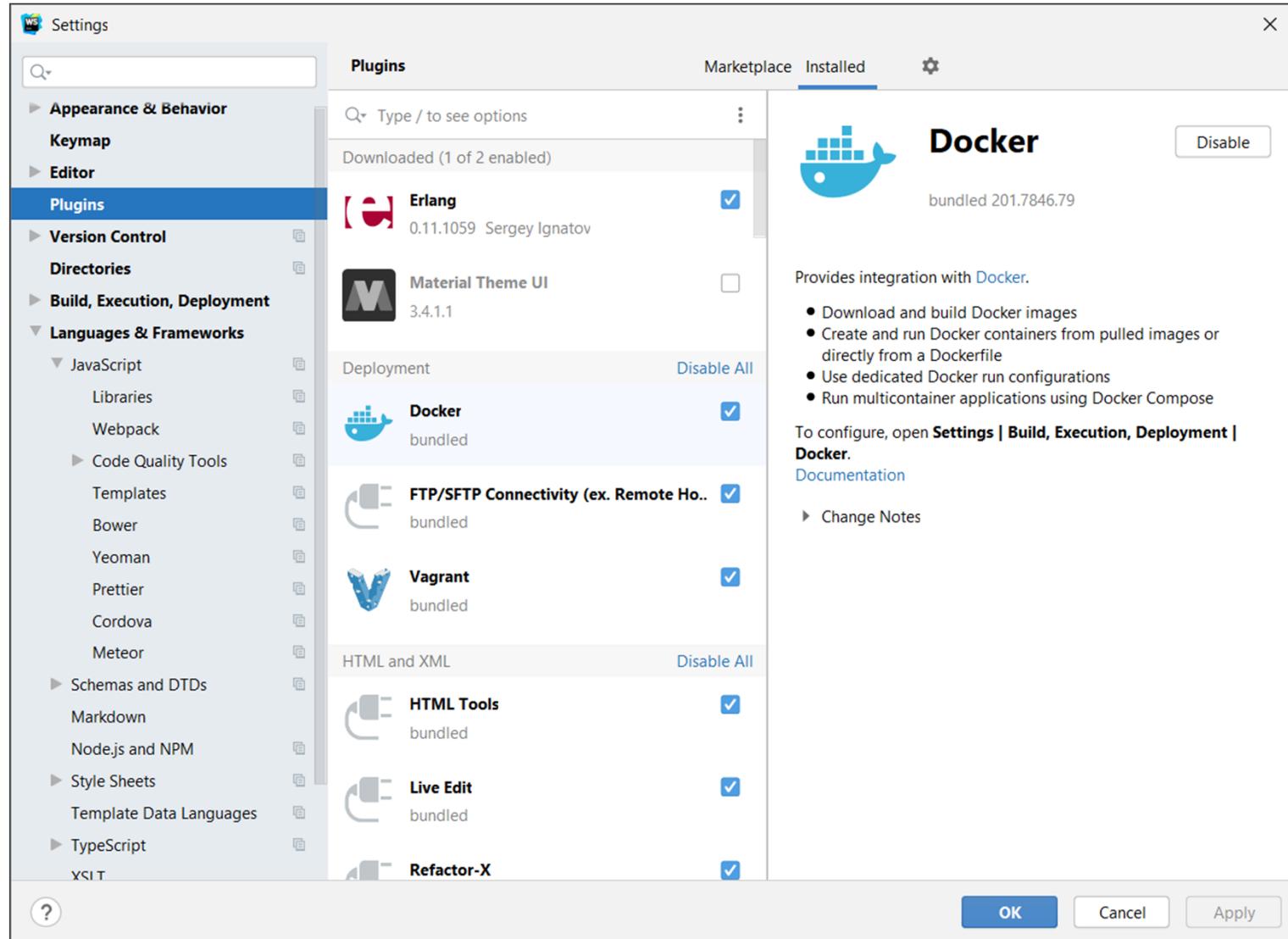
The screenshot shows the homepage of the JetBrains Plugins Repository. The header features the Jet Brains logo with a colorful arrow graphic. Navigation links include IDEs, .NET, Team Tools, Dev Guide, Sign In, and a search icon. A large, bold title "JetBrains Plugins Repository" is centered over a search bar with a placeholder "Search". The background has a vibrant, abstract geometric pattern of pink, red, orange, and black triangles.

IntelliJ Platform Based Products

 IntelliJ IDEA  PyCharm  PhpStorm

<https://plugins.jetbrains.com/>

File, Settings, Plugins



Other editors

Search for [editor name] plug-ins or extension or packages

The screenshot shows the Atom Packages website interface. At the top, there is a dark navigation bar with the Atom logo, links for Packages, Themes, Documentation, Blog, and Discuss, and a Sign in button. Below the navigation bar, a large banner features the text "Packages make Atom do amazing things." A search bar contains the placeholder "Search 8,868 packages" and a "Search" button. The main content area is titled "Featured" and displays six package cards:

- teletype**: Share your workspace with team members and col...
#collaboration #collaborative-editing #pair-programming ...
atom 1,126,740 648 Install
- scroll-through-time**: Two fingers scroll moves through time instead of s...
#scroll #time #space #xkcd
mathieudutot 93,985 158 Install
- hydrogen**: Run code interactively, inspect data, and plot. All t...
#execute #run #jupyter #python #julia
interact 1,848,395 732 Install
- hey-pane**: Atom Plugin to enlarge the active pane, either with...
#pane #focus #origami #zoom #autozoom
timomeh 153,086 151 Install
- atom-clock**: Display a customizable clock in the status bar.
- zentabs**: Keep the opened tabs amount below specified limit

<https://atom.io/packages>



Photo by [Stijn Kleerebezem](#) on Unsplash

Summary

- Tooling for frontend developers
- Git, Node.js, NPM
- Editors, Visual Studio Code, WebStorm
- CLI-tools per framework
- Browser Devtools
- Transpiling – Babel.js, TypeScript
- Linting, bundling,
- IDE extensions