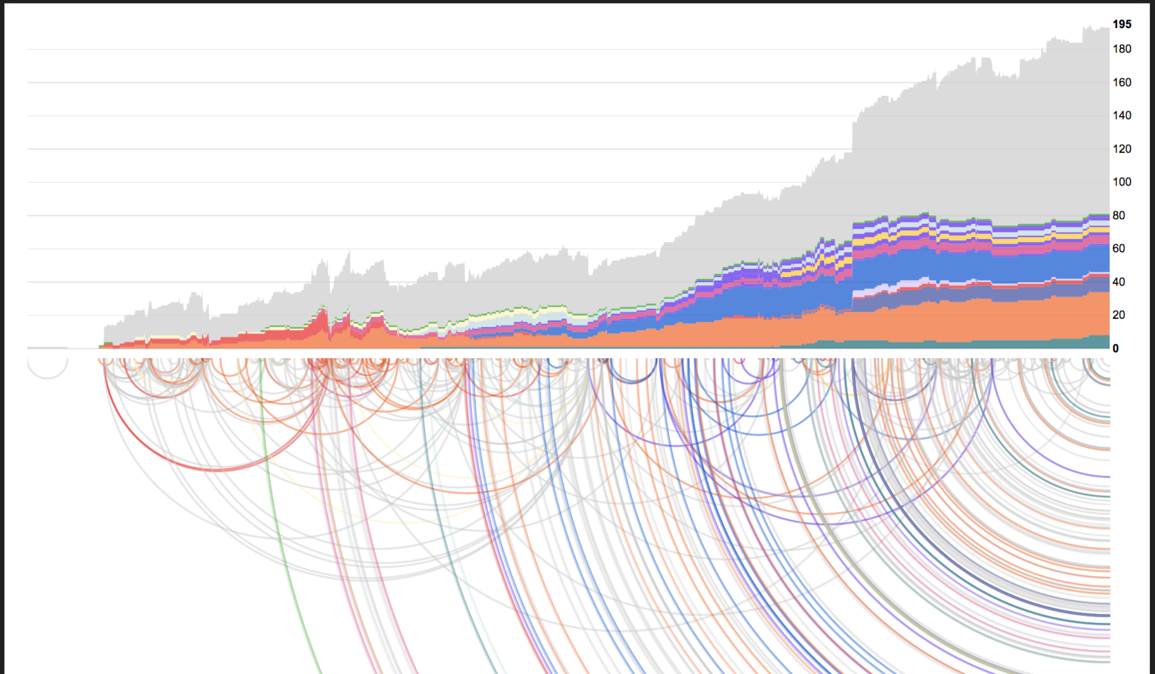
BUMBLEBEE UPDATE

ADSUG 2018

TIM HOSTETLER

SOME STATS FROM LAST YEAR

- 30 Releases
- 517 Commits
- 110 Issues Closed



PARITY WITH CLASSIC

- Co-author affiliation export tool
- Custom export formats
- Personalized user settings
- Classic search translator

OTHER IMPROVEMENTS

- Overall speed increases
  - Reduce superfluous requests
  - Better caching/storage usage
  - Lazy loading highlights
- Better user feedback
  - Loading bar
  - Error messages

IN THE WORKS

- myADS interface and sign-up screens (in planning)
- Some advanced ADS library features (in progress)
- Save/recall search history
- Export of citation metrics
- “Show similar articles” (in testing?)

CHALLENGES

- Aging tech stack
- Difficult to maintain
- Only so fast, without major refactor
- Lack of front-end devs/specialists

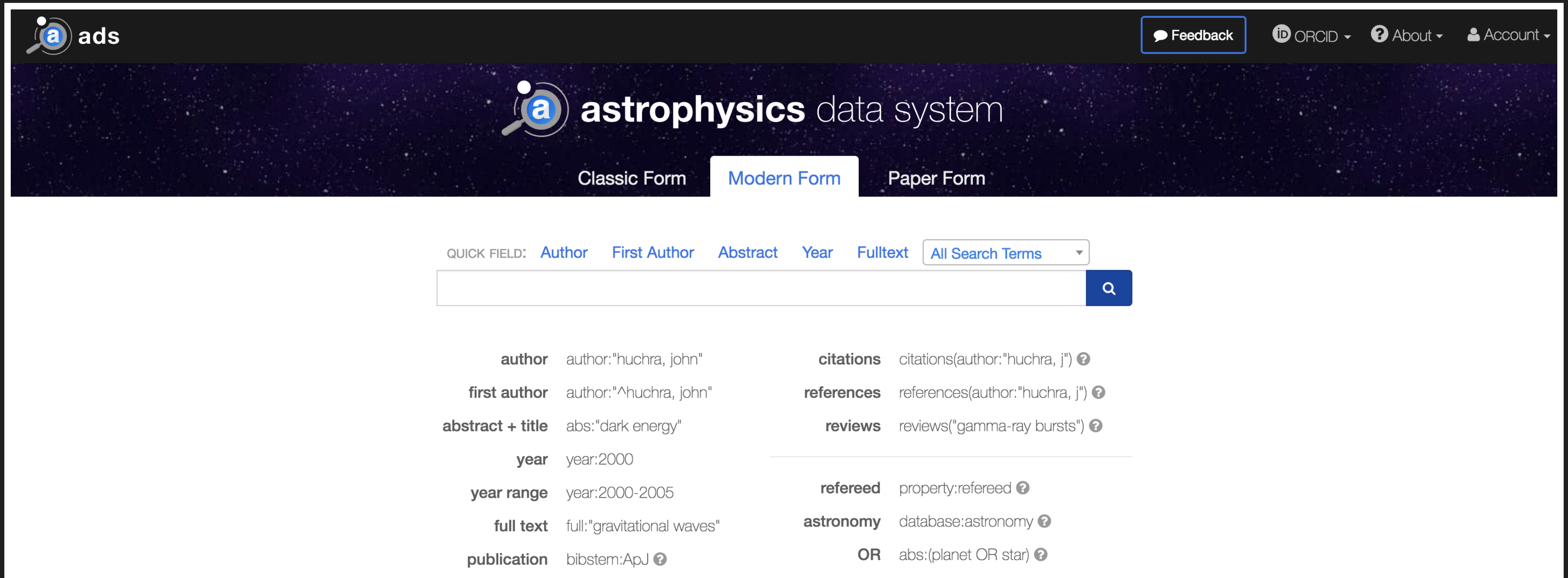
CONSIDERATIONS

- Refactor/Update codebase
- Move to newer front-end frameworks/technologies
- How to transition properly
- Balance priorities

WHAT REFACTORING COULD FIX

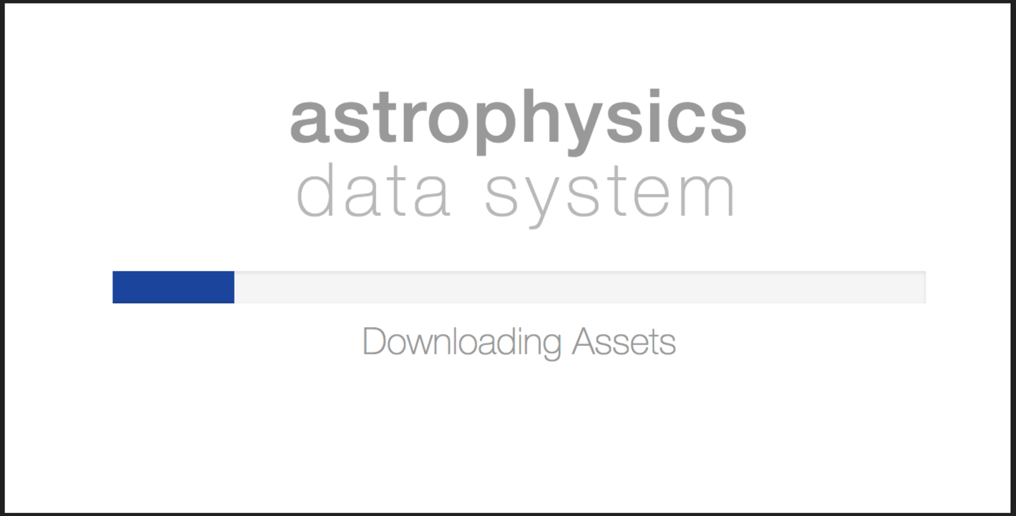
- Additional speed improvements (perceived & actual)
- Easier maintenance, less bugs
- Search engines and other non-JavaScript crawlers
- Better UX

BUMBLEBEE IS SHOWING ITS AGE



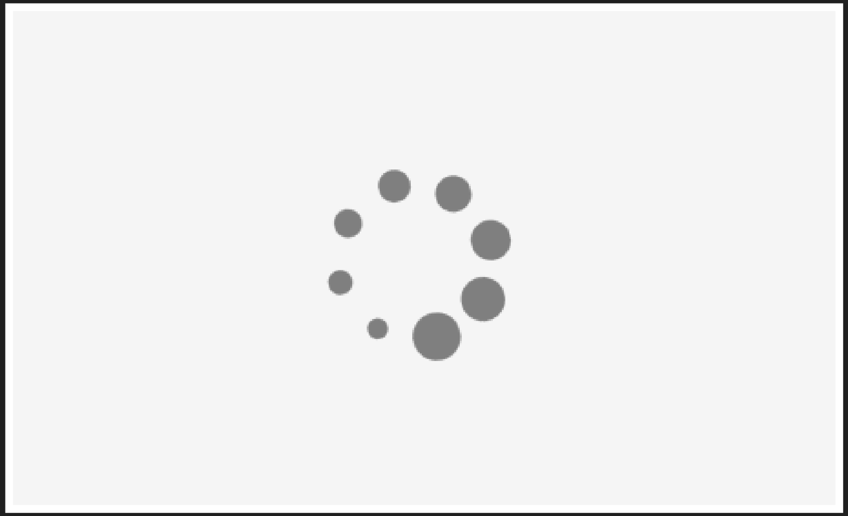
author	author:"huchra, john"	citations	citations(author:"huchra, j")
first author	author:"^huchra, john"	references	references(author:"huchra, j")
abstract + title	abs:"dark energy"	reviews	reviews("gamma-ray bursts")
year	year:2000		
year range	year:2000-2005	refereed	property:refereed
full text	full:"gravitational waves"	astronomy	database:astronomy
publication	bibstem:ApJ	OR	abs:(planet OR star)

USER ISSUES



astrophysics
data system

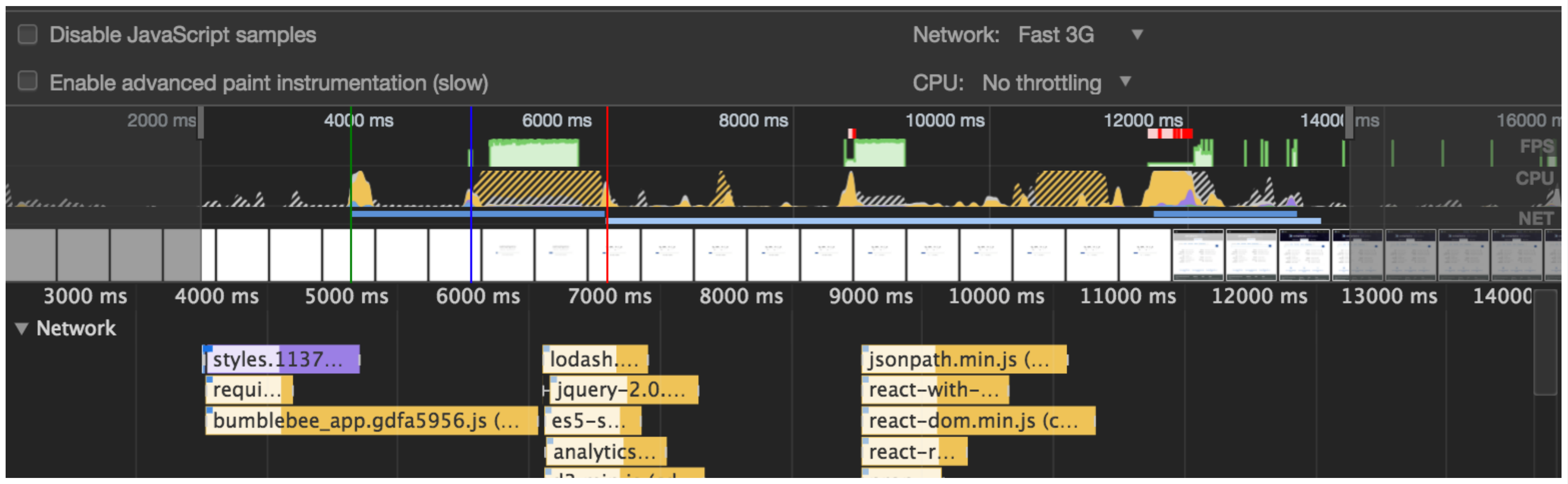
Downloading Assets



LOAD TIME

Average application load time **>1s**

Many unnecessary page renders/reflows



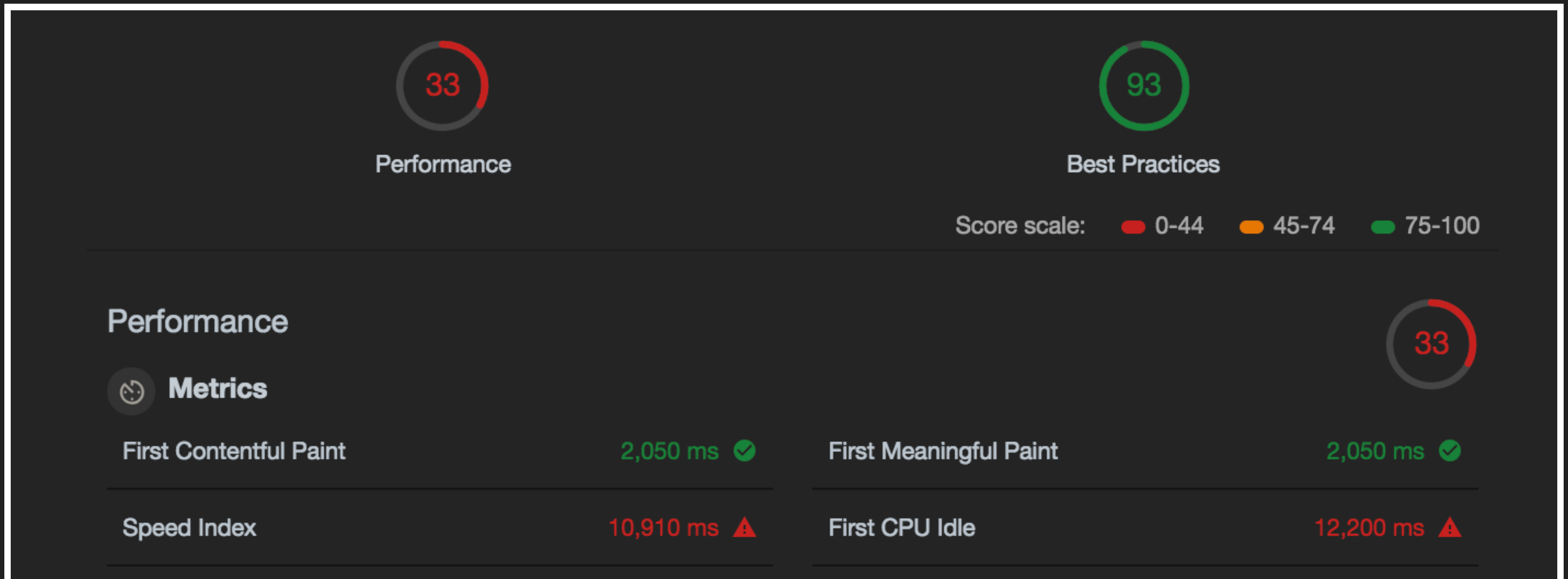
□ Disable JavaScript samples

□ Enable advanced paint instrumentation (slow)

Network: Fast 3G ▼

CPU: No throttling ▼

LIGHTHOUSE



33 Performance

93 Best Practices

Score scale: 🟥 0-44 🟧 45-74 🟩 75-100

Performance

33

Metrics

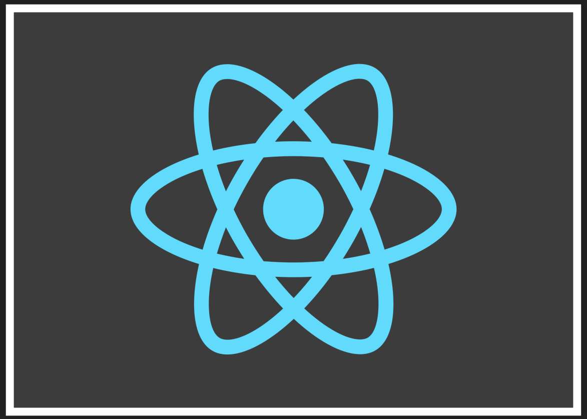
First Contentful Paint	2,050 ms ✓	First Meaningful Paint	2,050 ms ✓
Speed Index	10,910 ms ⚠	First CPU Idle	12,200 ms ⚠

WHY?

- Based on older (+4 years) tech stack
- Hard to maintain
- Hard to integrate with user applications
- Bad mobile performance

TECH STACK

BackboneJs & React



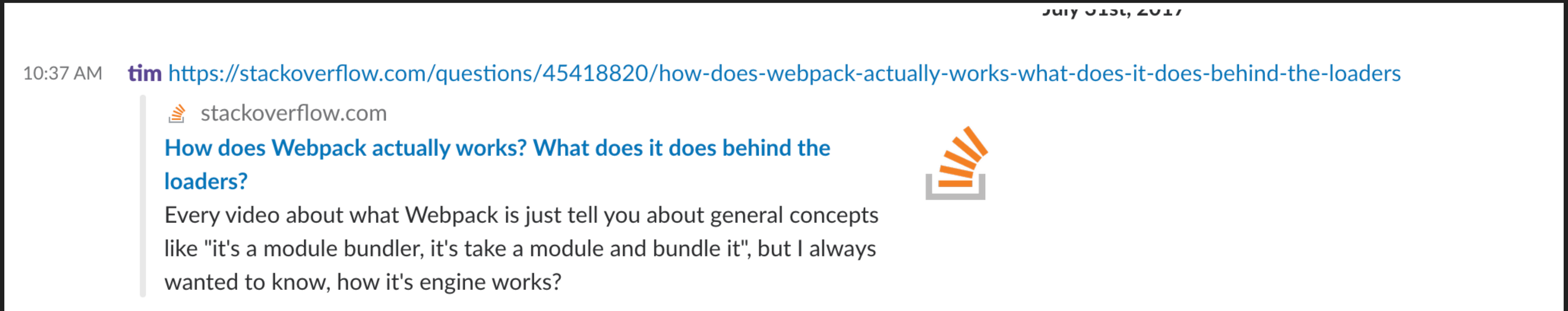
MAINTENANCE

- Separation of concerns
- Complicated builds
- Too many dependencies (100+ 3rd party libs)
- Testing is hard

INTEGRATIONS & SEARCH ENGINE OPTIMIZATION

- Zotero, Bookends, etc.
- Unfurl links
- Scrapers, non-JavaScript users
- Google, Bing, others

UNFURL LINKS



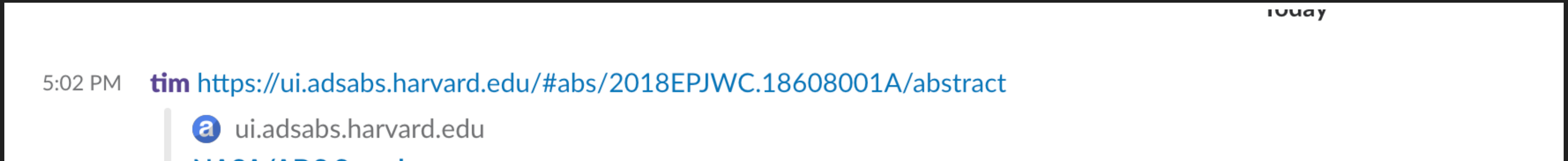
July 31st, 2017

10:37 AM **tim** https://stackoverflow.com/questions/45418820/how-does-webpack-actually-works-what-does-it-does-behind-the-loaders

stackoverflow.com

How does Webpack actually works? What does it does behind the loaders?

Every video about what Webpack is just tell you about general concepts like "it's a module bundler, it's take a module and bundle it", but I always wanted to know, how it's engine works?



Today

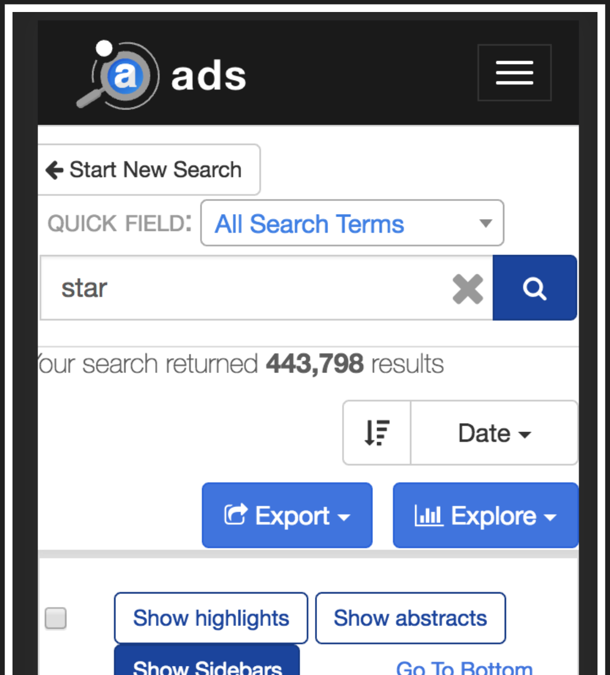
5:02 PM **tim** https://ui.adsabs.harvard.edu/#abs/2018EPJWC.18608001A/abstract

ui.adsabs.harvard.edu

USER EXPERIENCE

- Not completely responsive
- Some negative user feedback
- Confusing or hidden features

MOBILE RESPONSIVENESS



QUICK FIELD: All Search Terms

star

'our search returned **443,798** results

ACCESSIBILITY

- Facets not usable by screen readers
- Page regions can get readers into loops
- Some sections inaccessible

IT GETS BETTER

TYPES OF WEB APPLICATIONS

- Server-rendered (traditional)
- Client-rendered (single page application)
- Hybrid (universal)

HYBRID APPROACH

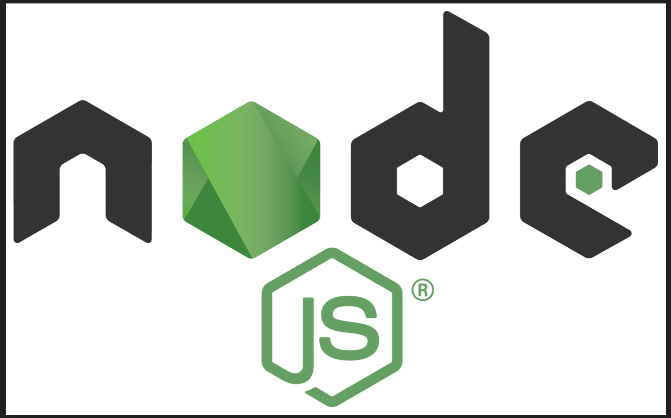
- Lives on both client and server
- Search engine optimization is easier
- Less load on server

PROPOSAL

- Hybrid web app
- New tech stack
- Updated UI framework

NEW TECH STACK

- Vue.js
- Node.js server



HOW WILL IT BE BETTER?

- Better state management
- Easier maintenance
- search engine optimization, non-JavaScript crawler support
- Responsive

PERFORMANCE GOALS

- Consistent load times < 1s
- Fewer page renders, utilizing virtual DOM
- Pre-rendering on server, hydrate on client

SEO, NON-JAVASCRIPT GOALS

- Metadata rendered server-side
- Non-JavaScript users possible
- Google, Bing, unfurl crawlers should just work

USER EXPERIENCE

- Consolidate and simplify interface
- Easier to implement user requested features
- Better mobile usability
- Prioritize based on user feedback

EASIER MAINTENANCE

- Support newer language features
- Better tooling
- Batteries included (fewer dependencies)
- Simplified builds
- Easier testing

HOW WE GET THERE

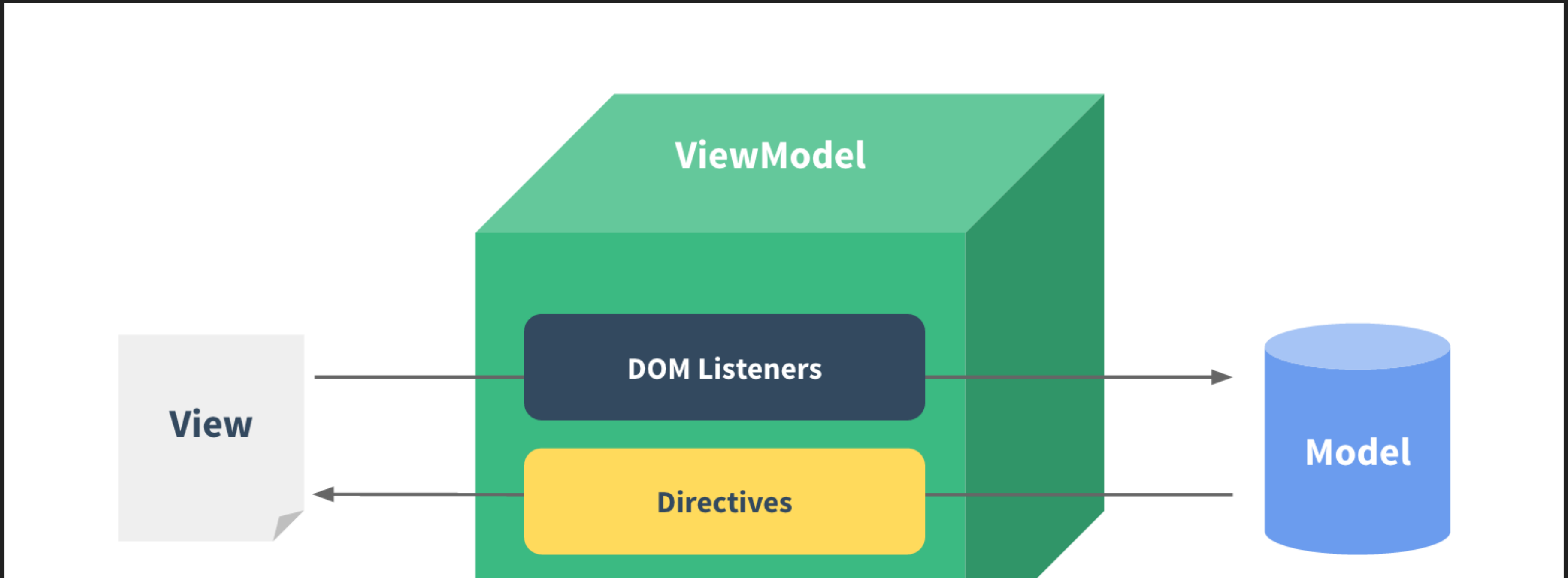
- Visual components need to be refactored
- User-facing part should stay mostly untouched
    - Improvements to responsiveness
    - Restructure of certain areas to provide better UX
- Gradual transition to new system

QUESTIONS?

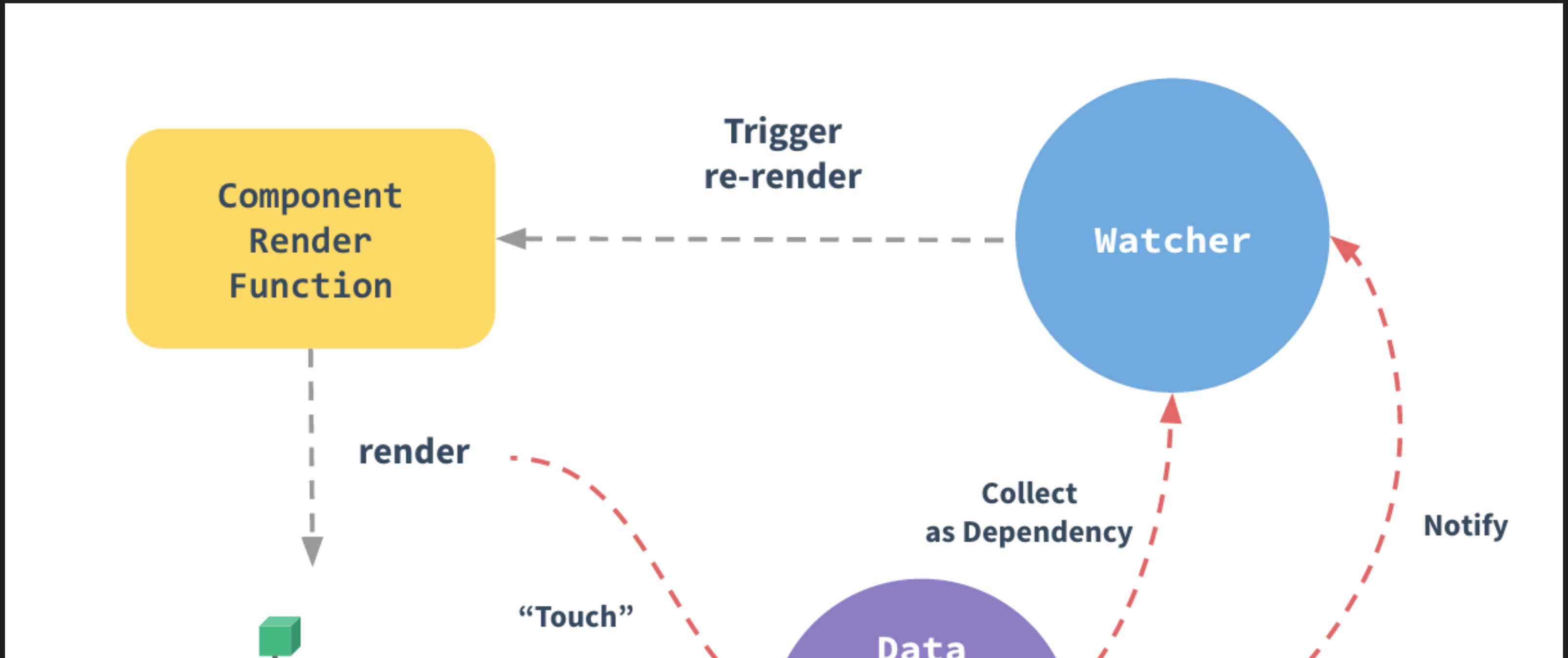
VUE INTERNALS

- MVVM pattern
- Action -> Model -> Diff -> Render
- Virtual DOM

VUE MVVM

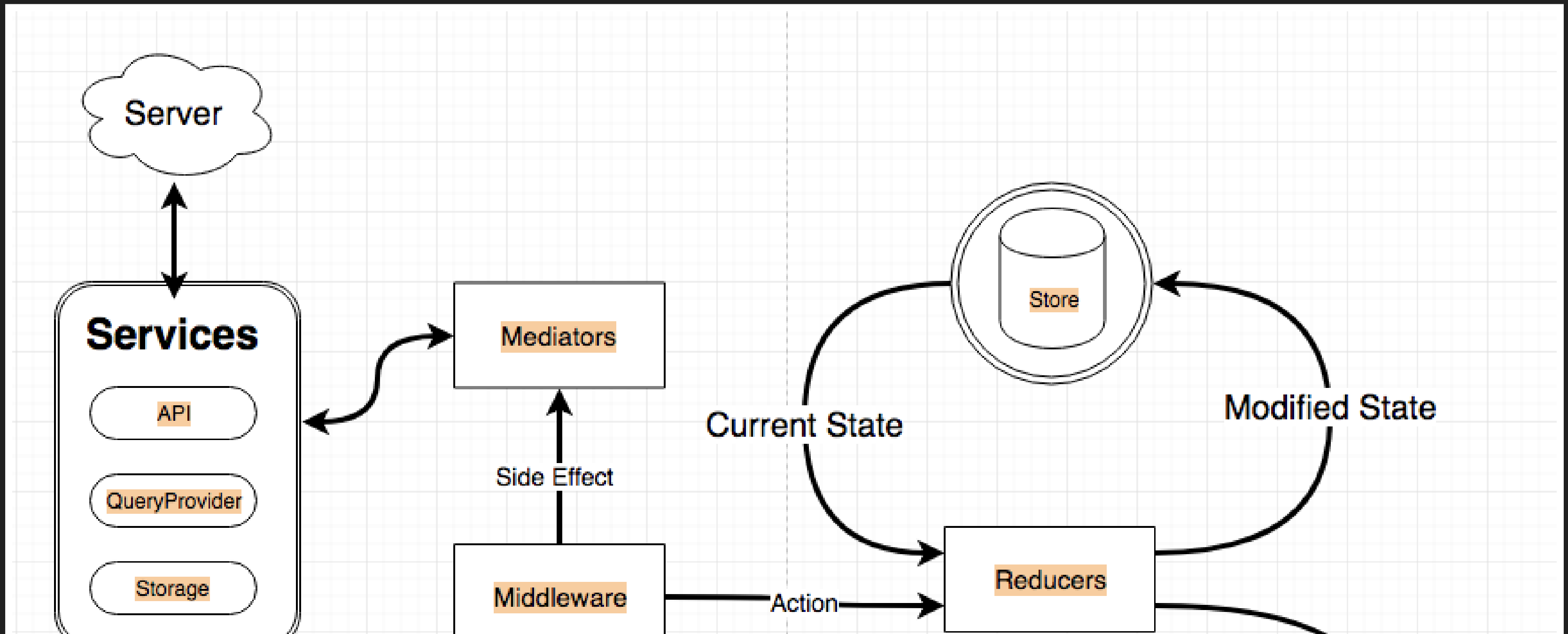


VUE DATABINDING



FLUX

- Technique for state management
- Reducers and single store
- Non-immutable data structures
- Pure functions



Server

Services

API

QueryProvider

Storage

Mediators

Side Effect

Middleware

Action

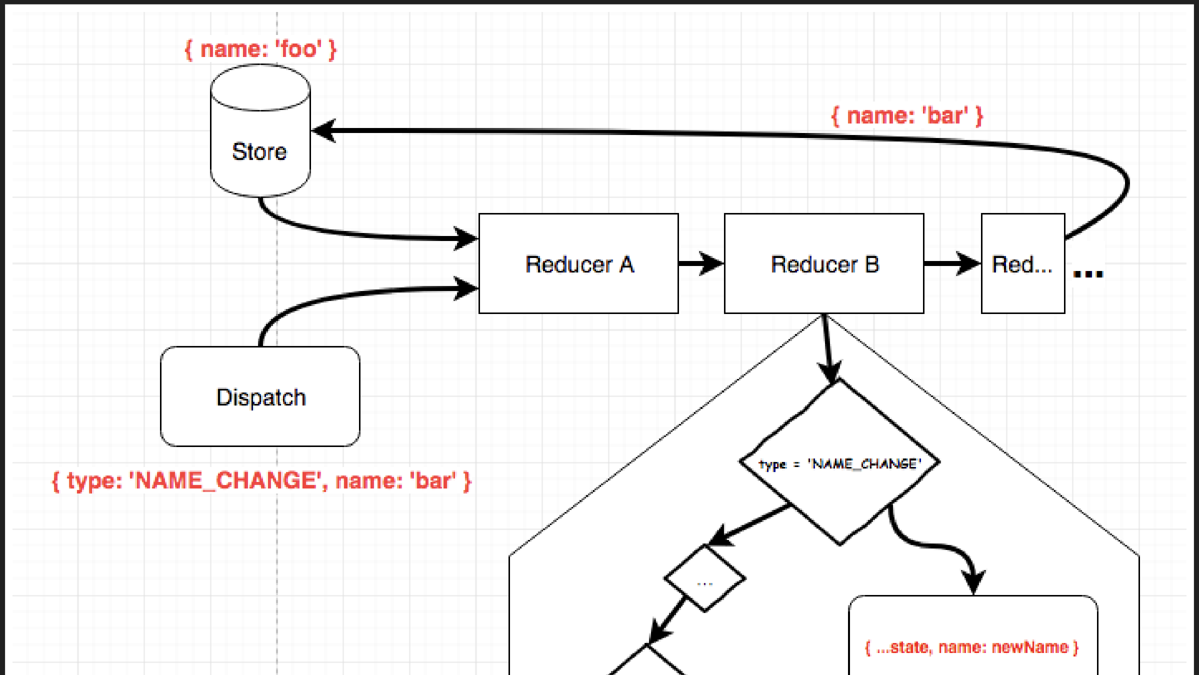
Current State

Store

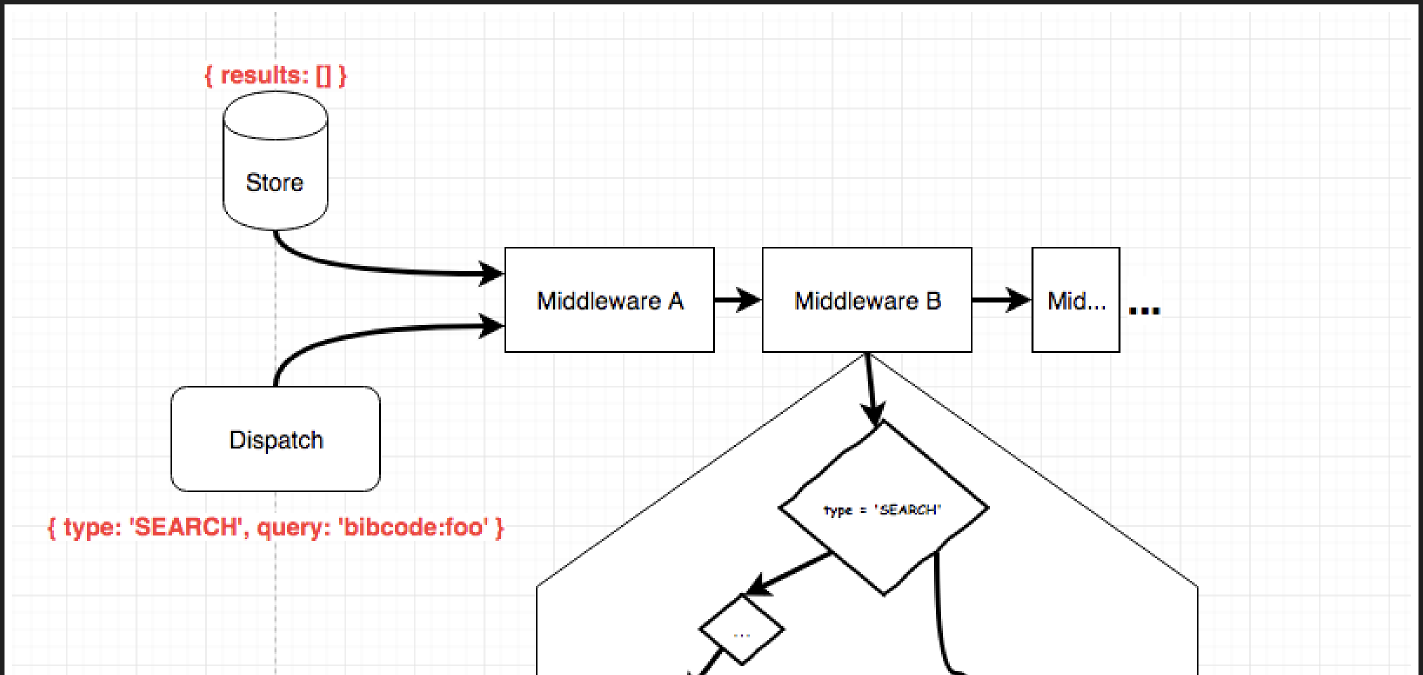
Modified State

Reducers

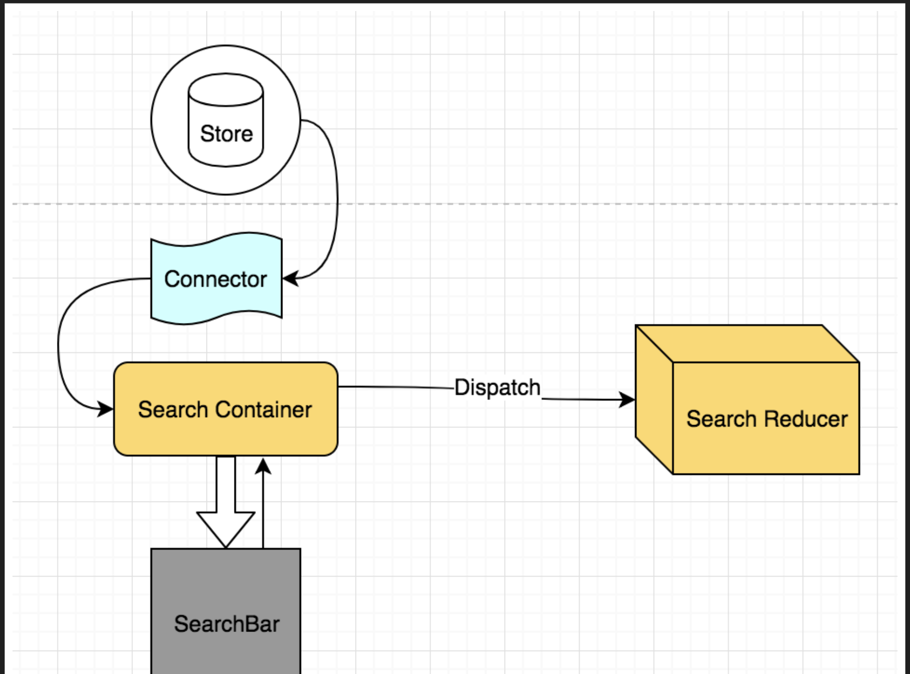
REDUCERS


{ name: 'foo' }
Store
{ name: 'bar' }
Reducer A
Reducer B
Red...
...
Dispatch
{ type: 'NAME_CHANGE', name: 'bar' }
type = 'NAME_CHANGE'
...
{ ...state, name: newName }

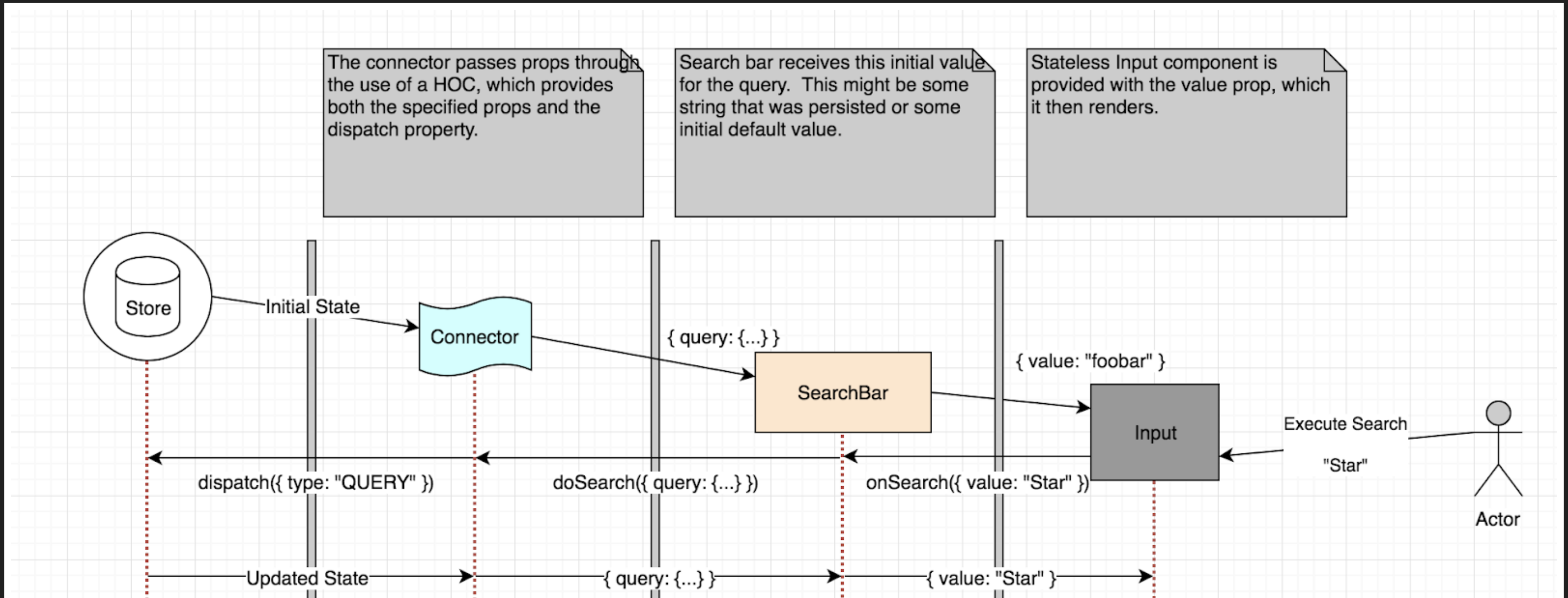
MIDDLEWARE


{ results: [] }
Store
Middleware A
Middleware B
Mid...
...
Dispatch
{ type: 'SEARCH', query: 'bibcode:foo' }
type = 'SEARCH'
...

COMPONENT COMMUNICATION



CONNECTED COMPONENTS



The connector passes props through the use of a HOC, which provides both the specified props and the dispatch property.

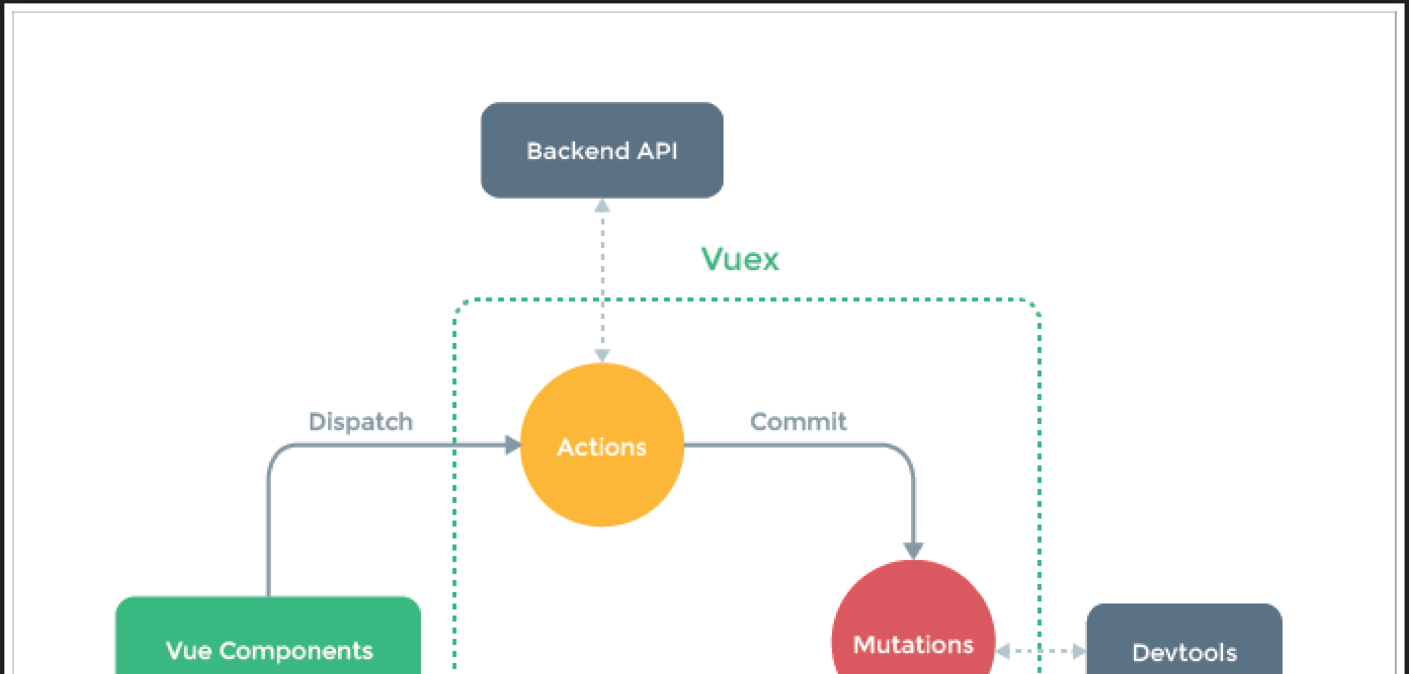
Search bar receives this initial value for the query. This might be some string that was persisted or some initial default value.

Stateless Input component is provided with the value prop, which it then renders.

VUEX

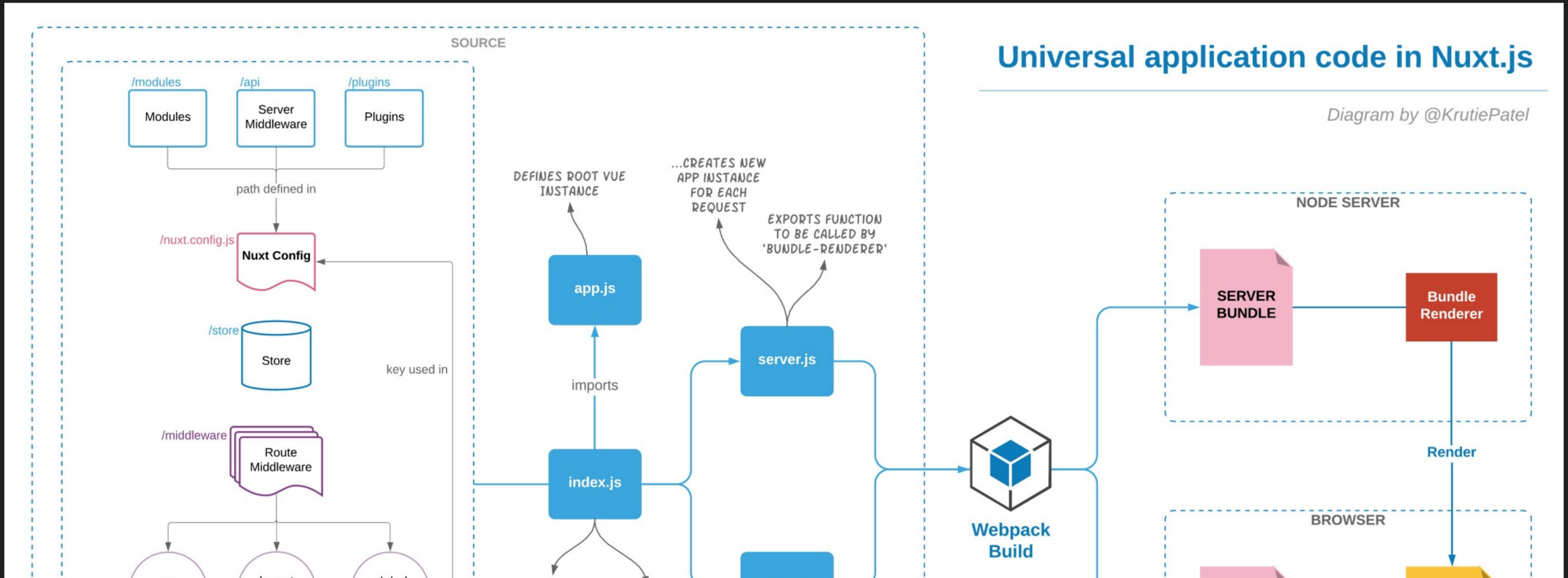
- Vue's implementation of Flux
- Baked into the core framework

VUEX


Backend API
Vuex
Dispatch
Actions
Commit
Vue Components
Mutations
Devtools

NUXT

- SSR skeleton/framework for Vue
- Provides scripts, hooks, middleware, etc.
- Based on Node.js server
- Selective rendering
- Bundling of client/server automatically



Universal application code in Nuxt.js

Diagram by @KrutiePatel