# A scientific approach to performance issues

React Native Connection
June 1st, 2023

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#### The Datadog platform



#### Infrastructure Monitoring

- **III** Containers
- fx Serverless
- Network
  Performance
  Monitoring
- Network Device Monitoring
- Cloud Cost Management

## Application Performance Monitoring

- Distributed Tracing
- \*\* Error Tracking
- ₹/≥ Continuous Profiler
- Database Monitoring
- Universal Service Monitoring

#### Digital Experience Monitoring

- **Synthetics**
- Real User Monitoring
- Session Replay

#### Log Management

- Observability Pipelines
- Sensitive
  Data Scanner
- Audit Trails
- Log Forwarding

#### **Security**

- Cloud Security
  Management
- Application
  Security
  Management
- Cloud SIEM

#### **Developer Experience**

- ⇔ CI Visibility
- Continuous Testing

#### **Watchdog Al**

Insights ● Impact Analysis ● Root Cause Analysis ● Anomaly Detection ● Alerts ● Correlation ● Optimizations

#### **Shared Platform Services**

Collaboration • Dashboards • Mobile • Agents • Notebook • Workflows • Open Telemetry • Service Catalog

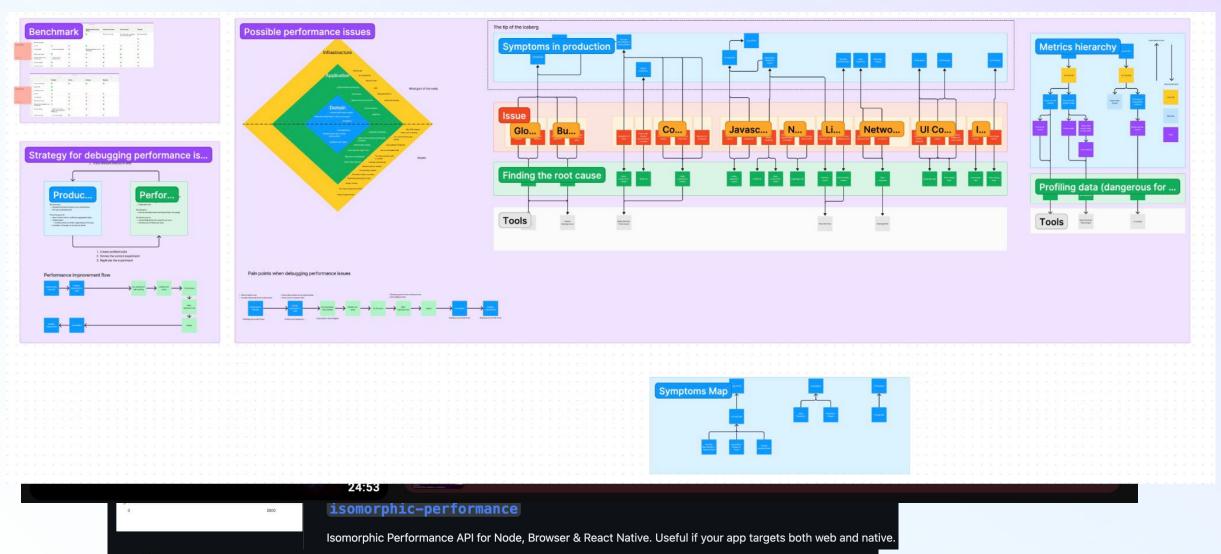
**O UNIFIED METRICS, LOGS, TRACES** 

#### How can we improve performance tracking?





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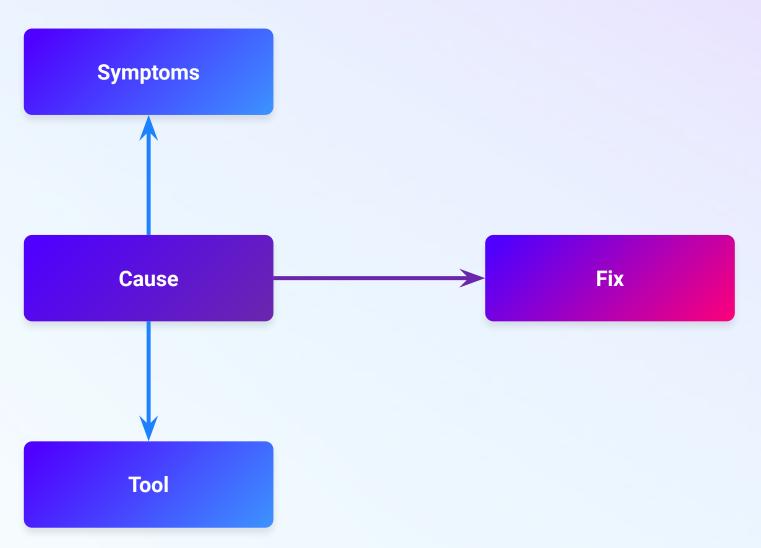


# 99%\* of perf issues come from 25 causes

\*Not scientifically proven



### The model



## Observing symptoms



### **Symptoms**

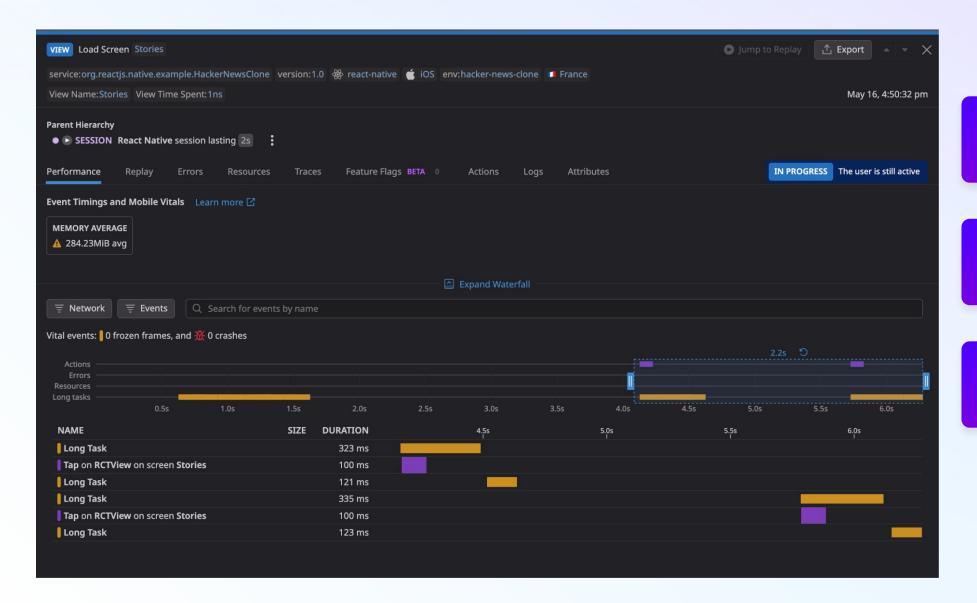
**UI Framerate** 

**JS Framerate** 

#### Adding observability



### **Adding observability**



Large selectors

Too many renders

**Useless renders** 

#### Selecting a group of causes

```
export const selectTopStories = (state: RootState): Story[] => {
       if (state.stories.selectorType === 'top') {
          return state.stories.ids
            .map(id => {
             return state.stories.stories.find(story => story.id === id);
           })
10
            .filter(story => story !== undefined)
            .map(story => ({
11
12
             ...story,
13
             timestamp: new Date((story as Story).time * 1000).toDateString(),
14
           })) as Story[];
15
16
17
       return state.stories.stories
18
          .map(story => ({
19
            ...story,
20
           timestamp: new Date(story.time * 1000).toDateString(),
21
         }))
22
          .sort((storyA, storyB) => storyA.time - storyB.time);
23
```

Large selectors

Too many renders

**Useless renders** 

# Validate causes with experiments



#### What's an experiment

**Protocol** 

Click on button

• Observe execution time with console.log

**Expectations** 

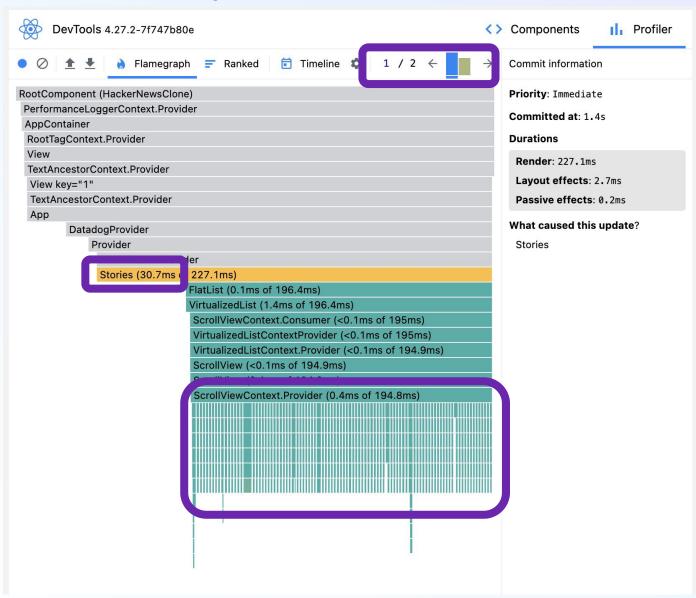
Execution time > 400ms

#### Running the experiment

```
export const selectTopStories = (state: RootState): Story[] => {
  const start = Date.now();
  let result: Story[] = [];
  if (state.stories.selectorType === 'top') { ...
  } else {--
  const end = Date.now();
  console.log('selector time', end - start);
  return result;
```

```
LOG selector time 49
LOG selector time 35
```

#### Repeat until you find all the causes



Large selectors

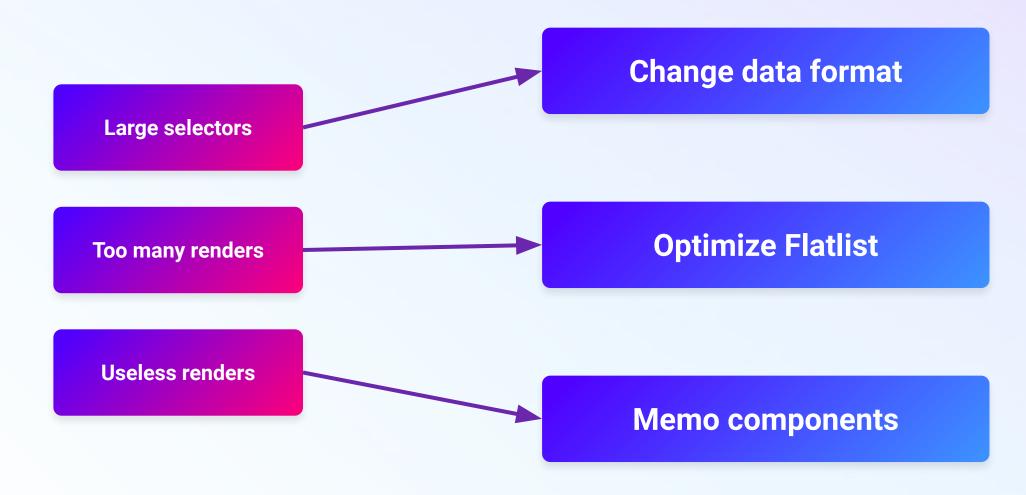
Too many renders

**Useless renders** 

# Apply fix



#### **Apply fixes**



## Check improvements



#### **Check improvements**



By zora\_goron at Fri May 12 2023 Show HN: focus.txt – A Minimalist Daily Planner

By DoreenMichele at Fri May 12 2023 A local TV station investigated an underground mine fire in Pennsylvania

By DoreenMichele at Fri May 12 2023 Wild Lupine and Karner Blue Butterflies (1996) [pdf]

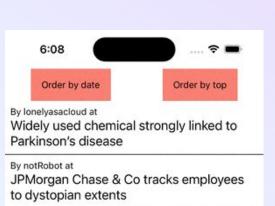
By luu at Fri May 12 2023 A Flexible Type System for Fearless Concurrency (2022) [pdf]

By marcodiego at Fri May 12 2023 From Manager to Compression Innovator: Yann Collet (Inventor of LZ4 and ZSTD)

By lopkeny12ko at Fri May 12 2023 Linda Yaccarino is the new CEO of Twitter

By meandave at Fri May 12 2023 Durin: A new mobile app for the IPFS network

By ramesh31 at Fri May 12 2023 Daft Punk releases Random Access Memories remaster with 9 bonus tracks



By zaikunzhang at
Optimization Without Derivatives: Prima
Fortran Version and Inclusion in SciPy

By ingve at
Digital Audio Workstation Front End
Development Struggles

By curious16 at CS 61B Data Structures, Spring 2023 UC Berkeley

By deegles at Seaflooding

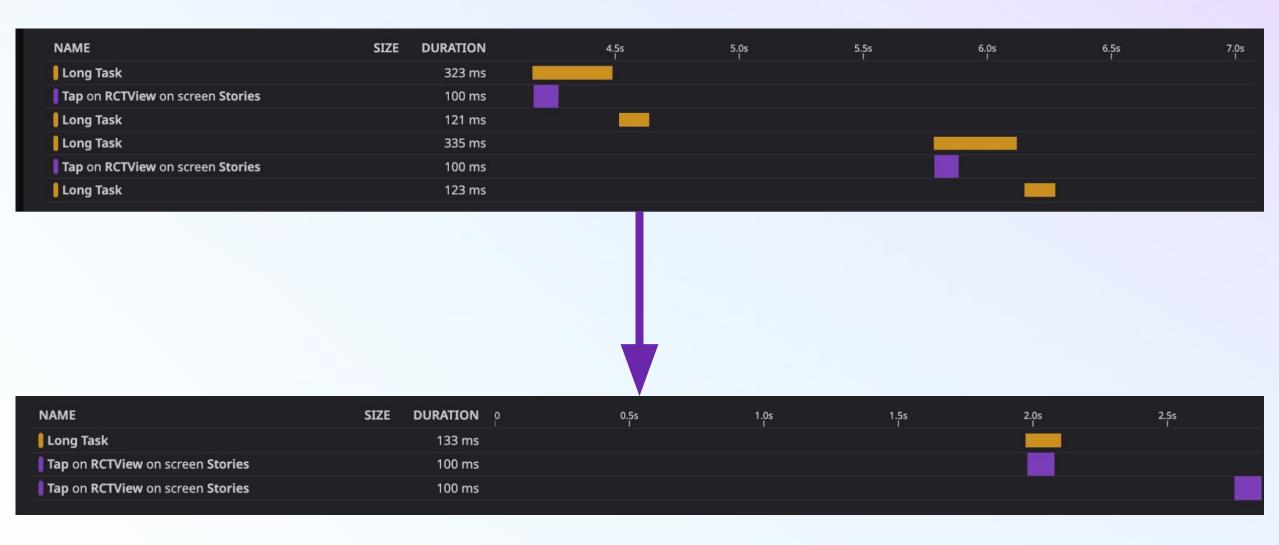
By the\_economist at BuildZoom (better way to build custom homes) Is hiring a Growth Associate

By spo81rty at My 20 year career is technical debt or deprecated

By mutant\_glofish at Ultimate Electronics (2021)

By tfourb at

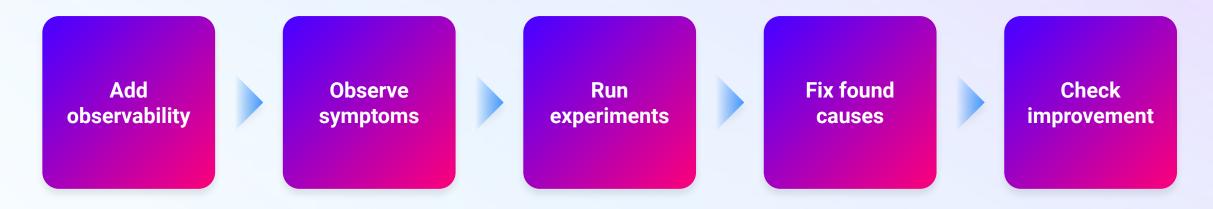
#### **Check improvements**

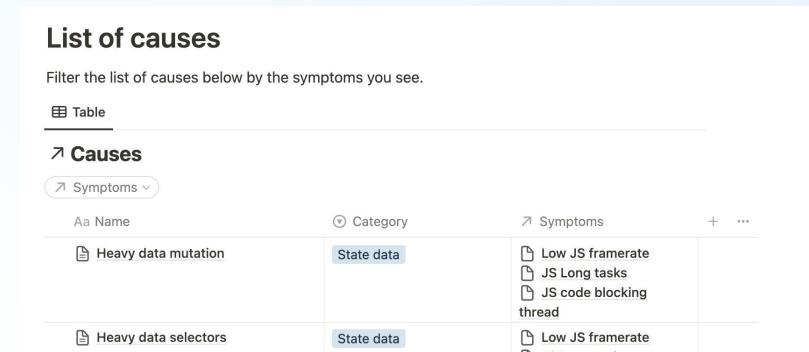


## Wrapping it up



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## Thank you!

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