





How to keep customers happy about your web application performance?

TECH 2



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IMAGINE THIS IS YOUR APP DEVELOPMENT CYCLE



AGENDA - PRESENT FEW GOOD PRACTICES



AGENDA - CROSS-FUNCTIONAL COMMUNICATION



SUPPORT



Listen to your customer support



Support engineer

Product owner

QA

SUPPORT



Listen to your customer support



Support engineer

Product owner

QA

Direct customer feedback is valuable

Prioritise it in your backlog

Good relations with support and customers allow to reproduce problems quicker

Understanding performance



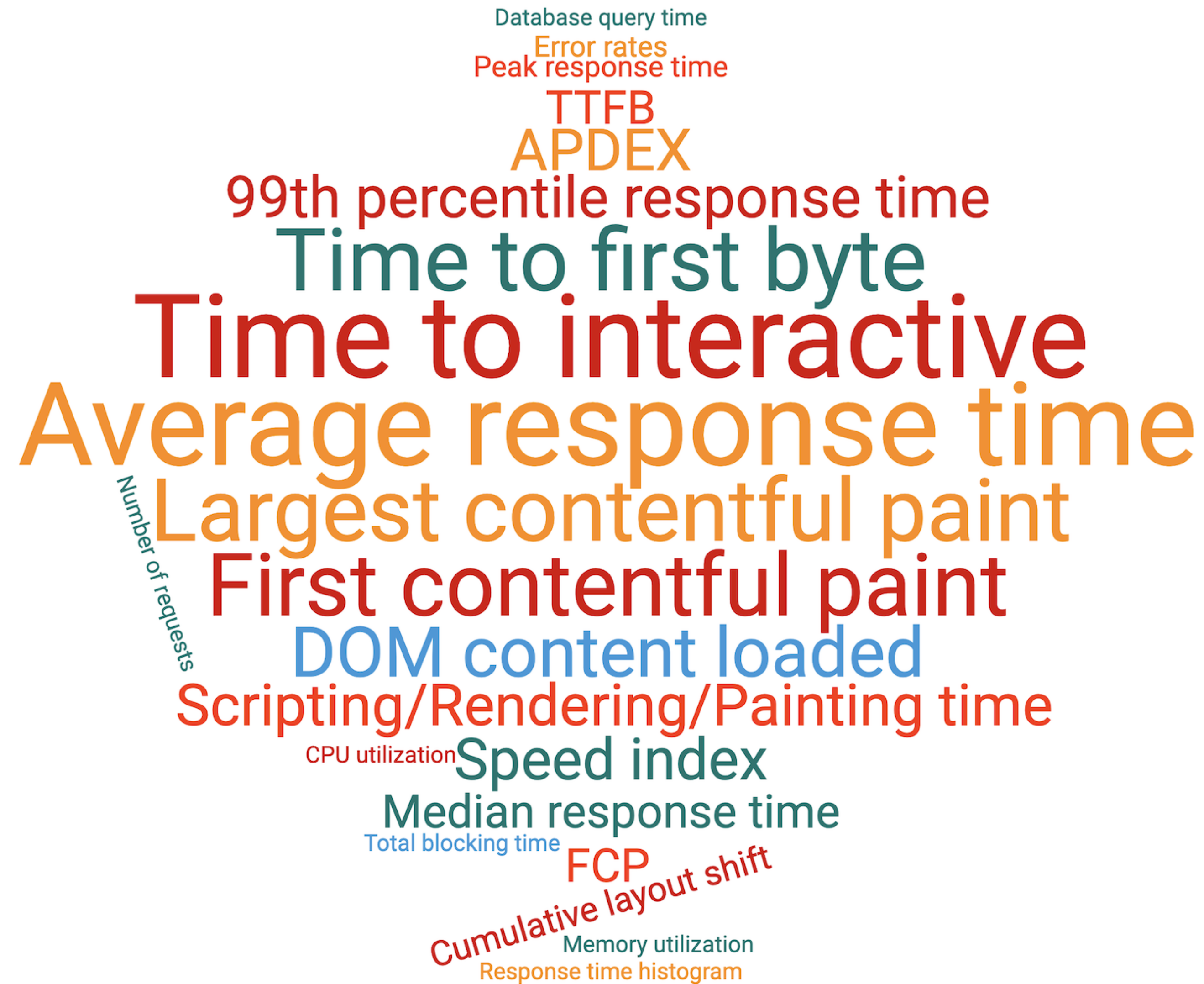
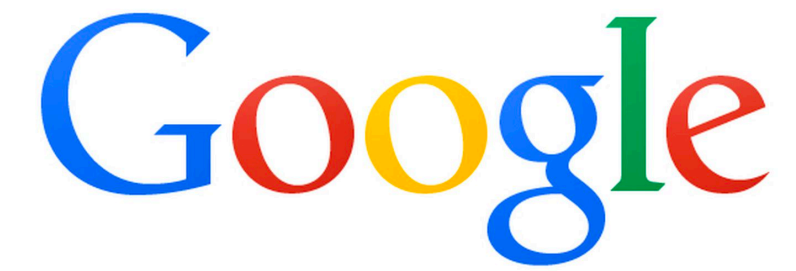
Slow/fast

What does it mean?



Metrics

One understands when they
know how to measure

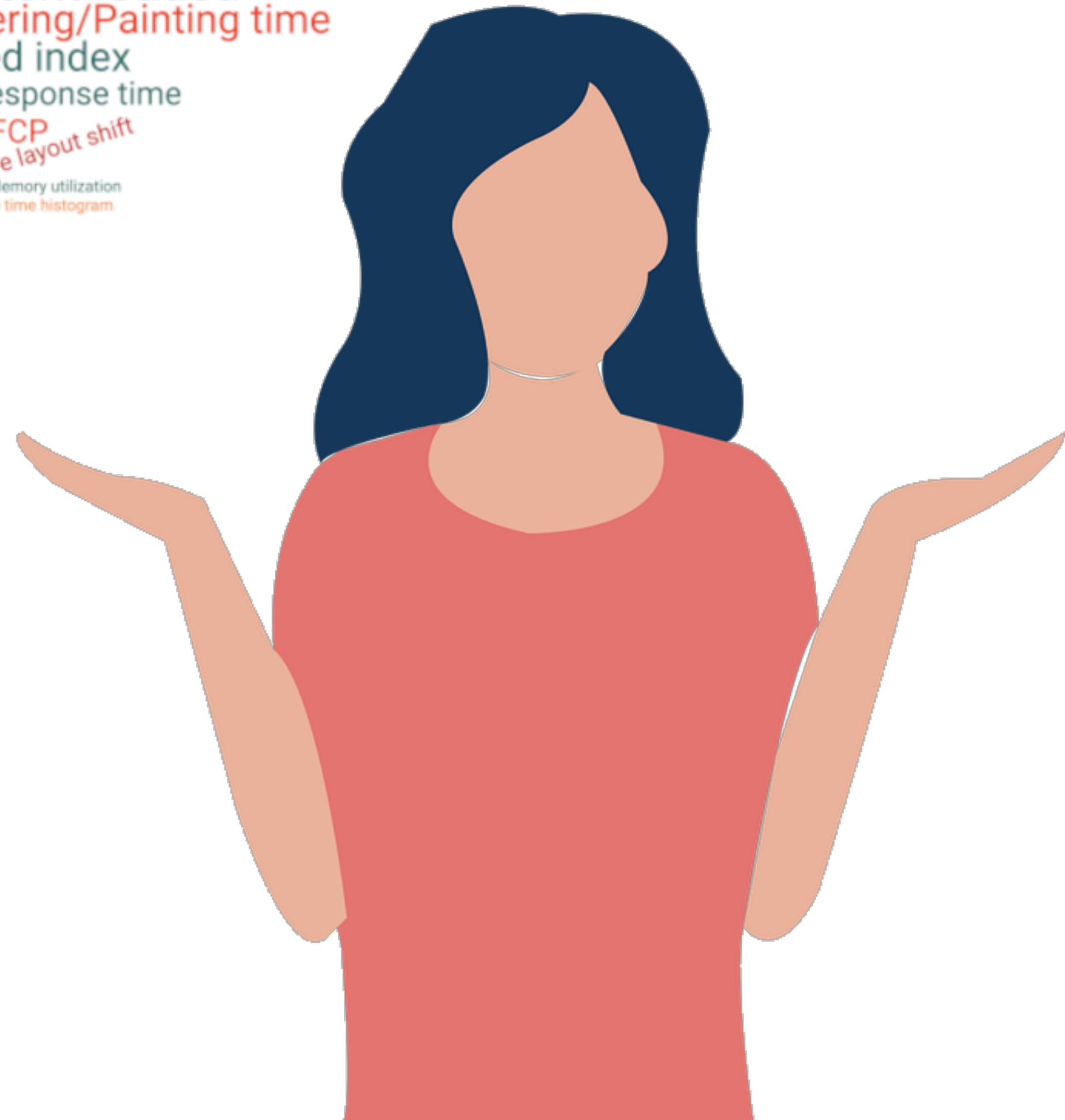




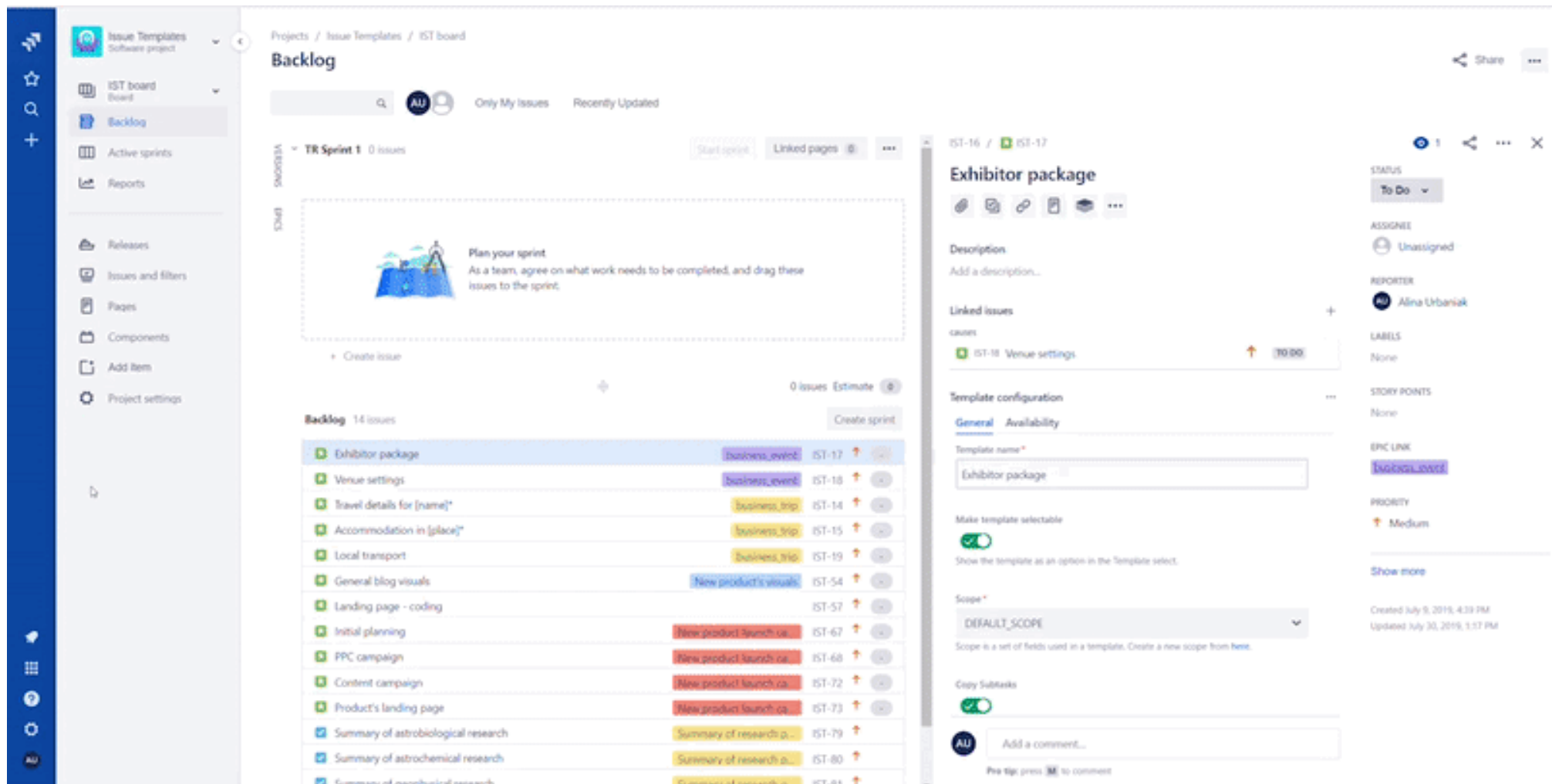
Database query time
Error rates
Peak response time
TTFB
APDEX
99th percentile response time
Time to first byte
Time to interactive
Average response time
Largest contentful paint
First contentful paint
DOM content loaded
Scripting/Rendering/Painting time
Speed index
Median response time
FCP
Cumulative layout shift
Memory utilization
Response time histogram
CPU utilization
Total blocking time



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CPU utilization



USER JOURNEY TIME

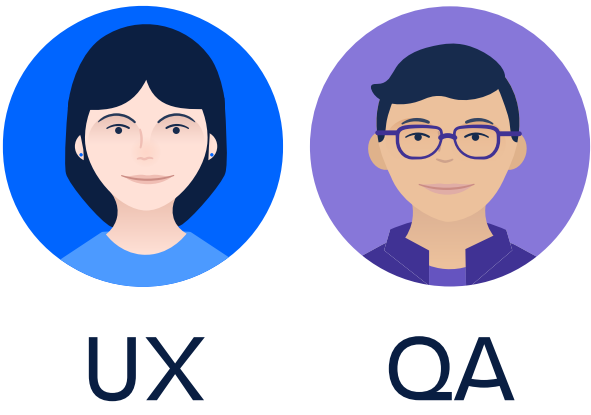
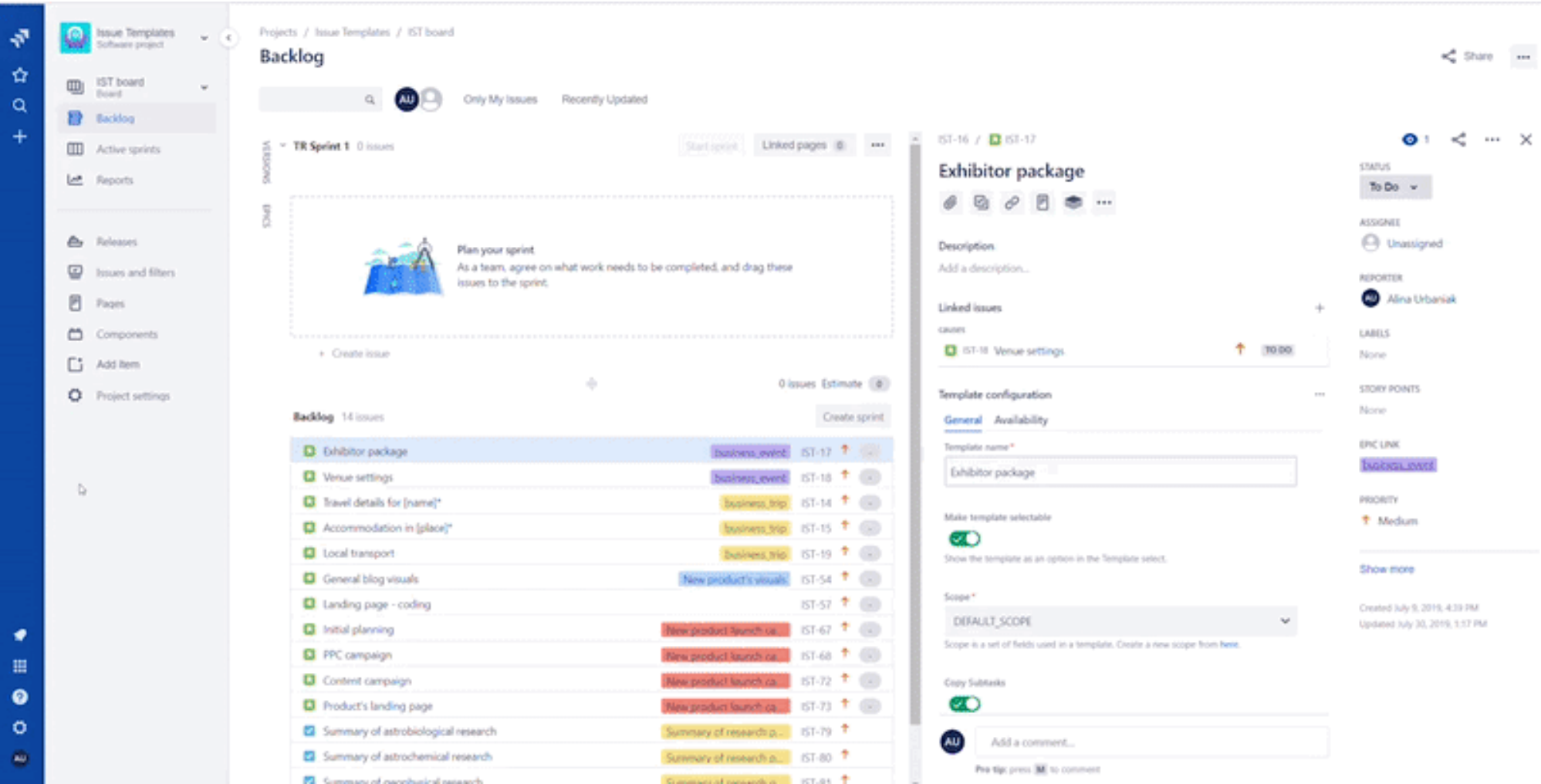


0



4.3 seconds

A bit like user-based usability testing...



- Too much data presented?
- Confusing UI?
- What content should be shown first?
- What can be loaded asynchronously?
- Can we do paging here?

0

4.3 seconds

☒ Restructure iJPT code and increase unit test coverage

☐ Virtual User credentials are logged in SSH commands

☐ Policy: Make modules to not depend on each other's implementation, instead

What needs to be done?

0

1.9 seconds

... and more user interaction analysis...



Users perception is ultimate metric



UX



QA

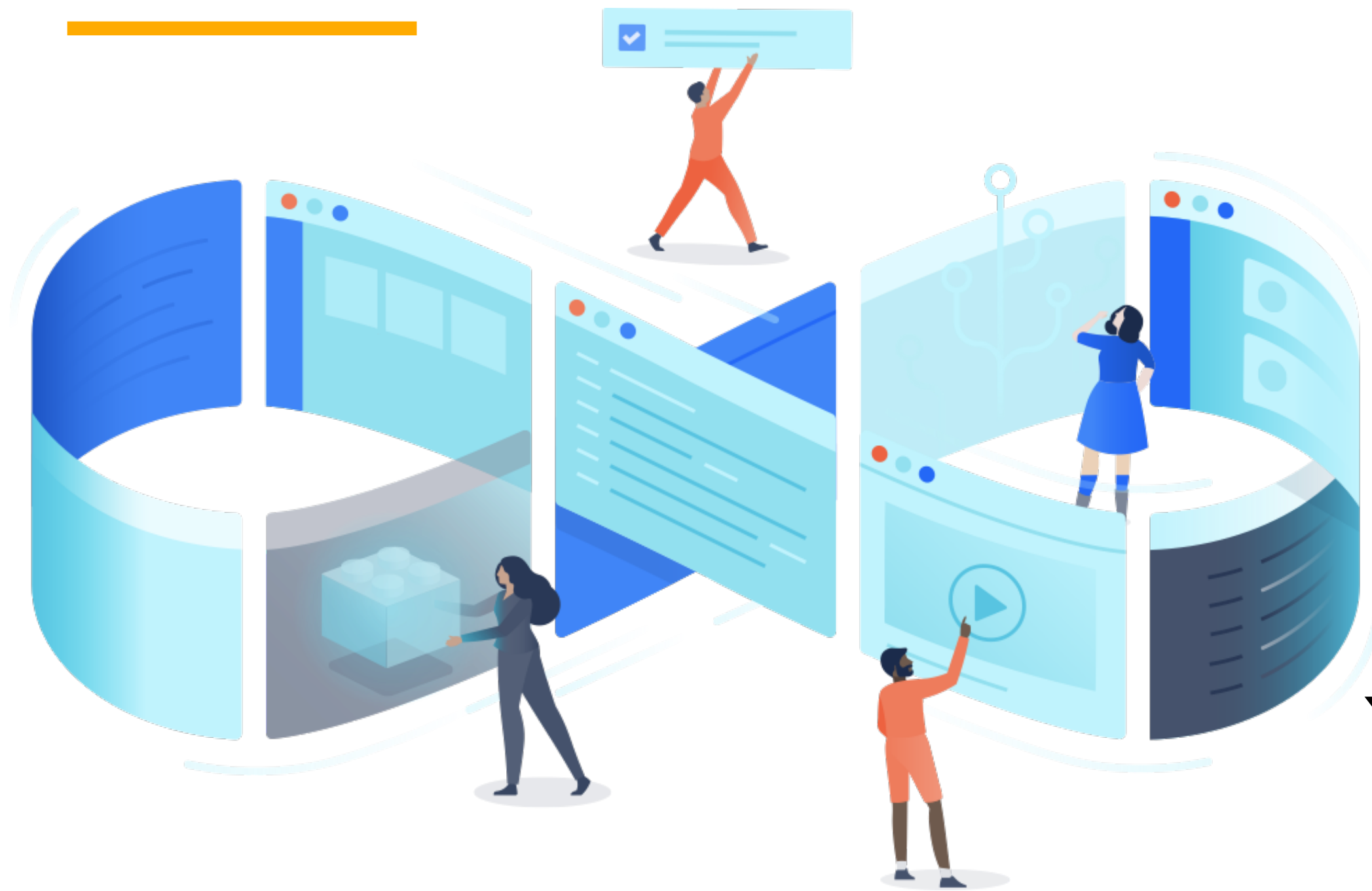
Seems
obvious
when done

Easy to omit
such a win

SPEAKING OF USER JOURNEY
CAN WE GET DATA ABOUT
THEM?

**(WITHOUT SITTING TOGETHER)*

REAL USER MONITORING + APPLICATION PERFORMANCE MANAGEMENT



Find and fix performance issues
before your customers notice



QA

Site reliability engineer
/ Observability team /
/ Tech lead /
DevOps

RUM + APM



Data

Records user interaction with website or client



Tools

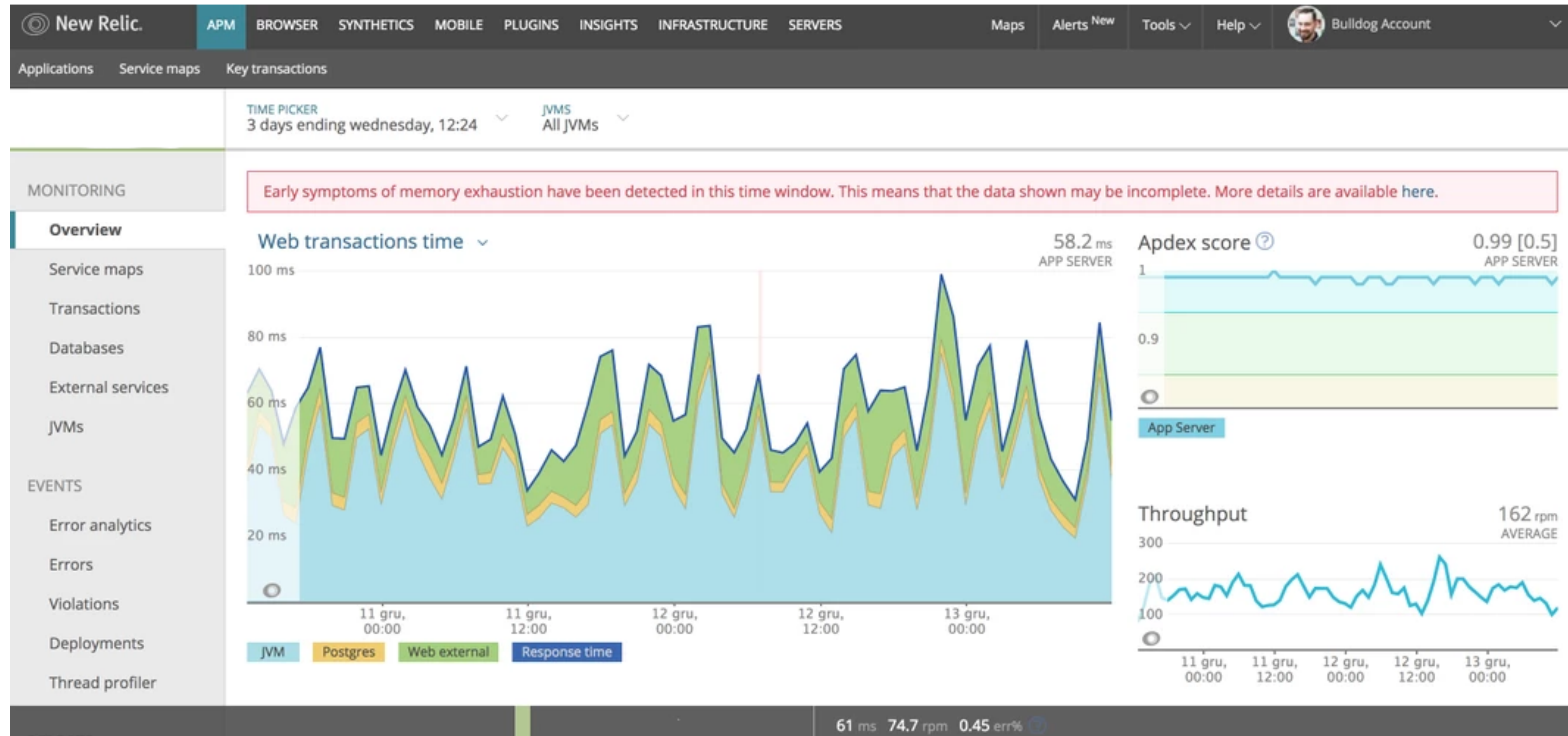
 **New Relic**  **dynatrace**
and more...



SLA

Expected level of service

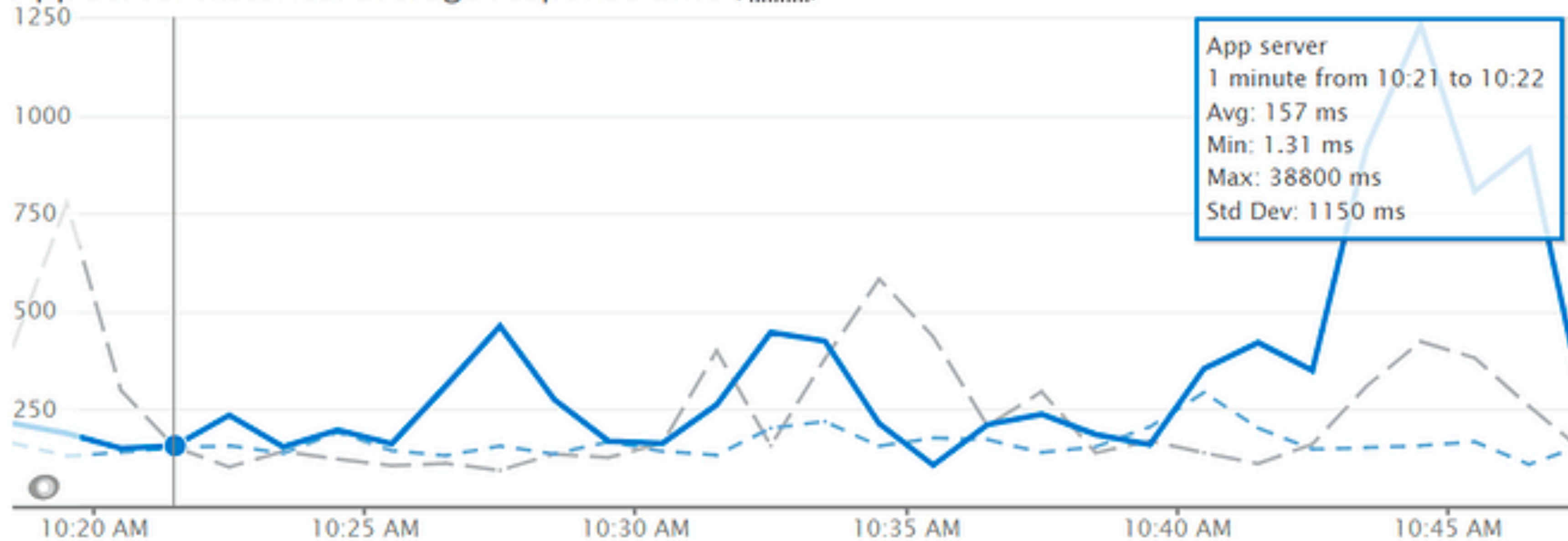
New Relic - general performance



New Relic - compare week-to-week

SERVICES
All servers ▾

App server historical average response time (ms)



App server
1 minute from 10:21 to 10:22
Avg: 157 ms
Min: 1.31 ms
Max: 38800 ms
Std Dev: 1150 ms

Add to a dashboard

Get chart link

Today

Yesterday

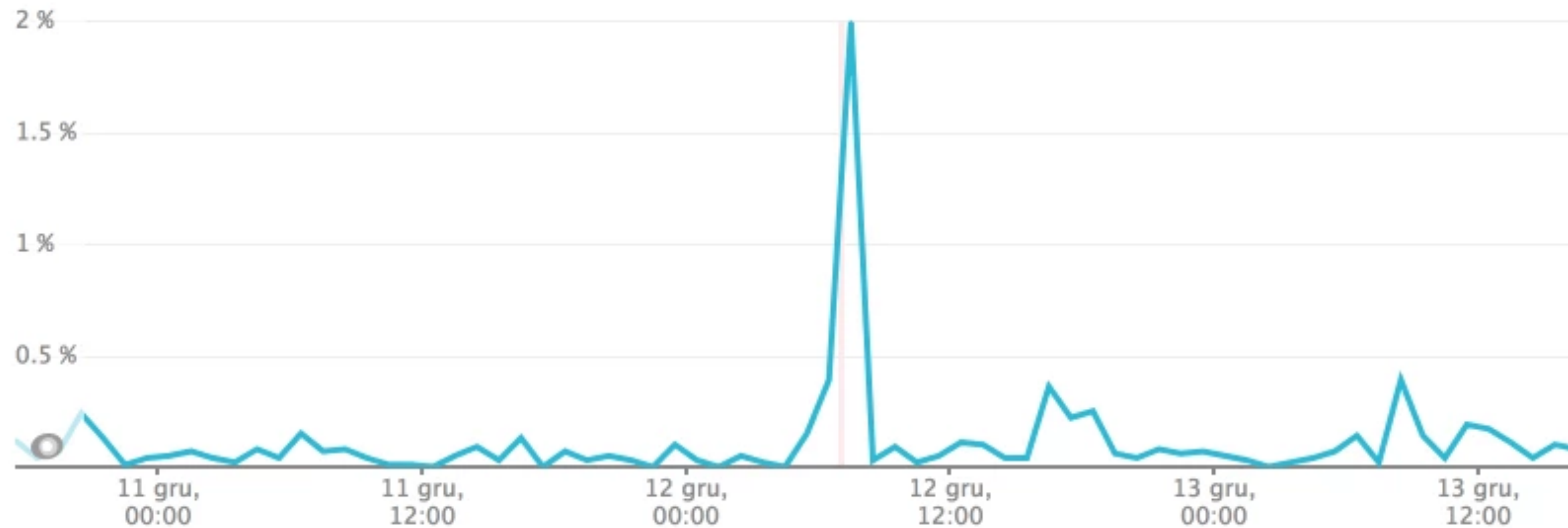
Last week



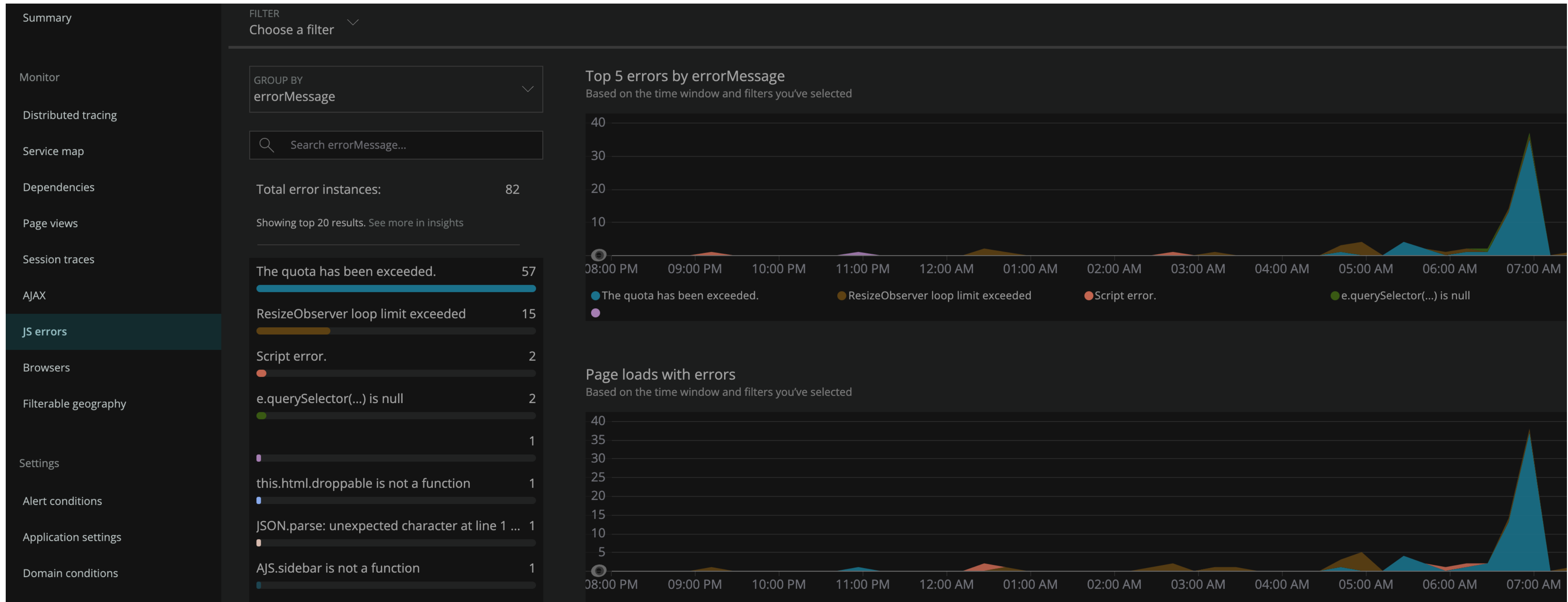
Compare with yesterday and last week

New Relic - errors (like http 50X)

Error rate (errors per request)



New Relic - JS errors



New Relic - drill down

Duration (ms)	Duration (%)	Segment	Drilldown	Timestamp
17,800	<div><div></div></div> 100.00%	ServletRequestListener.requestInitialized()		0.000 s
1.0	<div><div></div></div> 0.01%	> 35 fast method calls		0.000 s
17,800	<div><div></div></div> 99.96%	⌵ HttpAuthFilter.doFilter()		0.001 s
1.0	<div><div></div></div> 0.01%	⌵ 4 fast method calls		0.001 s
10,200	<div><div></div></div> 57.33%	⌵ /authentication (POST) (https://n.com/cdc/rest/usermanagement/1/authentication)	/cd	0.003 s
11.0	<div><div></div></div> 0.06%	> 22 fast method calls		10.217 s
7,550	<div><div></div></div> 42.43%	⌵ TrustedApplicationFilter.doFilter()		10.229 s
7,550	<div><div></div></div> 42.43%	⌵ JiraSecurityFilter.doFilter()		10.229 s
7,550	<div><div></div></div> 42.43%	⌵ JiraSecurityFilter.doFilter()		10.229 s
7,430	<div><div></div></div> 41.78%	⌵ /authentication (POST) (https://n.com/cdc/rest/usermanagement/1/authentication)		10.229 s

RUM + APM



Data-overload

Better pick **few key actions** to monitor.

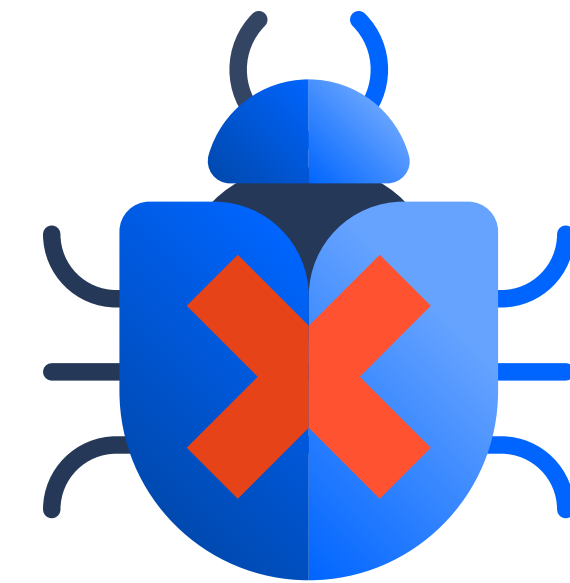
Rely on custom metrics.

leads to...



Lack of load control

Low probability of finding regression < ~10%



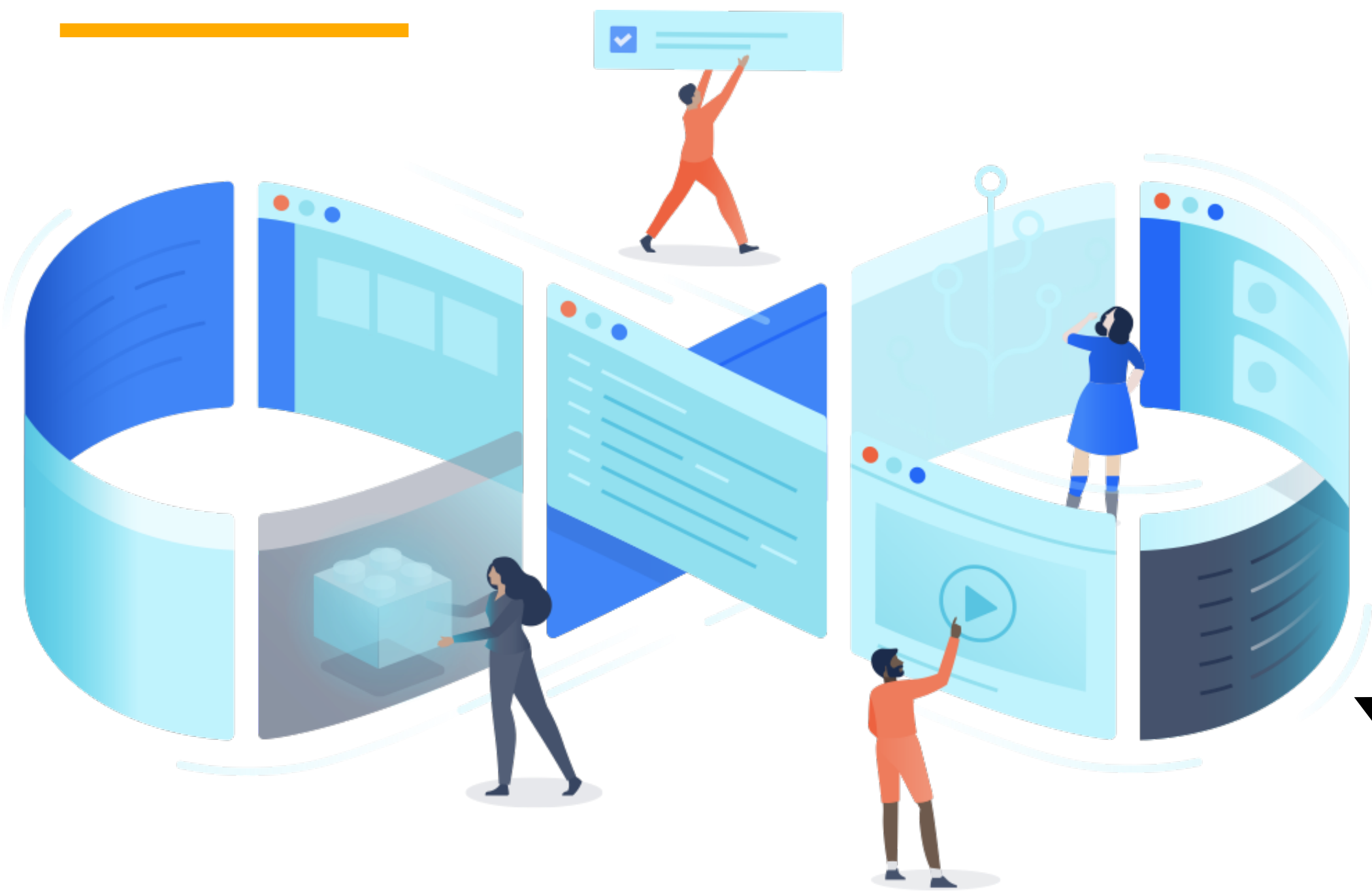
Testing on production

Reactive not proactive.
Doesn't prevent part of customers to see performance issues. Finds them late in dev process.






Use on staging, pre-prod, blue-green deployment, dogfooding

REGRESSION TEST SUITE



Establish regression test suite



Dev QA Product owner

Regression test suite



Maintainable

Record and playback is evil

....
and so on...

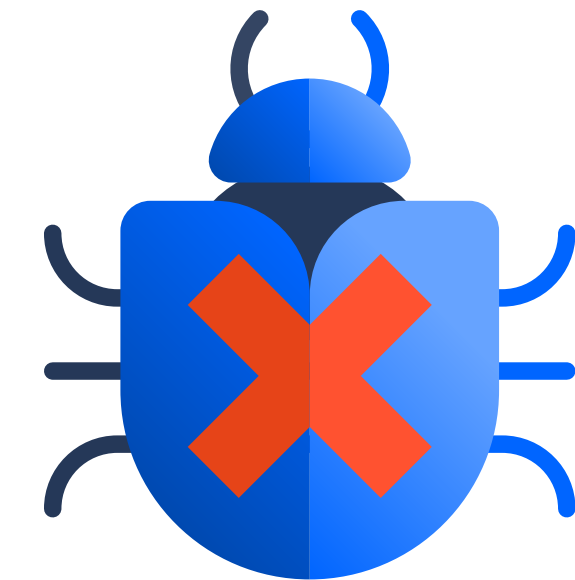


Acted upon

Commitment to fix issues
found



Cover only **key actions**
that you know you will care about

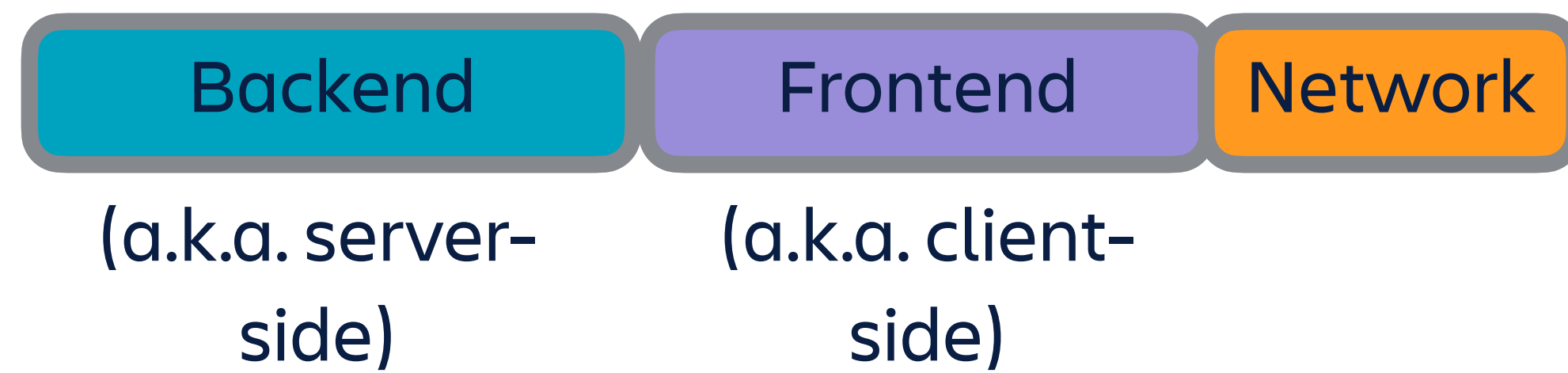
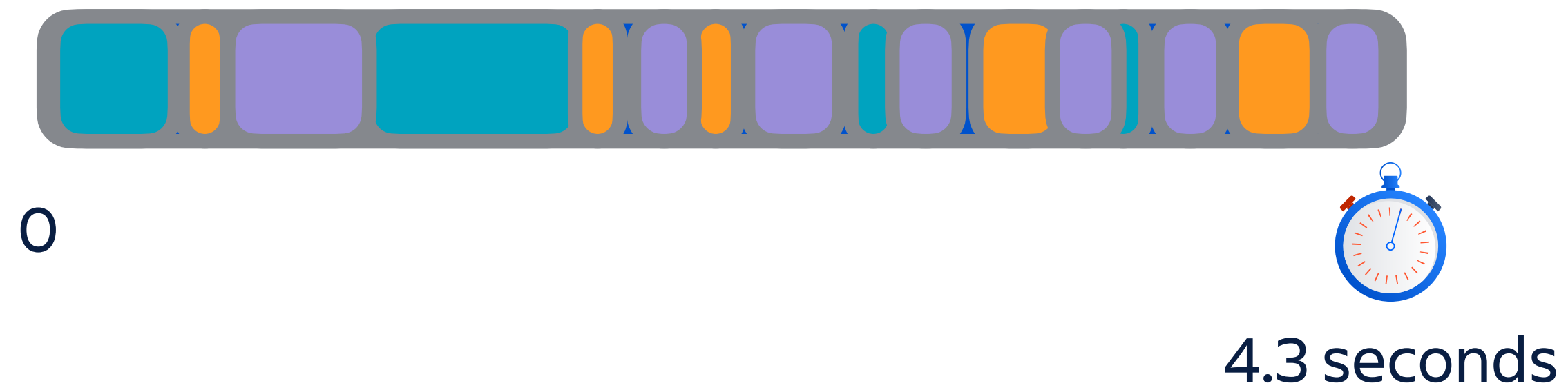


Repeatable

Predictable. Robust. Execute
3 times on the same commit

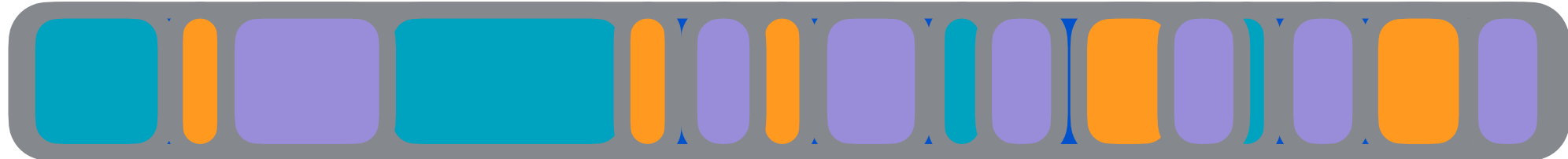


are results the same?



Cover Backend and Frontend

DRILL DOWN (SIMPLIFIED)



0



4.3 seconds



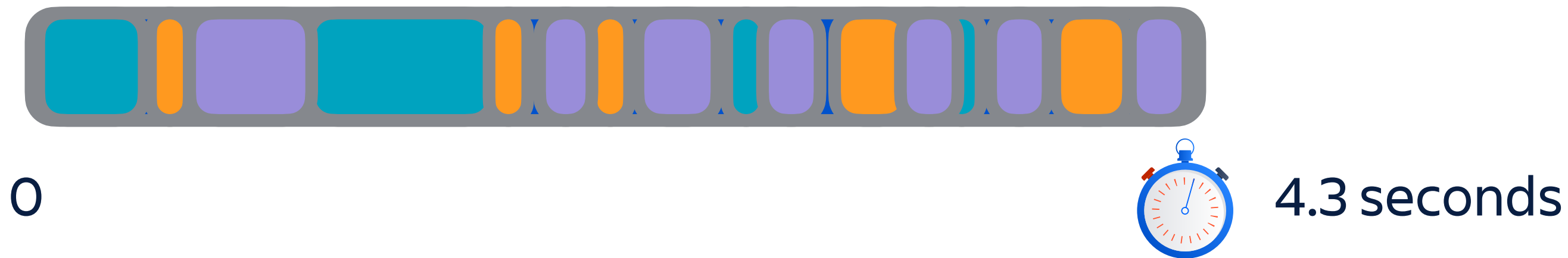
Depends on user load

Most of performance tooling
is about that

i.e.:REST/GraphQL API



DRILL DOWN (SIMPLIFIED)



Runs on client
workstation

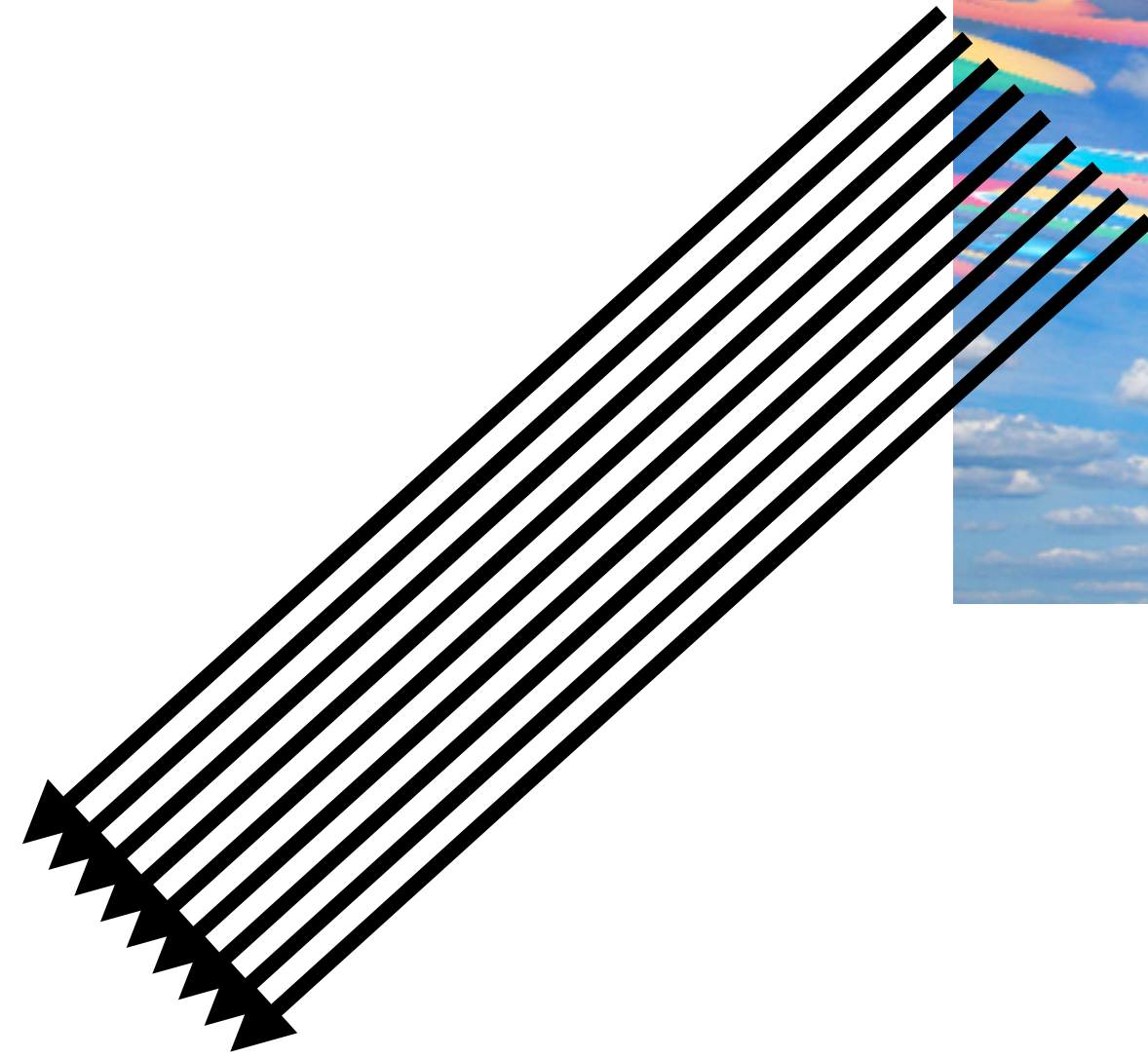
Can be heavy nowadays

Doesn't depend on users load as much

SOLUTION

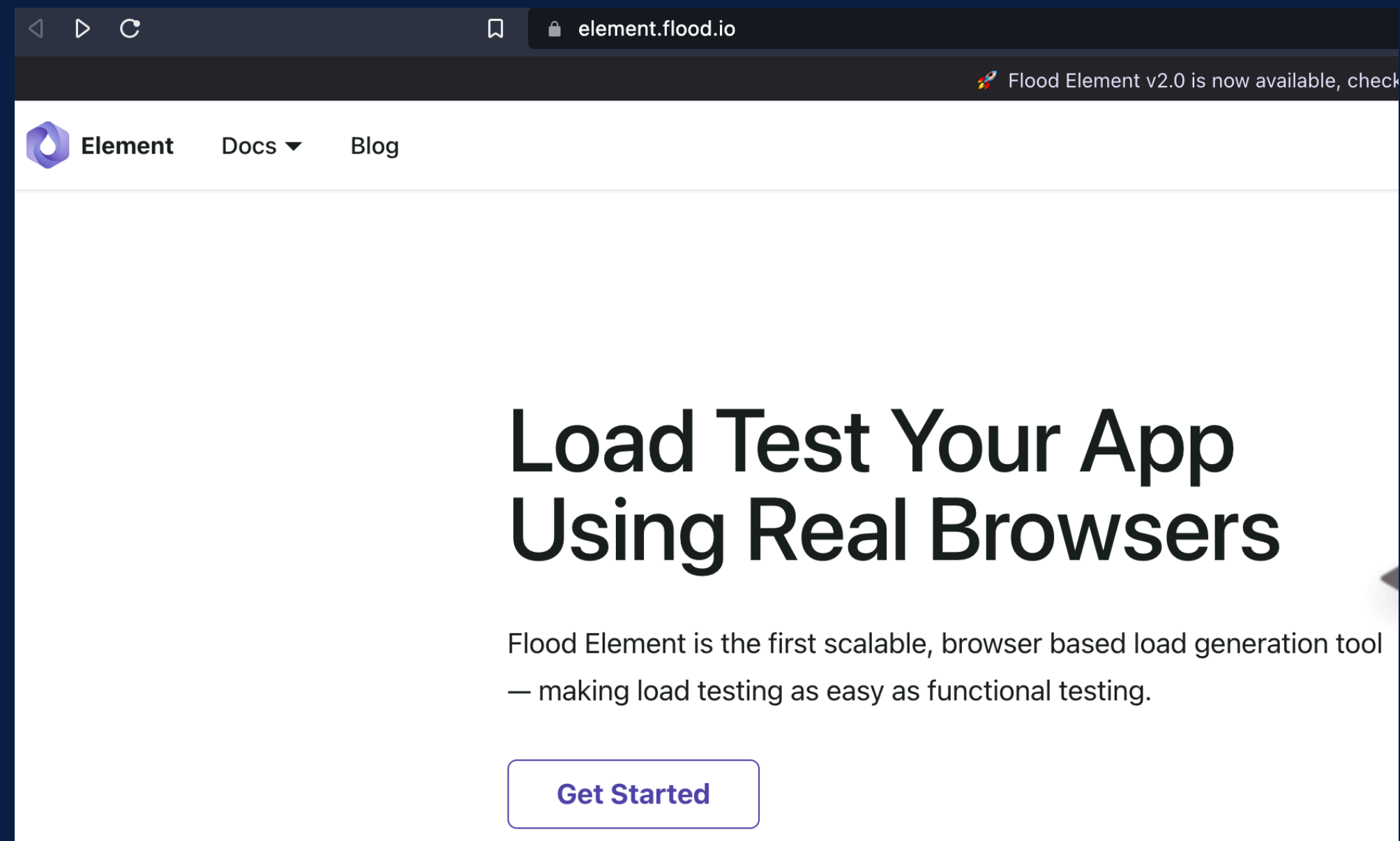


Our app

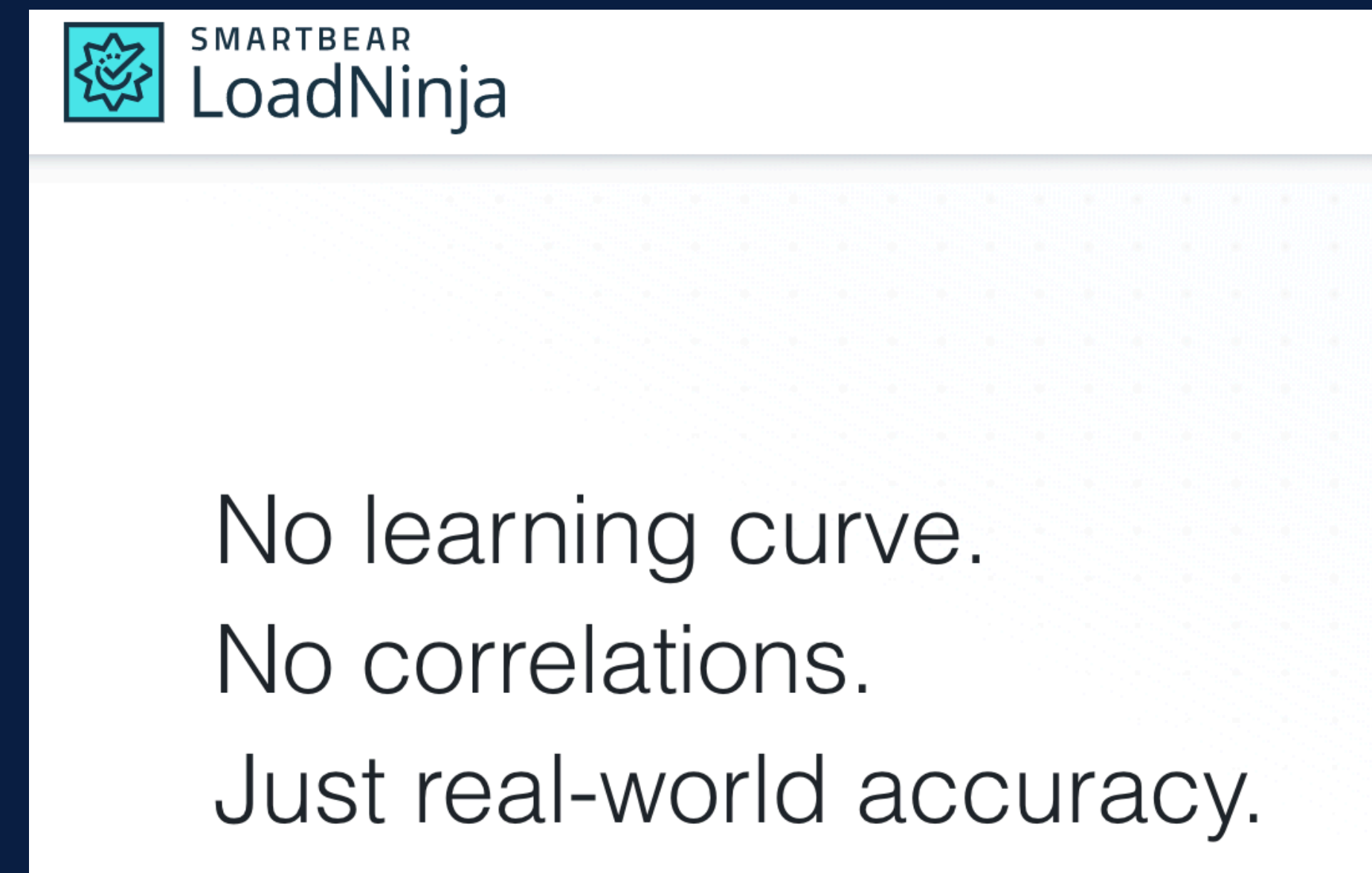


SOLUTIONS ON MARKET

flood.io



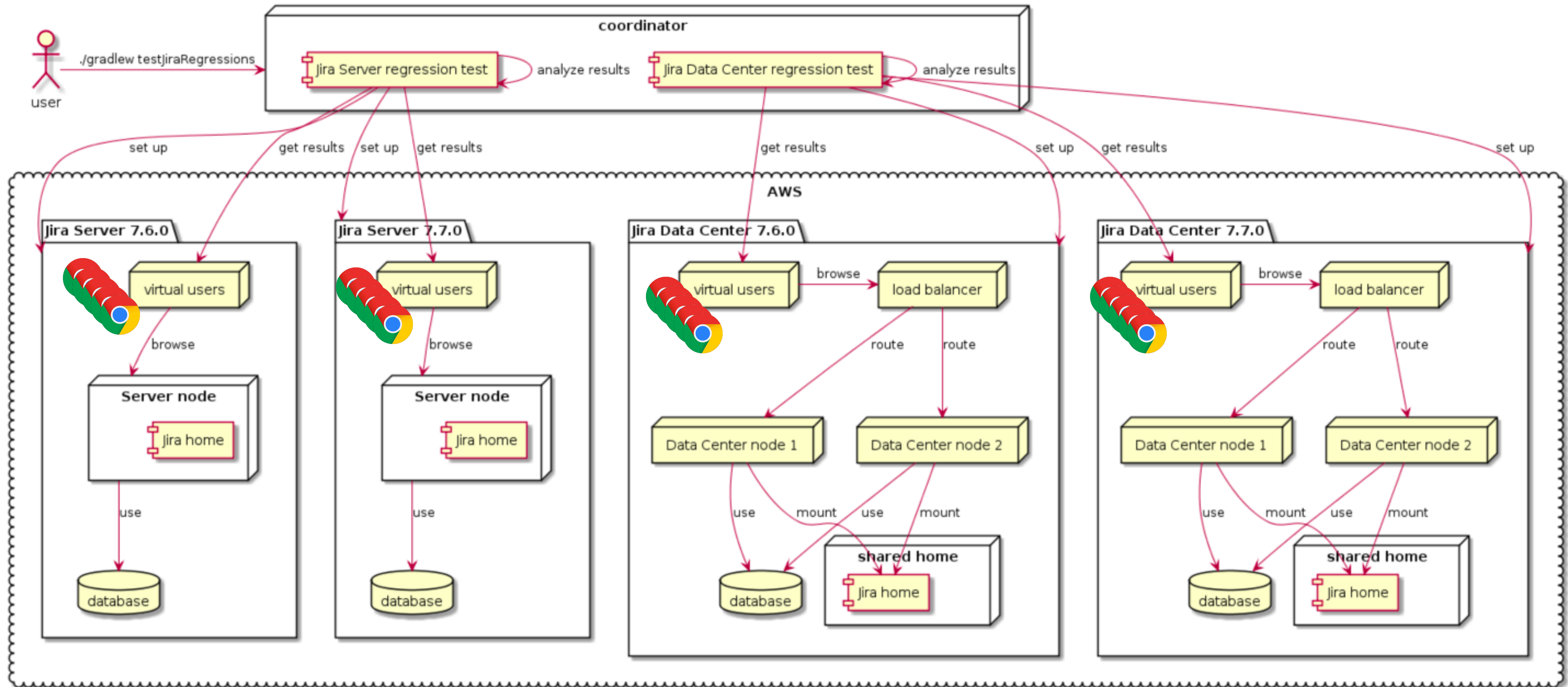
loadninja.com



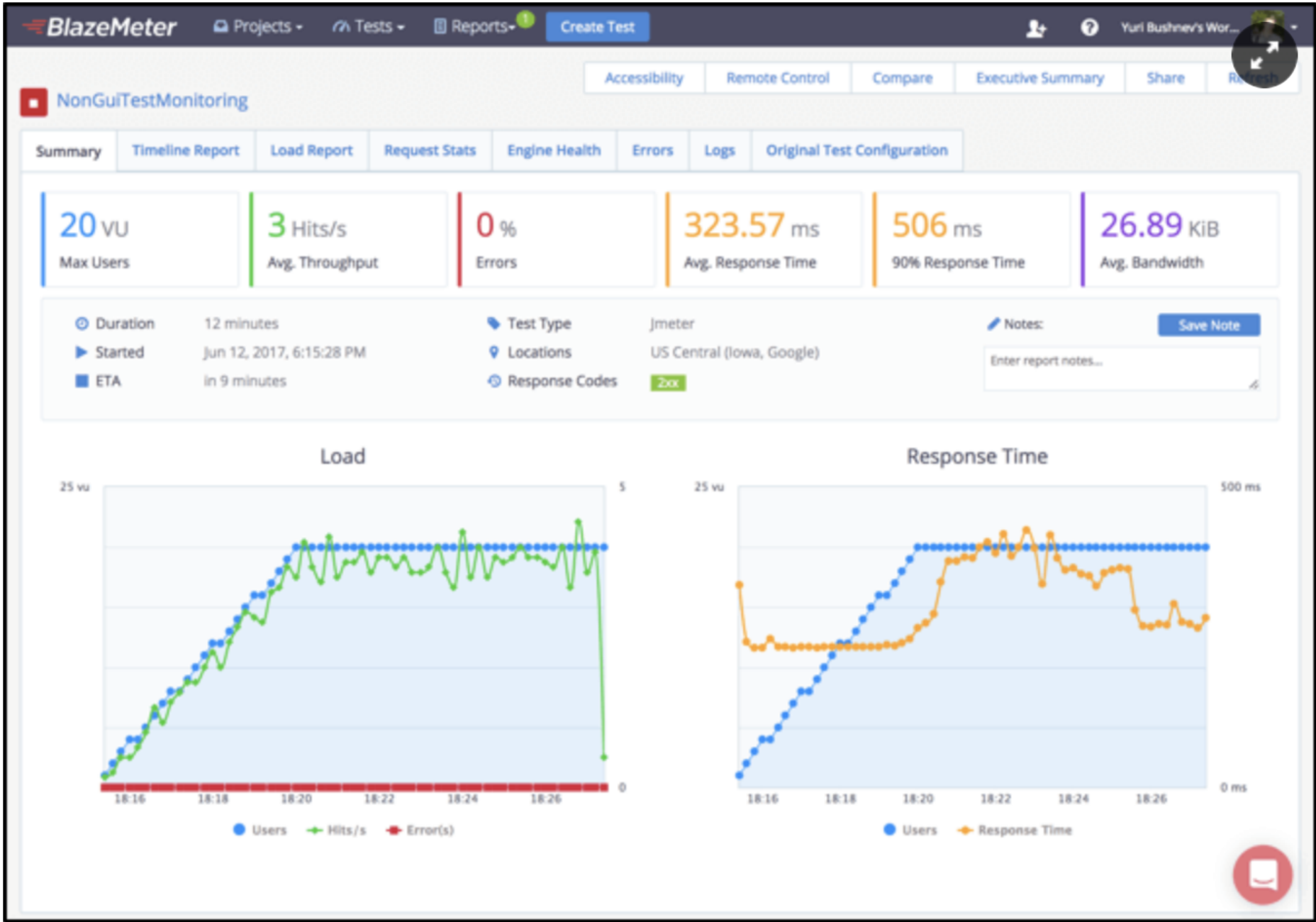
and more...

JIRA REGRESSION TEST

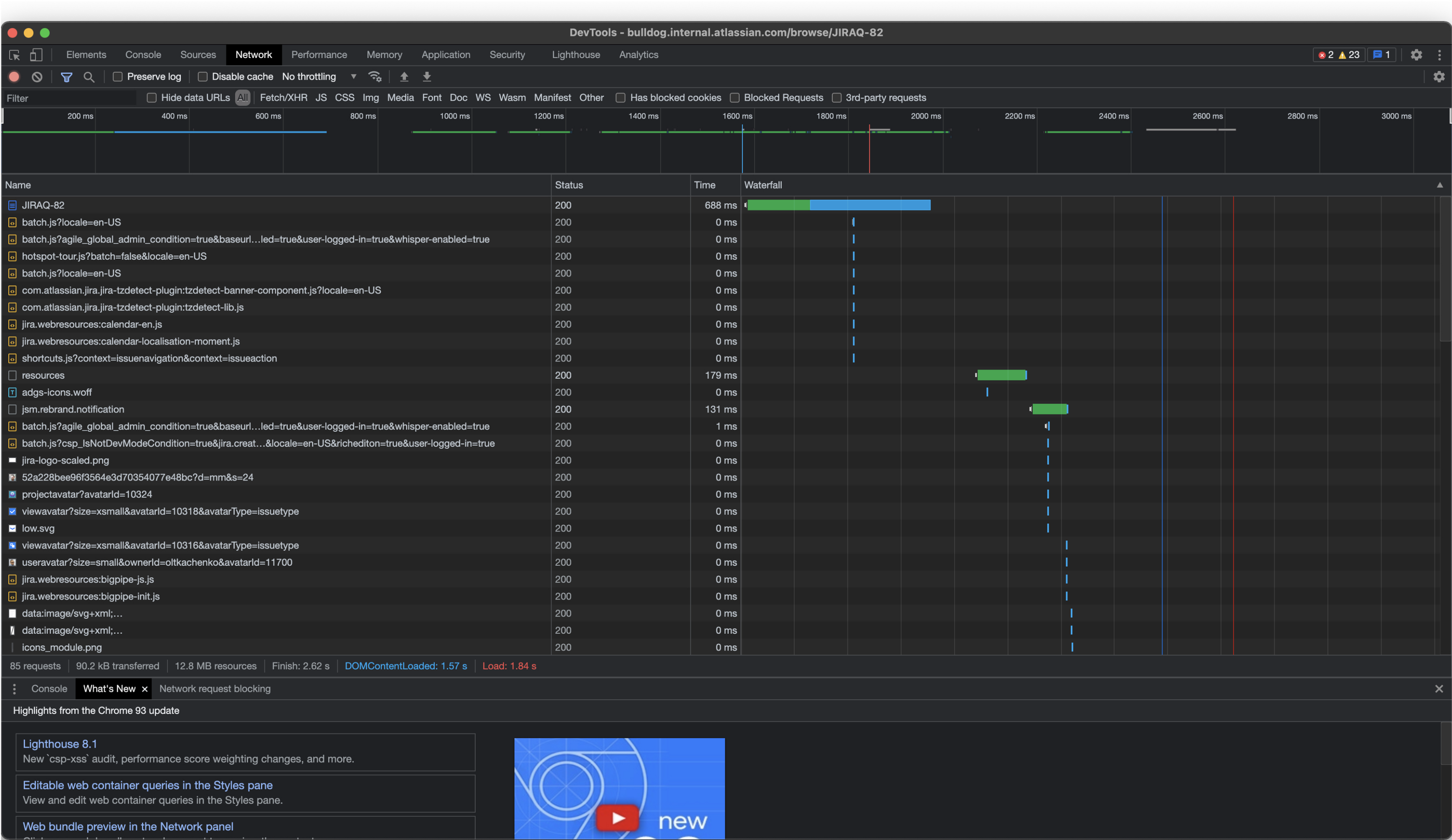
Jira regression test in JPT



CLASSIC PERFORMANCE TOOLS



CHROME DEVELOPER TOOLS



CHROME LIGHTHOUSE PERFORMANCE REPORT



There were issues affecting this run of Lighthouse:

- The page loaded too slowly to finish within the time limit. Results may be incomplete.

30

Performance

Metrics

■ First Contentful Paint	1.2 s	▲ Time to Interactive	9.7 s
▲ Speed Index	4.8 s	▲ Total Blocking Time	1,450 ms
▲ Largest Contentful Paint	3.6 s	● Cumulative Layout Shift	0.017

Values are estimated and may vary. The [performance score is calculated](#) directly from these metrics. [See calculator.](#)

View Original Trace

View Treemap

Show audits relevant to: All FCP LCP TBT CLS

Opportunities

— These suggestions can help your page load faster. They don't [directly affect](#) the Performance score.

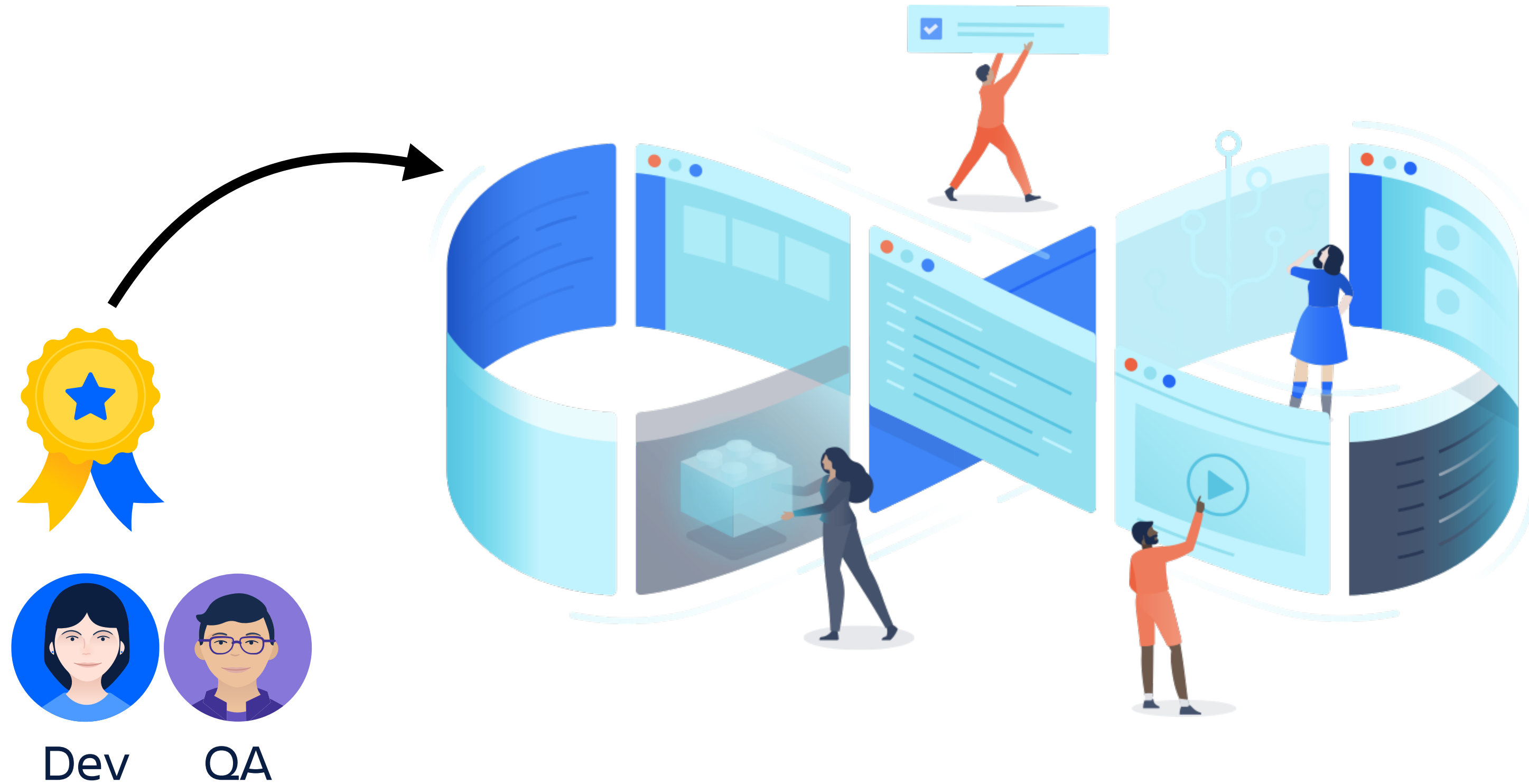
Opportunity	Estimated Savings
▲ Reduce unused JavaScript	2.36 s

CODE PROFILER

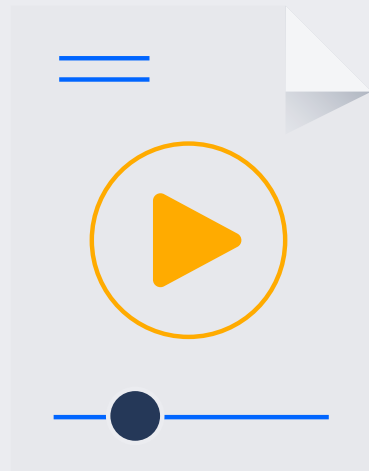
✓	m	100.0% - 152 s - inh. 0 μs	com.atlassian.plugin.web.descriptors.DefaultWebPanelModuleDescriptor\$ContextAwareWebPanel.getHtml
✓	m	64.6% - 98,874 ms - inh. 0 μs	com.atlassian.jira.plugin.webfragment.contextproviders.MultiContextProvider.getContextMap
✓	m	64.6% - 98,874 ms - inh. 0 μs	com.atlassian.jira.plugin.webfragment.CacheableContextProviderDecorator.getContextMap
✓	m	64.6% - 98,874 ms - inh. 0 μs	com.atlassian.jira.plugin.webfragment.CacheableContextProviderDecorator.initContextMap
✓	m	64.6% - 98,864 ms - inh. 0 μs	com.atlassian.jira.plugin.viewissue.LinkBlockContextProvider.getContextMap
✓	m	64.6% - 98,846 ms - inh. 0 μs	com.atlassian.jira.plugin.viewissue.LinkBlockContextProvider.getLocalIssueLinks
	m	34.1% - 52,232 ms - inh. 0 μs	com.atlassian.jira.plugin.viewissue.issueLink.LocalIssueLinkUtils.convertToIssueLinkContexts
	m	30.5% - 46,613 ms - inh. 0 μs	com.atlassian.plugin.osgi.bridge.external.HostComponentFactoryBean\$DynamicServiceInvocationHandler.invoke
	m	0.0% - 9,217 μs - inh. 0 μs	com.atlassian.plugin.osgi.bridge.external.HostComponentFactoryBean\$DynamicServiceInvocationHandler.invoke
	m	0.0% - 9,042 μs - inh. 0 μs	com.atlassian.jira.plugin.viewissue.LinkBlockContextProvider.getRemoteIssueLinks
	m	0.0% - 9,748 μs - inh. 0 μs	com.atlassian.jira.plugin.viewissue.AttachmentBlockContextProvider.getContextMap
✓	m	35.0% - 53,557 ms - inh. 0 μs	com.atlassian.plugin.web.model.ResourceTemplateWebPanel.getHtml
	m	35.0% - 53,540 ms - inh. 0 μs	com.atlassian.plugin.web.model.ResourceTemplateWebPanel.writeHtml
	m	0.0% - 17,432 μs - inh. 17,432 μs	java.io.StringWriter.toString
	m	0.3% - 500 ms - inh. 0 μs	com.atlassian.jira.plugin.webfragment.CacheableContextProviderDecorator.getContextMap
	m	0.0% - 23,046 μs - inh. 23,046 μs	java.lang.StringBuilder.append
	m	0.0% - 9,792 μs - inh. 0 μs	com.atlassian.jira.plugin.bigpipe.BigPipeWebPanelModuleDescriptor.getModule

REGRESSION TEST SUITE

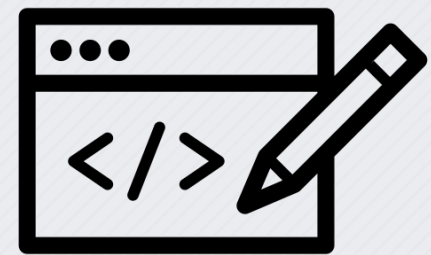
Include
performance
testing in daily
development



DEVELOPMENT VS REGRESSION SUITE



Record and playback is OK 



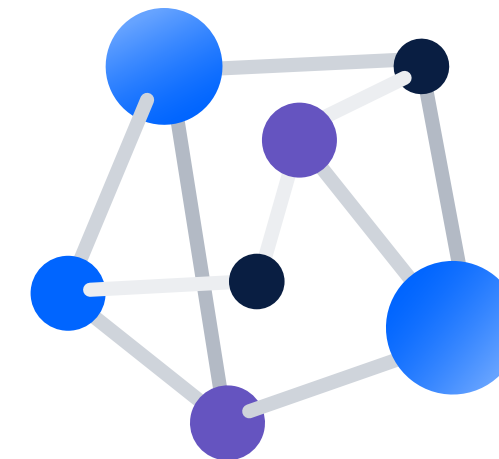
Pick tool to specific code change. Compare before and after your changes



Keep or throw away



Is recording still valid?



Broad scope
(backend+frontend)



Long living
Super robust



KONRAD MARSZAŁEK



Thank you!



Find and fix performance issues before your customers notice



Listen to your customer support



Establish regression test suite



Users perception is ultimate metric



Include performance testing in daily development

