

# ATLASSIAN

## How to keep customers happy about your web application performance? TECH 2





KONRAD MARSZAŁEK | SENIOR QUALITY ENGINEER

## **IMAGINE THIS IS YOUR APP DEVELOPMENT CYCLE**



## **AGENDA - PRESENT FEW GOOD PRACTICES**

# Good practice 4

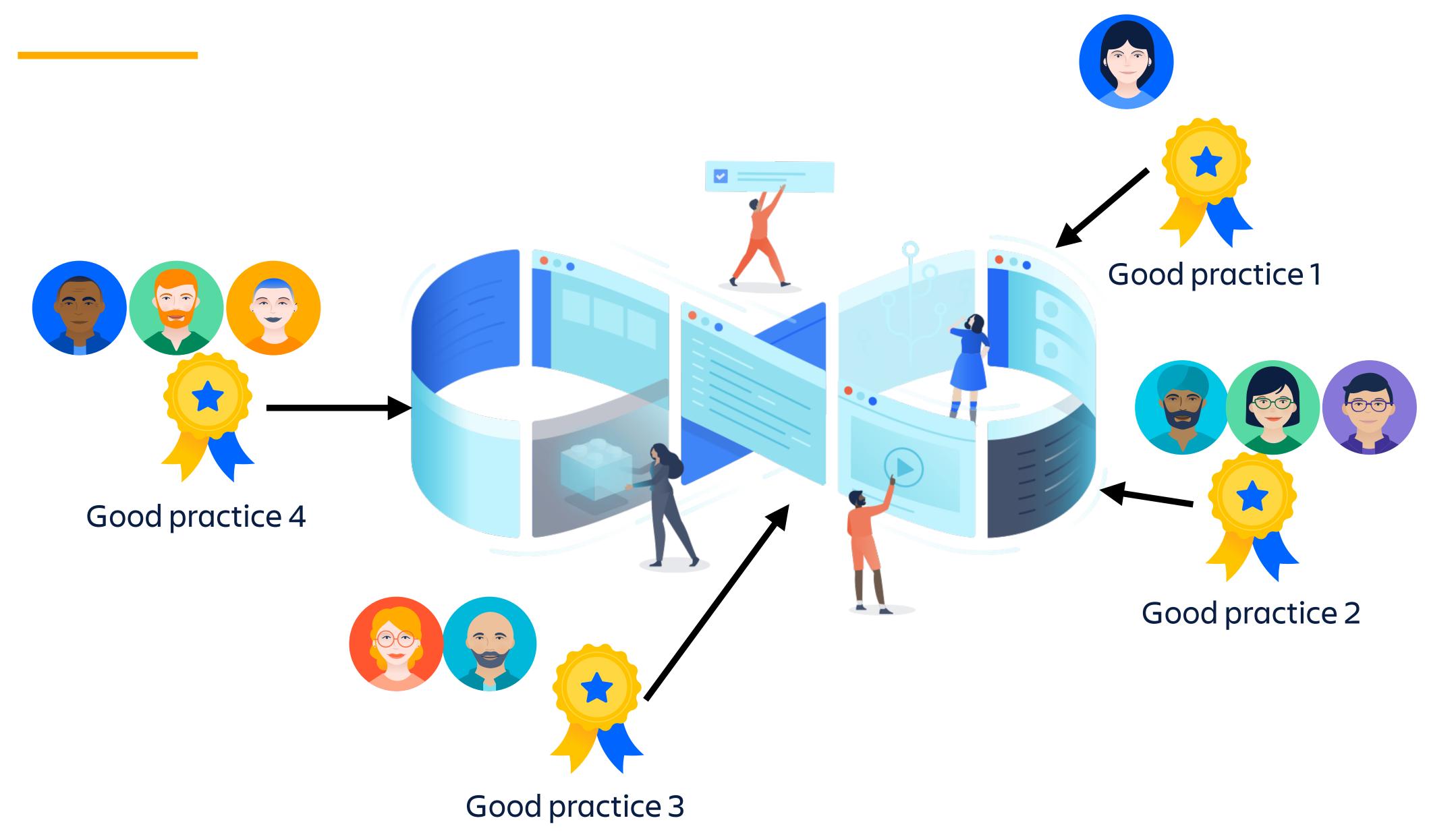


Good practice 3

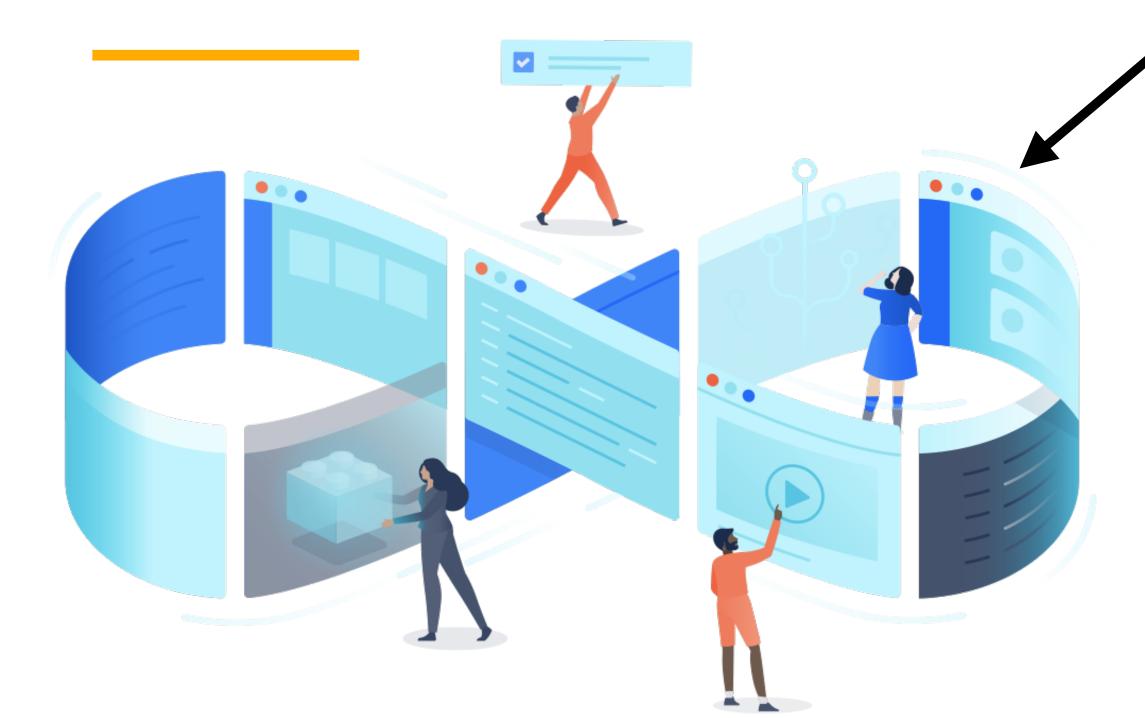




## **AGENDA - CROSS-FUNCTIONAL COMMUNICATION**









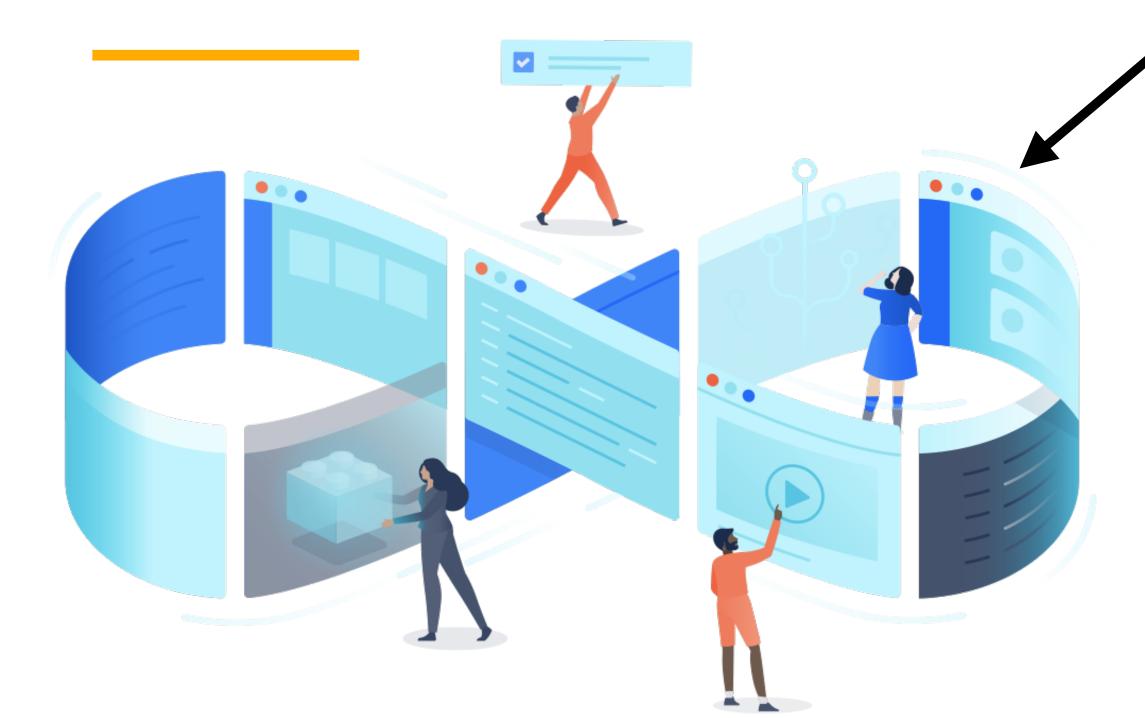


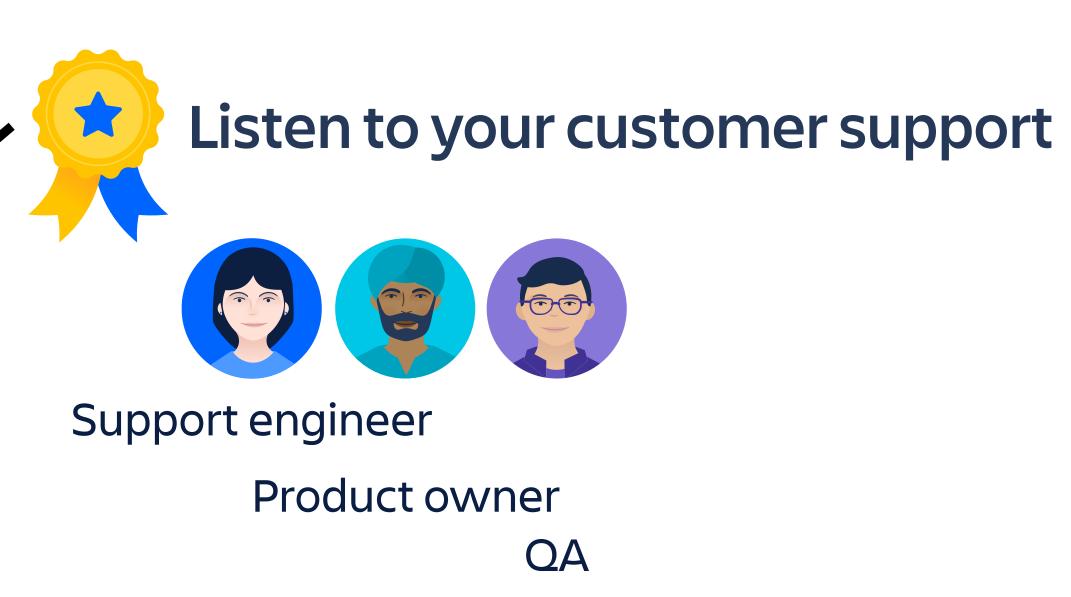
#### Support engineer

## 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

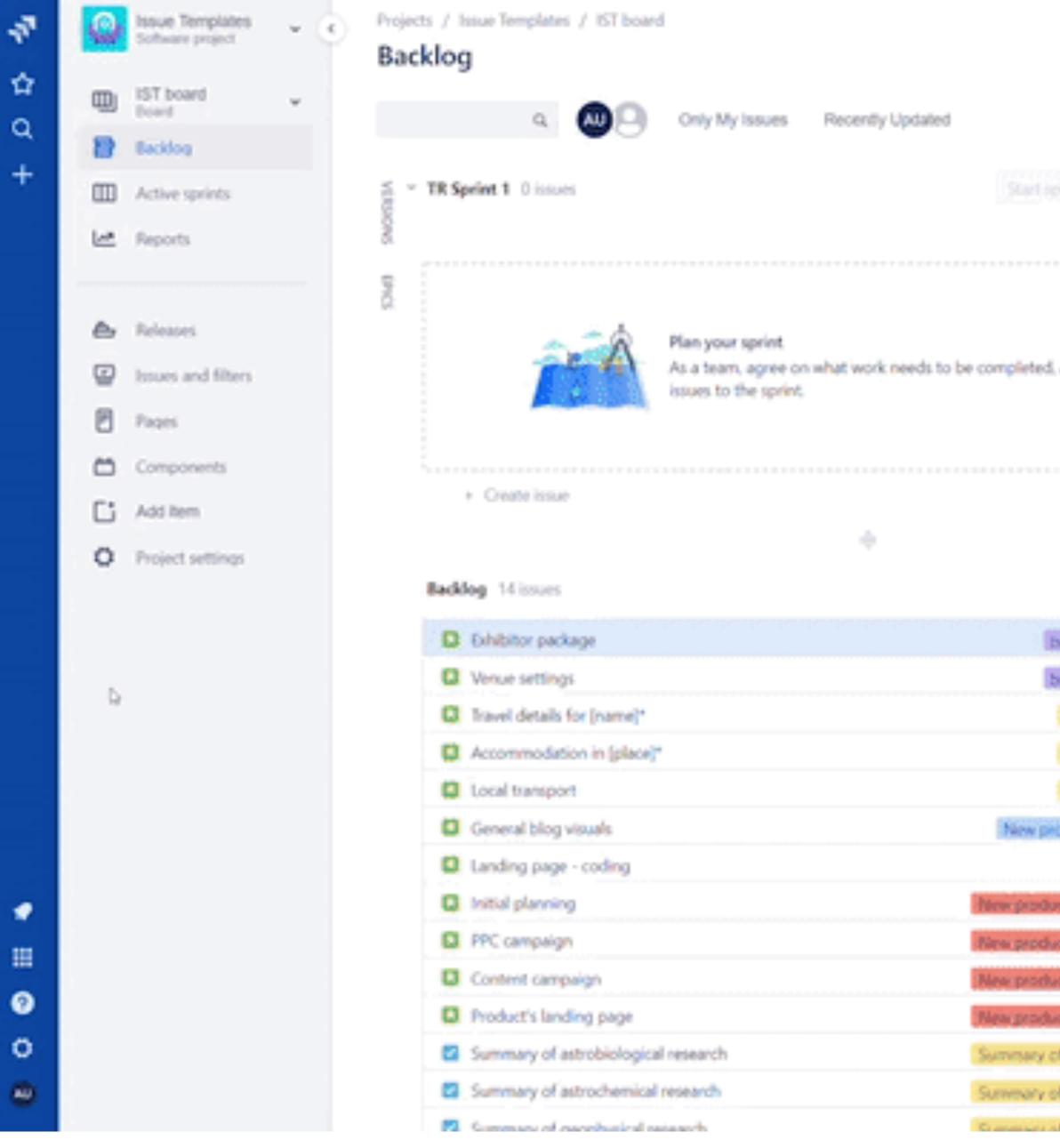
One understands when they know how to measure



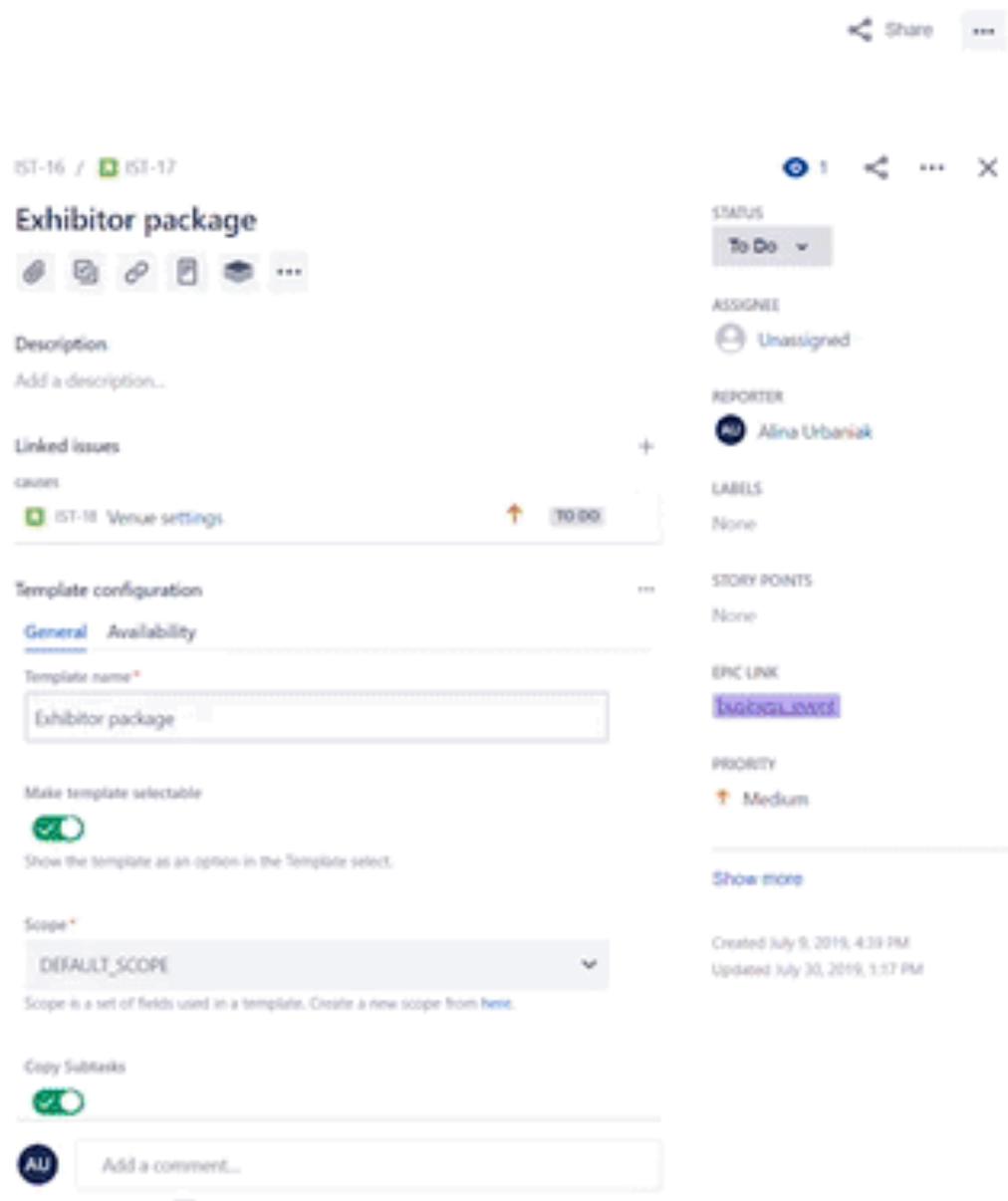
Database query time Error rates Peak response time 99th percentile response time Time to first byte Time to interactive erage response time Largest contentful paint Number of requests First contentful paint DOM content loaded Scripting/Rendering/Painting time Median response time FCP shift Cumulative layout shift Memory utilization Response time histogram

Database query time Error rates Peak response time TFB 99th percentile response time Time to first byte Time to interactive erage response time argest contentful paint Number of requests First contentful paint DOM content loaded Scripting/Rendering/Painting time Median response time FCP shift Cumulative layout shift Memory utilization Response time histogram **(**)



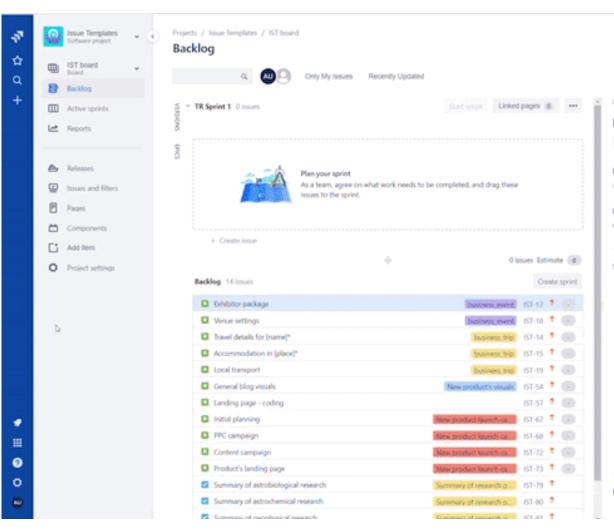


Start oprint Unked	pages (2) +++
e complicted, and drag these	
0.6	create sprint
Durakens, owint	IST-17 * 300
business, event	IST-18 🕈 🕢
business, trip	IST-14 🕈 💿
business_trip	IST-15 🕈 💿
busines, trip	IST-19 🕈 🐷
New product's visuals.	IST-54 🕈 🕟
	IST-57 🕈 🕟
New product Newsch Ca.	IST-67 🕈 💿
New product keuroth ca.	15T-68 🕈 🛞
New product launch ca	15T-72 🕈 💿
New product lounch ca	IST-73 🕈 💿
Summary of research p	157-79 *
Survey of research p.,	(ST-80 🕈
Commercial research of	ICT.04 🕈



Pro tip: press M to comment

### **USER JOURNEY TIME**

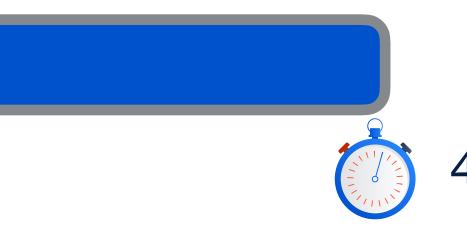


0

			< Share
ST-16 / 🖪 IST-17			• < •
Exhibitor package			status
@ ፼ ∂ ፼ ●			To Do 👻
Description			Unassigned
Add a description			REPORTER
Linked issues		+	Aina Urbaniak
Q IST-18 Venue settings.	10 00 T		LABELS None
Template configuration			STORY POINTS
General Availability			None
Template name*			EPIC LINK
Exhibitor package			buckets, sewed.
			PRORITY
Make template selectable			* Medium
Show the template as an option in the Template select.			Show more
Scope*			Const. 6 10.0 10.0 10.000
DEFAULT_SCOPE	~		Created July 9, 2019; 4:39 PM Updated July 30, 2019; 1:37 PM
Scope is a set of fields used in a template. Create a new scope from N	mit.		
Copy Subtasks			
Add a comment Pro tip: press IM to comment			
and the latest field of characters			

....

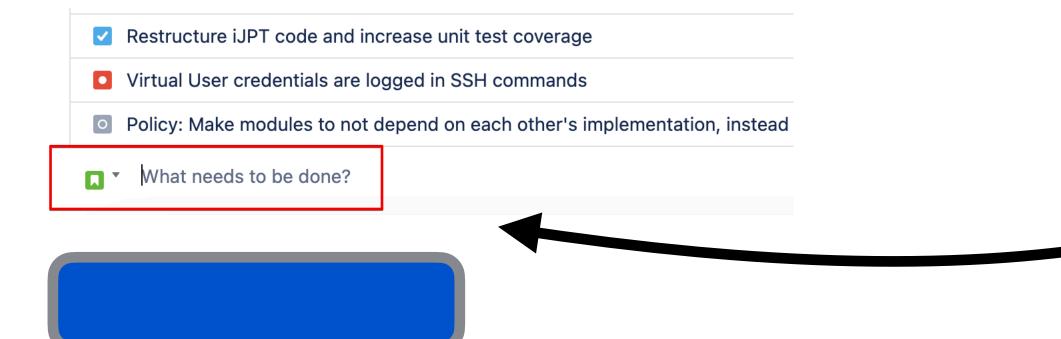
 $\times$ 



#### 4.3 seconds

#### A bit like user-based usability testing...

4	Issue Templates v C	Projects / Issue Templates / IST board Backlog			< Share
12 Q	E IST board +	Q. (A) Only My Issues Recently	Updated		
	😭 Bacilog	••••			
+	Active sprints	≦ ~ TR Sprint 1 0 issues	Start sprint United pages (8) ····	157-16 / 🖸 157-17	• • ×
	🗠 Reports	00W5		Exhibitor package	To Do v
		9		0 0 0 1 5	
	A Releases	a .			ASSIGNEE Unassigned
		Plan your sprint As a team, acree on what work	needs to be completed, and drag these	Description Add a description	O unitadino
	Issues and filters	issues to the sprint.		Phase is surroup point to	Alina Urbaniak
	Pages			Linked issues	+ And Croania
	Components			Calors 10 157-18 Venue settings 1 10080	LABELS
	Add Item	+ Create issue			None
	O Project settings		0 issues Estimate (@)	Template configuration	STORY POINTS
		Backlog 14 issues	Create sprint	General Availability	None
		D Exhibitor package	Dations event 57-17 *	Template name*	EPIC LINK
	6	Venue settings	business event 157-18 🕈 🕟	Exhibitor package	buckets, seered.
		Travel details for [name]*	business, trip 67-14 🕈 💽	Make template selectable	PROMITY
		Accommodation in (place)*	businets, trip 157-15 🕈 💿		* Medium
		Local transport	Dunivers Nip 157-19 * 🕟	Show the template as an option in the Template select.	Show more
		General blog visuals	New product's visuals IST-54 *	Scope *	
		Landing page - coding	157-57 🕈 🛞	DEFAULT SCOPE	Created July 9, 2019, 4:39 PM Updated July 30, 2019, 1:57 PM
*		Initial planning     PPC campaign	New product Aprix to ST-67 * 🕡	Scope is a set of fields used in a template. Create a new scope from Nexe.	
=		Content campaign	New product learnsh ca 157-68 * 🕢		
0		Commit campaign     Product's landing page	New product launch ca	Copy Subtesks	
0		Summary of astrobiological research	Summary of research p. 151-79	•	
-		Summary of astrochemical research	Summary of research a. IST-80 *	Add a comment	
		Commune of exceptionical nationship	Company of second on SCT.01	Pee tig: press MI to comment	



1.9 seconds



 $\mathbf{O}$ 

0





Too much data presented?

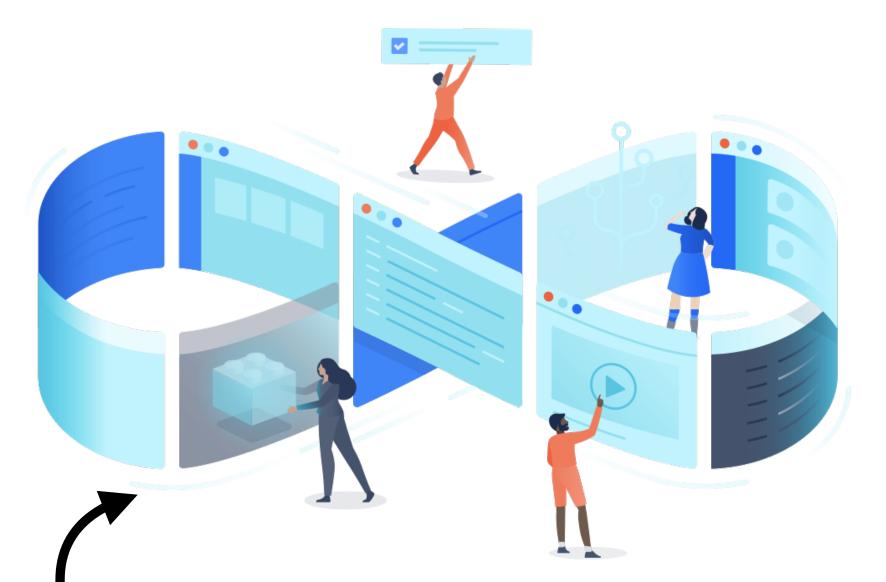
Confusing UI?

What content should be shown first?

4.3 seconds What can be loaded asynchronously?

Can we do paging here?

... and more user interaction analysis...



## Users perception is ultimate metric



# Seems obvious whendone

# Easy to omit such a win

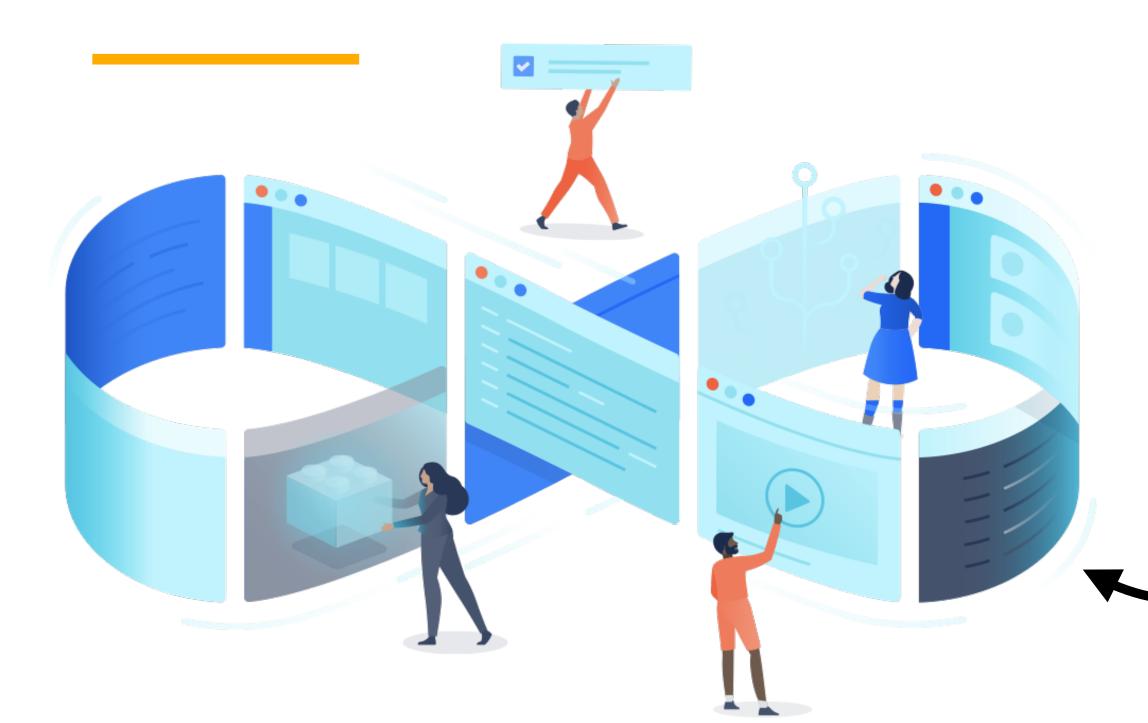
## SPEAKING OFUSER OURNEY

\*(WITHOUT SITTING TOGETHER)





#### **REAL USER MONITORING + APPLICATION PERFORMANCE MANAGEMENT**



# Find and fix performance issues before your customers notice



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







Records user interaction with website or client





## RUM + APM



Tools 🔘 New Relic. 🞵 dynatrace

and more...

Expected level of service

**SLA** 

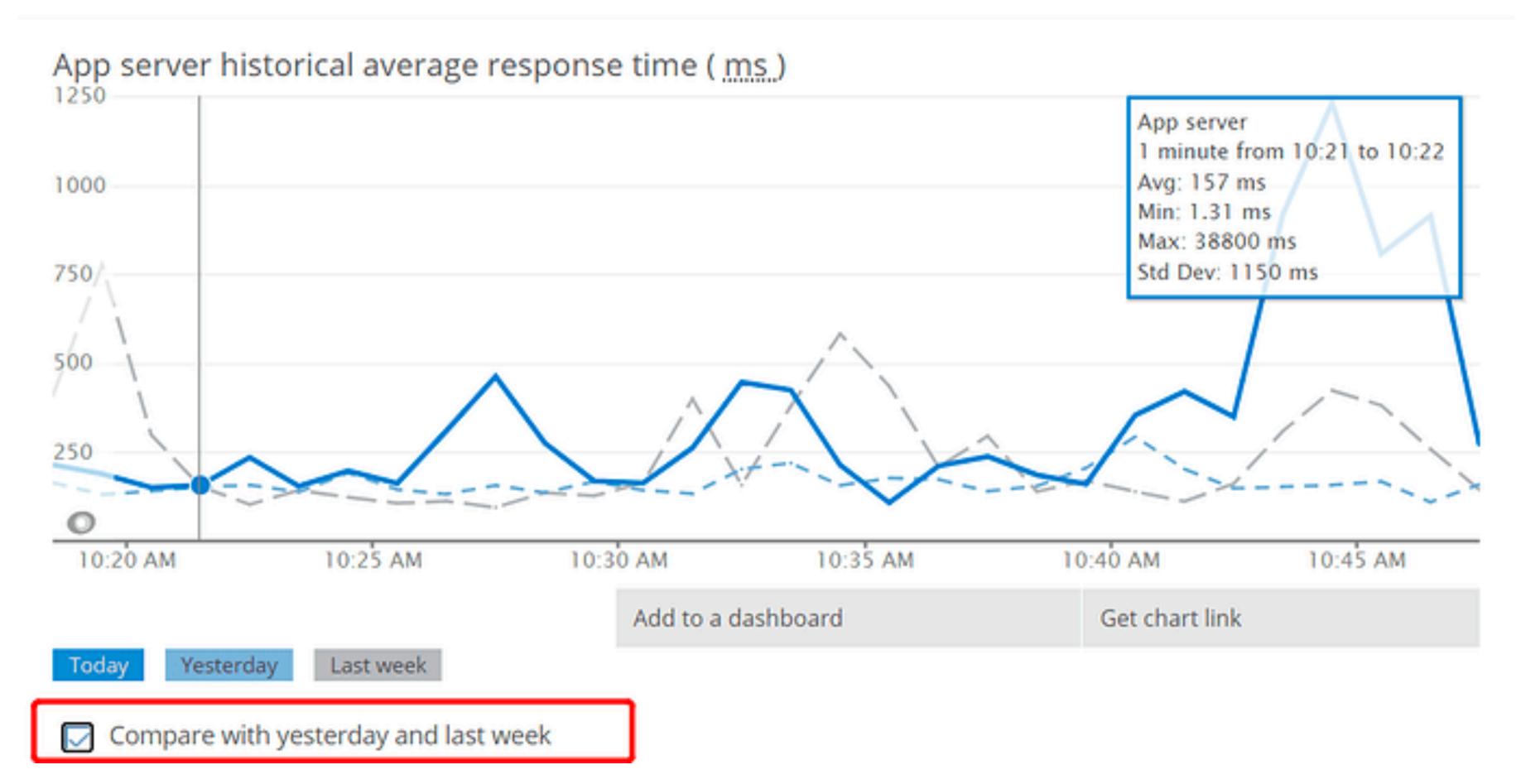
## New Relic - general performance

New Relic.	АРМ	BROWSER	SYNTHETICS	MOBILE	PLUGINS	INSIGHTS	INFRAST	RUCTU
Applications Service maps	: Kej	y transactions						
		TIME PICKER 3 days endi	ng wednesda	y, 12:24	JVMS All JV			
MONITORING		Early sym	ptoms of me	mory exha	ustion hav	e been det	ected in t	this tir
Overview		Web tra	nsactions	time ~				
Service maps		100 ms						
Transactions								
Databases		80 ms				1		
External services			$\neg \land$	Λ		$  \rangle  $	1 /	
JVMs		60 ms		VV		IN	V	V
EVENTS		40 ms	V V `	VV	V	JV		$\bigvee$
Error analytics		20 ms						
Errors								
Violations		0	11 gru,		11 gru,		12 gru,	
Deployments		JVM P	00:00	eb external	12:00 Respons	e time	00:00	
Thread profiler								
							•	
BED G BY C								



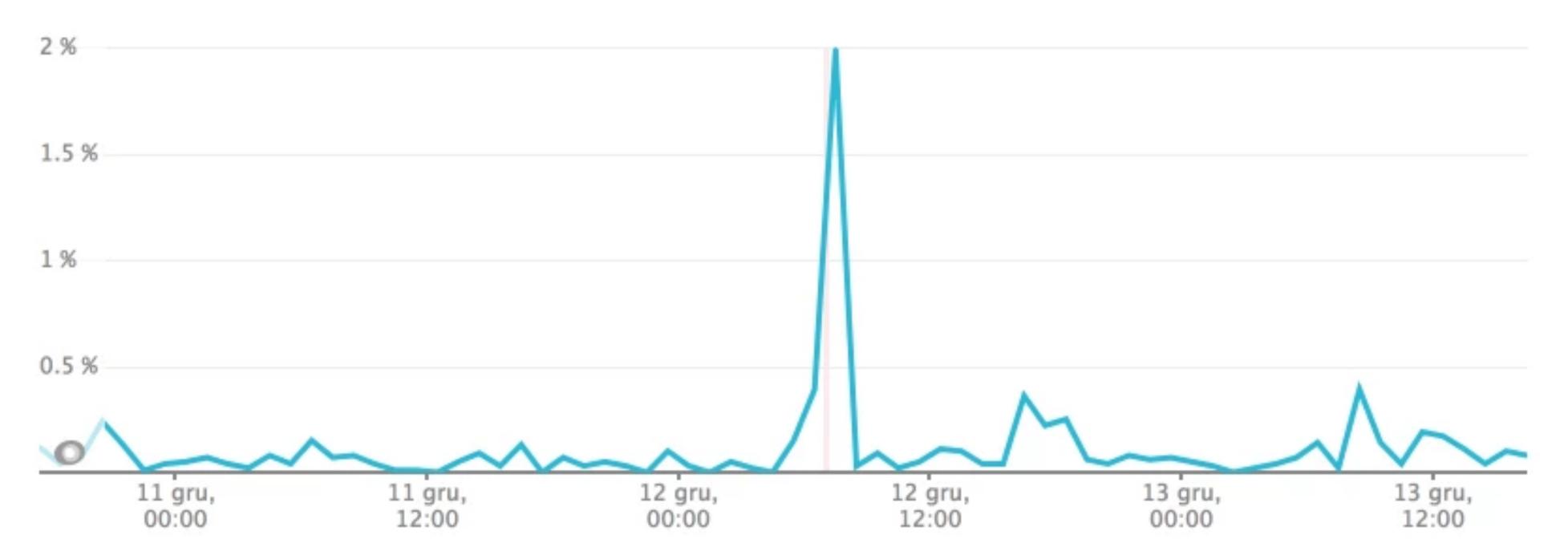
## New Relic - compare week-to-week





## New Relic - errors (like http 50X)

## Error rate (errors per request)



## New Relic - JS errors

Summary	FILTER V Choose a filter V	
Monitor	GROUP BY	<b>Top 5 errors by errorMess</b> Based on the time window and filte
Distributed tracing		40
Service map	Q Search errorMessage	-30
Dependencies	Total error instances: 82	20
Page views	Showing top 20 results. See more in insights	10
Session traces	The quota has been exceeded. 57	08:00 PM 09:00 PM 10
AJAX		The quota has been exceeded.
JS errors	ResizeObserver loop limit exceeded 15	
Browsers	Script error. 2	Daga laada with arrars
Filterable geography	e.querySelector() is null 2	Page loads with errors Based on the time window and filte
	1	-40
Settings	•	-30
Alert conditions	this.html.droppable is not a function 1	25
Application settings	JSON.parse: unexpected character at line 1 1	-15
Domain conditions	AJS.sidebar is not a function 1	5 08:00 PM 09:00 PM 10

<b>Sage</b> ters you've sele	ected								
10:00 PM	11:00 PM	12:00 AM	01:00 AM	02:00 AM	03:00 AM	04:00 AM	05:00 AM	06:00 AM	07:00 AM
	ResizeObser	rver loop limit ex	ceeded	●Script error.			e.querySelect	cor() is null	
ters you've sele	ected								

## New Relic - drill down

Duration (ms) Durat	tion (%)	Segment		Drilldown	Timestamp
17,800	100.00%	ServletRequestListener.requestInitialized()		0	0.000 s
1.0	0.01%	> 35 fast method calls			0.000 s
17,800	99.96%	<ul> <li>HttpAuthFilter.doFilter()</li> </ul>		0	0.001 s
1.0	0.01%	<ul> <li>4 fast method calls</li> </ul>			0.001 s
10,200	57.33%	<ul> <li>/authentication (POST) (https:// c/rest/usermanagement/1/authentication)</li> </ul>	/cd	0	0.003 s
11.0	0.06%	> 22 fast method calls			10.217 s
7,550	42.43%	<ul> <li>TrustedApplicationFilter.doFilter()</li> </ul>		0	10.229 s
7,550	42.43%	<ul> <li>JiraSecurityFilter.doFilter()</li> </ul>		0	10.229 s
7,550	42.43%	<ul> <li>JiraSecurityFilter.doFilter()</li> </ul>		0	10.229 s
7,430	41.78%	<ul> <li>- /authentication (POST) (https:// n.com/cdc/rest/usermanagement/1/authentication)</li> </ul>		0 🗸	10.229 s





## **Data-overload**

## Better pick few key actions to monitor. Rely on custom metrics. leads to...

Stack



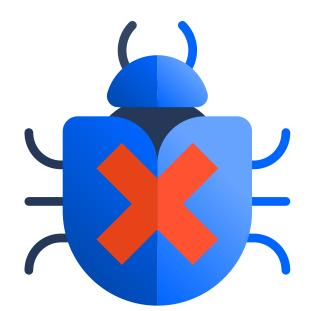
## Lack of load control

Low probability of finding regression < ~10%



## RUM + APM





## **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**



owner

## Regression test suite



## Maintainable

#### Record and playback is evil

and so on...

....

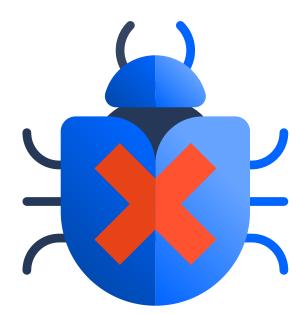
Commitn

Cover only key actions that you know you will care about



## Acted upon

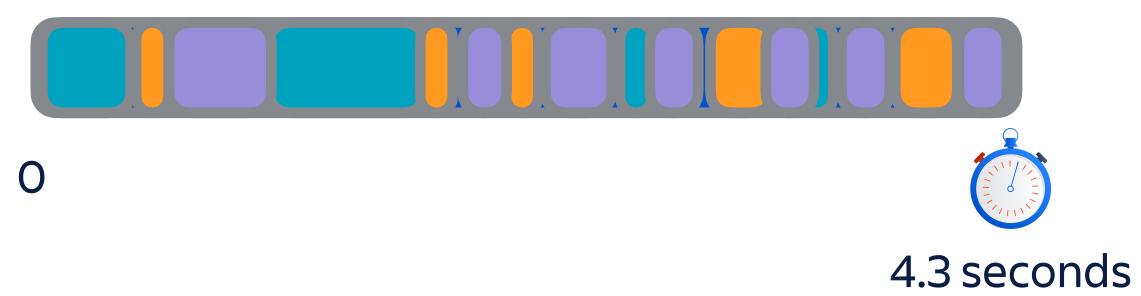
Commitment to fix issues found



## Repeatable

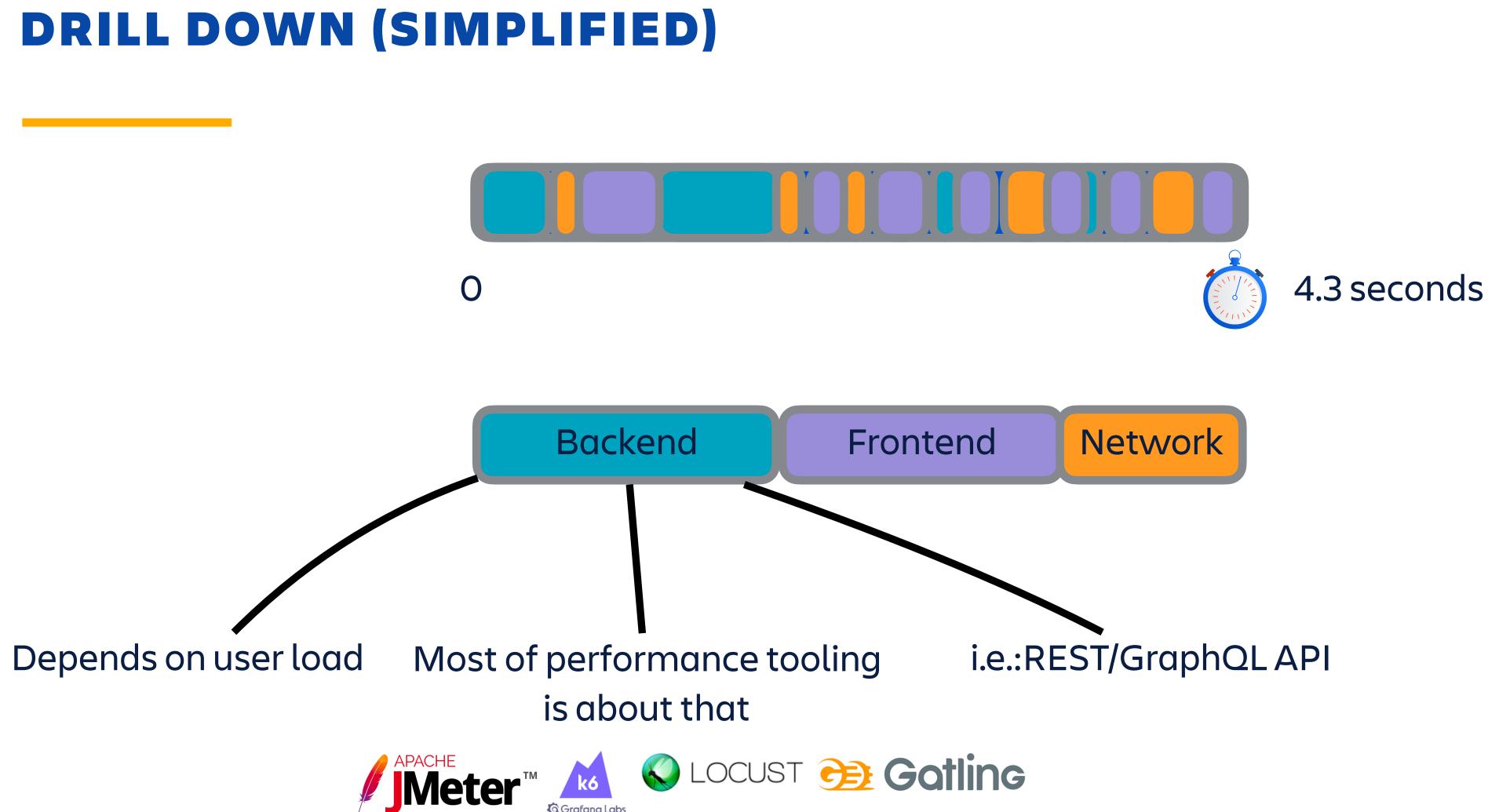
Predictable. Robust. Execute 3 times on the same commit

are results the same?

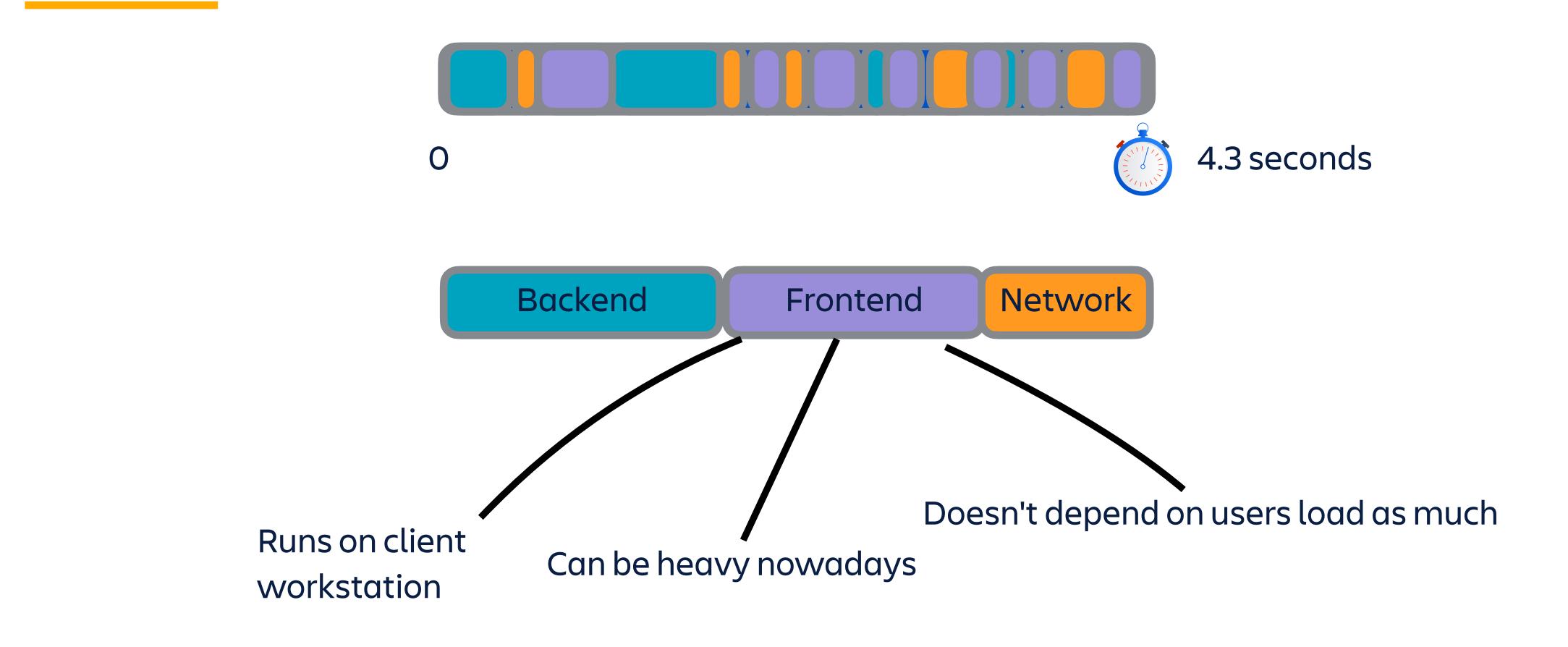


Backend	Frontend	Network
(a.k.a. server- side)	(a.k.a. client- side)	

# Cover Backend and Frontend



## DRILL DOWN (SIMPLIFIED)





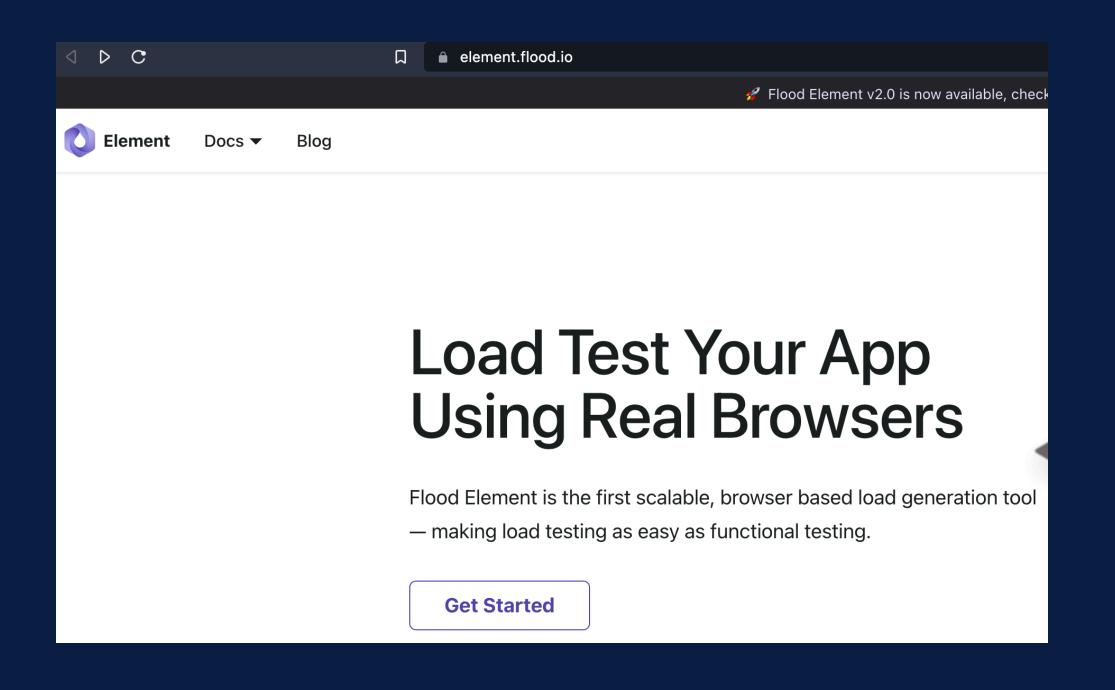


## Our app





## flood.io



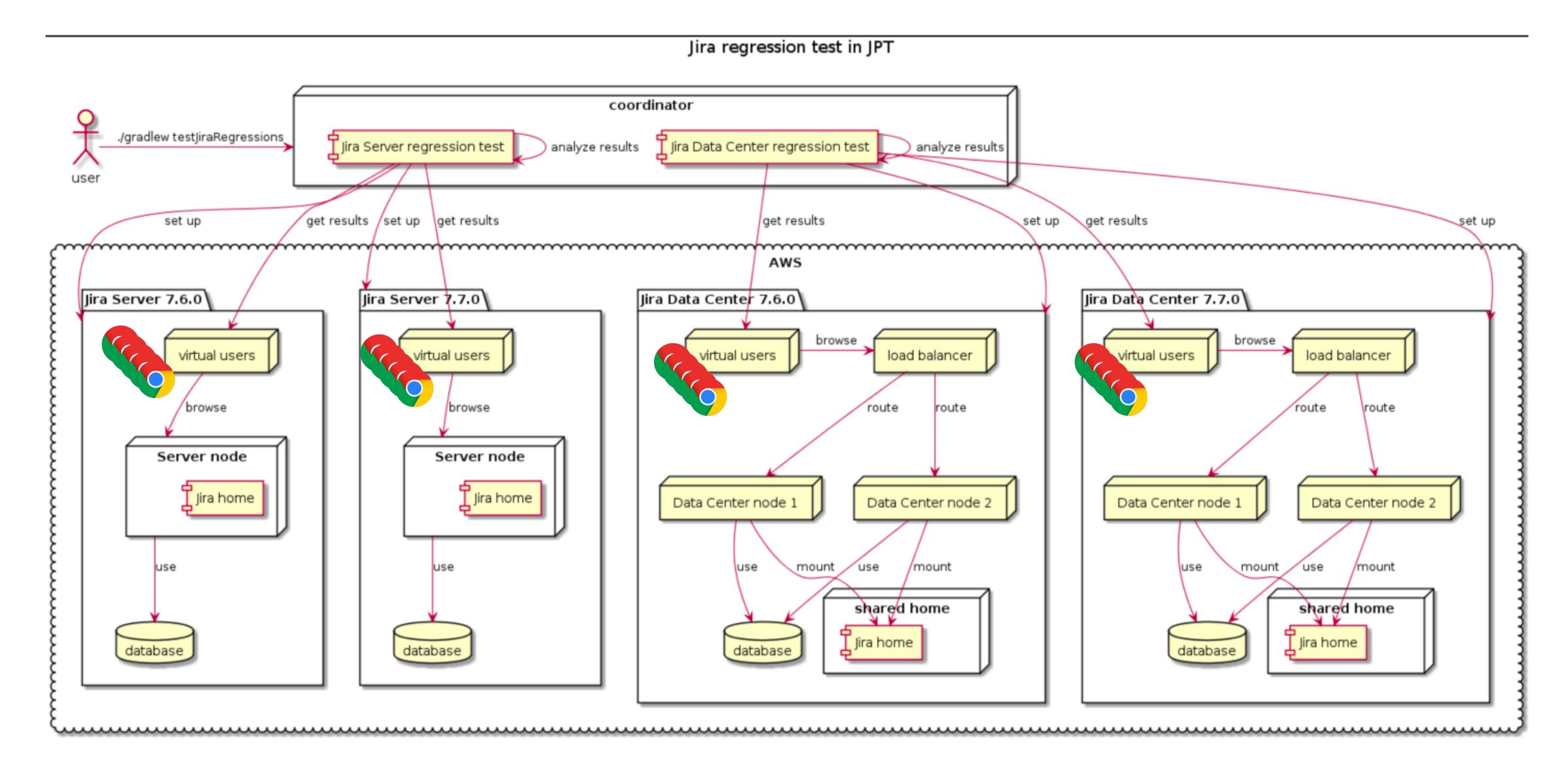
## loadninja.com



No learning curve. No correlations. Just real-world accuracy.



## **JIRA REGRESSION TEST**



## **CLASSIC PERFORMANCE TOOLS**



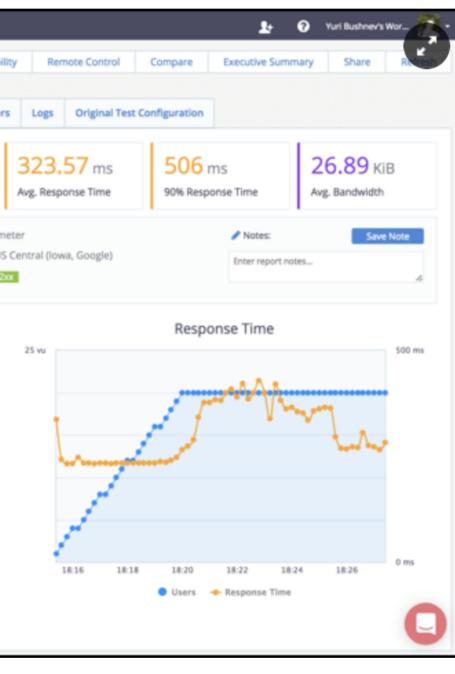




	limeline Report	Load Report	Request Stat	ts Engine Heal	th
20 VU Max Users		3 Hits/s Avg. Throughpu	t	0 % Errors	
<ul> <li>Ourati</li> <li>Starte</li> <li>ETA</li> </ul>	d Jun 12	nutes 2, 2017, 6:15:28 PM vinutes		<ul> <li>Test Type</li> <li>Locations</li> <li>Response C</li> </ul>	odes
25 vu		Load	m	w{	1
	Ninest	N			
0					



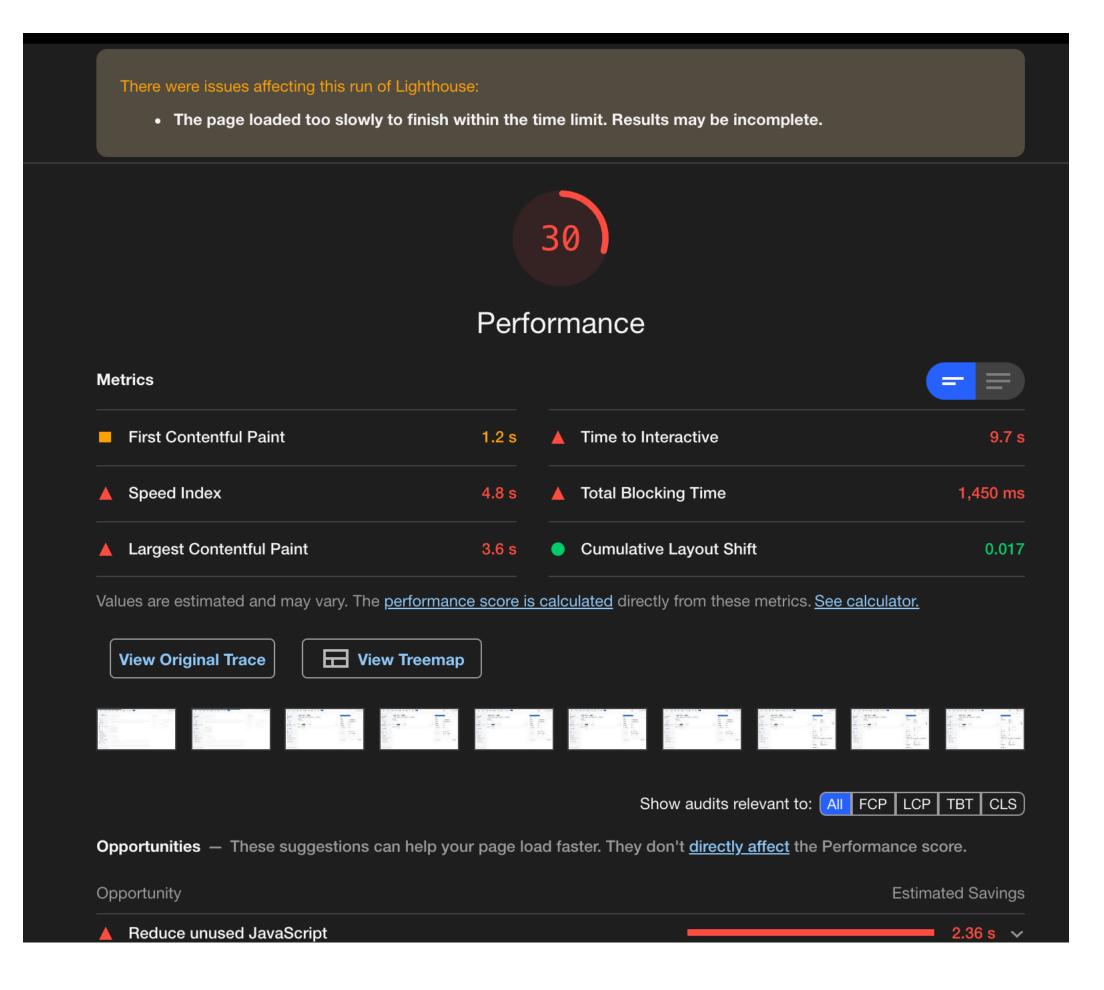




## **CHROME DEVELOPER TOOLS**

	DevToo	ols - bulldog.inter	nal.atlassian.con	n/browse/JIRAQ-8	82					
🕞 🔂 Elements Console Sources Network Performance Memory Application Securit	ty Lighthouse	Analytics							82 🛦	23 🖻 1 🔹 🗄
O Q Preserve log Disable cache No throttling ▼ 3 1 ±										
										· •••
Filter						0000	0.100	0000	0000	0000
200 ms 400 ms 600 ms 800 ms 1000 ms	1200 ms	1400 ms	1600 ms	1800 ms	2000 ms	2200 ms	2400 ms	2600 ms	2800 ms	3000 ms
Name	Status		Time Waterfall							▲
JIRAQ-82	200		688 ms 🛯							
o batch.js?locale=en-US	200		0 ms	1 I I						
batch.js?agile_global_admin_condition=true&baseurlled=true&user-logged-in=true&whisper-enabled=true	200		0 ms	1						
o hotspot-tour.js?batch=false&locale=en-US	200		0 ms	1						
o batch.js?locale=en-US	200		0 ms							
o com.atlassian.jira.jira-tzdetect-plugin:tzdetect-banner-component.js?locale=en-US	200		0 ms	1						
o com.atlassian.jira.jira-tzdetect-plugin:tzdetect-lib.js	200		0 ms	1						
Jira.webresources:calendar-en.js	200		0 ms	1						
o jira.webresources:calendar-localisation-moment.js	200		0 ms	1						
shortcuts.js?context=issuenavigation&context=issueaction	200		0 ms	- I						
	200		179 ms							
adgs-icons.woff     adgs-icons.woff	200		0 ms			I I				
ism.rebrand.notification	200		131 ms							
batch.js?agile_global_admin_condition=true&baseurlled=true&user-logged-in=true&whisper-enabled=true	200		1 ms			4				
batch.js?csp_IsNotDevModeCondition=true&jira.creat&locale=en-US&richediton=true&user-logged-in=true	200		0 ms			1				
■ jira-logo-scaled.png	200		0 ms			1				
52a228bee96f3564e3d70354077e48bc?d=mm&s=24	200		0 ms			1				
projectavatar?avatarId=10324	200		0 ms			1				
viewavatar?size=xsmall&avatarId=10318&avatarType=issuetype	200		0 ms							
low.svg	200		0 ms			1				
viewavatar?size=xsmall&avatarld=10316&avatarType=issuetype	200		0 ms							
useravatar?size=small&ownerId=oltkachenko&avatarId=11700	200		0 ms			1				
jira.webresources:bigpipe-js.js	200		0 ms							
jira.webresources:bigpipe-init.js	200		0 ms							
data:image/svg+xml;	200		0 ms							
/ data:image/svg+xml;	200		0 ms							
icons_module.png	200		0 ms				<u>                                      </u>			
85 requests 90.2 kB transferred 12.8 MB resources Finish: 2.62 s DOMContentLoaded: 1.57 s Load: 1.8	84 s									
Console What's New × Network request blocking										×
Highlights from the Chrome 93 update										
Lighthouse 8.1 New `csp-xss` audit, performance score weighting changes, and more.		$ \rightarrow $								
Editable web container queries in the Styles pane View and edit web container queries in the Styles pane.	$\langle ( ) \rangle$									
Web bundle preview in the Network panel	$\mathcal{A}$	nev	N							

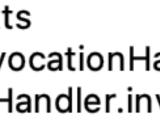
## CHROME LIGHTHOUSE PERFORMANCE REPORT



### **CODE PROFILER**

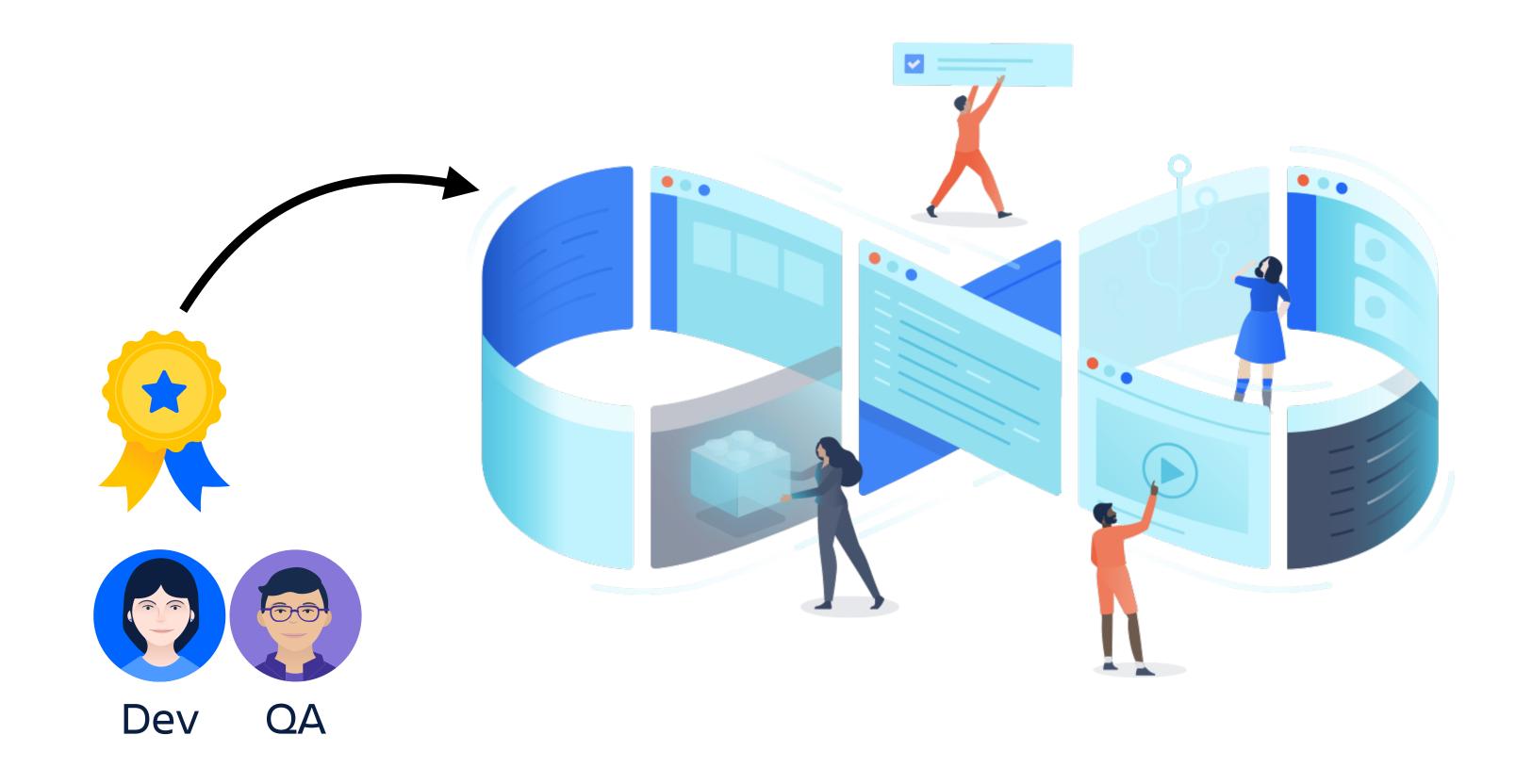
100.0% - 152 s - inh. 0 μs com.atlassian.plugin.web.descriptors.DefaultWebPanelModuleDescriptor\$ContextAwareWebPanel.getHtml 1 mmm 64.6% - 98,874 ms - inh. 0 μs com.atlassian.jira.plugin.webfragment.contextproviders.MultiContextProvider.getContextMap 🗸 🔟 💳 64.6% - 98,874 ms - inh. 0 μs com.atlassian.jira.plugin.webfragment.CacheableContextProviderDecorator.getContextMap 🗸 🔟 💳 64.6% - 98,874 ms - inh. 0 μs com.atlassian.jira.plugin.webfragment.CacheableContextProviderDecorator.initContextMap w m = 64.6% - 98,864 ms - inh. 0 μs com.atlassian.jira.plugin.viewissue.LinkBlockContextProvider.getContextMap w m = 64.6% - 98,846 ms - inh. 0 μs com.atlassian.jira.plugin.viewissue.LinkBlockContextProvider.getLocalIssueLinks > 🔟 💳 34.1% - 52,232 ms - inh. 0 μs com.atlassian.jira.plugin.viewissue.issuelink.LocallssueLinkUtils.convertTolssueLinkContexts > 🔟 💻 30.5% - 46,613 ms - inh. 0 μs com.atlassian.plugin.osgi.bridge.external.HostComponentFactoryBean\$DynamicServiceInvocationHa > 0.0% - 9,217 μs - inh. 0 μs com.atlassian.plugin.osgi.bridge.external.HostComponentFactoryBean\$DynamicServiceInvocationHandler.in > 🔟 0.0% - 9,042 μs - inh. 0 μs com.atlassian.jira.plugin.viewissue.LinkBlockContextProvider.getRemoteIssueLinks > 🔟 0.0% - 9,748 μs - inh. 0 μs com.atlassian.jira.plugin.viewissue.AttachmentBlockContextProvider.getContextMap w m = 35.0% - 53,557 ms - inh. 0 μs com.atlassian.plugin.web.model.ResourceTemplateWebPanel.getHtml > 00 = 35.0% - 53,540 ms - inh. 0 μs com.atlassian.plugin.web.model.ResourceTemplateWebPanel.writeHtml 0.0% - 17,432 μs - inh. 17,432 μs java.io.StringWriter.toString > 🔟 0.3% - 500 ms - inh. 0 μs com.atlassian.jira.plugin.webfragment.CacheableContextProviderDecorator.getContextMap 0.0% - 23,046 μs - inh. 23,046 μs java.lang.StringBuilder.append > 🔟 0.0% - 9,792 μs - inh. 0 μs com.atlassian.jira.plugin.bigpipe.BigPipeWebPanelModuleDescriptor.getModule



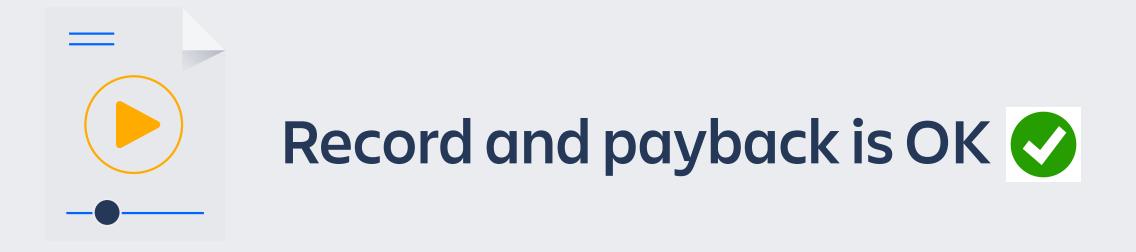


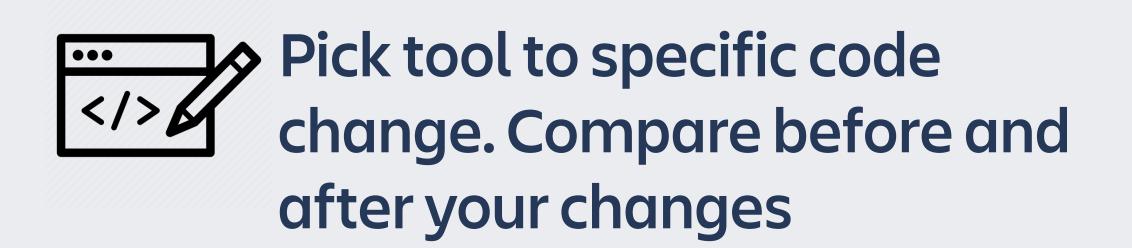
#### **REGRESSION TEST SUITE**

Include performance testing in daily development



## **DEVELOPMENT VS REGRESSION SUITE**



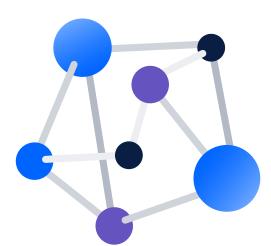




Keep or throw away



## Is recoding still valid?



## Broad scope (backend+frontend)



## Long living Super robust









# Thank you!





