



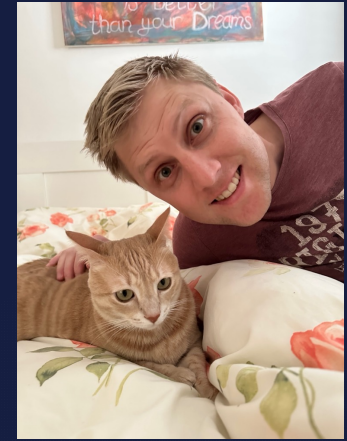
**Hold my beer - Load testing.  
In Production.  
On Autopilot**

## About Me

# Slava Antonenko

Site Reliability Engineer @ Outbrain













Outbrain is a world-leading recommendation platform for the open web.

**600 Services**

**250 repos**

**1K Employees**

**75 groups**



**344 Billion**

**Monthly Recommendations**

Exclusive Partnerships With:

CNN

WSJ

The Washington Post

msn

WIRED

GH

Vox

POLITICO

HEARST

CONDÉ NAST

Sports Illustrated

People



REFINERY29

meredith

bon appétit

... and *many* more publishers.

"Probably, if you ask them, they will tell you that Messi will never reach that because they feel like Messi is never probably as close to the people as Maradona was, they never got to see Messi on a pitch playing every weekend in Argentina, for example.



Photo-Illustration:CNN/Getty Images

Some people argue Messi is already equal to Maradona.

"I feel like if you ask someone younger, someone who didn't quite get to see Maradona play but lived through the entire Messi era they will tell you that, yeah, he deserves that comparison, that he can stand right there beside Maradona.

"It's just different ways to look at it and I feel like he can stack right up with him without the World Cup but if he wins the World Cup, then the arguments of those who say that he doesn't just become almost pointless."

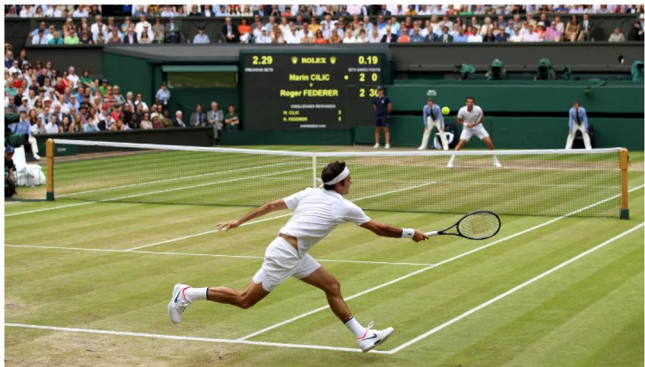
Win or lose on Sunday, there is no doubting Messi's legacy as a hero is already assured in his homeland.

PAID CONTENT outbrain

**25+ Red Carpet Blunders We Won't Soon Forget**  
Bleacher Breaker

**Perfect Shave Without Irritation or Cuts! The Trimmer Every Man...**  
greemy

**40 Things About "Shawshank Redemption" Most Fans Never...**  
Factable



Julian Finney/Getty Images

Federer's forehand is widely regarded as one of the greatest shots in tennis.

The balance of power may have shifted, but what cannot be denied is that neither Nadal or Djokovic are as aesthetically pleasing as the Swiss.

Watching Federer play in 3D is - and there is still just about time to talk about his style in the present tense - to be mesmerized. It was, sorry, is special, an *I-was-there* moment that can be told, and retold, to the grandchildren or anyone who will listen. No one has made playing sport at the highest level seem so effortless.

The annals of sport history will put Federer alongside the likes of Michael Jordan, Muhammad Ali, Tiger Woods and, of course, Serena Williams. Gamechangers all who transcended their sports, who will be talked about for years after retirement, inspiring one generation after another.

Tennis is entering a new future. Federer will soon be retired, Nadal, at 36, is unlikely to play to the same age as his friend and rival, such has been his history with injuries, and Djokovic is 35, still able to accumulate more major titles but aging none the less.

We knew, one day, it would happen. But, as we know, it takes time to adjust to change.

PAID CONTENT outbrain

**[Photos] Brad Pitt's Daughter Turns 20 And Is His Replica**

**[Gallery] Overrated Movies Everyone Pretends To Love**

**We are selling off our remaining tactical laser flashlights at 60%**

"It's the dream of every little kid, I was lucky enough to have achieved everything and what I was missing is here."

## 'The debates are over'

For large parts of his career, Messi had struggled to step out of [Diego Maradona's](#) shadow, a man who was loved in Argentina for both his greatness and his flaws and who, ultimately, had delivered World Cup glory for the country.

Now, Messi has answered every question posed by his critics, according to [Guillem Balague](#), football journalist and authorized biographer of Messi.



Natacha Pisarenko/AP


Lionel Messi has finally achieved his lifelong dream.

"It means that the debates are over," Balague told CNN Sport. "The [Cristiano] Ronaldo debate is over, the [Diego] Maradona debate is over, the best player in the world ever [debate] is over. That's what it means. In terms of what he had done for 15 years, he was just the best player in the world.




Advertisement


Paid content 👁️ ▶️



SpaceX takes another shot at launching biggest rocket  
*Space today*



The Mac Studio is compact, cool an...  
*iNews*



The best 2023 electric cars  
*Motor Magazine*



Who is staying **up to date** by  
visiting their favorite website at  
least once a day?

Who **didn't** hear about the Will Smith Chris Rock thing at the 2022 Oscars?





60%



High Traffic





**Outbrain** engineering culture &&

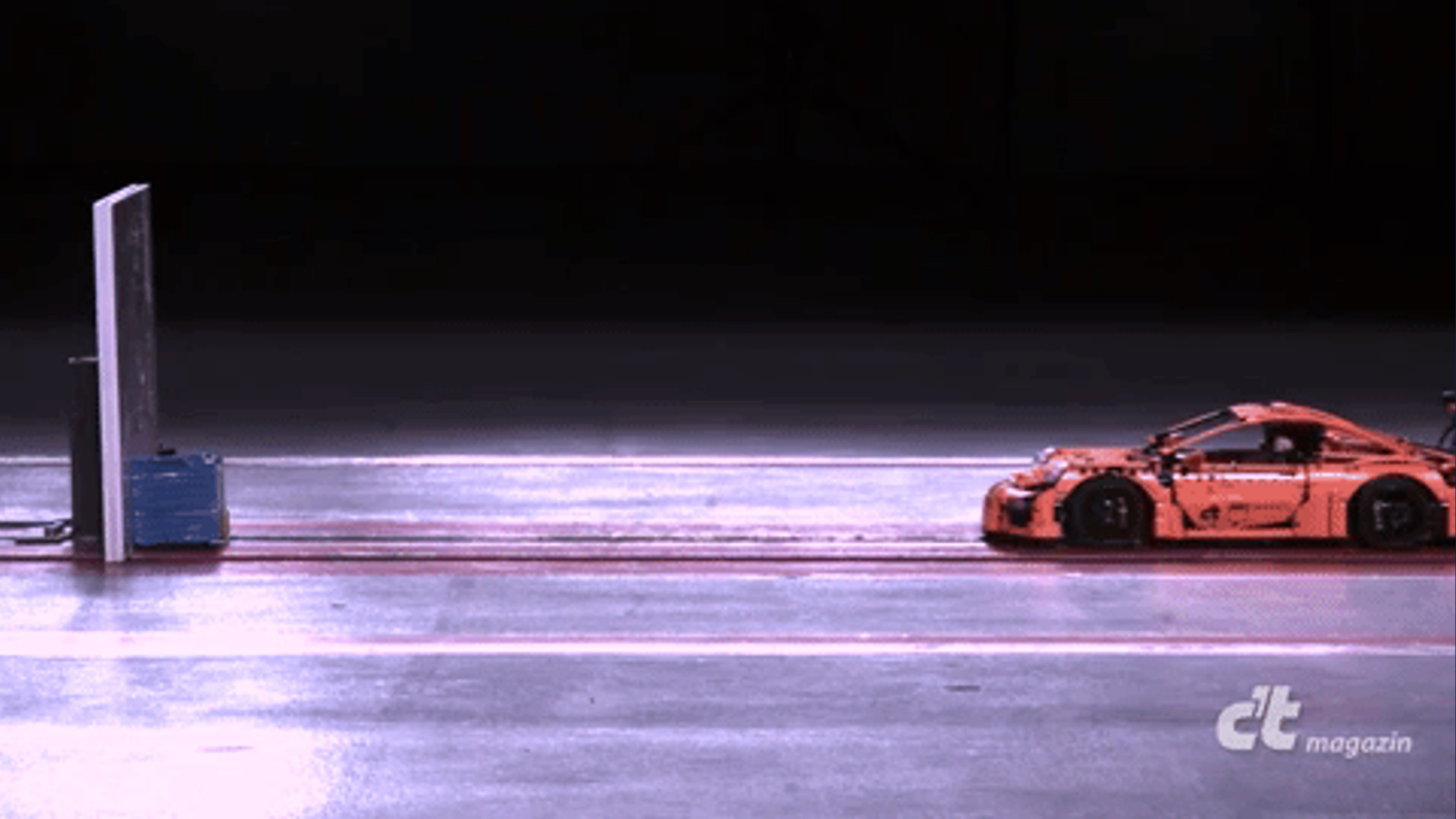




Imagine...









**Best** simulation  
**Real-time** simulation

**&&**





**NOT GOOD ENOUGH!**



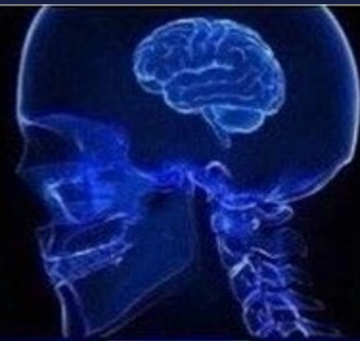
## The Risks

- Data center loss
- Degraded customer experience
- Revenue loss

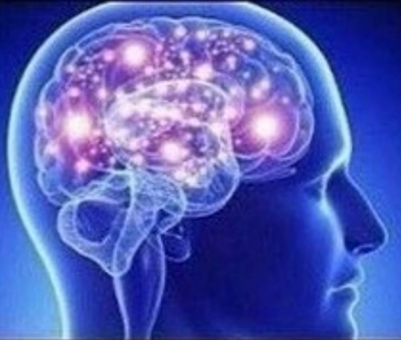




**NO  
LOAD TESTS**



**TEST ENV  
LOAD TESTS**



**PRODUCTION  
LOAD TESTS**



# Our Data Centers



## Balance & Shift Traffic

- Geographical location
- Data Centers traffic balancing



# How to determine the target traffic for the test?

X = time frame

Y = number of datacenters

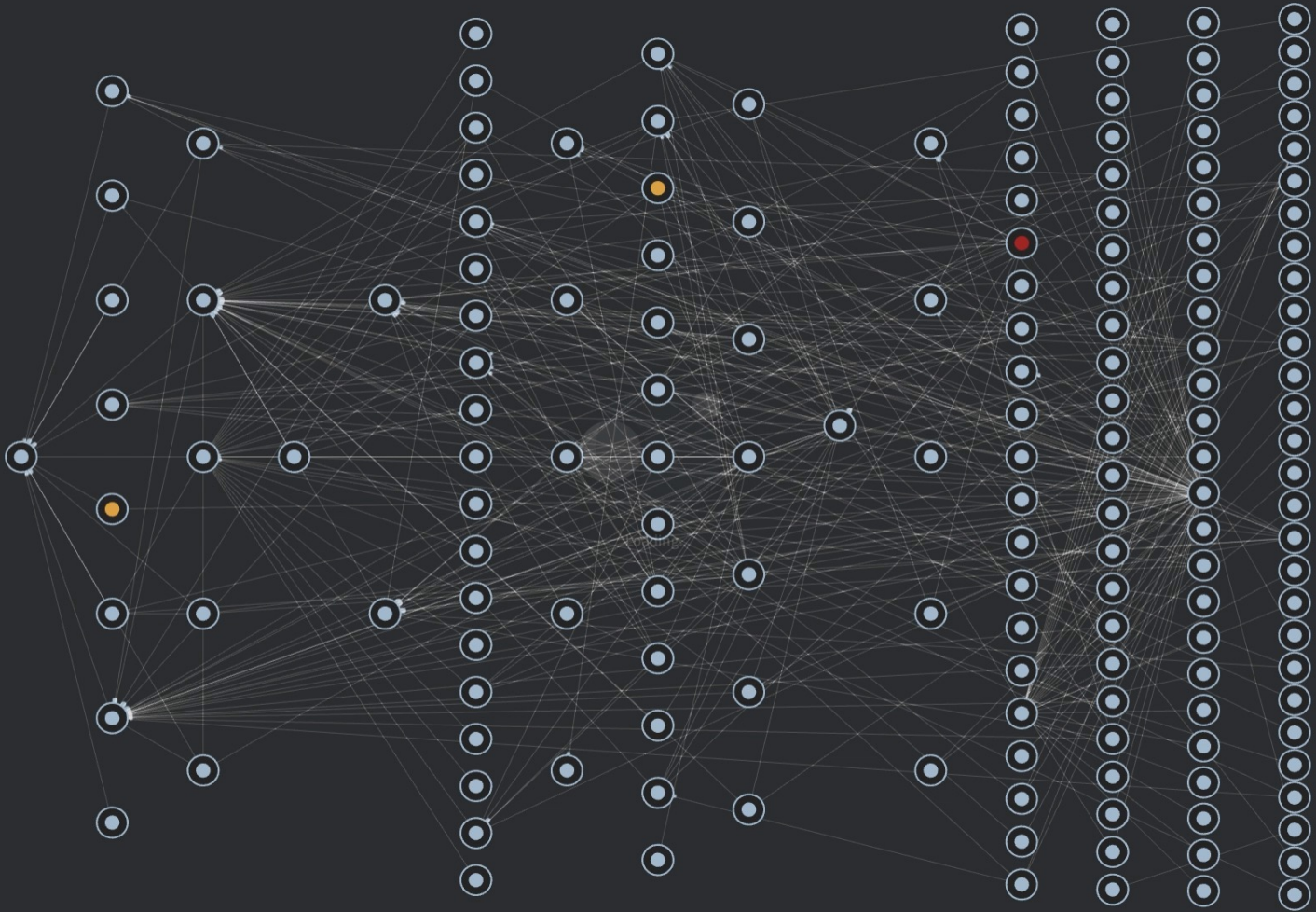
$$\frac{\text{max\_traffic}(X)}{(Y - 1)} + \Delta$$



# Our Ecosystem





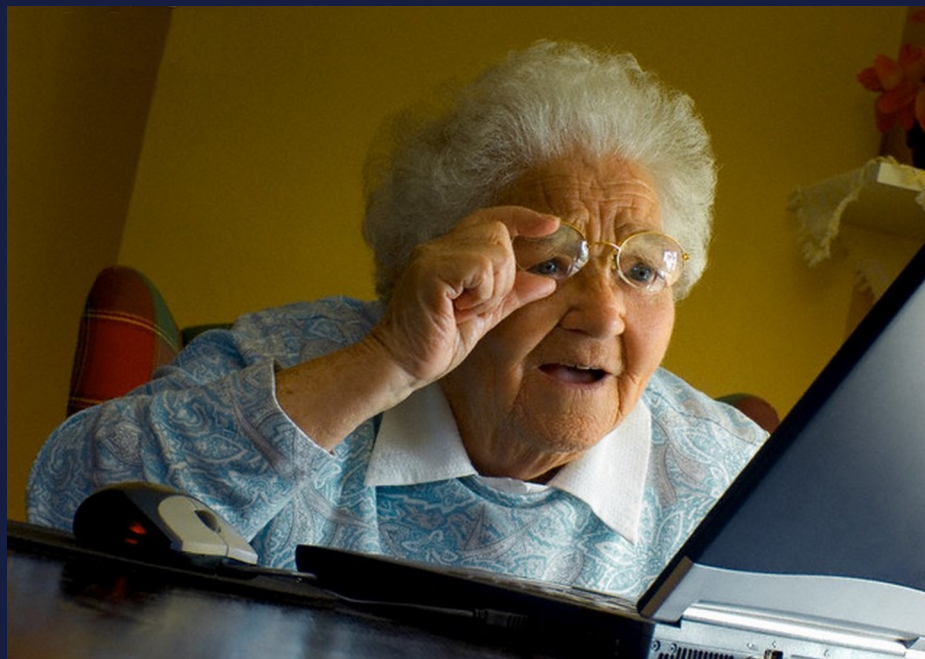




## Not long ago Load Test were **MANUAL**

### The problems

- **Cost** valuable working **time**
- Lack of Load Tests leads to to **issues** which are **not discovered quickly** enough
- Open to **human errors**
- Potential **loss** of **income**





**Third  
party tools**



**Develop  
on my own**



**Not Free!**



**&&**



</>

&&

&&

# Load Test automation Runner

## LOTR

||



# When is the **best time** to conduct Production Load Tests? &&



## Step 1 - Pre Execution

- Third-party systems health check **Slack**, **DB**, **Prometheus (Thanos)**, **PD**, etc.
- Datacenter **health check**
- Blocker issues



**@channel** Currently we are experiencing following issues:

1. Revenue Hour Over Hour #lotr-app-test2
2. Ingress errors (votesonlinedb) #lotr-app-test2
3. Smart Logic #lotr-app-test2



**@channel** Alerts found - Load Test can't start until all alerts are resolved



Revenue Hour Over Hour acknowledged by **@santonenko** on #lotr-app-test2



Revenue Hour Over Hour resolved by **@santonenko** on #lotr-app-test2



Ingress errors (votesonlinedb) ignored by **@santonenko** on #lotr-app-test2



Smart Logic ignored by **@santonenko** on #lotr-app-test2



All alerts were resolved or ignored, Load Test can start now.



## Step 2 - Warming up

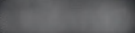
- Traffic shift until Target reached
- Validate stability



Load Test in sadc1 started




Following countries were shifted to sadc1:


Germany: 



Status

Progress - 5.0%

Current External traffic in sadc1 - 

Current ODB requests in sadc1 - 




Following countries were shifted to sadc1:


France: 



Status

Progress - 10.0%

Current External traffic in sadc1 - 

Current ODB requests in sadc1 - 



Following countries were shifted to sadc1:

India: 

## Step 3 - Maintain

- Target reached
- 1+ hour
- Traffic Balancer start to **stabilize traffic**



Target reached

**Traffic Balancer** APP 11:20



Traffic balance started

**Lotr** APP 11:20



Maintain phase will take 70 minutes time

**Traffic Balancer** APP 11:23



Traffic is getting too high

DC - sadc1

ODB requests - [REDACTED]

Looking for a traffic shift outside →



Following countries were shifted to nydc1:

Indonesia: [REDACTED]



Current ODB requests in sadc1 - [REDACTED]

## Step 4 - Cooling down

- Traffic returns back
- Load Test info

Lotr APP 10:25

Load Test in sadc1 ending

Following countries were shifted to nydc1:  
Germany:

Status

Progress - 82.5%

Current External traffic in sadc1 -

Current ODB requests in sadc1 -

Reverted to baseline successfully

Status

Load tested DC - sadc1

nydc1 odb traffic -

chdc2 odb traffic -

sadc1 odb traffic -

Total odb traffic -

[See more](#)

Warming up Maintain Cooling down 100.0%

Load Test in sadc1 completed

</>



&&

||



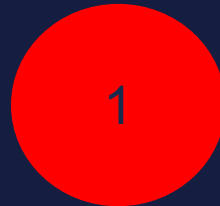
How do we **PROTECT** the  
Production environment?

&&





## Traffic Lights



**Abort**

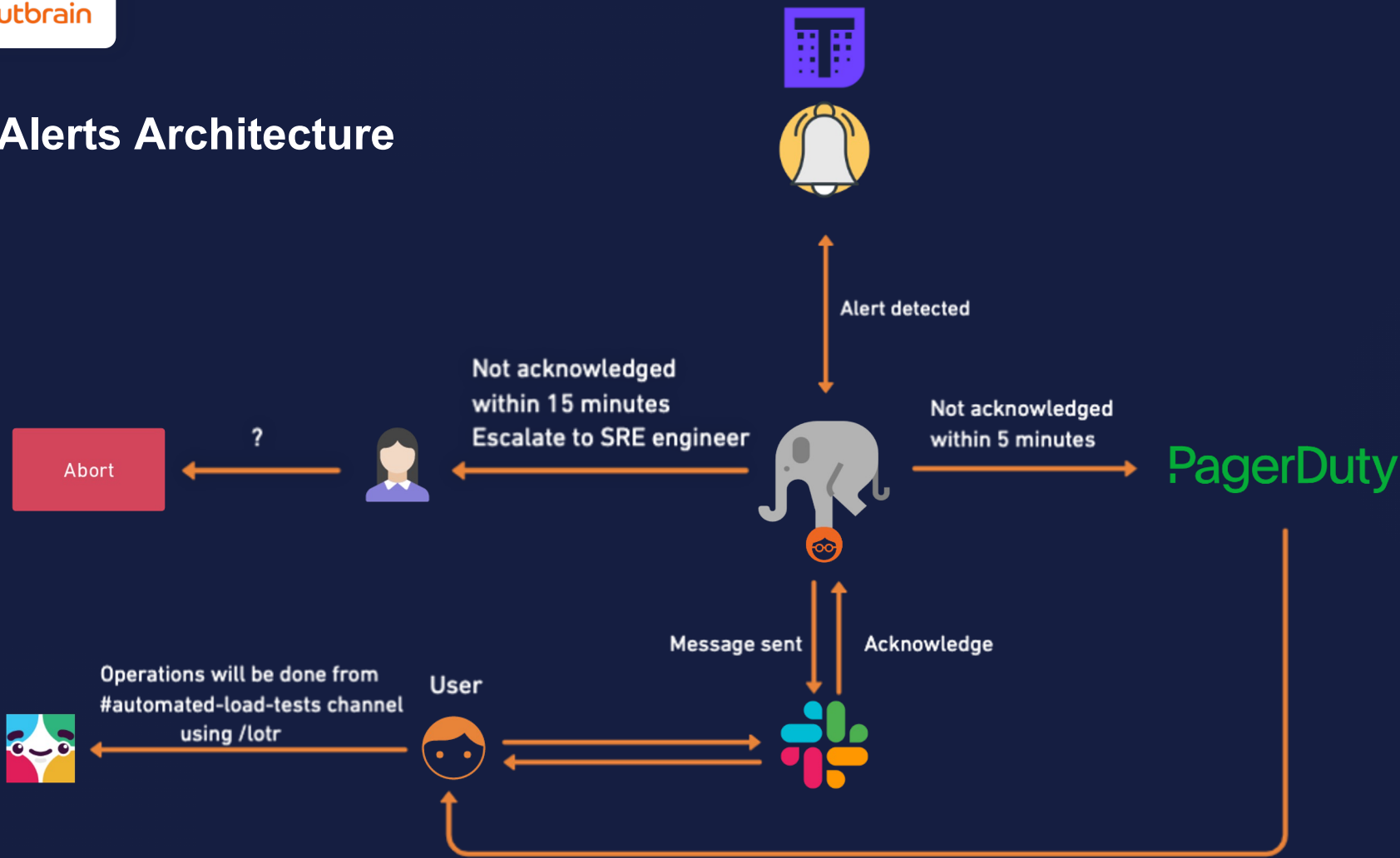


**Pause and Reduce**




**Keep state**

# Alerts Architecture





## Custom Slack alert

 Severity 3

**@channel** ODB Latency percentile 90 - crossed the threshold of 250.0  
Last 5 minutes with average value of 302.1963636363637

Labels

datacenter = sadc1

Please acknowledge that you are investigating or ignore for a known issue!

You can perform operations on [#lotr-app-test2](#) channel using /lotr. For more detai...

[See more](#)

Acknowledge

Ignore



PagerDuty

**@channel** Alert - ODB Latency percentile 90

Sent because the alert was not acknowledged yet on [#lotr-app-test2](#) Slack channel



ODB Latency percentile 90 acknowledged by **@santonenko** on [#lotr-app-test2](#)



ODB Latency percentile 90 resolved by **@santonenko** on [#lotr-app-test2](#)

## Manual vs Automatic

- **4x** more Load Tests
- Increased revenue
- **Saving** human work **hours**  
From **15 to 0** per Load Test
- Engineering **culture change**







We went **FROM** this

**&&**







**TO** this

**&&**







# Load Test in production? **Not only** a Test

&&



</>



DATA

&&

||



## Load Tests comparison

- Identify anomalies
- Raise flags for potential issues



## Resources utilization

- Identify low utilization
- Plan hardware purchase
- Save costs



**YOU GET A LOAD TEST**

**YOU GET A LOAD TEST**

**EVERYONE GETS A LOAD TEST**



“Failure is **NOT** the opposite of success. It is **PART** of success” &&





**This is what it's all about**



# Nir Kriss

Head of Site Reliability Engineering @ Outbrain









# Thank You.

You can find us at

<https://linkedin.com/company/outbrain>

Slava Antonenko

