

# Chaos Engineering:

## *Getting out of the starting blocks*

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What currently prevents the wide adoption of chaos engineering in your organization?



**Adrian Hornsby**  
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I have some serious questions for you Twitter. What currently prevents the wide adoption of chaos engineering in your organization?

[#SRE](#) [#AWS](#) [#Serverless](#) [#Software](#) [#ChaosEngineeing](#)

Hard to start.

24.3%

**Enough chaos in prod!**

**45.7%**

Cultural issues (blame)

20.8%

Other - comment

9.1%

514 votes · Final results

# Why is production chaos?





**Adrian Hornsby**  
@adhorn



The results of the survey are out!!

"Hard to start." - 24%

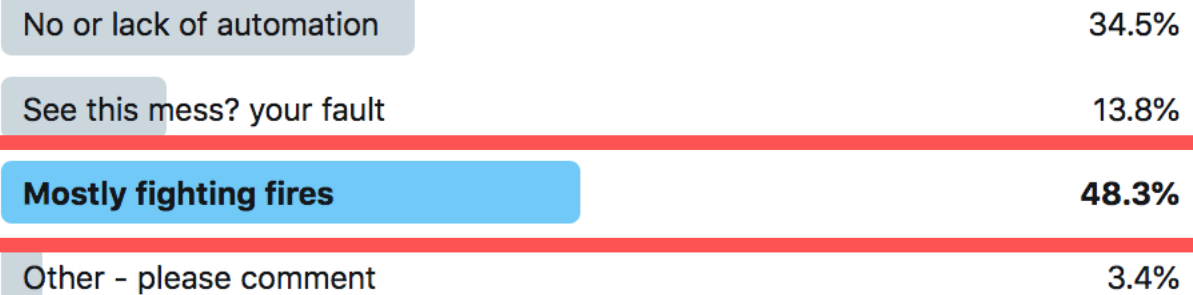
"Enough chaos in prod!" - 46%

"Cultural issues" - 21%

Thank you everyone who participated 🙏

A follow up question for you:

Why is production chaos?



116 votes · Final results





#0 - DON'T CALL IT CHAOS ENGINEERING.





#0 - ~~DON'T~~ CALL IT ~~CHAOS~~ ENGINEERING.



#1 - DON'T FOCUS ON CHAOS ENGINEERING,  
LOOK AT THE BIGGER PICTURE.





# Good intentions never work [...]

Because people already had  
good intentions



If good intentions don't work,  
what does?



# The Andon Cord



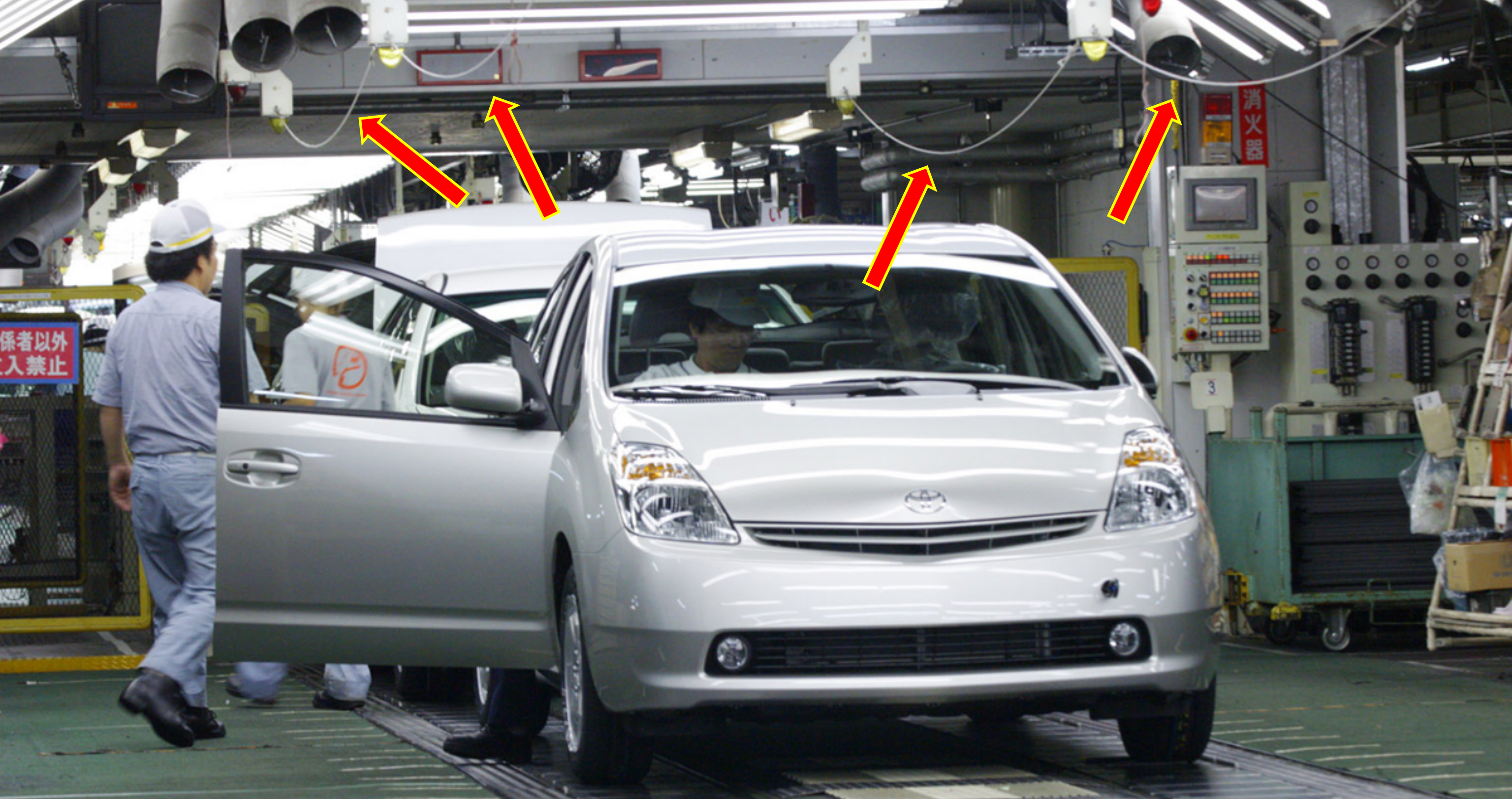
1902





Toyota will not allow any defect that they know about to go down the manufacturing line.





Source: <http://www.autoexpress.co.uk/toyota/prius/34615/japanese-earthquake-hits-car-production>



# Andon Customer Service



Microsoft Xbox 360 Wireless Controller  
for Windowsby [Microsoft](#)

★★★★☆ (131 customer reviews) | 6 answered questions

**Note:** This item is only available from third-party sellers  
([see all offers.](#))

14 used &amp; new from \$24.00

[See all buying options](#)

Have one to sell?

[Sell on Amazon](#)[Add to Wish List](#)

- Erroneously listed recharge cable as included
- Andon cord pulled and page corrected
- **Contacts per unit go from 33% to 3.7%**

Hello,

We're contacting you about your recent attempt to purchase "The Wolverine". We recently learned that a technical issue may have prevented you from being able to watch this video. We're very sorry about this.

To help make it up to you, we've issued a £3.48 for this order. The refund will be applied to your original order payment method and should complete within the next 2-3 business days.

We look forward to seeing you again soon.

Sincerely,  
Customer Service  
[Amazon.co.uk](https://www.amazon.co.uk)

Please note: this e-mail was sent from a notification-only address that cannot accept incoming e-mail. Please do not reply to this message.

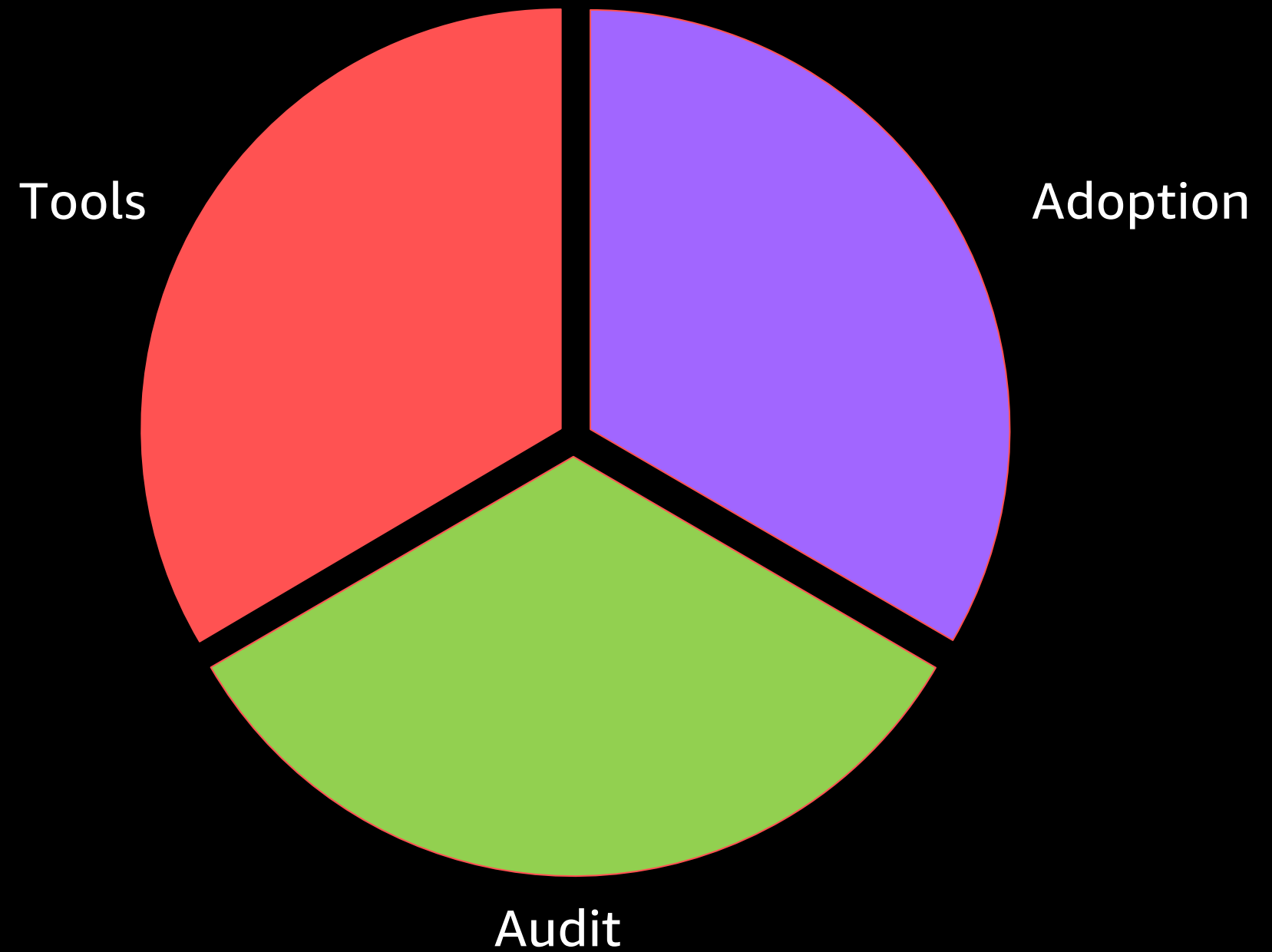
"Good intentions never work, you need good mechanisms to make anything happen."

Jeff Bezos



People have good intention to start  
with!

# Good Mechanisms $\approx$ Complete Processes





#2 - CHANGE BEGINS WITH UNDERSTANDING.

What are the top 5 “painful” reasons  
for your fires?

1. It is always DNS
2. Configuration drift
3. SSL Certificate expiration
4. Deployment failure
5. Failed link to 3<sup>rd</sup> party provider

# Anatomy of a COE

- What happened?
- What was the impact on customers and your business?
- What were the contributing factors?
- What data do you have to support this?
- What lessons did you learn?
- What corrective actions are you taking?

# Audit

## **Weekly Operational Metrics Review**

- Continuous inspection mechanism
- Maintains focus on operations
- Foundation of a healthy operations program

## **Typical Agenda - typically divided into fifteen-minute slots**

- Share successes and failings
- Action items follow up
- Review COEs
- Review key service metrics
- Identify new best practices

# Policy Engine

- Automated risk and opportunity analyzer
- Identifies potential risks to availability, infrastructure, security and more
- Highlights opportunities to optimize resource utilization
- Extensible and configurable
- Provides a view into policy compliance
- Allows acknowledgment
- Reports roll-up the organization hierarchy

**Mechanism to propagate local learnings globally**





#3 - CHOOSE YOUR TROJAN HORSE.

Find the right team to start with:

Not the best (*improvements are harder*)  
Not the worse (*they have bigger problems*)

# Choose the metrics to measure improvement:

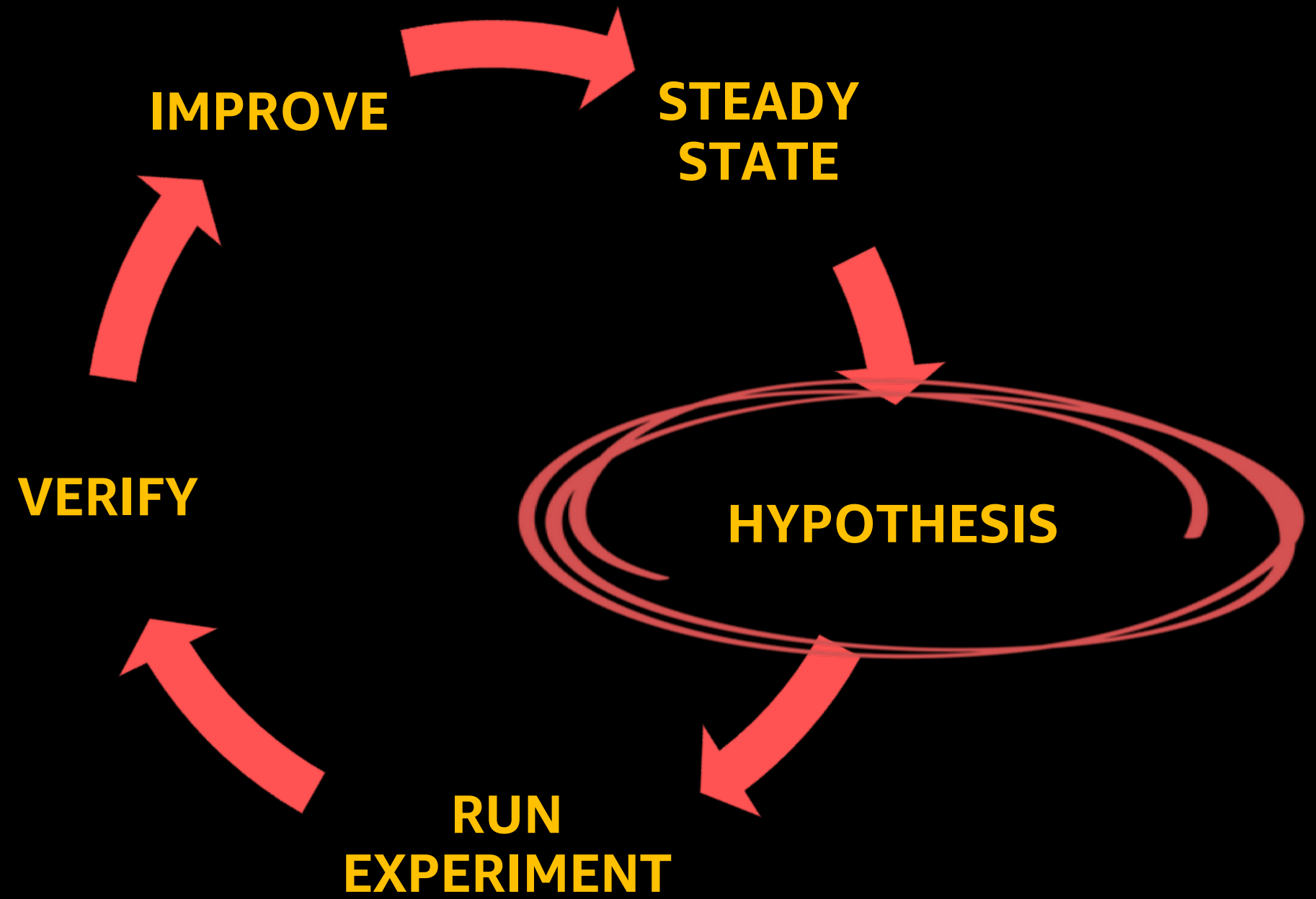
MTTR is \_\_always\_\_ a good default.



A group of people are gathered around a large wooden table in a workshop or classroom setting. In the foreground, a woman with dark hair tied back, wearing a red scarf and a light-colored shirt, is focused on drawing on a large sheet of paper with a yellow marker. She has a yellow hair clip in her hair. To her left, a man with headphones around his neck is looking towards the right. In the background, two other women are sitting on a ledge, one holding a smartphone. The table is cluttered with various items: a green cup, a clear plastic container, a pair of scissors, a colorful lanyard, and several pens and pencils. The overall atmosphere is collaborative and creative.

#4 - OVER-INDEX ON THE HYPOTHESIS.







# CONVERGENCE



# DIVERGENCE





A wide-angle photograph of a beach at sunset. The sun is a bright, glowing orb on the horizon, casting a long, shimmering reflection across the wet sand. The sky is a gradient of orange and yellow. In the foreground, the sand is covered in intricate, wavy ripples that catch the low light. In the distance, a line of trees and a few small structures are visible on the left side of the horizon.

#5 - INTRODUCE CHAOS ENGINEERING  
EARLY IN THE JOURNEY.



# Start simple and local!!

```
$ docker stop 94a214bbeebd
```

# DDoS yourself

```
$ wrk -t12 -c400 -d30s http://127.0.0.1/api/health
```

# Burn CPU with Stress(-ng)

<https://kernel.ubuntu.com/~cking/stress-ng/>

```
$ stress-ng --cpu 0--cpu-method matrixprod -t 60s
```

# Adding latency to the network

```
$ tc qdisc add dev eth0 root netem delay 300ms
```

# Blocks DNS resolution

```
$ iptables -A INPUT -p tcp -m tcp --dport 53 -j DROP
```

A close-up photograph of two hands, one from the top and one from the bottom, cupping a glowing, spherical fireball. The fireball is bright orange and yellow with visible flames. The hands are light-skinned and have some hair. The background is solid black.

# #6 - BLAST-RADIUS REDUCTION MINDSET.



#7 - IF YOU HAVEN'T VERIFIED IT, IT'S PROBABLY BROKEN.



# Verification:

1. Disaster Recovery & backups
2. Auto scaling
3. Multi-AZ
3. Fault tolerance & self healing
4. People



# https://github.com/adhorn

## **aws-lambda-chaos-injection**

Chaos Injection library for AWS Lambda

 Python  35  2

## **chaos-ssm-documents**

Collection of AWS SSM Documents to perform Chaos Engineering experiments

 Shell  53  13

## **aws-lambda-layer-chaos-injection**

AWS Lambda Layers to inject latency into AWS Lambda Functions

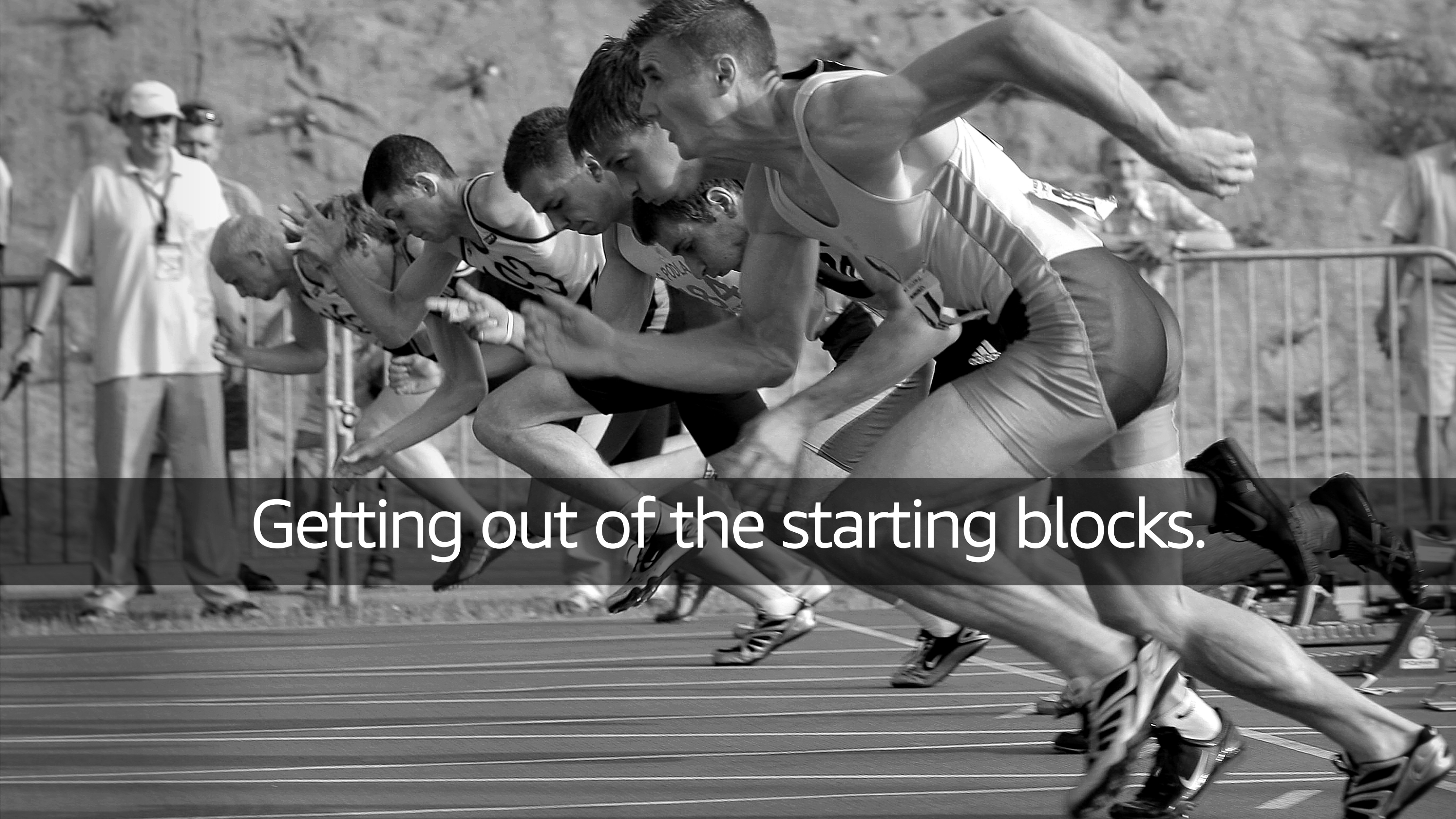
 Python  27  5

## **aws-chaos-scripts**

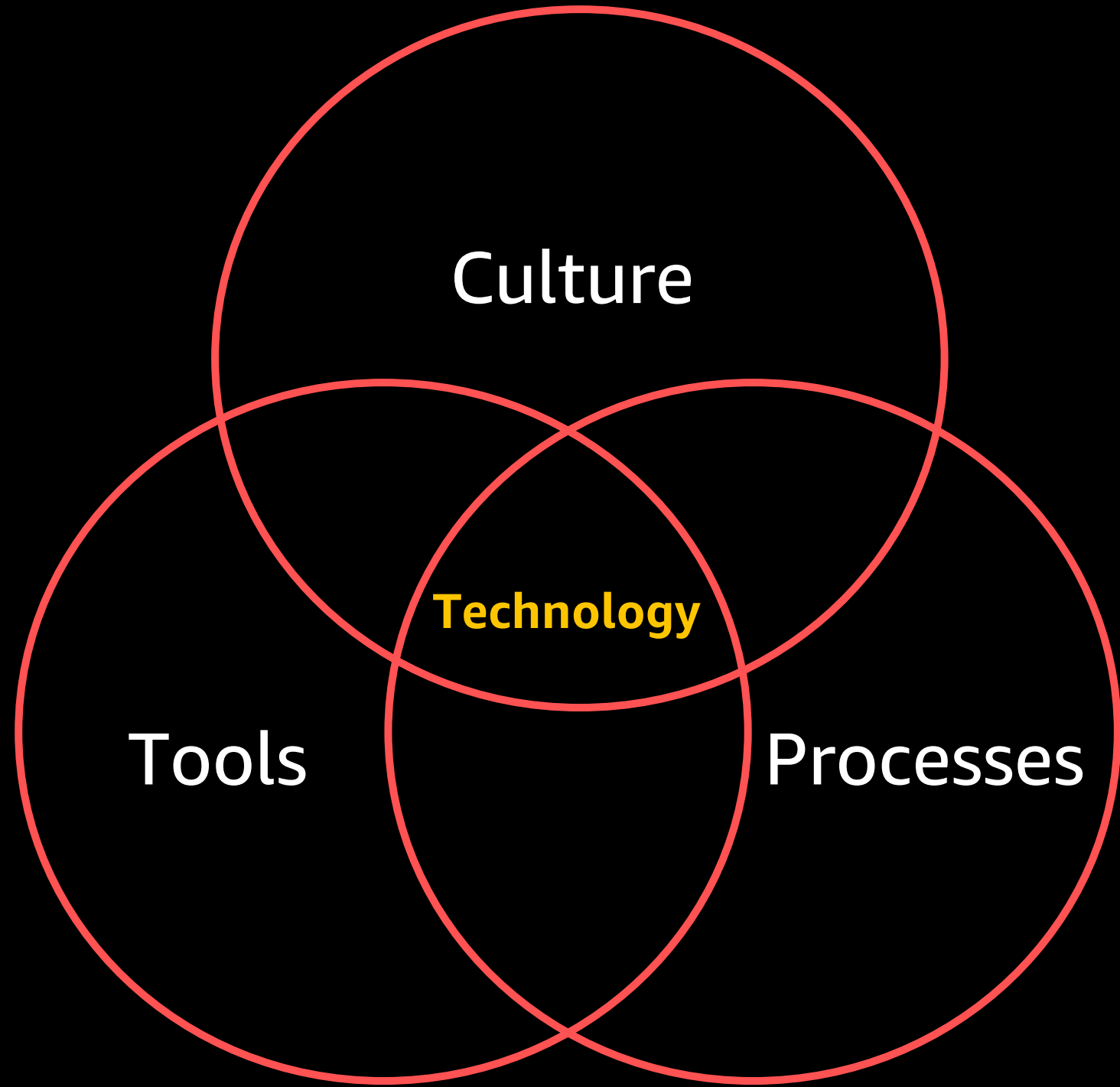
Collection of python scripts to run failure injection on AWS infrastructure

 Python  27  3





Getting out of the starting blocks.



# Thank you!

Adrian Hornsby

<https://medium.com/@adhorn>

 adhorn

