

# Chaos Engineering: *Getting out of the starting blocks*

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



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@adhorn

I have some serious questions for you Twitter. What currently prevents the wide adoption of chaos engineering in your organization?  
**#SRE #AWS #Serverless #Software #ChaosEngineering**

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?

No or lack of automation 34.5%

See this mess? your fault 13.8%

**Mostly fighting fires 48.3%**

Other - please comment 3.4%

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

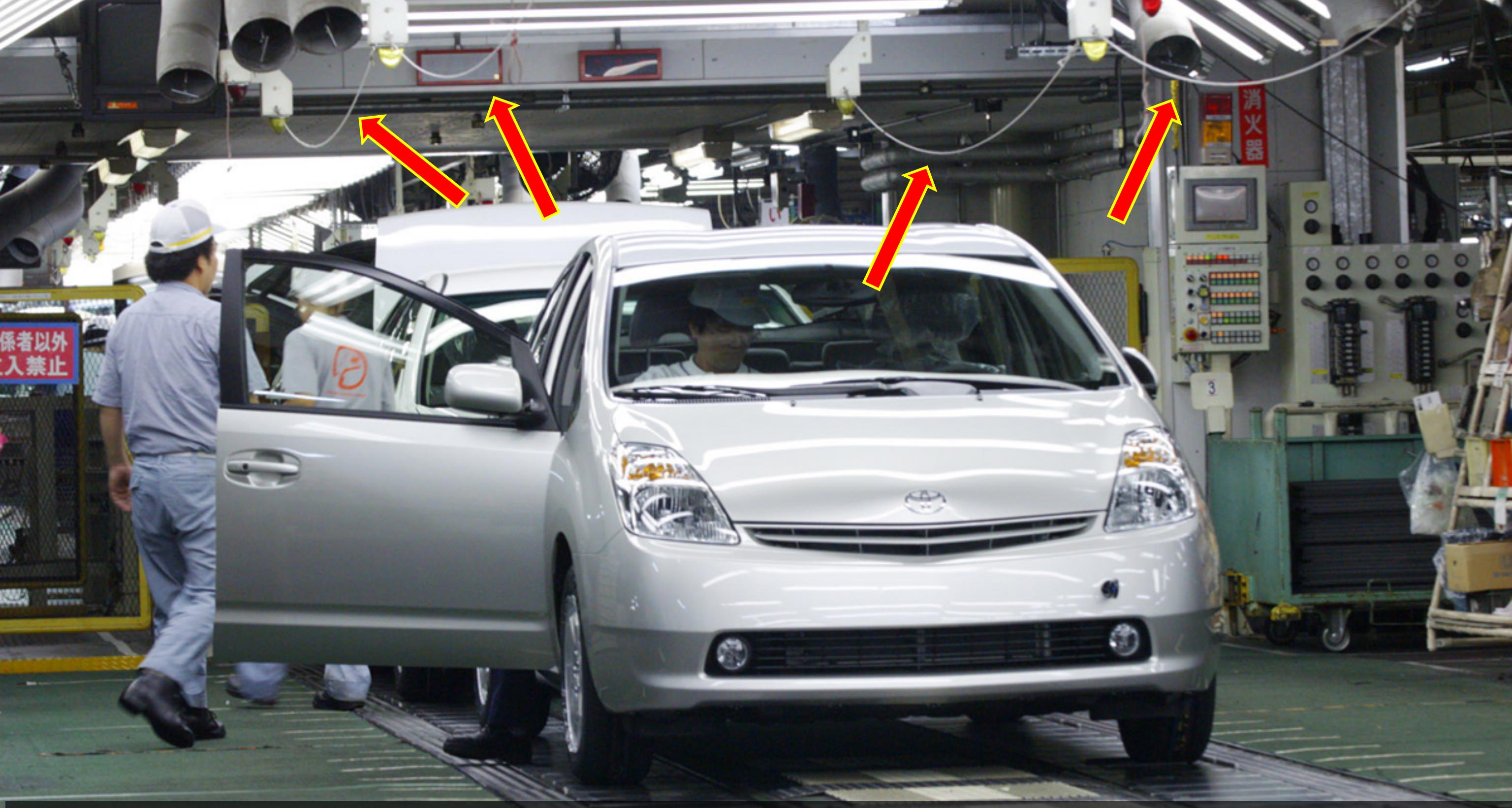


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1902



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



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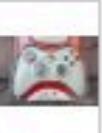
Electronics Accessories

Audio &amp; Home Theater

Camera &amp; Photo

Car Electronics &amp; GPS

Cell Phones &amp; Accessories



## Microsoft Xbox 360 Wireless Controller for Windows

by [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."

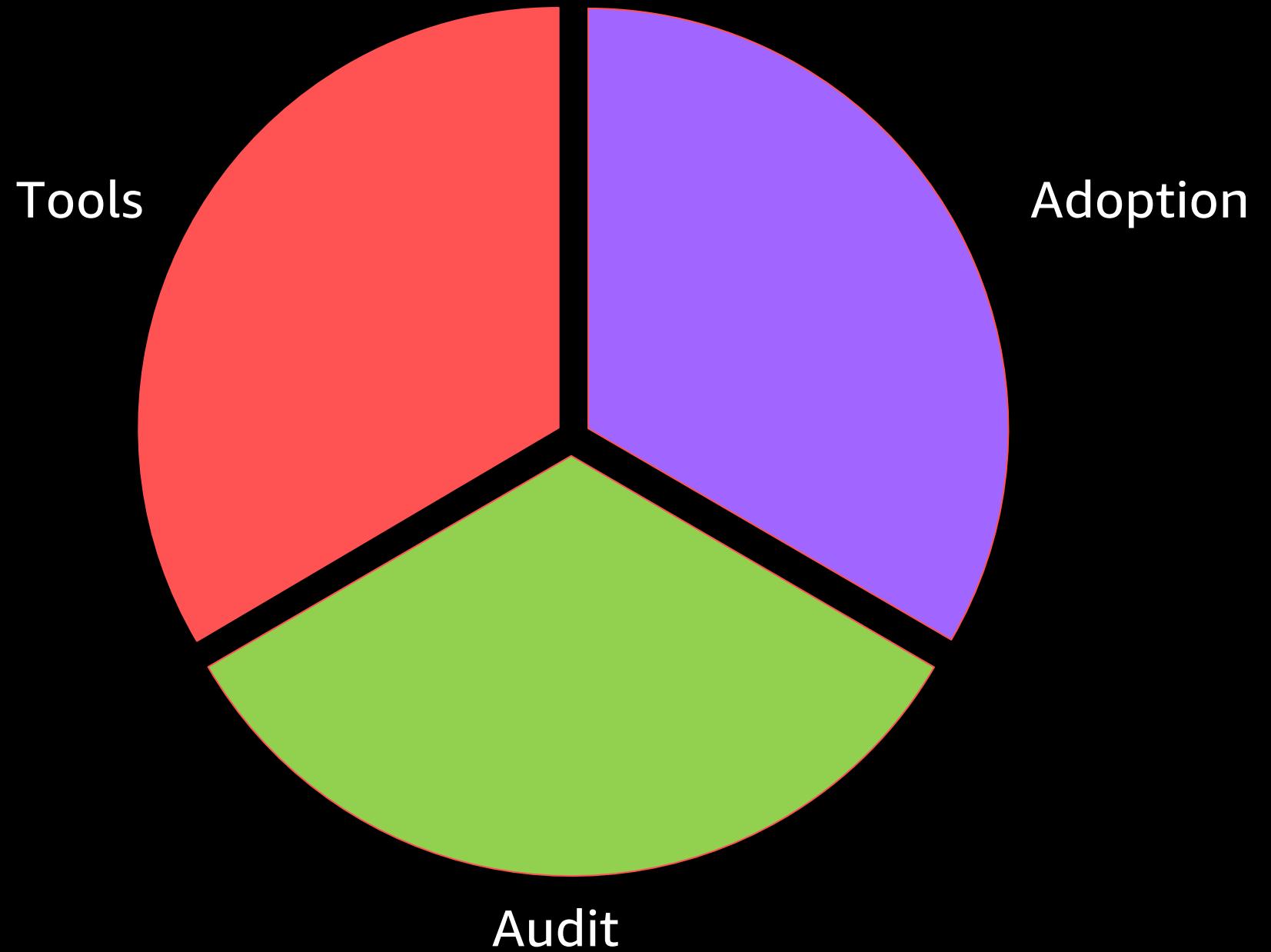
Jeff Bezos



People have good intention to start  
with!



# Good Mechanisms ≈ 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:

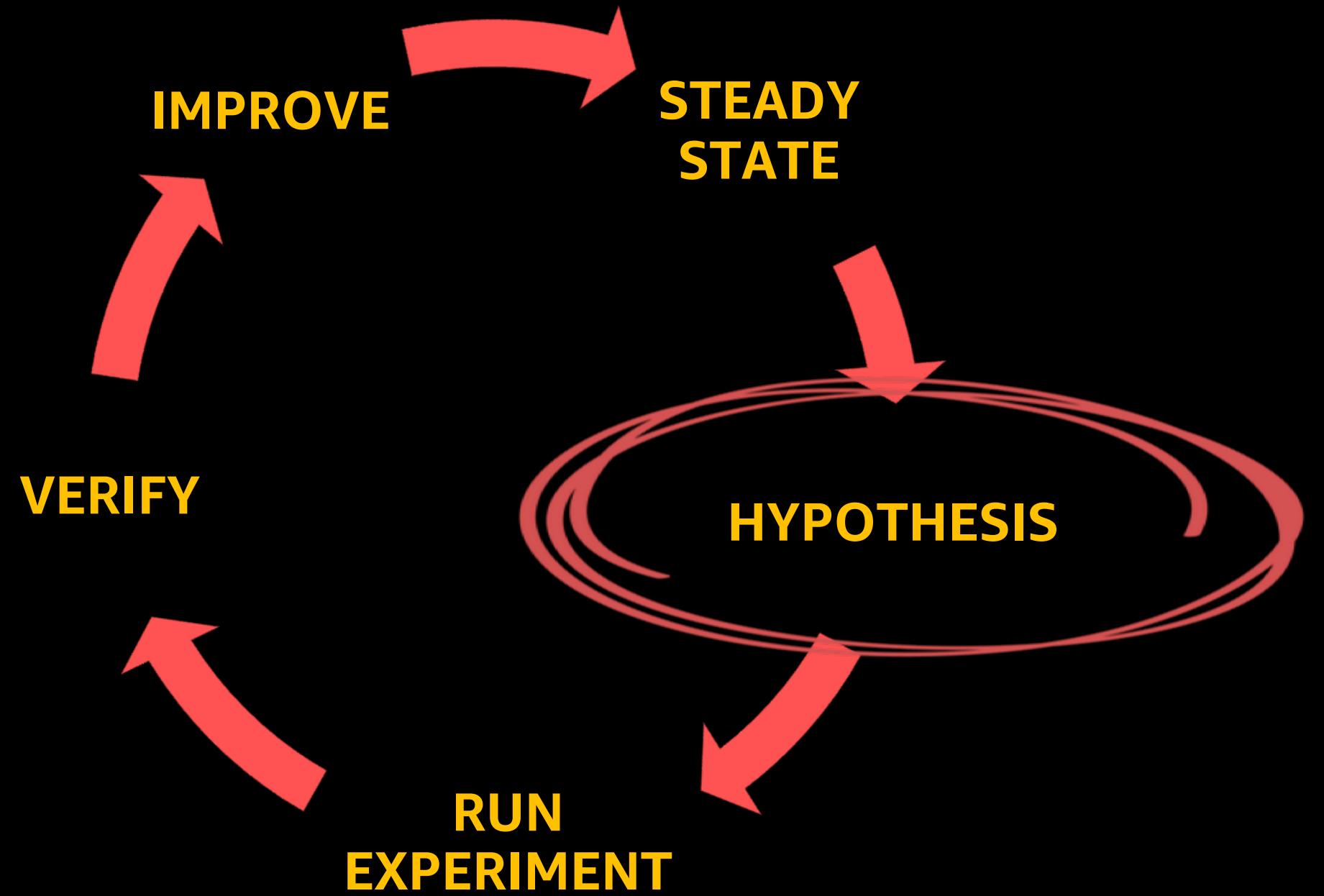
Not the best (*improvements are harder*)  
Not the worse (*they have bigger problems*)

Choose the metrics to measure improvement:

MTTR is always a good default.



#4 - OVER-INDEX ON THE HYPOTHESIS.





t

# CONVERGENCE



# DIVERGENCE





#5 - INTRODUCE CHAOS ENGINEERING  
EARLY IN THE JOURNEY.

# Start simple and local!!

```
$ docker stop 94a214bbebd
```



# 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

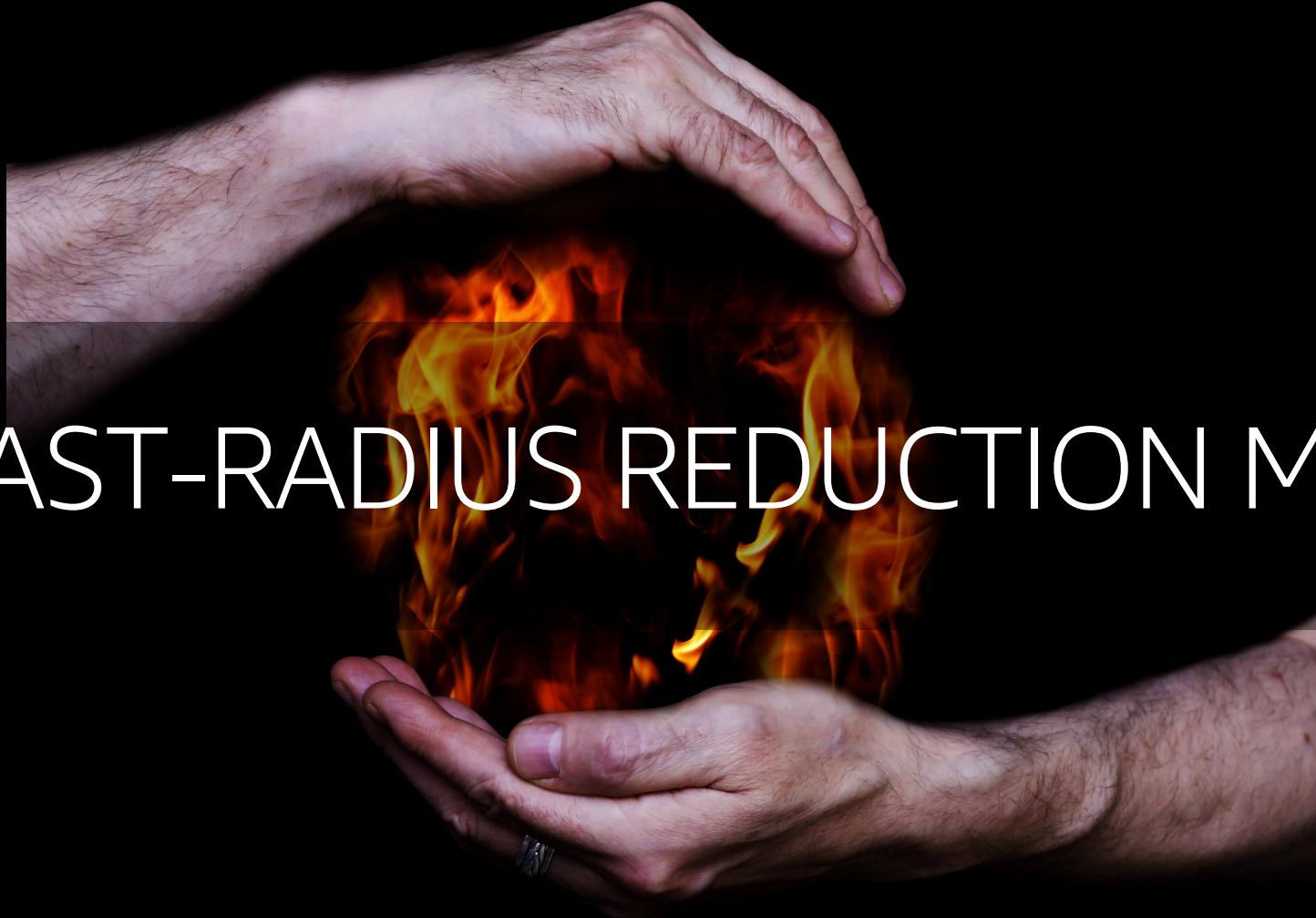
```
$ tc qdisc add dev eth0 root netem delay 300ms
```



# Blocks DNS resolution

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





## #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

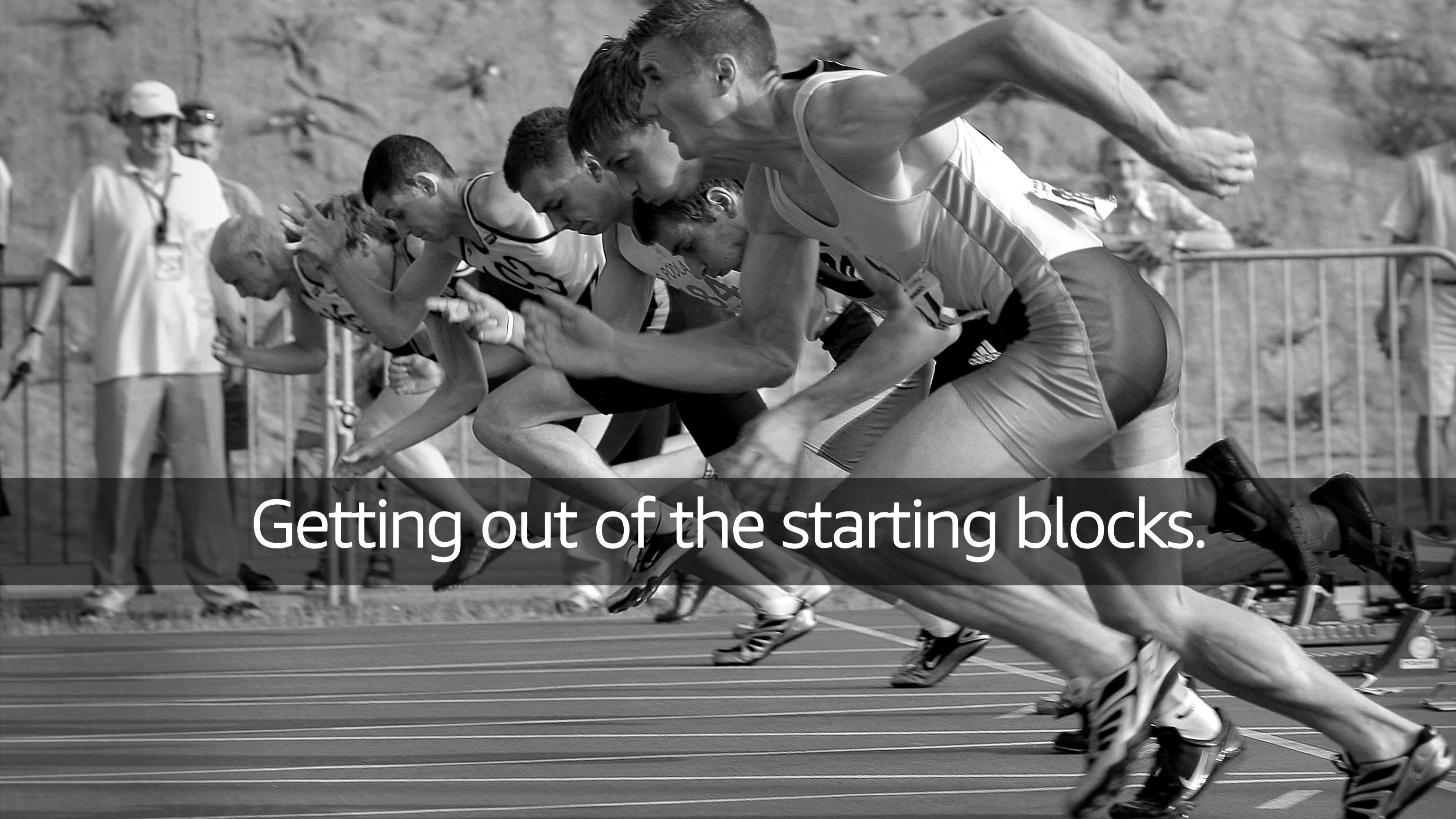
 [aws-chaos-scripts](#)

Collection of python scripts to run failure injection on AWS infrastructure

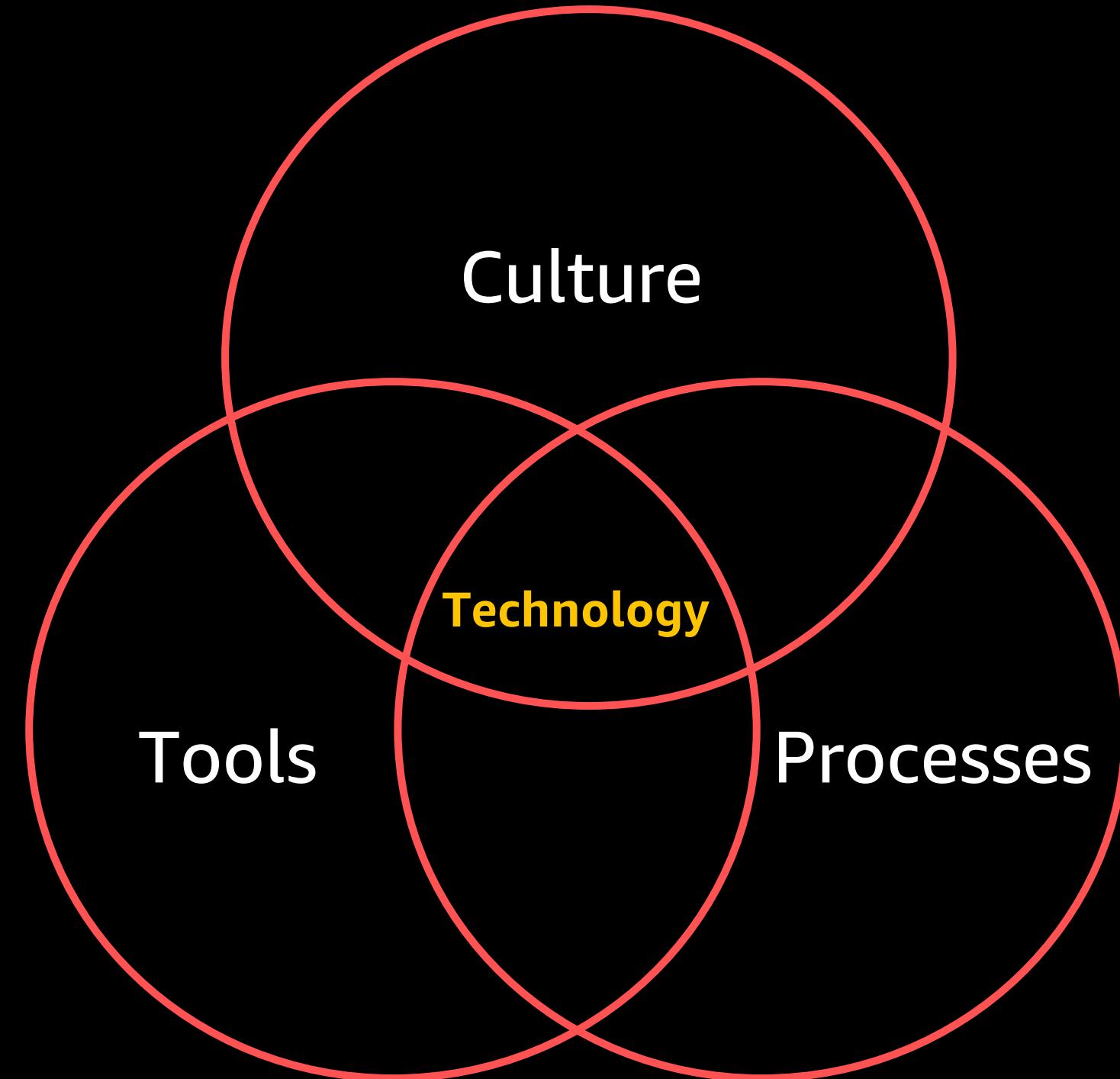
 Python    27    3



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# Thank you!

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

