

VACCINATE your Software, Build its IMMUNITY



Who Am I?



- A Son, Husband and a Father
- Tester at heart
- Speaker by choice
- Head QA and Delivery by designation at Metacube Software
- Process Advocate to deliver quality
- Blogger



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A meme featuring a man with a beard and a red cape, shouting and holding a sword, with the text "TONIGHT WE TEST" overlaid.

TONIGHT WE TEST

IN PRODUCTION!

What is Chaos Engineering?

Chaos Engineering

Like a vaccine, we inject harm to build *immunity*.



Little History !! 2020



Chaos Engineering Now Part of AWS Well-Architected Framework

The eighth update to the Well-Architected Framework (WAF) was recently announced. It now includes Chaos Engineering as a requirement for a reliable system.

Chaos Gorilla
Outage of entire Amazon Availability Zone

Security Monkey
Finds security violations and vulnerability

Doctor Monkey
Taps into health checks and fixes unhealthy resources

Latency Monkey
Simulate degradation or outages in a network

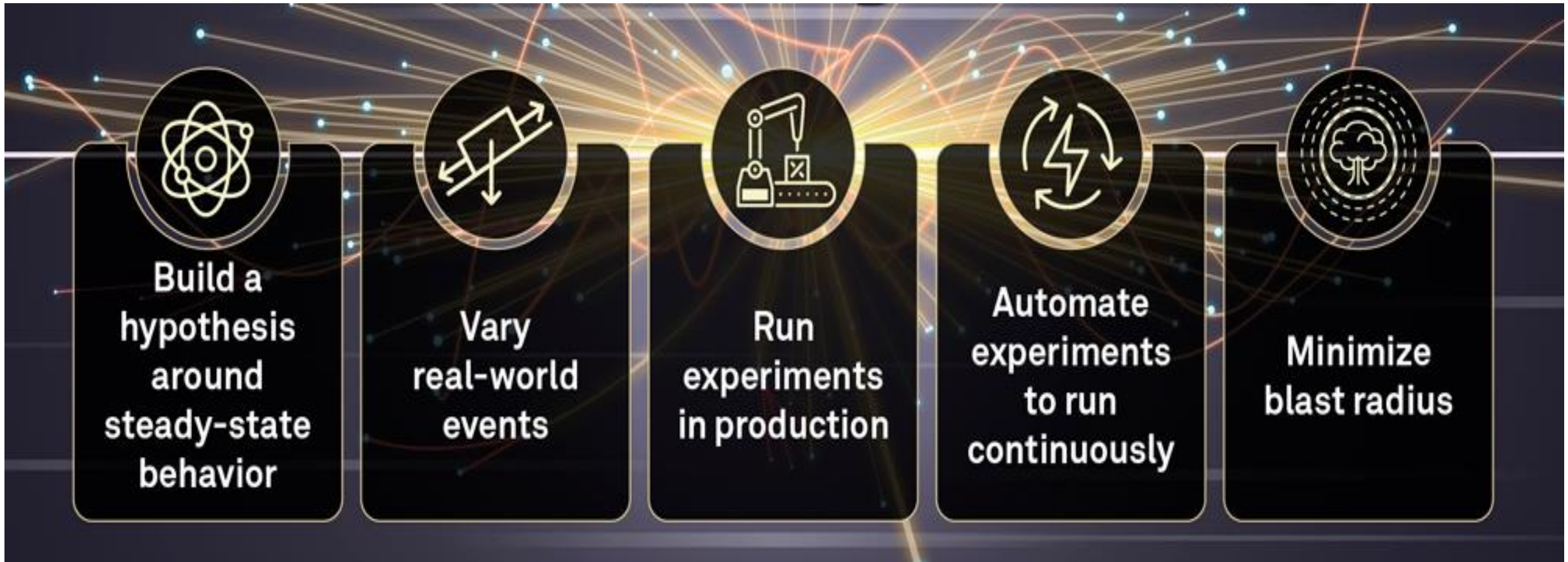
Netflix Principles

1. Individual Services failure should not fail entire system



2. Do not believe that you can prevent the above one!

Chaos Testing Principles



<https://www.verica.io/blog/the-advanced-principles-of-chaos-engineering/>

Build a Hypothesis Around Steady-State Behavior

Under _____ circumstances, the security team is notified.



Under SECURITY CONTROL VIOLATION circumstances, the security team is notified.

Vary Real-World Events



Use Production to run your Experiments



Automate Experiments & Run them Continuously

Automation is important in such systems for two reasons:

- Automation provides a means to scale out the search for vulnerabilities that could contribute to undesirable systemic outcomes
- To empirically verify our assumptions over time, as unknown parts of the system are changed

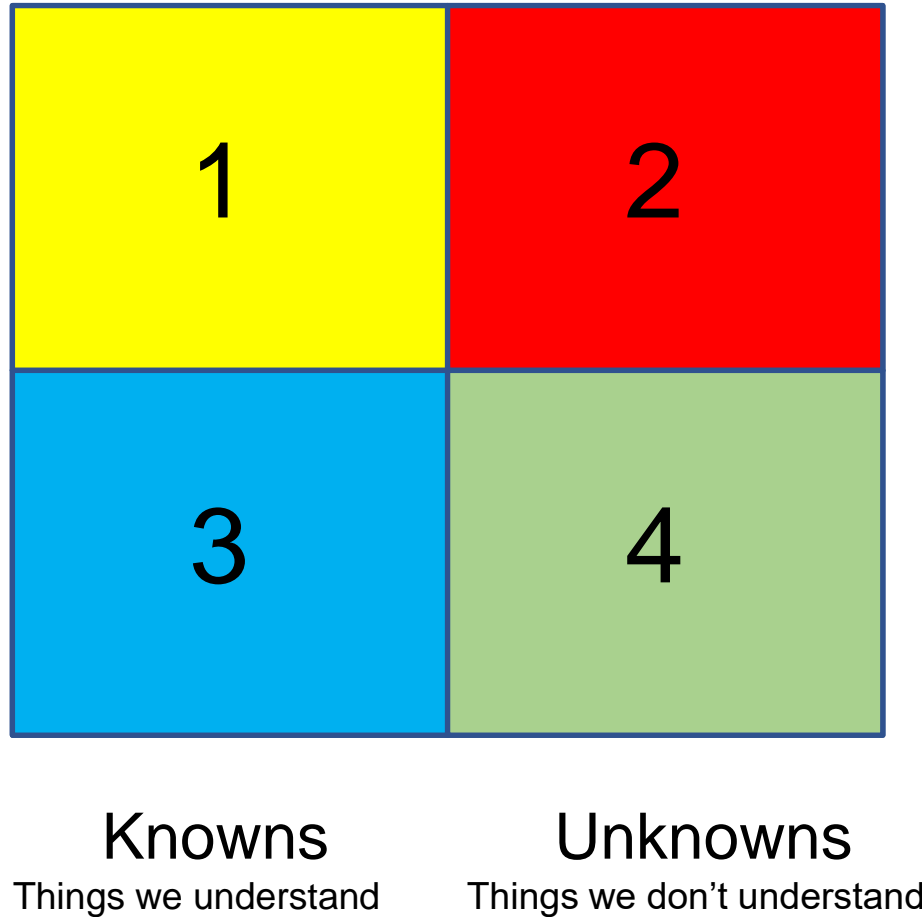
Keep Blast Radius as Small as Possible



Chaos Testing Execution Rules

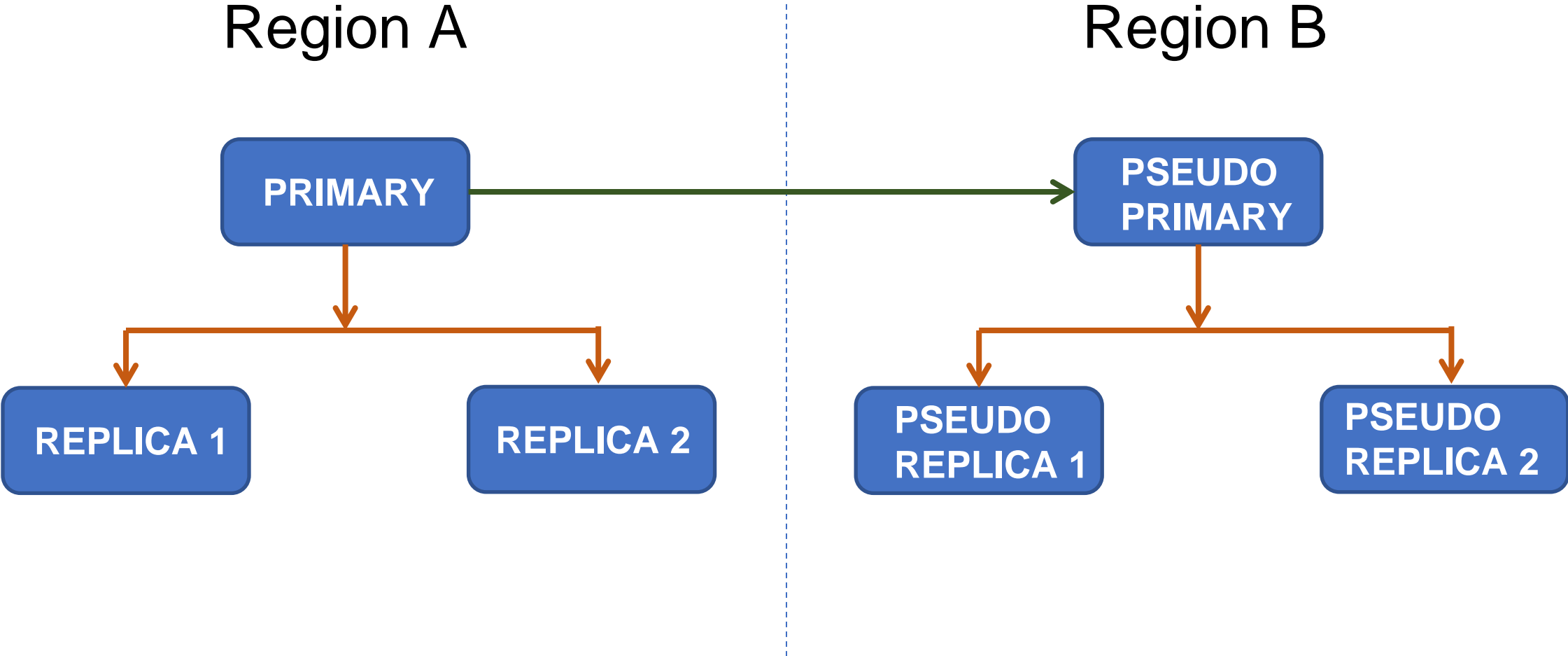
Known
Things we are aware of

Unknown
Things we are not aware of



- 1 Known Knowns**
Things you are aware of and understand
- 2 Known Unknowns**
Things you are aware of but do not fully understand
- 3 Unknown Knowns**
Things you understand but are not aware of
- 4 Unknown Unknowns**
Things you are neither aware of nor fully understand

Chaos Testing - Scenario



Chaos Testing– Setting up Known/Unknowns

1 Known Knowns

When a replica shuts down it will be removed from the cluster. ✓

A new replica will then be cloned from the primary and added back to the cluster. ✓

2 Known Unknowns

The clone will occur, as we have logs that confirm if it succeeds or fails, ✓

The weekly average of the mean time it takes from experiencing a failure to adding a clone back to the cluster effectively. ✗

3 Unknown Knowns

If we shutdown the two replicas for a cluster at the same time, we don't know exactly the mean time it would take us to clone two new replicas off the existing primary. ✗

We have a pseudo primary and two replicas which will also have the transactions. ✓

4 Unknown Unknowns

What would happen if we shutdown an entire cluster in our main region? ✗

Will the pseudo region be able to failover effectively because we have not yet run this scenario?. ✗

Benefits of Performing Chaos Testing

CUSTOMER

- Increased availability and durability of service
- No outages disrupt their day-to-day lives.

BUSINESS

- Prevent big losses in revenue and maintenance costs
- Happy and more engaged engineers
- Improve Incident Management System for company based on Chaos testing results

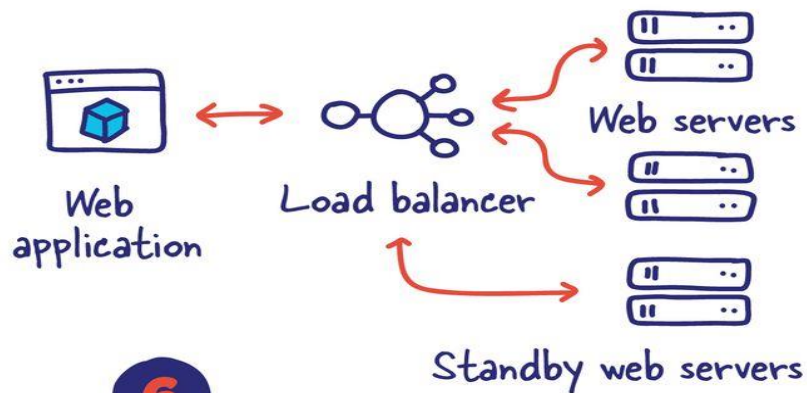
TECHNICAL

Insights from Chaos Testing means:

- Reduction in incidents
- Reduction in on-call burdens
- Increased understanding of system failure modes
- Improved Incident Management System overall

8 FALLACIES OF DISTRIBUTED SYSTEMS

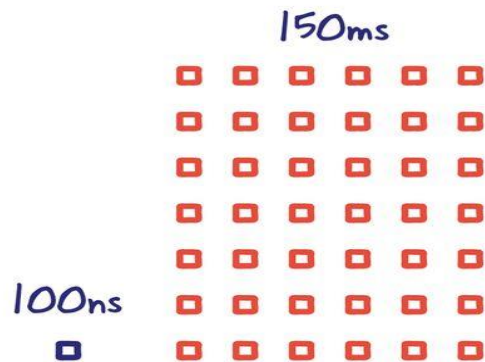
1 The network is reliable.



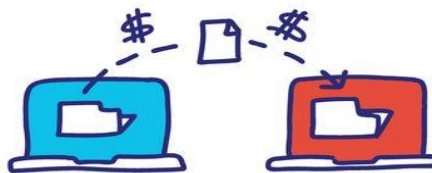
6 There is one administrator.



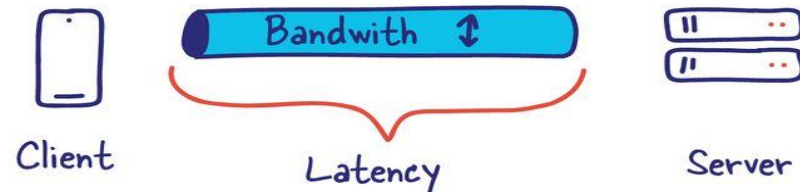
2 Latency is zero.



7 Transport cost is zero.



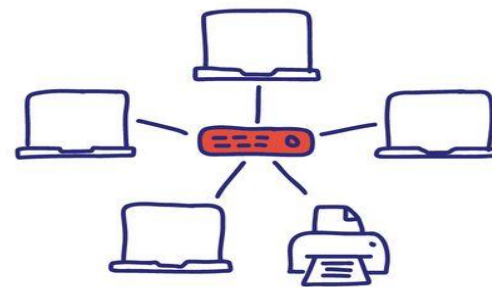
3 Bandwidth is infinite.



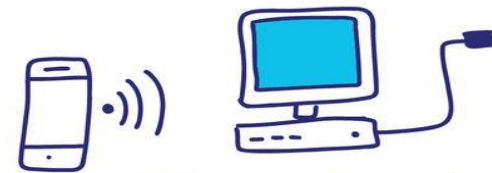
4 The network is secure.



5 Topology doesn't change.



8 The network is homogeneous.



Summary

- There are not 100% safe systems from outage
- We can certainly have some control over the impact on partners, employees, customers, and business reputation
- Running Chaos tests minimizes the number of crashes or system failures apparent in production as long as the QA testing or DevOps teams are involved
- With in-depth knowledge, proper tools, cooperation, collaboration, and pragmatic cooperation between teams and team members, there's no reason why organizations can't leverage the power of chaotic testing.

Thank You and Stay Connected!



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OPEN HOUSE

OPEN TO
QUESTIONS.
OPEN TO
CONVERSATIONS.
OPEN TO ALL.