

@ana_m_medina

INTRODUCTION TO CHAOS ENGINEERING

Ana Medina
Chaos Engineer at Gremlin
@ana_m_medina

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I work at Gremlin as a Chaos Engineer.

I was a Software Engineer at Uber
in SRE doing Chaos Engineering and
Cloud Computing.

I'm from Costa Rica and Nicaragua and
currently living in San Francisco, CA.

College dropout.
Self taught engineer



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**Anything that can go
wrong....**

will go wrong.

- Murphy's Law

GREMLIN

Chaos Engineer /'kɑː,əs / ,enjə'nɪr/

noun

1. a person helping companies avoid outages by running proactive chaos engineering experiments.



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As an SRE, we want to have confidence that our systems are resilient or even antifragile.

Confidence

1. **full trust**; belief in the powers, **trustworthiness**, or reliability of a person or thing:

Resilient

1. **springing back**; rebounding
2. Returning to the original form or position after being bent, compressed, or stretched.

“Some things benefit from shocks; they thrive and grow when exposed to volatility, randomness, disorder, and stressors and love adventure, risk, and uncertainty. Yet, in spite of the ubiquity of the phenomenon, there is no word for the exact opposite of **fragile**. Let us call it **antifragile**. **Antifragility** is beyond resilience or robustness. The resilient resists shocks and stays the same; **the antifragile gets better.**”

-Nassim Nicholas Taleb

Antifragile: Things That Gain from Disorder

How to make our systems antifragile?

BREAK THINGS ON PURPOSE.

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CHAOS ENGINEERING

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We test **proactively**, instead of
waiting for an outage.

-Kolton Andrus
CEO, Gremlin

**Thoughtful, planned
experiments designed to
reveal the weakness in our
systems.**

WHAT CHAOS ENGINEERING IS

- Controlled and planned chaos engineering experiments
- Preparing for unpredictable failure
- Preparing engineers for failure
- Preparing for game days
- A way to improve SLA
 - fortify systems
 - build and move fast
 - build confidence in systems
 - reveal weak points in your systems
 - build assurance that you can still serve your customers

WHAT CHAOS ENGINEERING IS NOT

- Random chaos engineering experiments
- Unsupervised chaos engineering experiments
- Unmonitored chaos engineering experiments
- Unexpected chaos engineering experiments
- Breaking production by accident
- Creating Outages

WHY DO CHAOS ENGINEERING?

- Microservice Architecture is tricky
- Our systems are scaling fast
- Services will fail
- Dependencies on other companies will fail
- Prepares for real world scenarios
- Reduce amount of outages, reduce down time, lose less money

WHY DO CHAOS ENGINEERING?

- Human Factor: Train on-call engineers

Human Factor

1. It accounts for the user's capabilities and limitations in seeking to ensure that tasks, functions, information, and the environment suit that user.

Train engineers in a healthy way:

- a. maintaining quality of life
- b. their mental health
- c. avoid burnout / turnover

**If you haven't tried it, assume it's
broken.**

-Unknown

WHAT COMPANIES ARE DOING IT?

- Netflix
- Amazon
- Dropbox
- Uber
- Slack
- Twilio
- And more!

@ YOUR COMPANY / WHERE CAN YOU IMPLEMENT THIS?

- Application
- API
- Caching
- Database
- Hardware
- Cloud Infrastructure / Bare metal

@ YOUR COMPANY / WHAT SERVICES/TEAMS SHOULD DO THIS?

- Critical services - (Tier 0 services)
 - Top 5 critical services is a good way to get started
- Critical data storage

@ YOUR COMPANY / WHAT CAN YOU DO?

- Unpredictable circumstances
- Large traffic spikes
- Race conditions
- Datacenter failure
- Time travel - system clocks to be out of sync
- Network errors
- CPU overloads

@ YOUR COMPANY / HOW?



Form a hypothesis.



Run an experiment.



Abort Conditions



Failure



Success



Find and fix issues.



Scale up and repeat.

Minimize the
blast radius.

HOW ARE PEOPLE DOING IT?

ChaosMonkey

KubeMonkey

Gremlin

WHERE TO LEARN MORE

[Principles of Chaos](#)

[Chaos Engineering Book](#)

[Awesome Chaos Engineering GitHub Repo](#)

[Chaos Engineering Slack](#) gremlin.com/slack

[Gremlin Community](#)

[Netflix - Chaos Kong](#)

[Chaos Engineering Meetups](#)

[Learn More about SEV](#)

[Learn More about GameDays](#)

Get Involved: come to [ChaosConf](#) in San Francisco, CA - chaosconf.io

**ARE YOU
READY?**

THINGS NEEDED TO DO CHAOS ENGINEERING:

- High Severity Incident Management - "SEVs"
- Useful monitoring
- Alerting and paging
- Clear instructions on how to roll back an experiment
- Measure the impact of downtime

@ana_m_medina

THANKS!

#BreakThingsOnPurpose

@ana_m_medina
ana@gremlin.com

www.gremlin.com

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