Chaos Engineering
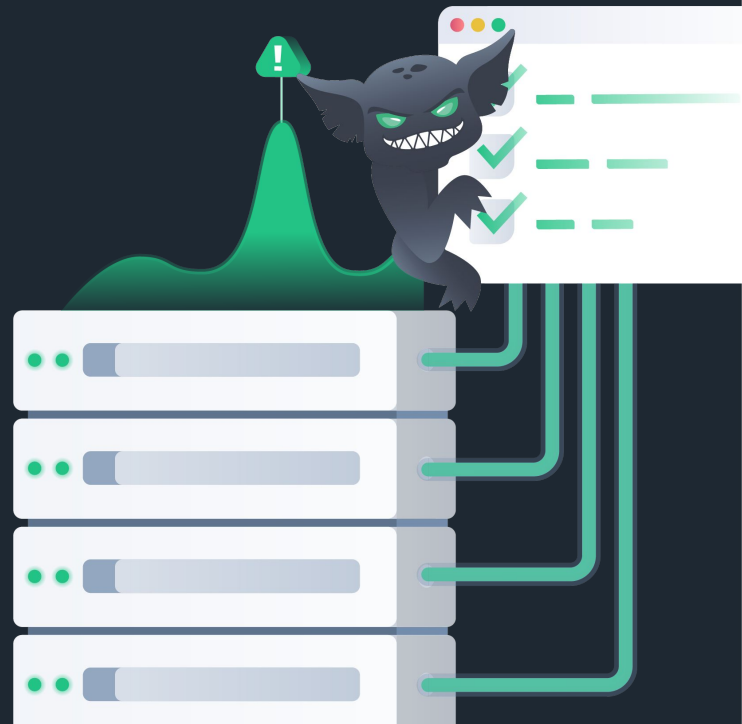
By the Numbers

qualtrics.®XM

qualtrics XM ®

- 40+ teams
- < 3 months
- 500+ hrs saved

Mission

Build a more reliable internet.

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Proactively improve reliability

Free stickers: gremlin.com/talk/SkillUp-Days

Chaos Engineering

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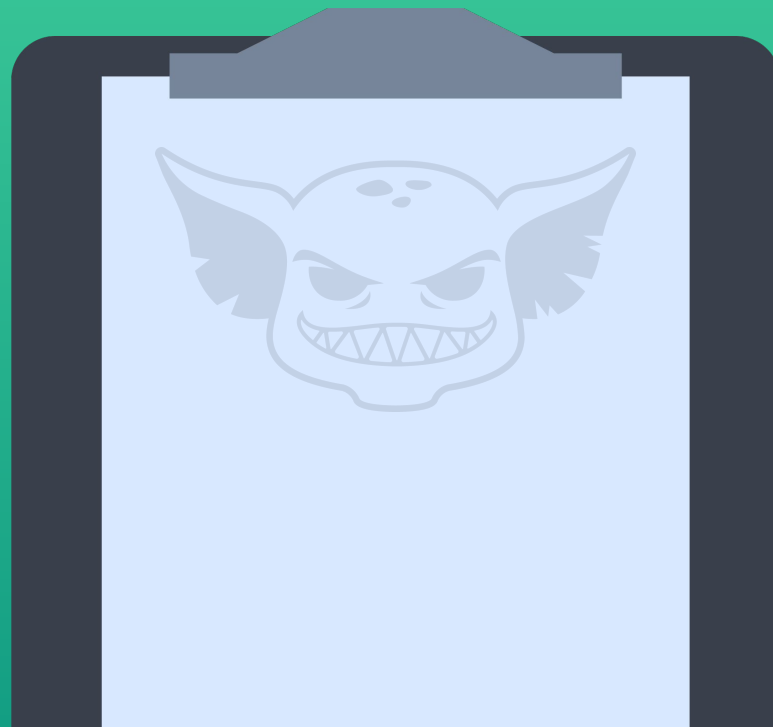
Chaos Engineering

Thoughtful, planned experiments designed to ~~reveal the weakness in our systems~~ **improve our understanding of how systems work**, so that we can improve them.
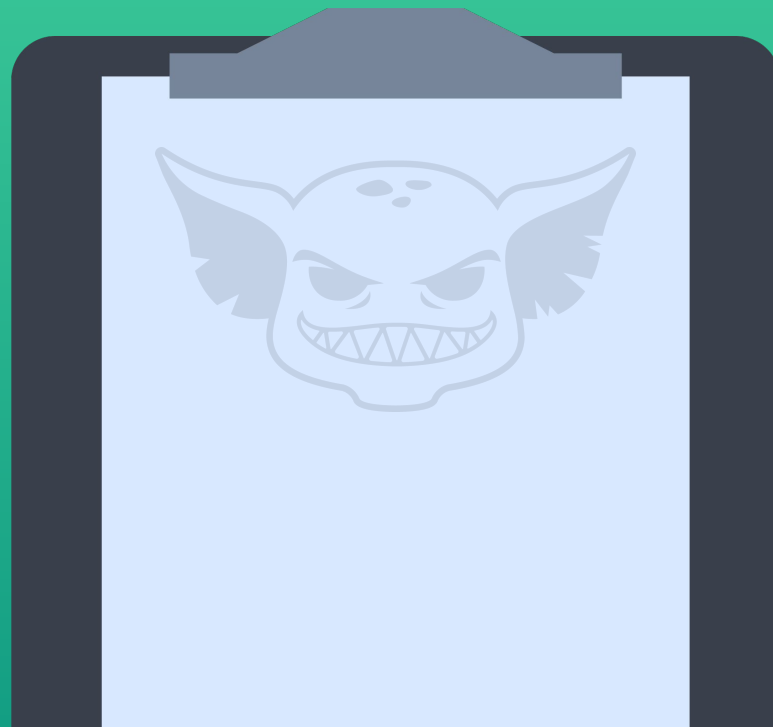
Chaos Engineering

1. There's a process. It's planned, not random.

2. Validate your mental models/understanding.

3. Use your knowledge to improve systems.

4. Build a practice and culture of learning

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Blackholes

- 2nd most popular attack

- ~5700 attacks in Q1 2021

What percent of your incidents (SEV0&1) have been caused by:

	<20%	21-40%	41-60%	61-80%	>80%
Bad code deploy (e.g., a bug in code deployed to production leading to an incident)	39%	24%	19%	11.8%	6.1%
Internal dependency issues (non-DB) (e.g., a service operated by your company had an outage)	41%	25%	20%	10.1%	3.7%
Configuration error (e.g., wrong settings in your cloud infrastructure or container orchestrator causing an incident)	48%	23%	14%	10.1%	5.2%
Networking issues (e.g., ISP or DNS outage)	50%	19%	13%	15.7%	1.7%
3rd party dependency issues (non-DB) (e.g., lost connection to a payment processor)	48%	23%	13%	14.3%	1.7%
Managed service provider issues (e.g., cloud provider AZ outage)	61%	14%	9%	12.5%	3.9%
Machine/infrastructure failure (on-prem) (e.g., a power outage)	64%	14%	6%	12%	4.4%
Database, messaging, or cache issues (e.g., lost DB node leading to an incident)	58%	18%	18%	5…	1.2%
Unknown	66%	10%	15%	7.…	1%

Legend: ● <20% ● 21-40% ● 41-60% ● 61-80% ● >80%

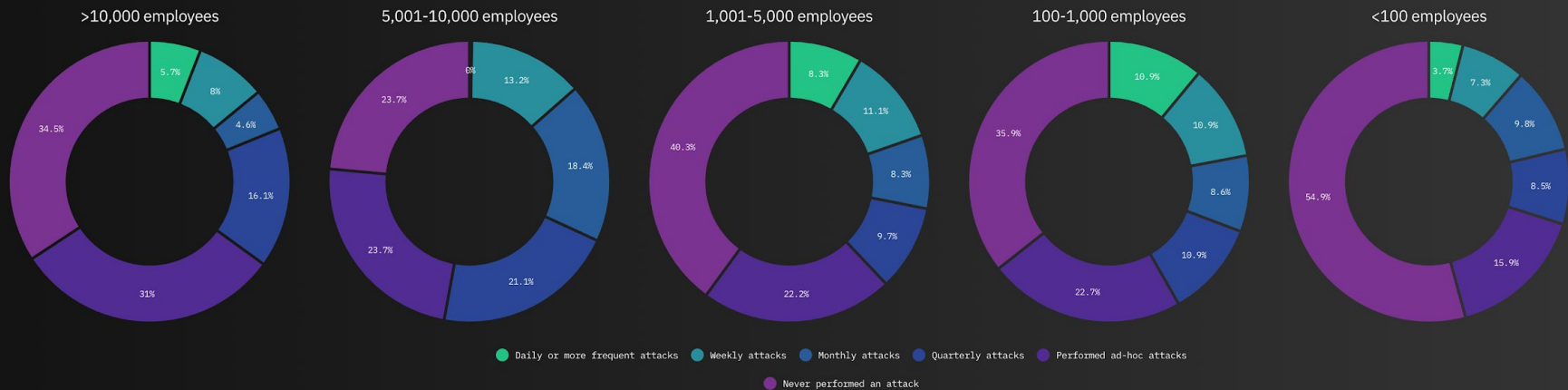# Let's get into some numbers

State of Chaos Engineering

- 400+ respondents

- Large range of company sizes

- Broad range of company ages

- Mix of industries

- Varied maturity levels

gremlin.com/state-of-chaos-engineering

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Who is running Chaos Engineering attacks?
(by size of org)

>10,000 employees
- 5.7%
- 8%
- 4.6%
- 16.1%
- 31%
- 34.5%

5,001-10,000 employees
- 0%
- 13.2%
- 18.4%
- 21.1%
- 23.7%
- 23.7%

1,001-5,000 employees
- 8.3%
- 11.1%
- 8.3%
- 9.7%
- 22.2%
- 40.3%

100-1,000 employees
- 10.9%
- 10.9%
- 8.6%
- 10.9%
- 22.7%
- 35.9%

<100 employees
- 3.7%
- 7.3%
- 9.8%
- 8.5%
- 15.9%
- 54.9%

Legend:
- Daily or more frequent attacks
- Weekly attacks
- Monthly attacks
- Quarterly attacks
- Performed ad-hoc attacks
- Never performed an attack

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So how do you do it?

Scientific Process

1. Question
2. Hypothesis
3. Testing
4. Analysis
5. Share & repeat

Scientific Process

1. **Question:**

   Is my app / system reliable?

Scientific Process

1. **Question:**

   ~~Is my app / system reliable?~~

   Does my app / system work the way I think it does?

Scientific Process

1. Question
2. **Hypothesis:**

   I think given $CONDITION, my app / system will $REACTION

Scientific Process

1. Question
2. Hypothesis
3. **Testing:**

   Insert failure or replicate
   the condition

Scientific Process

1. Question
2. Hypothesis
3. Testing
4. **Analysis:**

   What did you learn?

   What can be improved?

Scientific Process

1. Question
2. Hypothesis
3. Testing
4. Analysis
5. **Share & repeat:**
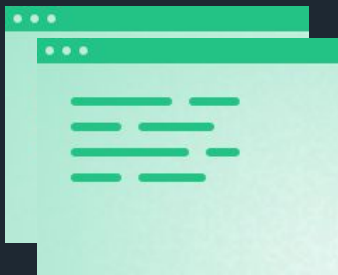
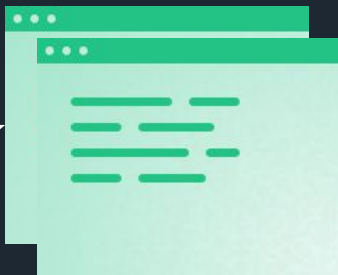   Share your learnings!

   Repeat to test improvements
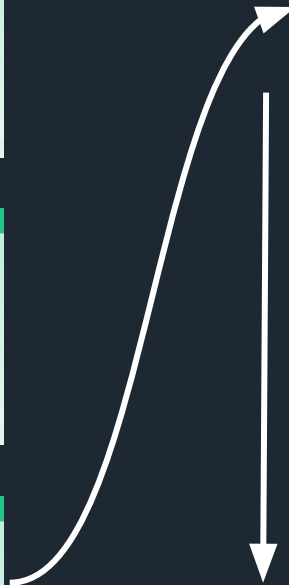
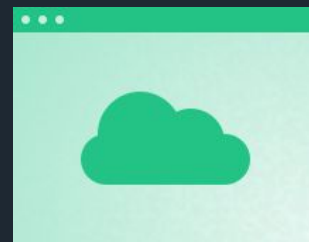# Start Small & Increase the Blast Radius

Development   Staging   Production
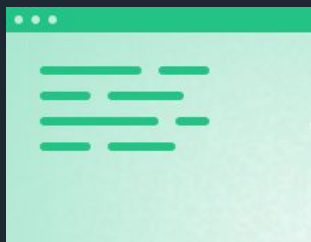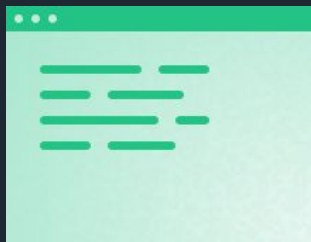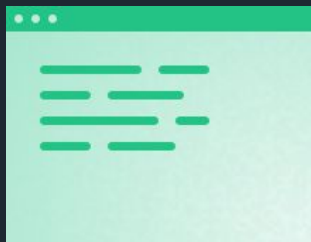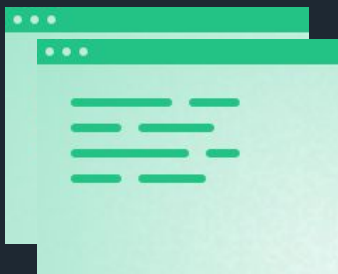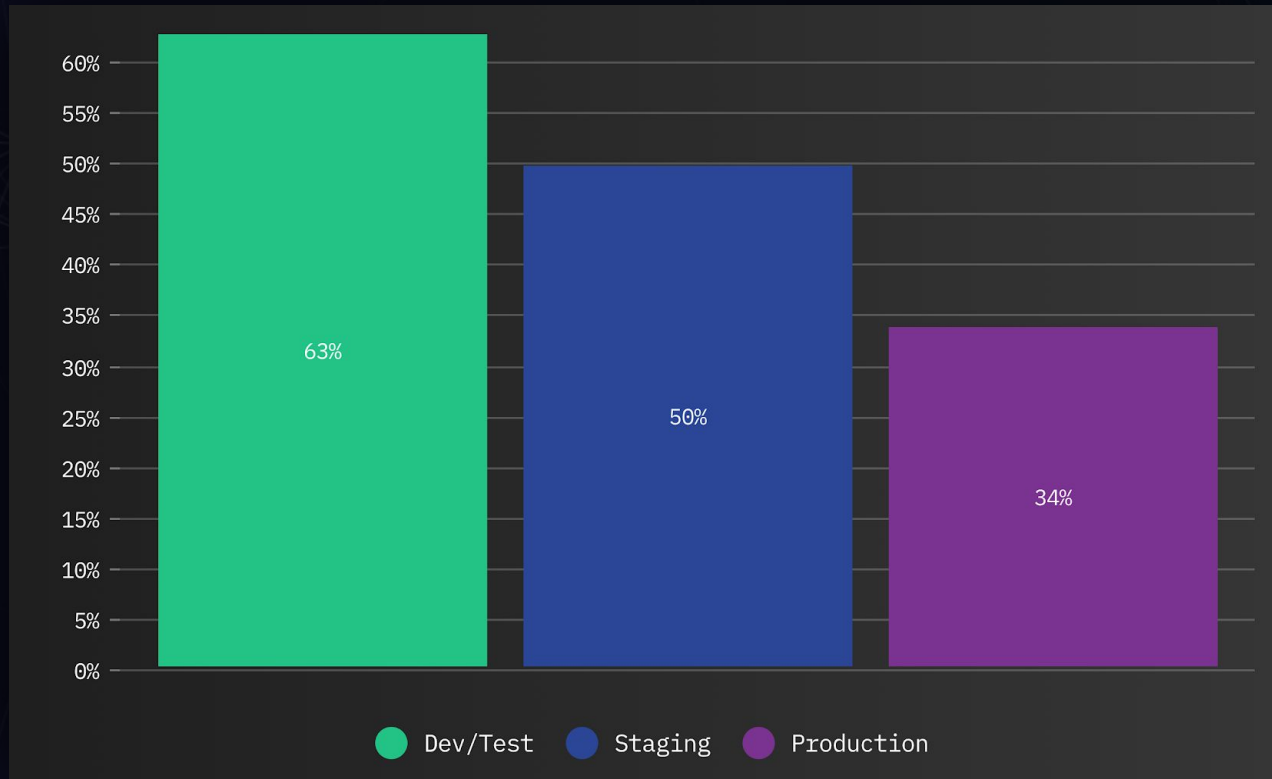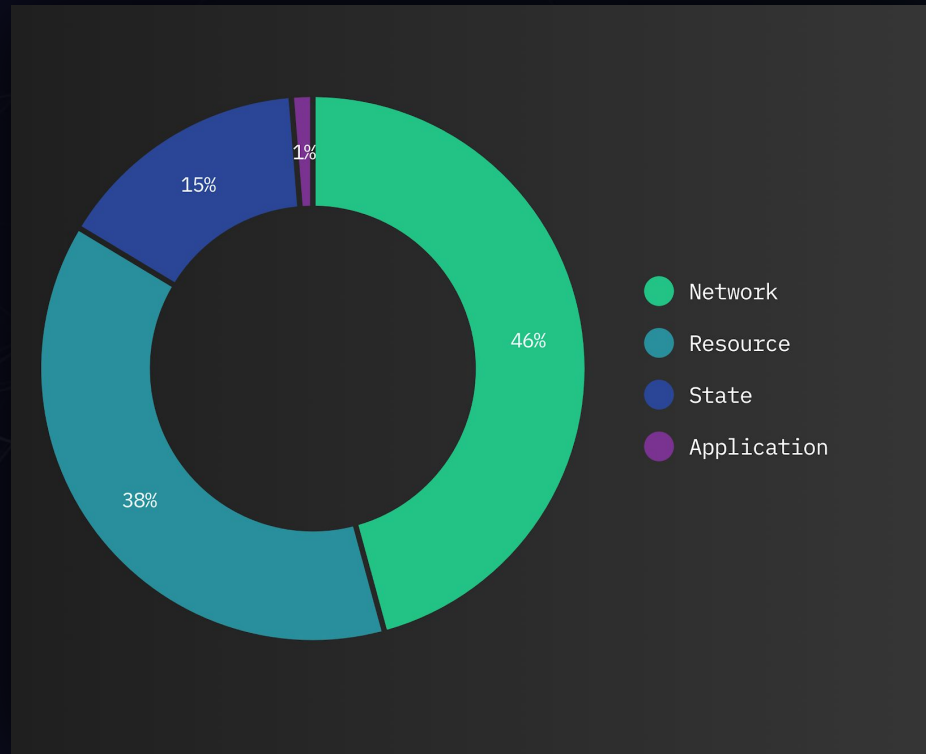
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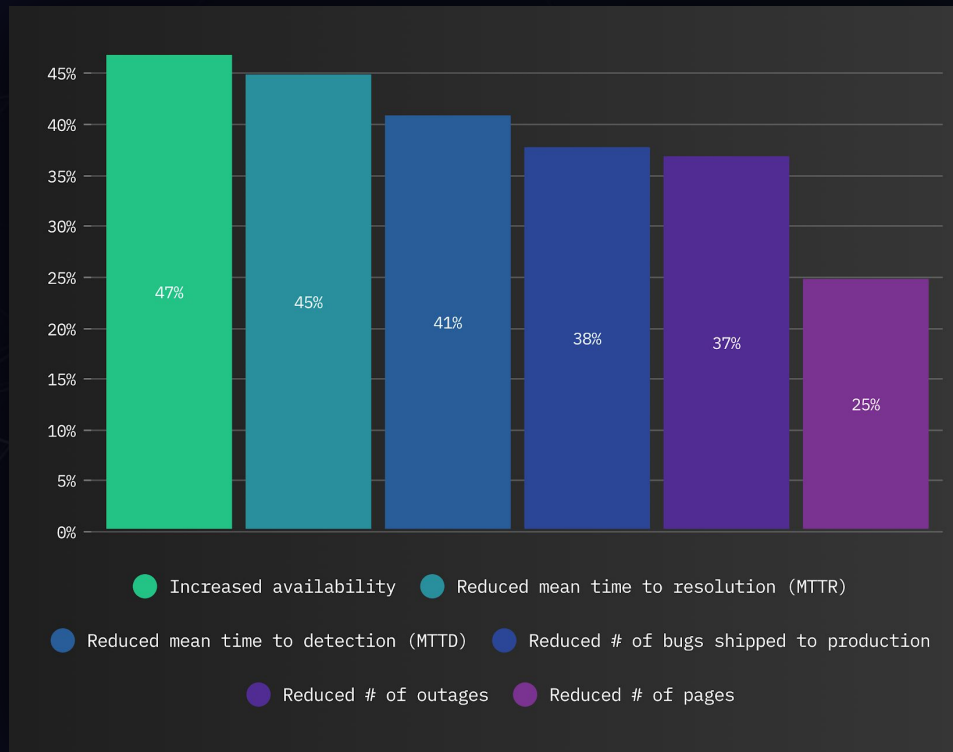# Where are they running Chaos Engineering attacks?

- ● Dev/Test
- ● Staging
- ● Production

Dev/Test: 63%
Staging: 50%
Production: 34%

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What Chaos Engineering attacks are they running?

- Network — 46%
- Resource — 38%
- State — 15%
- Application — 1%

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More results & what's next?

What results can you expect?

- 🟢 Increased availability
- 🟢 Reduced mean time to resolution (MTTR)
- 🔵 Reduced mean time to detection (MTTD)
- 🔵 Reduced # of bugs shipped to production
- 🟣 Reduced # of outages
- 🟣 Reduced # of pages

47% 45% 41% 38% 37% 25%

State of Chaos Engineering

Teams who frequently run Chaos Engineering experiments have **>99.9% availability**

23% *of teams have a mean time to resolution (MTTR) of* **under 1 hour** *&* **60% under 12 hours**

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Thank you!
Questions?

Stickers: gremlin.com/talk/SkillUp-Days
Report: gremlin.com/state-of-chaos-engineering

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