Jake Pittis
jpittis

Resiliency Testing with Toxiproxy

shopify

How do our applications behave when there are failures in production?

Too many failures.

Large code bases.

Constantly changing.

We need tools to help us reason about resiliency.

Resiliency Reasoning Tools

Resiliency Reasoning Tools

Incidents

🔥

Resiliency Reasoning Tools

Incidents

🔥

Gamedays

Resiliency Reasoning Tools

Incidents

🔥

Gamedays

Chaos
Engineering

	Authenticity
Production Incident	100%
Gameday	Mostly
Chaos Engineering	Mostly

	Authenticity	Production Impact
Production Incident	100%	High
Gameday	Mostly	Controlled
Chaos Engineering	Mostly	Controlled

	Authenticity	Production Impact	Automation
Production Incident	100%	High	Mixed
Gameday	Mostly	Controlled	Manual
Chaos Engineering	Mostly	Controlled	Automated

	Authenticity	Production Impact	Automation	Accessibility
Production Incident	100%	High	Mixed	SRE
Gameday	Mostly	Controlled	Manual	SRE
Chaos Engineering	Mostly	Controlled	Automated	Depends on Tooling

Resiliency is a product concern.

Incidents 🔥

Gamedays

Chaos Engineering

Timeline

Incidents

Gamedays

Chaos Engineering

Timeline

Incidents

Gamedays

**Chaos
Engineering**

**Random
Failures**

**Test
Hypothesis**

**Discover
Unknowns**

Gamedays

Test
Hypothesis

Resiliency Matrix

Resiliency Matrix

	Storefront	Checkout	Signup
Redis	Available	Degraded	Available
MySQL	Degraded	Down	Down
Memcached	Available	Available	Available

For a naive ecomerce application.

Gamedays

Toxiproxy

Test
Hypothesis

Toxiproxy

Application → Database
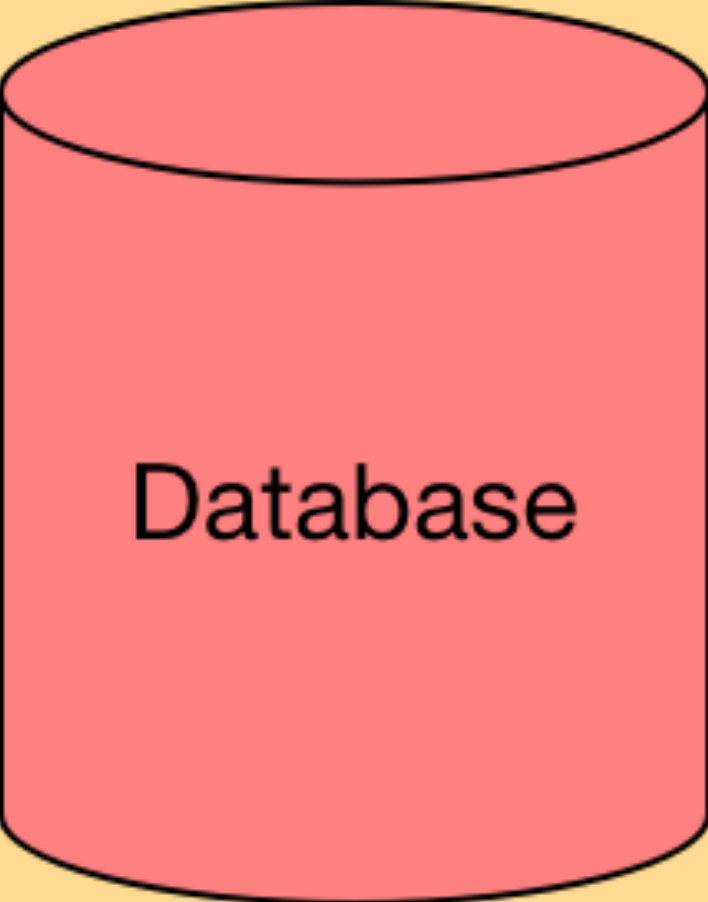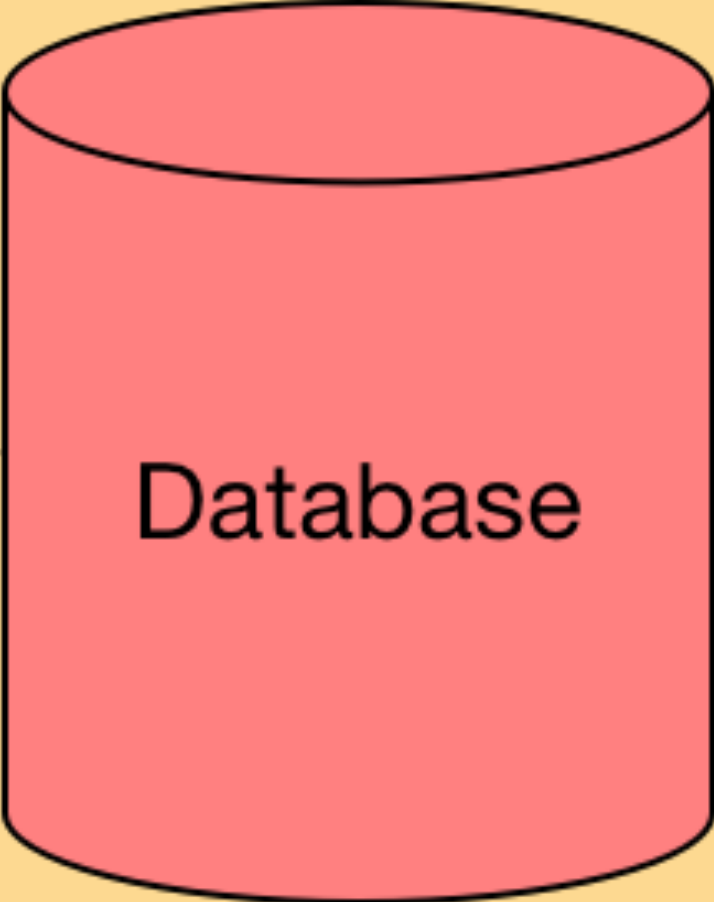
Inject many kinds of failures.

Upstream Latency of 200 ms.

Application → 🐵 → Database

Blackhole data.

Reject connections.

Hello World of Toxiproxy

```ruby
Toxiproxy['mysql'].down do
  assert mysql_query_fails
end
```

Resiliency Matrix

	Storefront	Checkout	Signup
Redis	Available	Degraded	Available
MySQL	Degraded	Down	Down
Memcached	Available	Available	Available

	Storefront	Checkout	Signup
Redis	Available	Degraded	Available
MySQL	Degraded	Down	Down
Memcached	Available	Available	Available

	Storefront	Checkout	Signup
Proxy 1	Available	Degraded	Available
Proxy 2	Degraded	Down	Down
Proxy 3	Available	Available	Available

	Storefront	Checkout	Signup
Proxy 1	Test	Test	Test
Proxy 2	Test	Test	Test
Proxy 3	Test	Test	Test

A few hundred tests.

Boot Example

```
Toxiproxy[/.*/].down do
  assert application_can_boot
end
```

Readonly Example

```
Toxiproxy['mysql_writer'].down do
  get '/'
  assert_response :ok
end
```
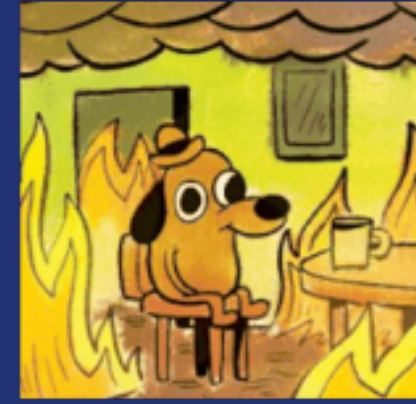
	Authenticity	Production Impact	Automation	Accessibility
Production Incident	100%	High	Mixed	SRE
Gameday	Mostly	Controlled	Manual	SRE
Chaos Engineering	Mostly	Controlled	Automated	Depends on Tooling

	Authenticity	Production Impact	Automation	Accessibility
Production Incident	100%	High	Mixed	SRE
Gameday	Mostly	Controlled	Manual	SRE
Chaos Engineering	Mostly	Controlled	Automated	Depends on Tooling
Toxiproxy	Limited	None	Write Once	All Developers

Resiliency Matrix

	Storefront	Checkout	Signup
Redis	Available	Degraded	Available
MySQL	Degraded	Down	Down
Memcached	Available	Available	Available

Jake Pittis
jpittis

Read the README
github.com/Shopify/toxiproxy

Client Libraries for
Ruby, Go, Python, .net, php, node and Java
(Or write your own!)

shopify