

NETFLIX

Fail

238.029	+2
	+3
	+4
	+5
	+6
92	
2-8-18-32-21-9-2	

 re as
a

78.96	-2
	+1
	+2
	+4
	+6
34	
2-8-18-5	

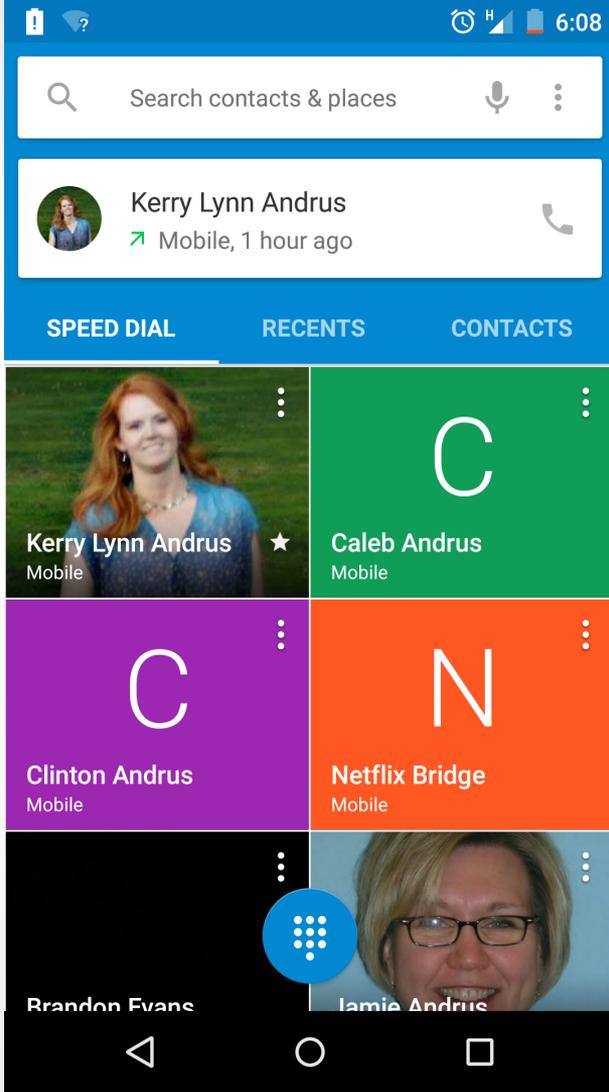
 Service

Kolton Andrus (@deelyle)

Overview

1. Why is Failure Testing Important?
2. How did we build Failure as a Service?
3. How has this made our systems more resilient?

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Why Failure Testing?

1. Makes our systems immune to failure
2. Prevents larger outages
3. Production verification is requisite



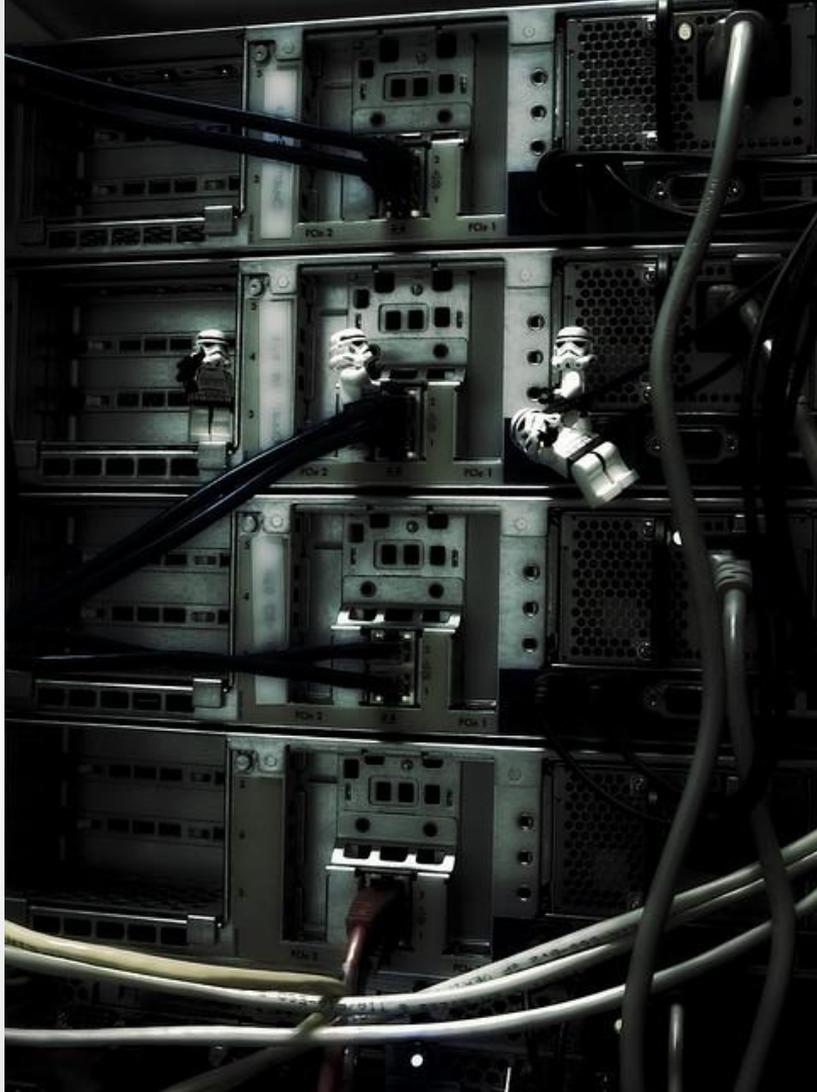
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Failure testing is a form of Hormesis -
we imbibe the poison to become
immune.

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Validating that our defenses will work when called upon - by exercising them at scale in production.

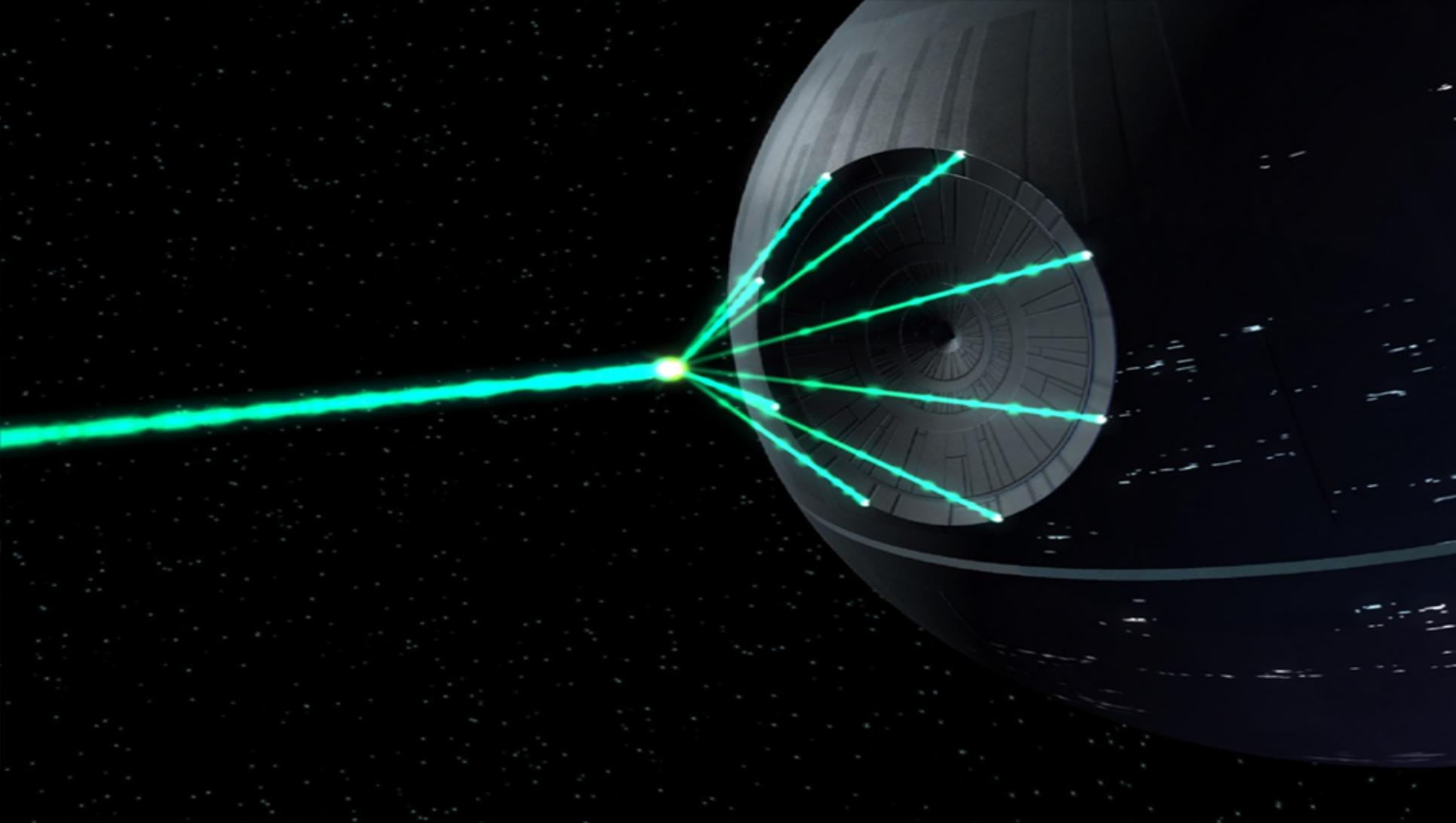
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Building Failure as a Service



FIT - Failure Injection Testing

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What about the monkeys?



The 5 W's

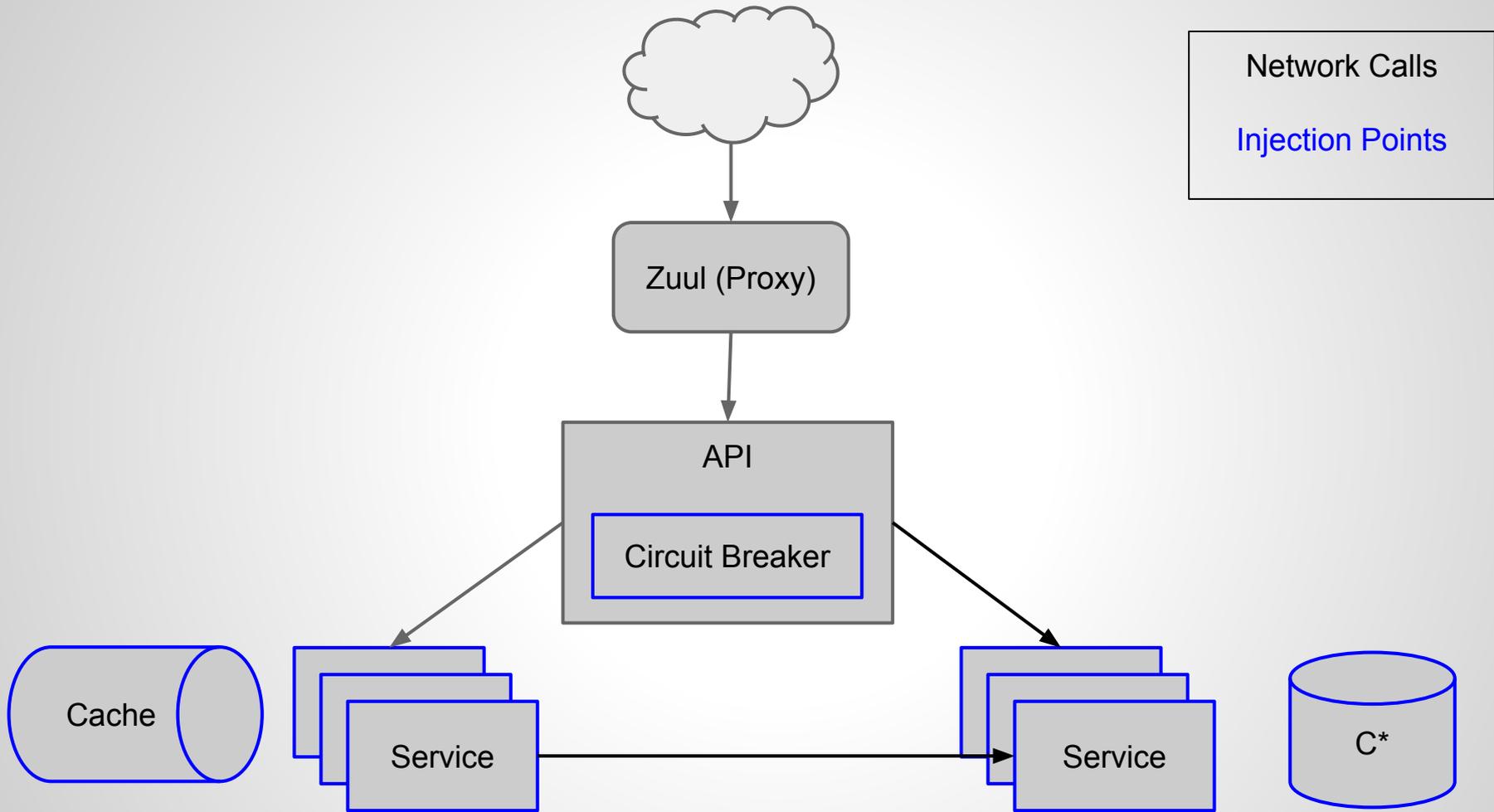
1. Why
2. Who - Failure Scope
3. Where - Injection Point
4. What - Injected Failure
5. When - Ad-hoc & Automated



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```
public boolean doFIT() {
    final FitContext fitContext = new FitContextImpl();
    if(fitContext.shouldInjectFailure(injectionPoint)) {
        final InjectedFailure failure = fitContext.retrieveFromContext(injectionPoint);
        int delay = failure.getDelay() == null ? 0 : failure.getDelay().intValue();
        final int timeout = _readTimeout.get().intValue();

        if( delay > 0){
            try {
                if(log.isDebugEnabled()) log.debug("App : " + _appName + "; zone : " + _zone + "; Injected FIT Delay");
                Thread.sleep(Math.min(delay, timeout));
            } catch (InterruptedException e) {
                Thread.currentThread().interrupt();
            }

            if (delay >= timeout) return true;
        }

        if( failure.shouldFail() ){
            if(log.isDebugEnabled()) log.debug("App : " + _appName + "; zone : " + _zone + "; Injected FIT failure");
            return true;
        }
    }
    return false;
}
```

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“Knowing how the system behaves in the face of failure is invaluable - our assumptions are often incomplete”

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Injection Testing

For a general overview of FIT.

Designed to cause failure in production, use it wisely!

Trace



Trace a customer or device

Fail

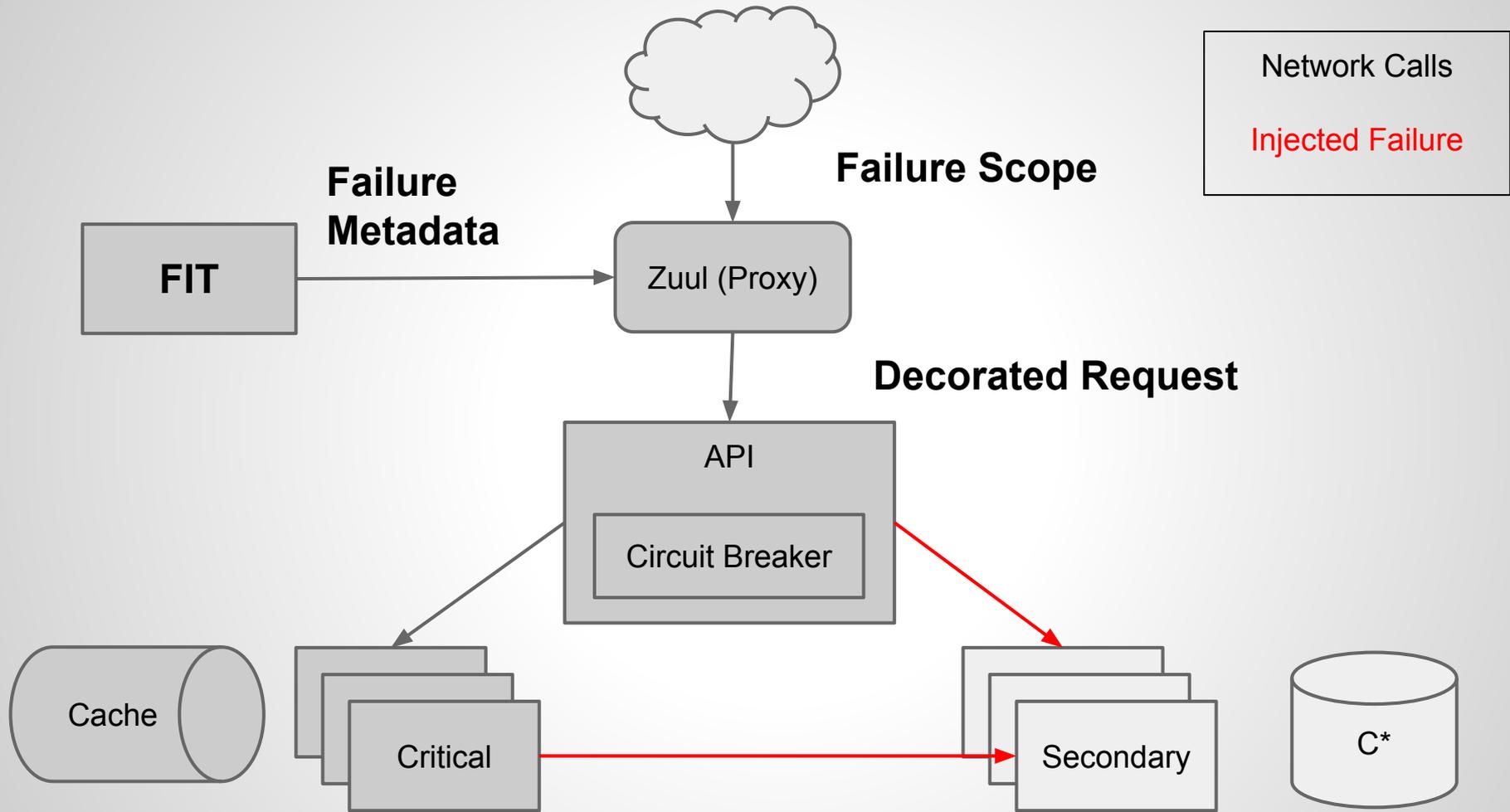


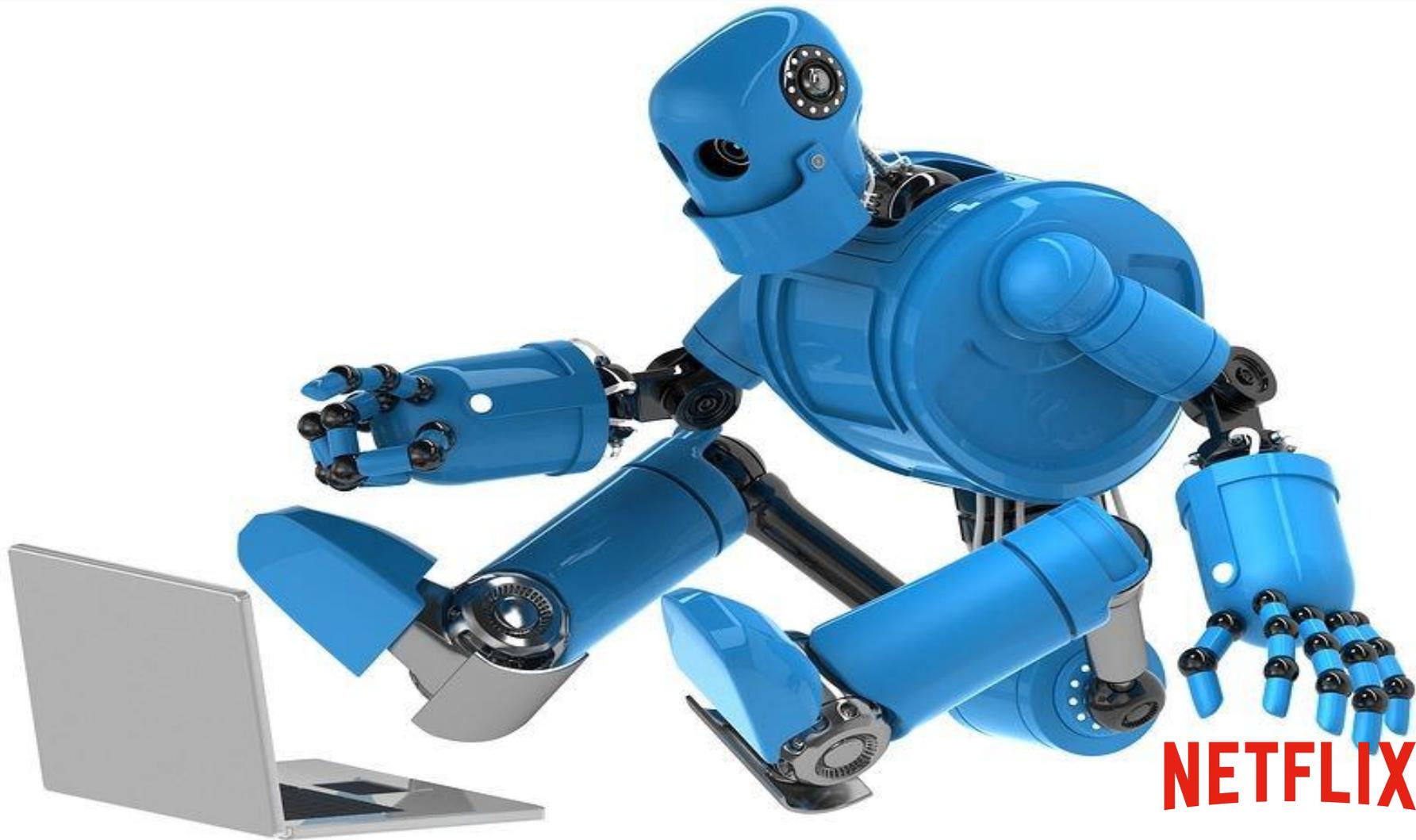
Inject Failure

Sessions



See all active failures





Great, does it work?

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Unable to connect to Netflix. Please try again or
visit:

www.netflix.com/tvhelp

Try Again

Exit

ui-200

✕

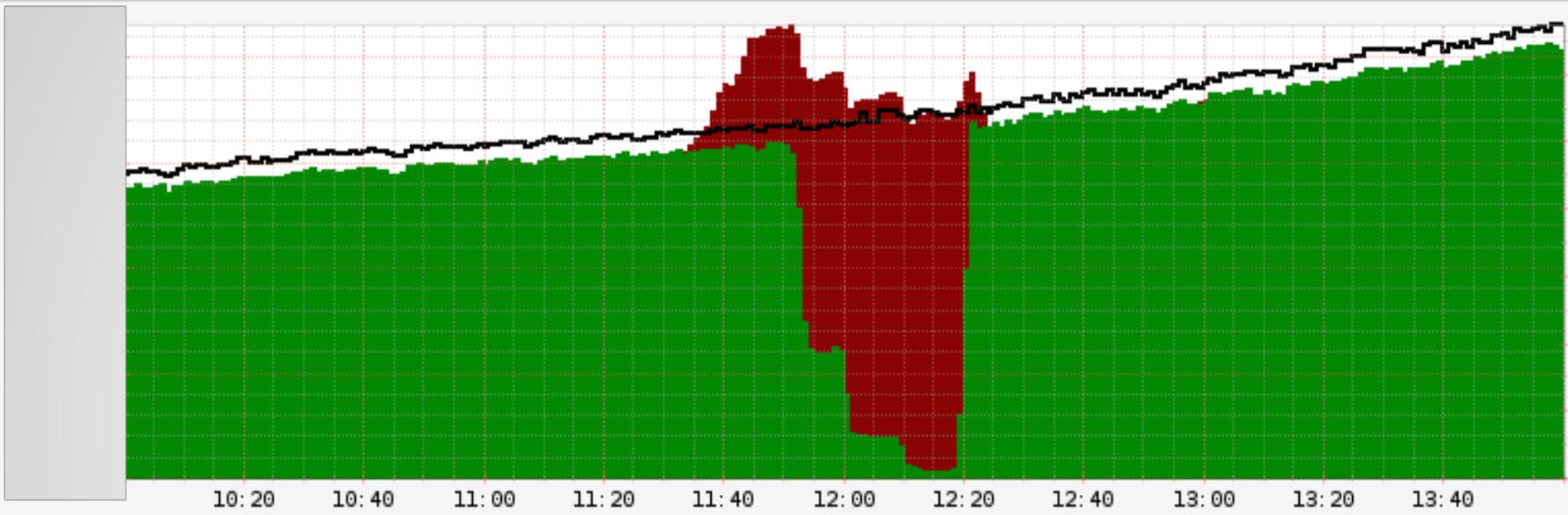
Marvel's Daredevil



★★★★★

Haven't Seen It

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■ CdnSelection Success

■ CdnSelection Fallback

■ SPS

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Aggressive failure testing creates not just robust programs, but an antifragile programming culture.

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Take Aways

1. Failure Testing is a worthwhile investment
2. Testing in Production is sustainable
3. It can harden your systems against failure

Resources

- [Netflix Techblog - FIT](#)
- [“On Designing and Deploying Internet-Scale Services”](#) - James Hamilton
- [Drift into Failure](#) - Sidney Dekker
- [Antifragile](#) - Nassim Nicholas Taleb

Photo Credits

- Nuclear Blast - Mark Waldrep
- [Forest Fire](#)
- [Poison](#)
- [Needle](#)
- [Explosion](#)
- [Robot](#)

Demo Slides

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Failure Injection Testing

Visit [go/fit](#) for a general overview of FIT.

This tool is built to cause failure in production, use it wisely!

Trace



Trace a customer or device

Fail



Inject Failure

Sessions



See all active failures

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Browse

Personalize

KIDS

Search



Kolton



2013 12 149 minutes

In this reboot of the 1950s TV series, Native American warrior Tonto and lawman John Reid form a contentious partnership to clean up the Old West. [More info](#)

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New Session

Injection Mode

Failure Scope

Device

Customer

Cluster

App

Region

Scenario

Scenario

Impact

Who will this failure impact?

Combine these attributes to impact only the customers you intend.

Target an individual customer or device. Limit the impact to a specific region, app or cluster.

Where will the failure be injected?

How will it fail?

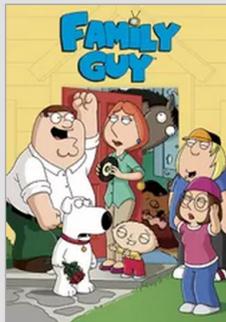
Fail will cause this layer to throw an exception or return an error.

Sessions

Failures are being actively injected for these sessions. [Create a session](#) to begin an attack or trace.

Failure Scope	Scenario	Impact
 NFDEV-MGK-000008003  <input type="text"/>	simone_zuul_api	   
 LGTV20151=11001466328  <input type="text"/>	simone_zuul_api	   
 <input type="text"/>	map_all	   
 NFANDROID1-LGE==NEXUS=5S-C0EAE23CD6099FA645B075AE1FFB25052EC0734E4EE200ED56EE7758CD107369	blue	   
 <input type="text"/>	subscriber	   
 <input type="text"/>	blue	   

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Comedies

