



Microservices, Service Mesh, and CI/CD Pipelines - Making it All Work Together

Brian Redmond, Microsoft



Who am I?

Brian Redmond

- Cloud Architect @ Microsoft (17 years)
- Azure Global Black Belt Team
- Live in Pittsburgh, PA, USA
- Avid marathon runner and outdoors enthusiast
- World traveler



DO WHAT IS
GREAT.

LOVE



Microservices

The answer to all problems.



Containers

The answer to all problems.



Kubernetes

The answer to all problems.









I DON'T ALWAYS TEST MY CODE

**BUT WHEN I DO, I DO IT IN
PRODUCTION**



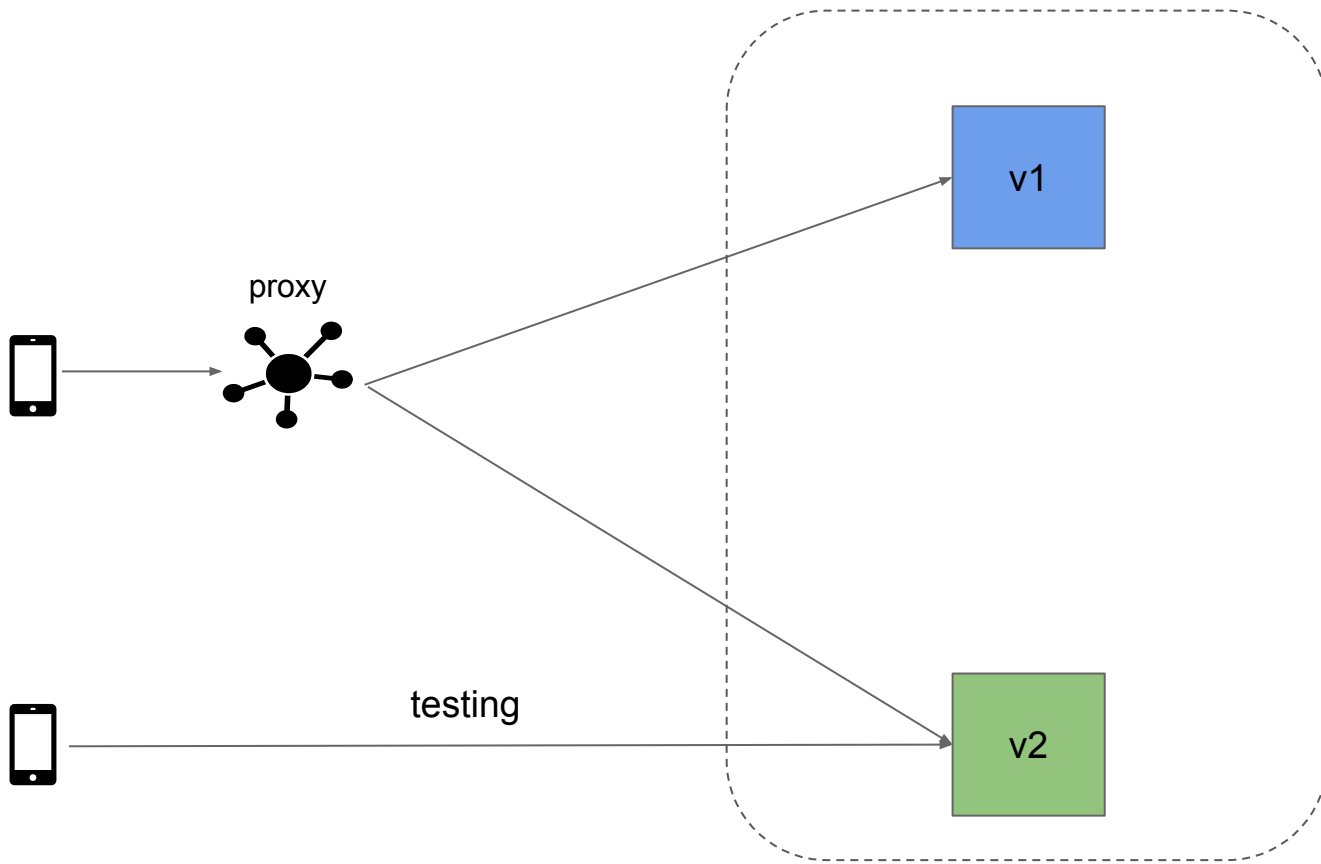
**KEEP
CALM
AND
CROSS YOUR
FINGERS**



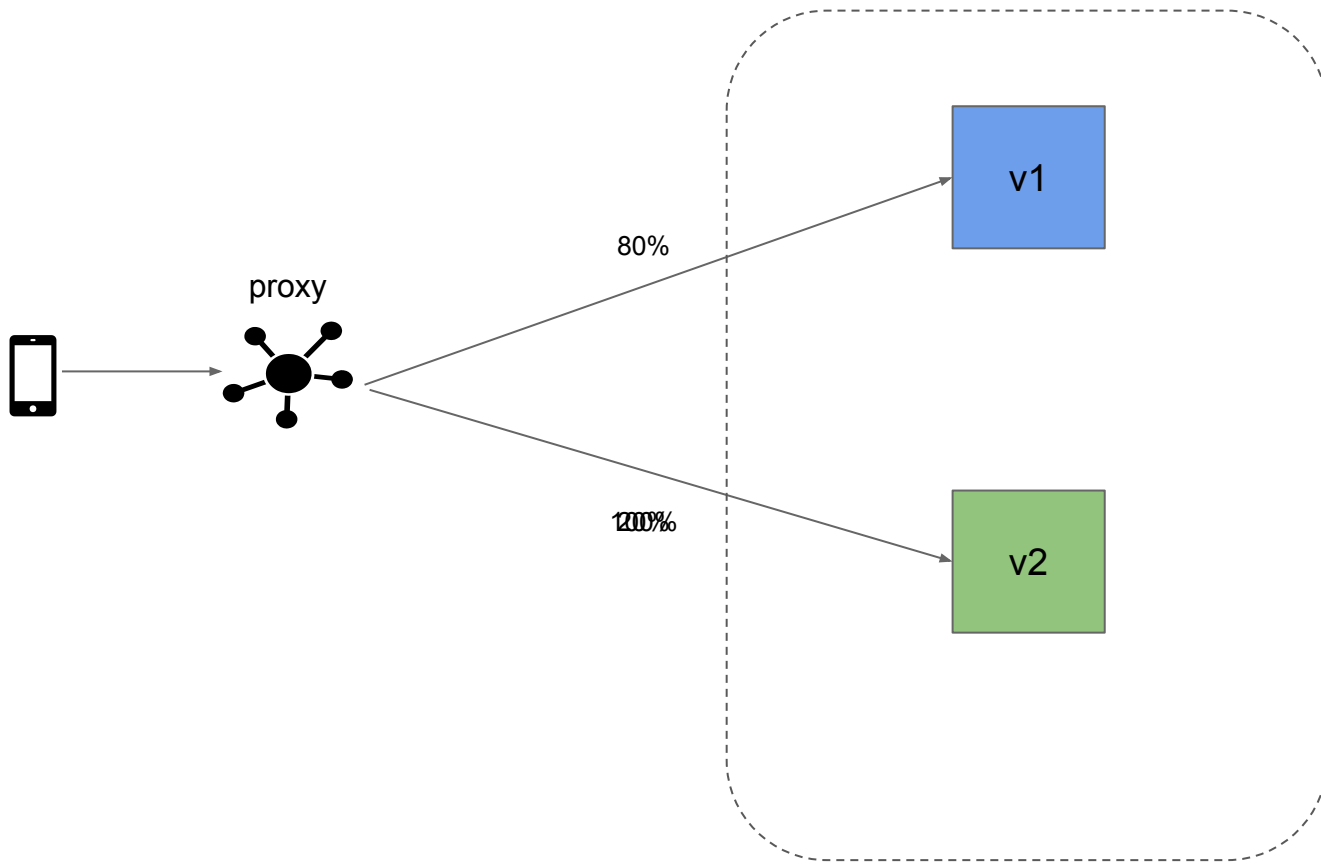
Deployment Strategies

- Container Native Development
- Continuous Integration
- Continuous Deployment
- Blue/Green testing
- Canary testing
- A/B testing

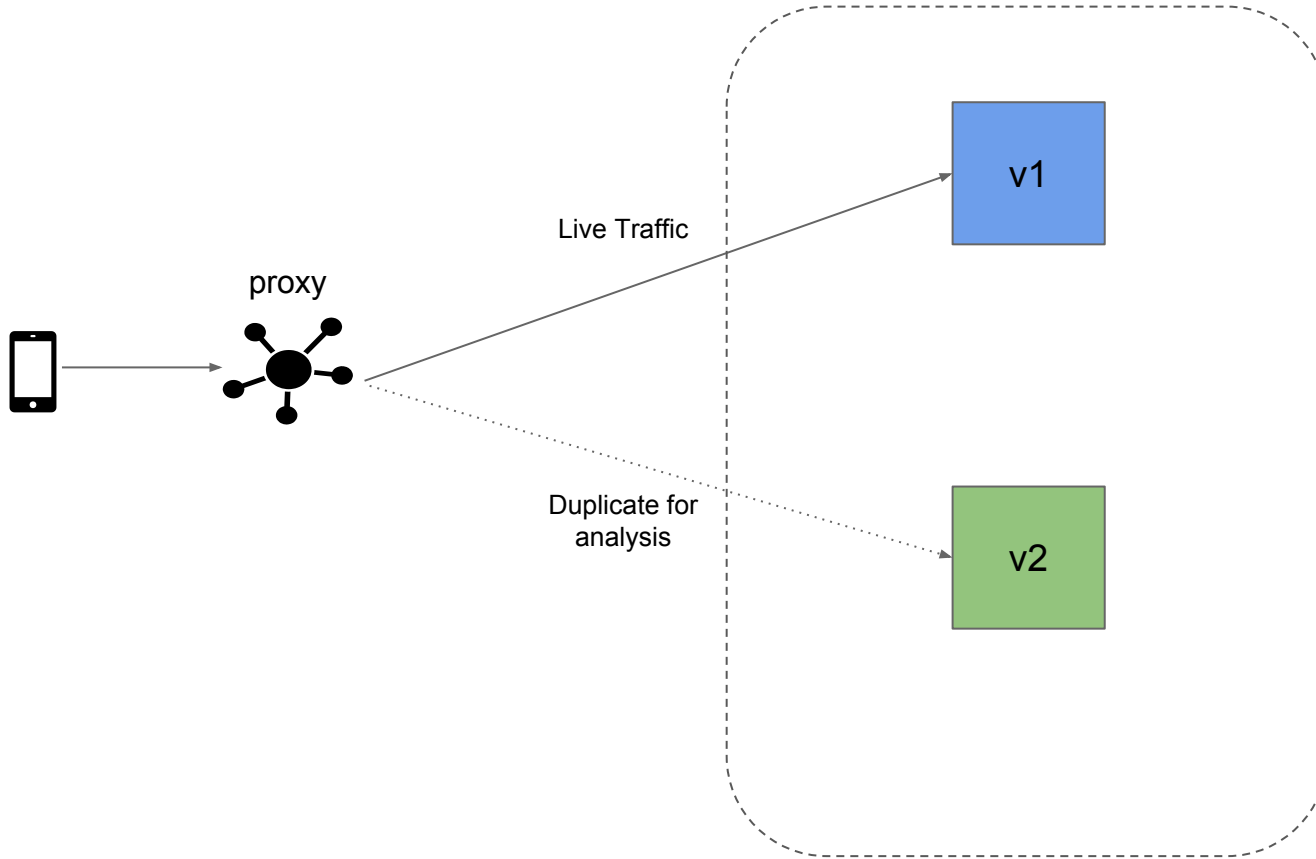
Blue / Green Testing



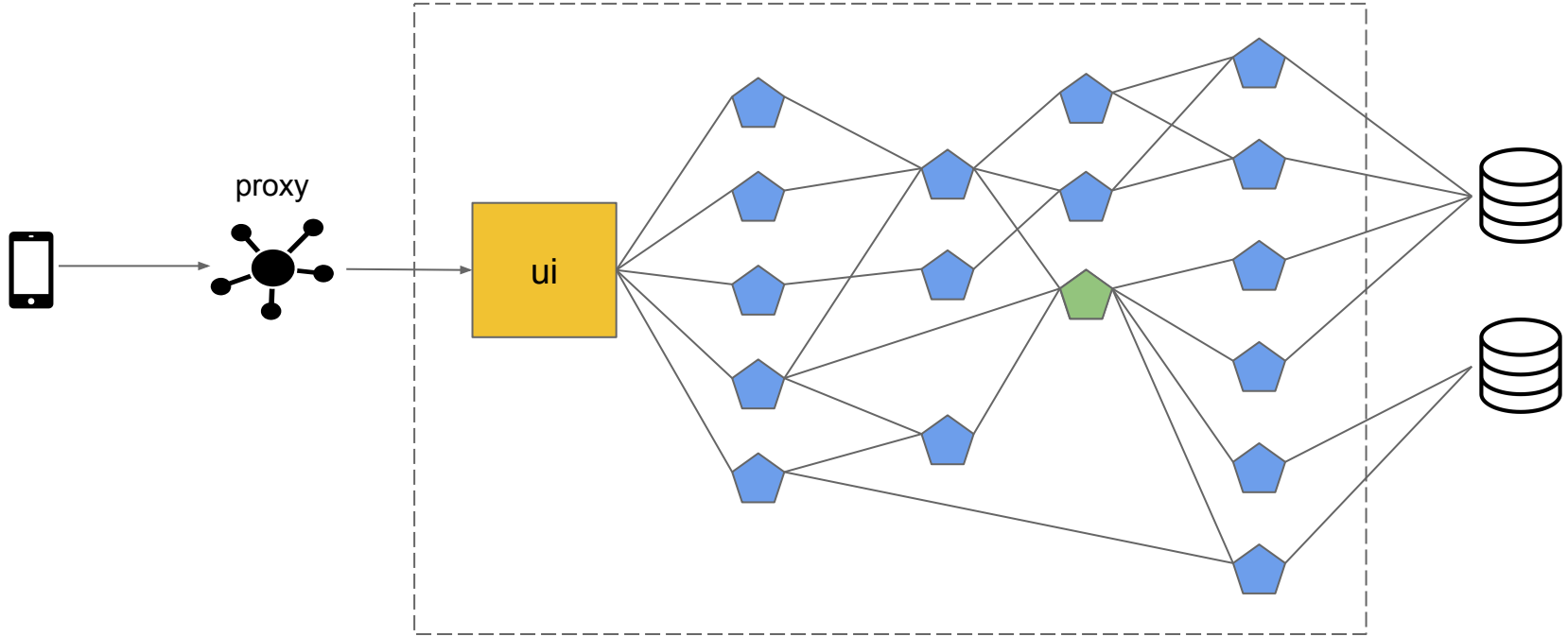
Canary Testing



A / B Testing



Microservices Deployment



What's
missing?





advanced routing



observability

chaos testing

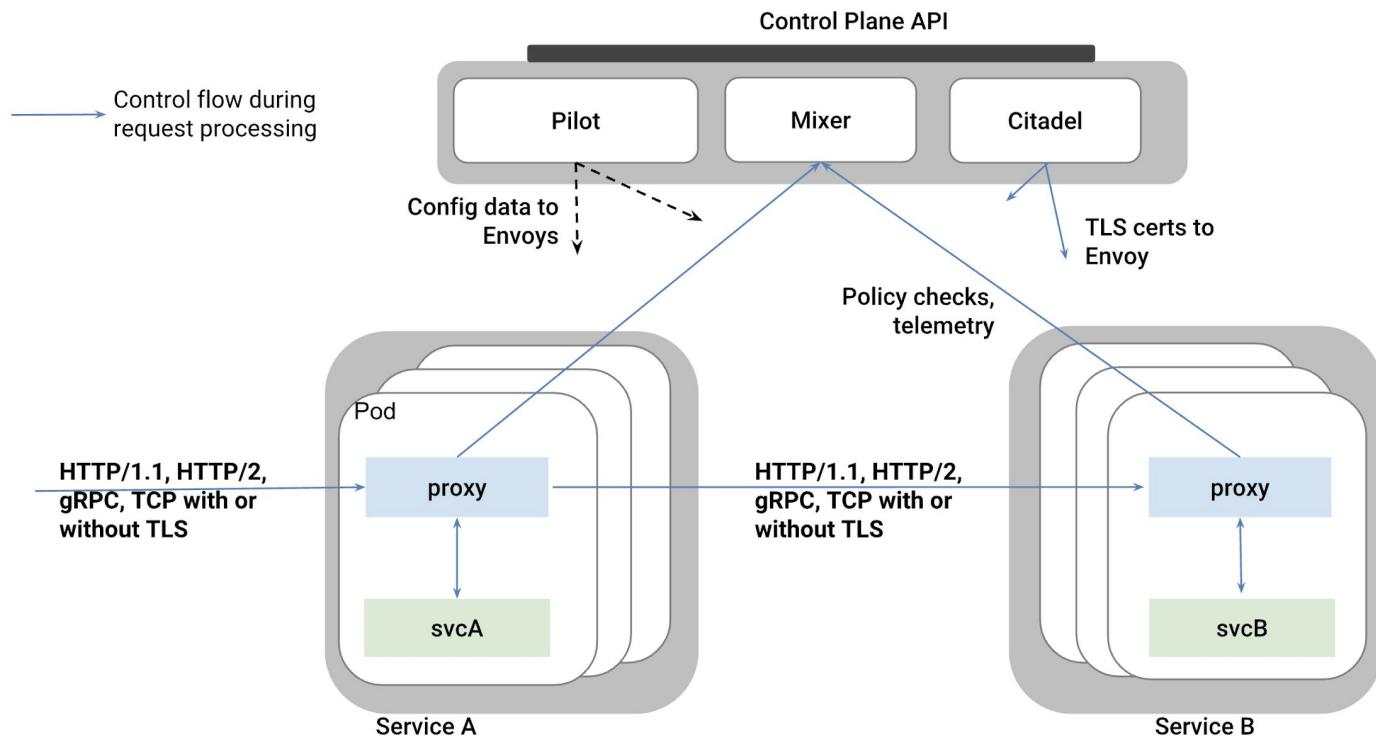


Enter Istio

- Service discovery and routing
- Health checking
- Observability
- Authentication and authorization
- Resiliency
- Policy enforcement



Istio



What can I do with Istio?

advanced routing → route rules, traffic shaping

observability → metrics, logs, and tracing

chaos testing → fault injection (delays, faults)

what about a
C/C++ tool?

I SEE YOU'RE CREATING A PIPELINE



LET ME HELP YOU WITH THAT

Brigade

brigade = event-driven scripting for kubernetes

- Encapsulate functions in containers
- Run in parallel or serial
- Trigger workflow from Github, Docker registry, etc.
- Javascript (pipeline as code)
- Project config stored as secrets
- Well suited for CI/CD pipelines

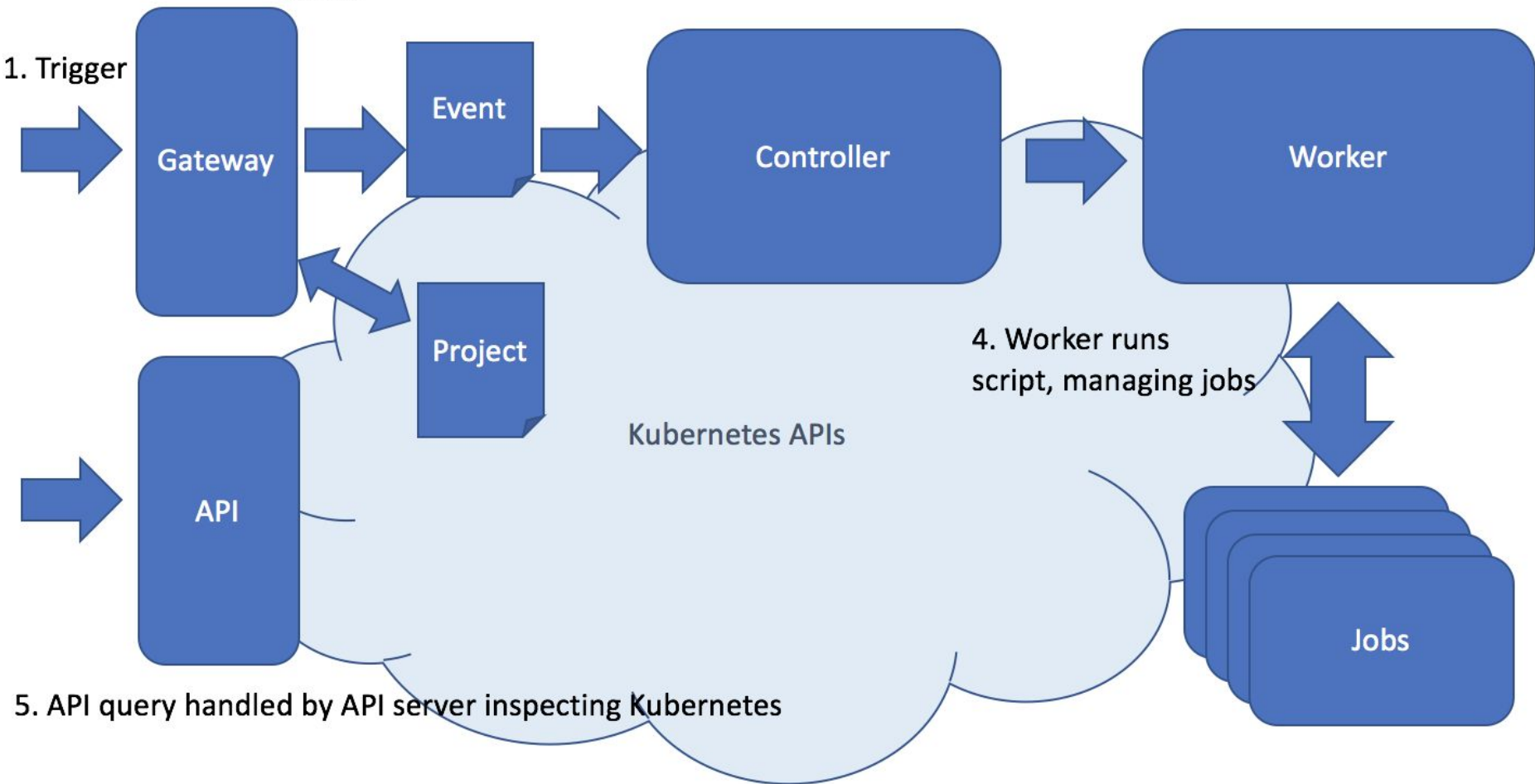


2. GW loads project, creates event.

3. Controller reads event, creates worker

4. Worker runs script, managing jobs

5. API query handled by API server inspecting Kubernetes



Demo time!

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21 ^@^@^@è
22 H<8d>55~
23 ^@^@^@10
24 ^@^@^@è
25 -&^@H<8b>
26 (&^@H<8b>
27 Ç^E<90>^
28 Ç^E]^A/^@^A^@^@^@<80>=w^H/^@^@t^G<80>^M¶ i &^@^Aö^E<86>g .^@^AtCH<8b>^Eu8 .^@H<85>
29 ^C^@l ^A^@^@^@è (i^D^@H<8d>=})+ .^@z ^@^B^@^@è <97>M^@^@H<8d>=$ò .^@z <80>^@^@^@è A
30 ^@^@l ^B^@^@^@è l f^D^@H<8d>5w^H^@^@l ^C^@^@^@è -f^D^@H<8d>53^l^@^@l ^l^@^@^@è <8b>
```

CATASTROPHIC ERROR

User attempted to use program in the manner
program was meant to be used.

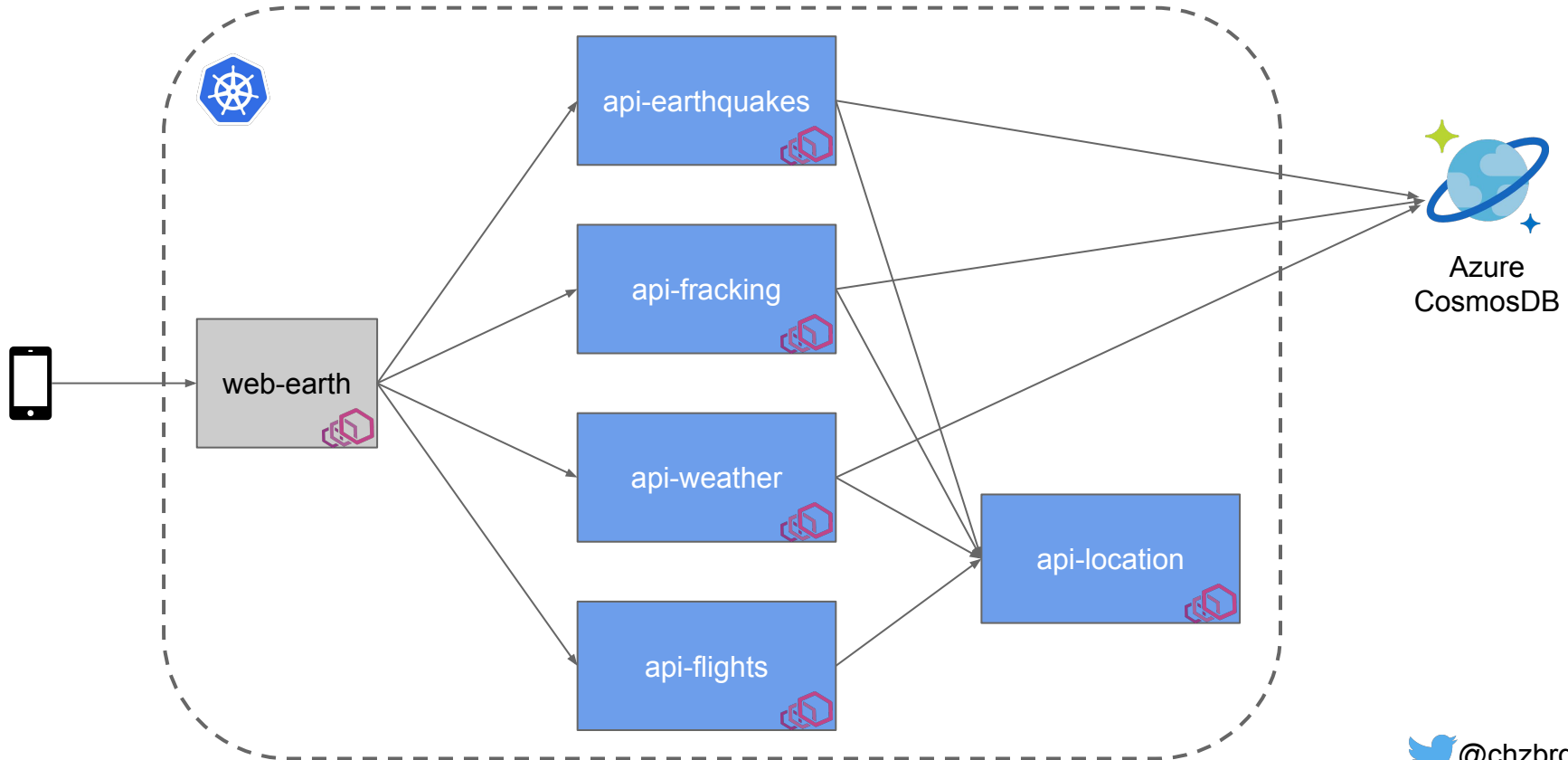
Options:

- 1) Erase computer
- 2) Weep

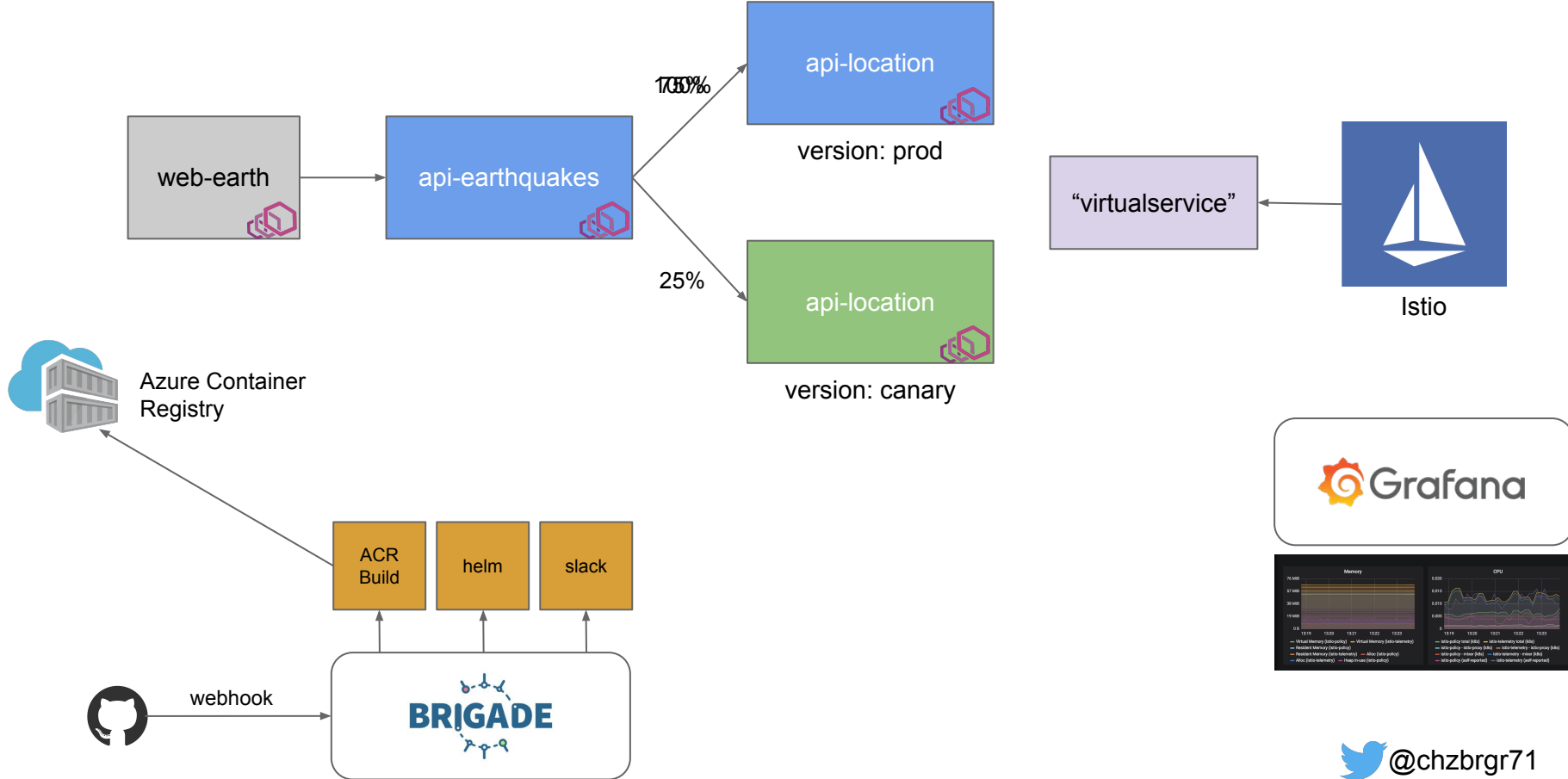
```
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Demo App Architecture

Azure Kubernetes Service



Demo - What you will see





PADOVA MARATHON

42,195

21,221

5253

21,097

Polaroid

UniCredit

ASSINDUSTRIA
SPORT PADOVA

La Nuova
Provincia di Padova

Comune
di Padova

Polaroid

UniCredit

ASSINDUSTRIA
SPORT PADOVA

La Nuova
Provincia di Padova

NIKE RUNNING

POLIZIA

Summary

- Microservices and containers bring added challenges for deployment/testing
- Testing in production is a good idea (with canary)
- Service Mesh solutions help with:
 - Observability
 - Advanced Routing
 - Chaos Testing
- CI/CD can automate the process

Questions?

you can find me at:

- Twitter, Github: @chzbrgr71
- brian.redmond@microsoft.com
- Demo code: <https://github.com/chzbrgr71/os-summit-tokyo>



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