Satellite INDIA 2021

Resilience testing with GitHub Actions & LitmusChaos

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CEO

CHAOS NATIVE

Litmus (a CNCF Project)

Technology architect

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Entrepreneur in storage (CloudByte)

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Cloud Native Data (OpenEBS and MayaData)

↓

Cloud Native Chaos (LitmusChaos)

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Resilience for cloud native enterprises
(ChaosCarnival & ChaosNative)

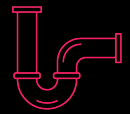
Agenda

- Cloud Native Developers - The new arena
- Chaos Engineering
- Cloud Native Chaos Engineering
- Litmus overview
- GitHub Actions and Chaos in CI pipelines
- GitHub Actions in Action
- Q&A

CloudNative Developers

All about microservices

Microservices updates are coming faster than before



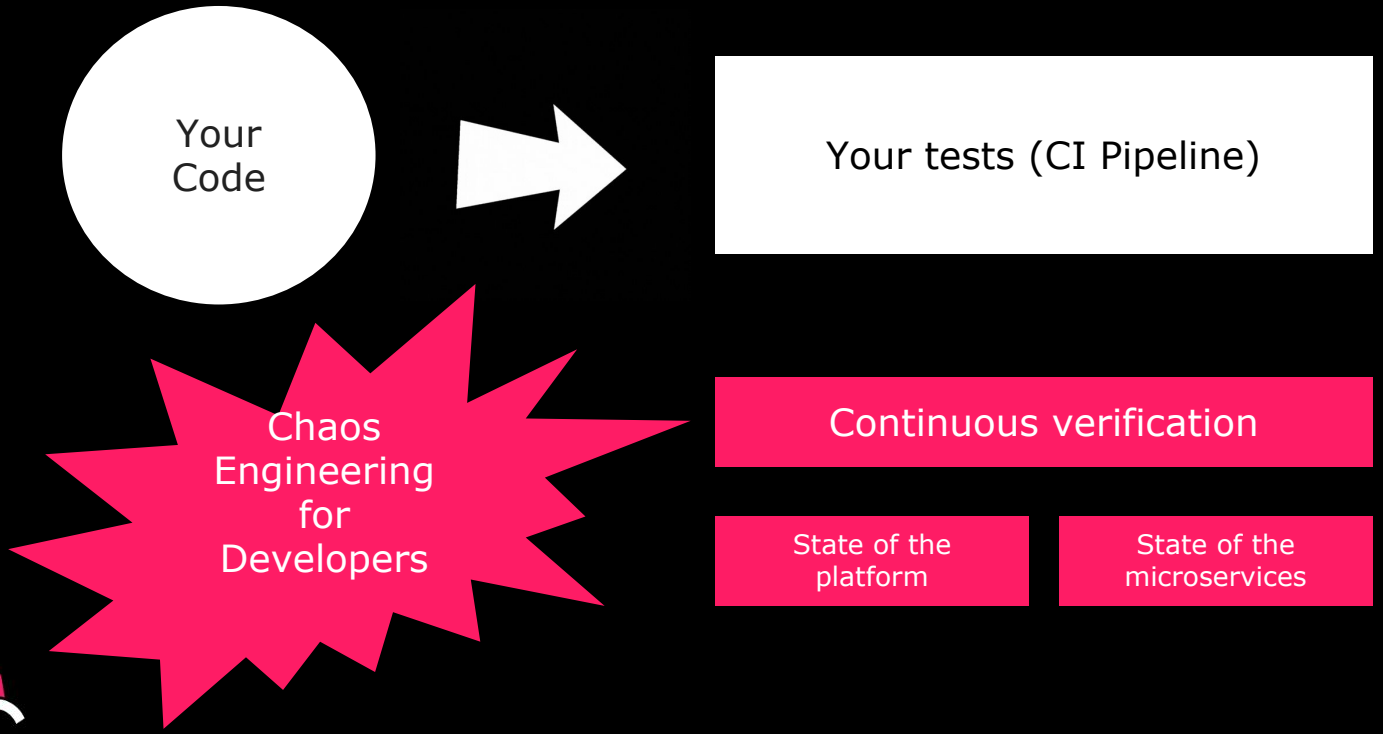
Pipelines are becoming longer and complex

Developers need a way to suggest the underlying stack is behaving well

- I want to concentrate on my code and my tests
- At the same time, I want to make sure that my code is tested for faults in the dependencies

Chaos Engineering for Developers ?

Chaos Engineering for Developers ?



Chaos Engineering

DOWNTIMES ARE EXPENSIVE

Feedback loop can be activated by proactive testing in production

Test

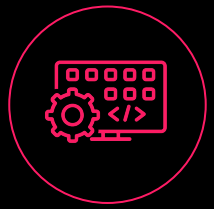
Don’t wait

State of Chaos Engineering... till recently

- Standard practices exist
- Limited to experts & enthusiasts
- Large deployments
- For those who burnt their hands, resolution is Chaos Engineering

How is it done typically?

Game Days



Rarely integrated into CI or CD system

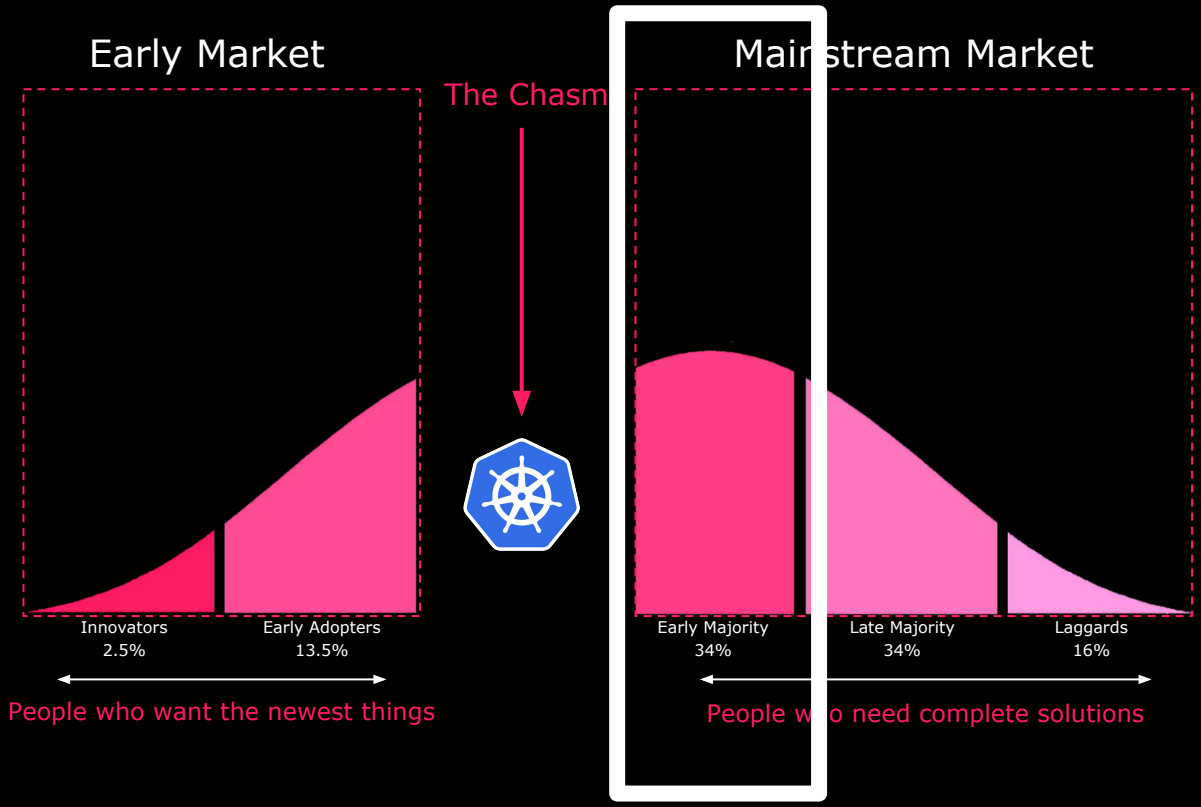
Only the SREs. Developers do not engage in Chaos Engineering

Manual Planning & Execution

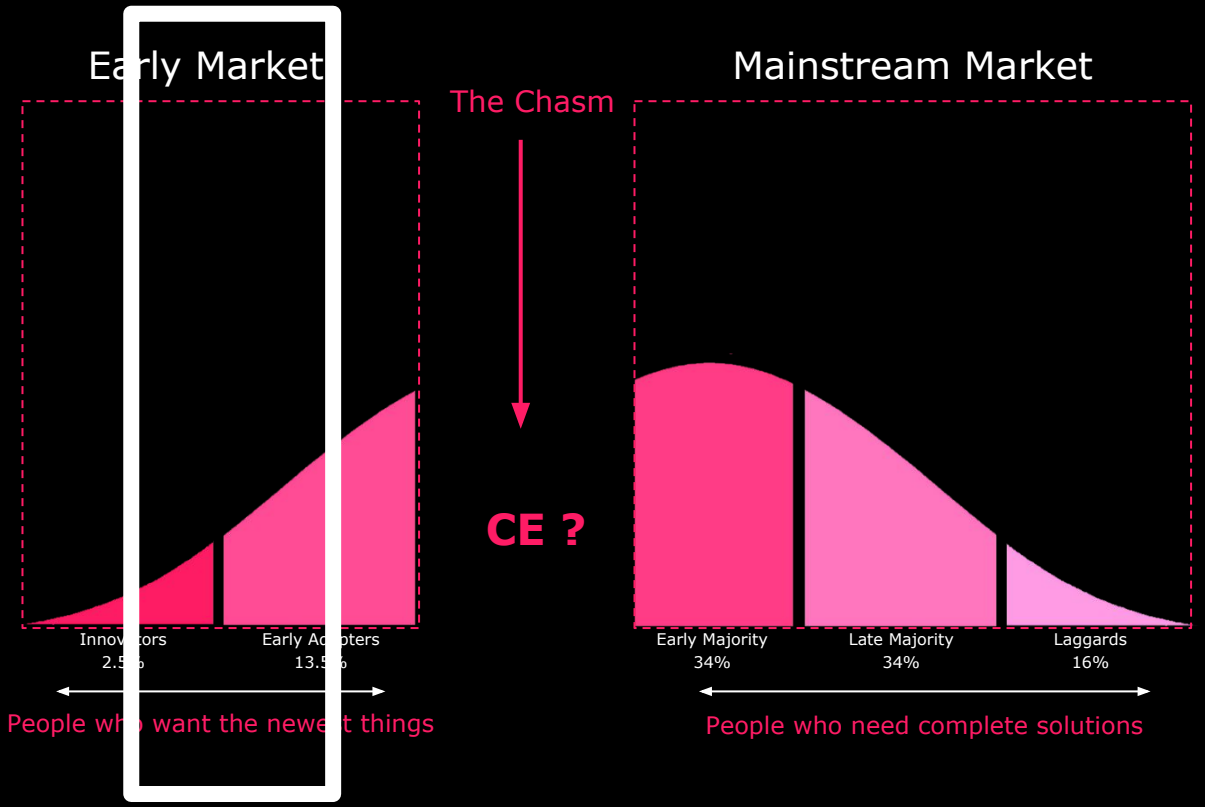
Chaos observability is not a commodity, it is a custom built stack at each enterprise

Custom measurement process for management to see any results on increase in reliability

Crossing the Chasm - Cloud Native

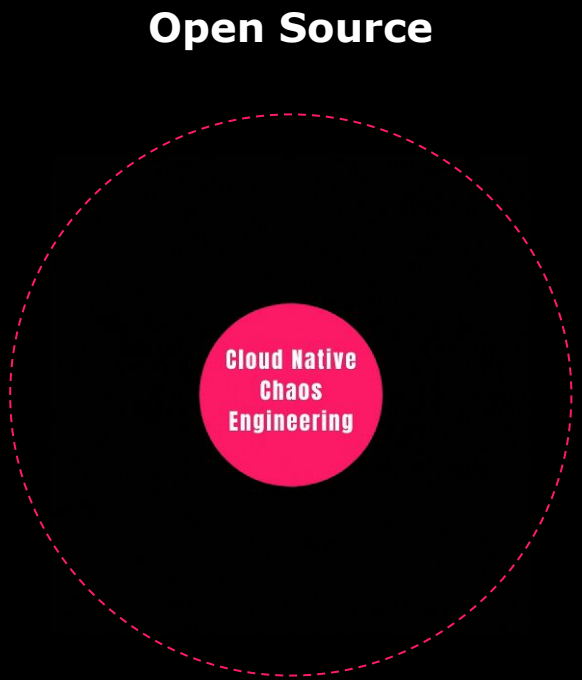


Crossing the Chasm -
Chaos Engineering in Cloud Native?



Cloud Native
Chaos Engineering

Principles of Cloud Native Chaos Engineering



Litmus is built for modern Chaos Engineering

Open Source

Open
Observability

Community
Collaboration

GitOps

Open API and lifecycle
management

LitmusChaos project overview

Litmus is an open source toolset for practicing highly scalable chaos engineering practices in cloud native environments.

48 Chaos Experiments
200,000+ Experiment runs
40,000 + installations

1500+ GitHub stars
500+ Slack members

Project status

CNCF Sandbox; Applied for Incubation (June 2021)

Maintainers

ChaosNative, Amazon, Intuit

Other Notable Contributors

Intuit (116), RingCentral (108), Deutsche Telecom (72), Full Stack (66), RedHat (66), Microsoft (34), Ericsson (31), Amadeus (27), HSBC (26) and more

Contrib count = A combination of pr/review/issues

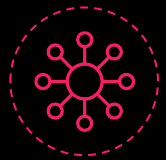
Litmus use cases

1. In CD pipelines as a test gate for CD or post action of CD
2. Automated and randomized testing in staging and prod environments using GitOps
3. In CI pipelines for developers - introduce chaos stage to test against failures early

Litmus is a cross cloud multi-tenant Chaos Engineering platform

Litmus components

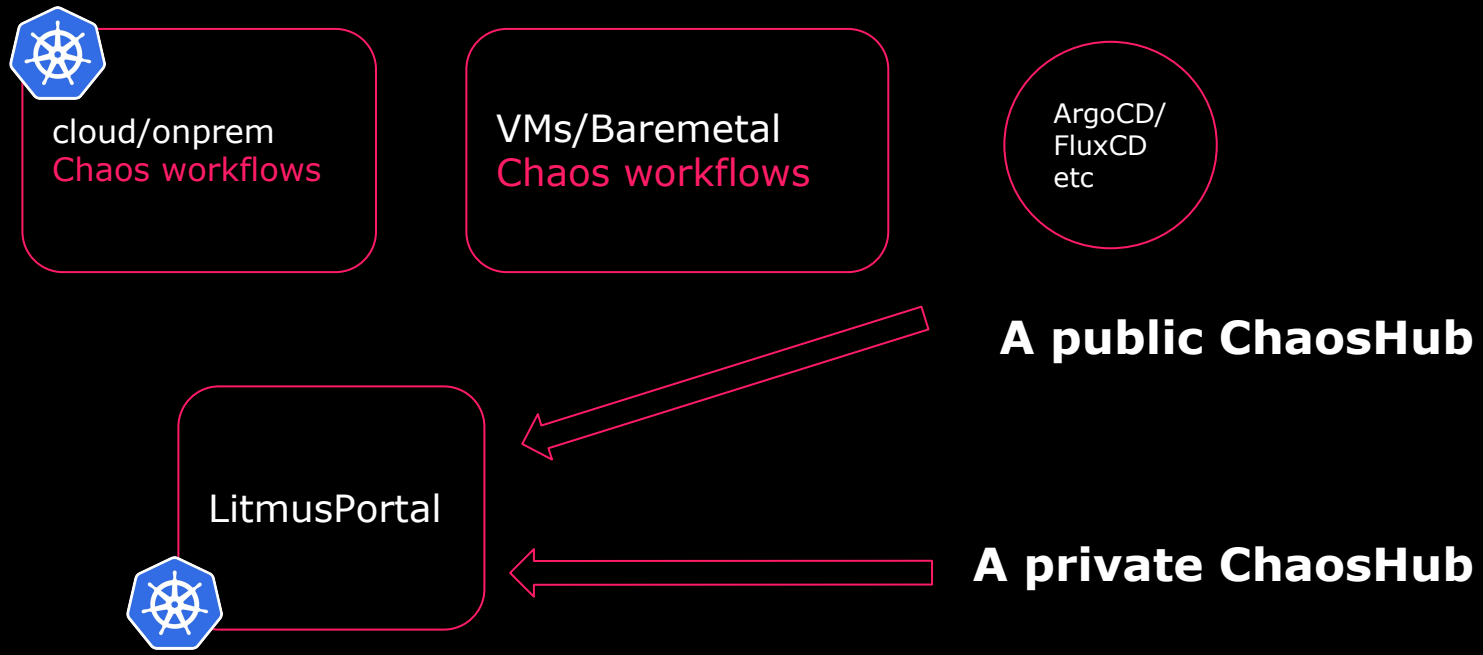
A helm chart



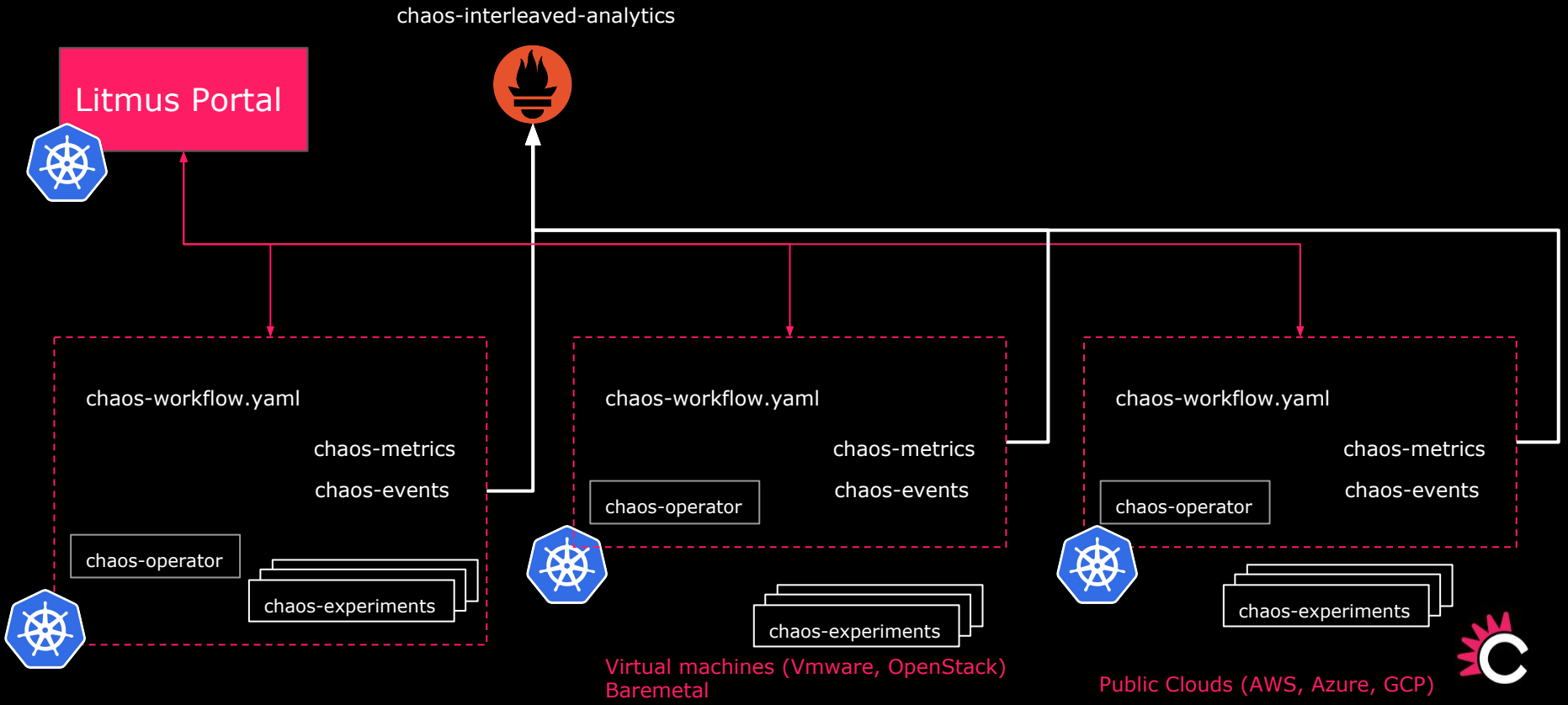
A public ChaosHub

A private ChaosHub

Litmus after you set it up



Litmus in a nutshell



Litmus and Argo Workflow

LitmusChaos workflow

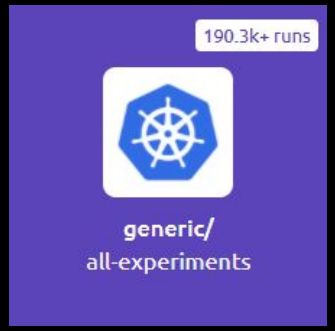
Argo workflow

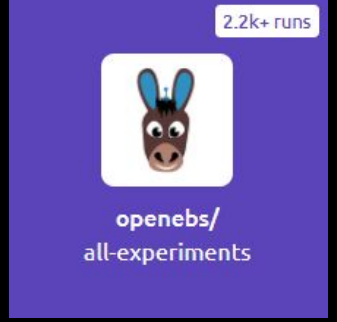
Consolidate status & results

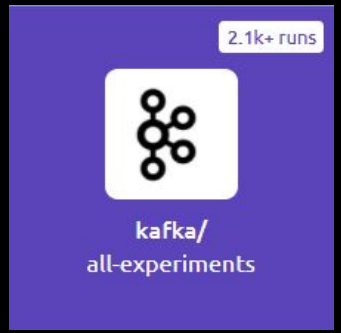
Litmus Experiments

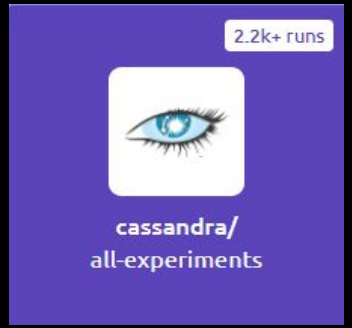
Experiments list

Pod Chaos	Node Chaos	Network Chaos	Stress Chaos	Cloud Services	Application Chaos
Pod Failure Container Kill Pod Autoscale	Node Drain Forced Eviction (Node Taints) Node Restart/PowerOff	Network Latency Packet Loss Network Corruption, Duplication	Pod, Node CPU Hog Pod, Node Memory Hog Pod, Node Disk Stress Pod Ephemeral Storage Fill	AWS EKS EC2 Termination AWS EBS Disk Detach GCP GPD Disk Detach	Kafka Leader Broker Failure Cassandra Ring Disruption OpenEBS Control Plane / Volume Failure

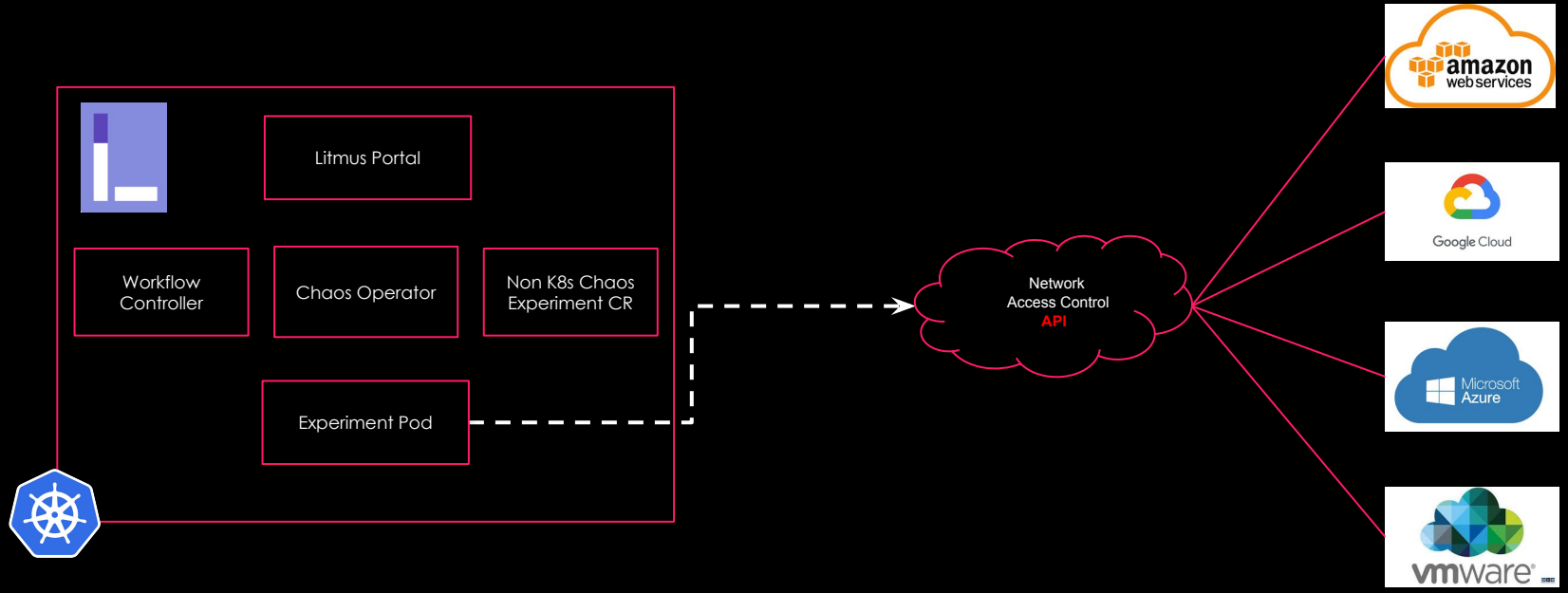




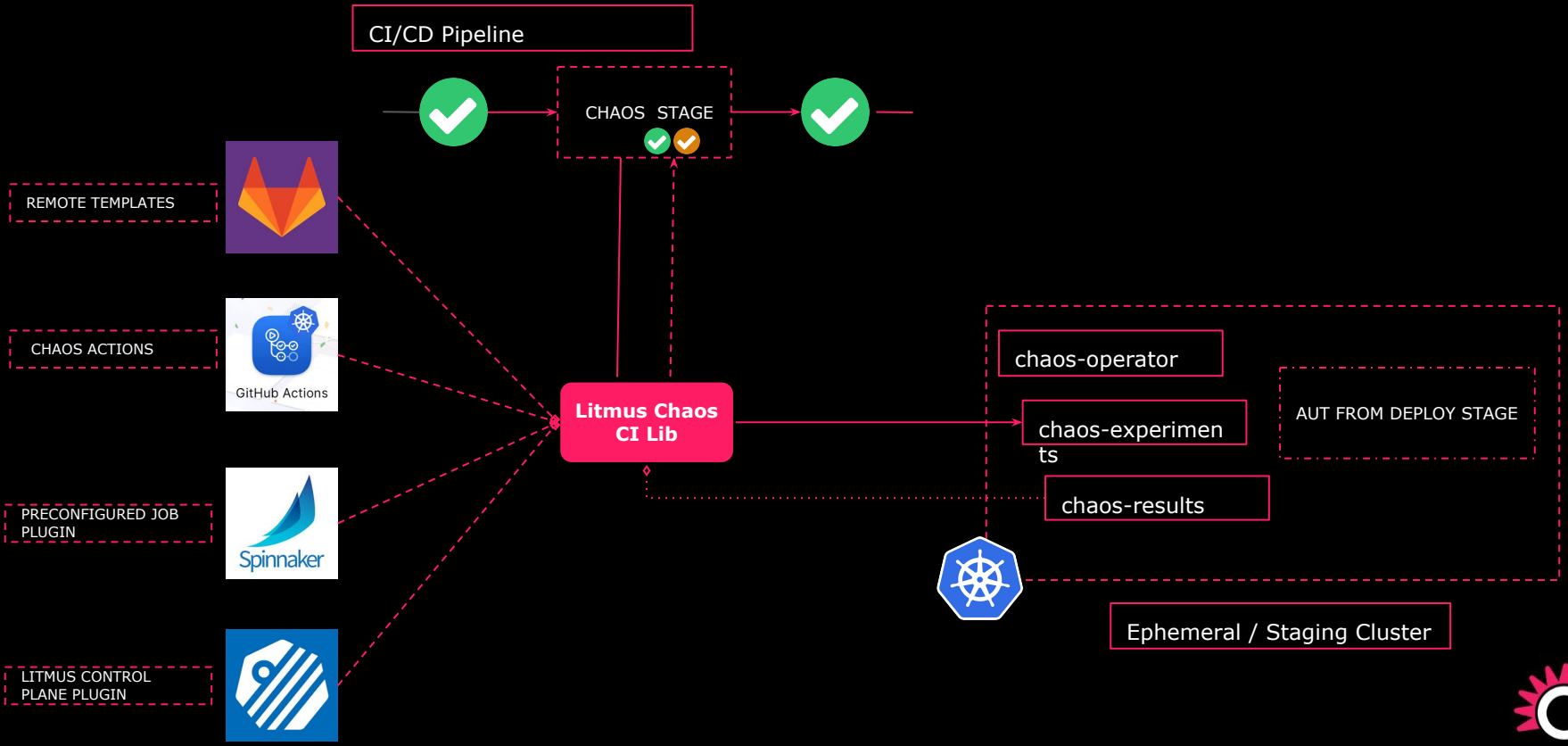




Litmus for non-Kubernetes chaos

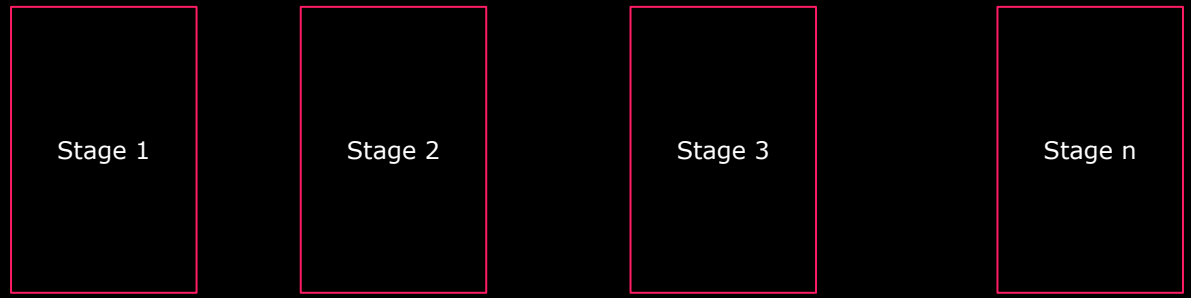


Chaos in CI pipelines



Chaos Actions

Actions in CI pipelines



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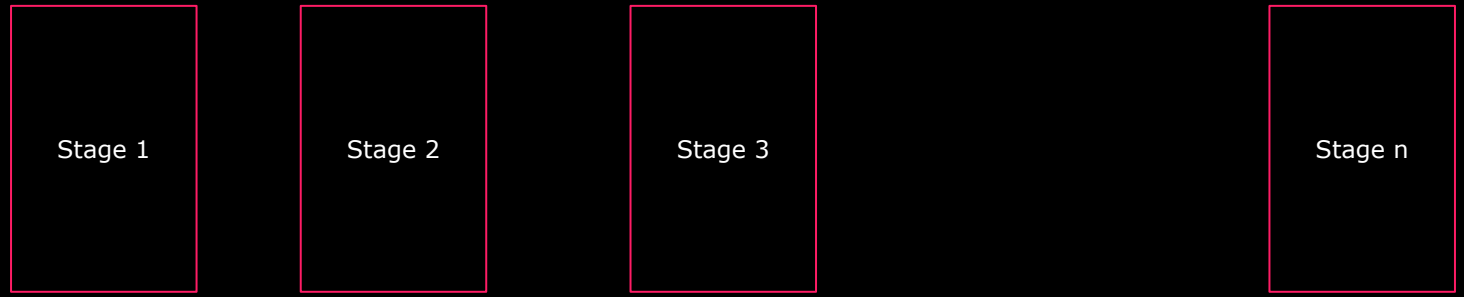

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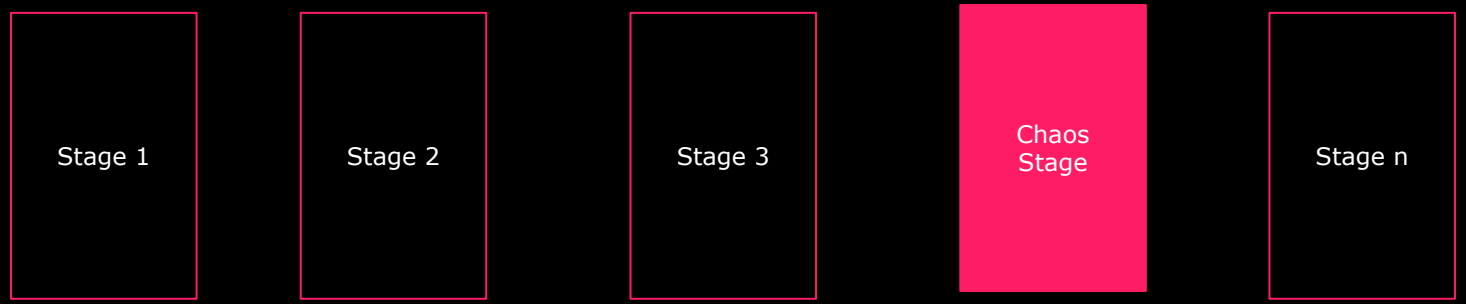
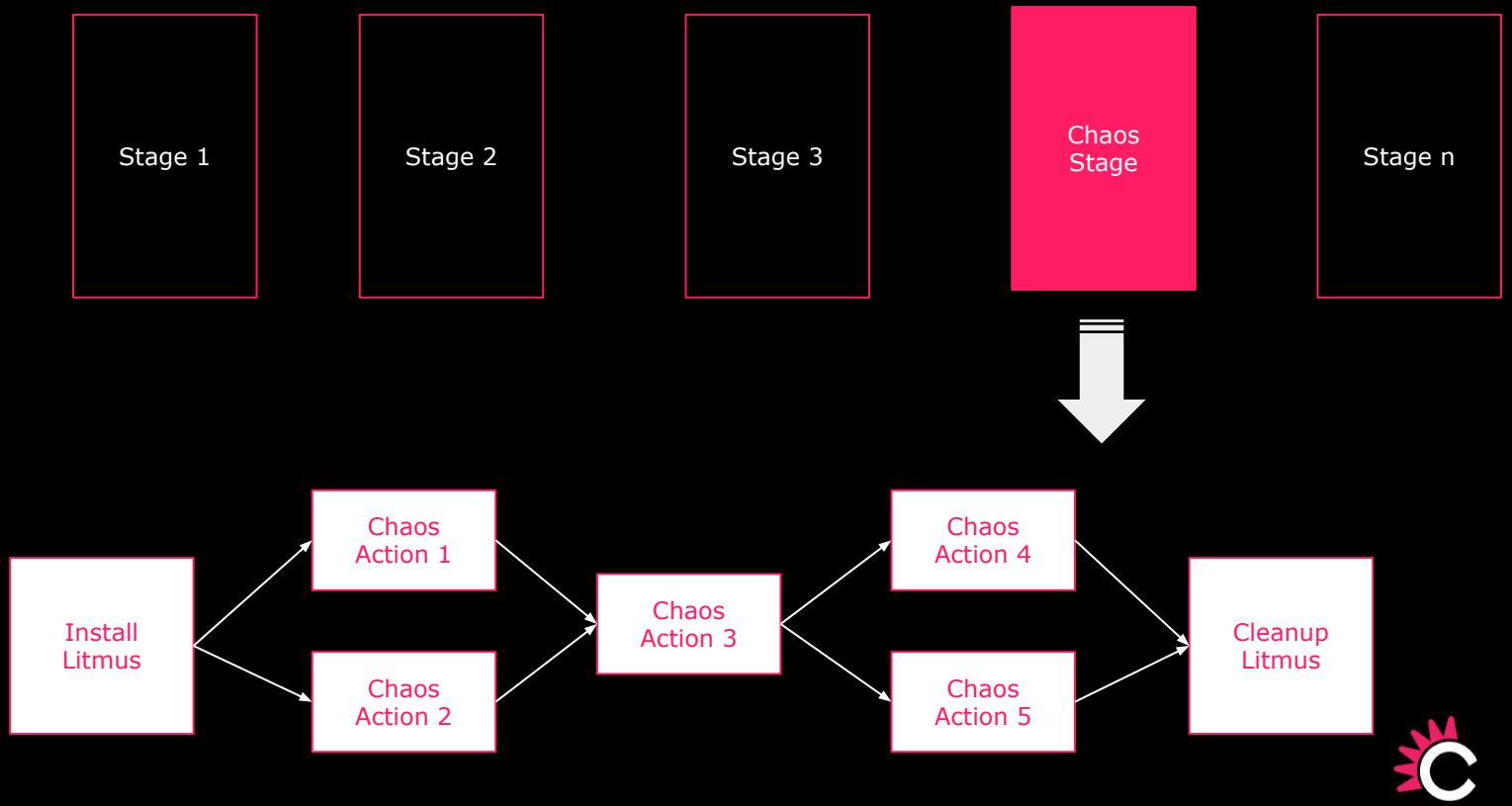
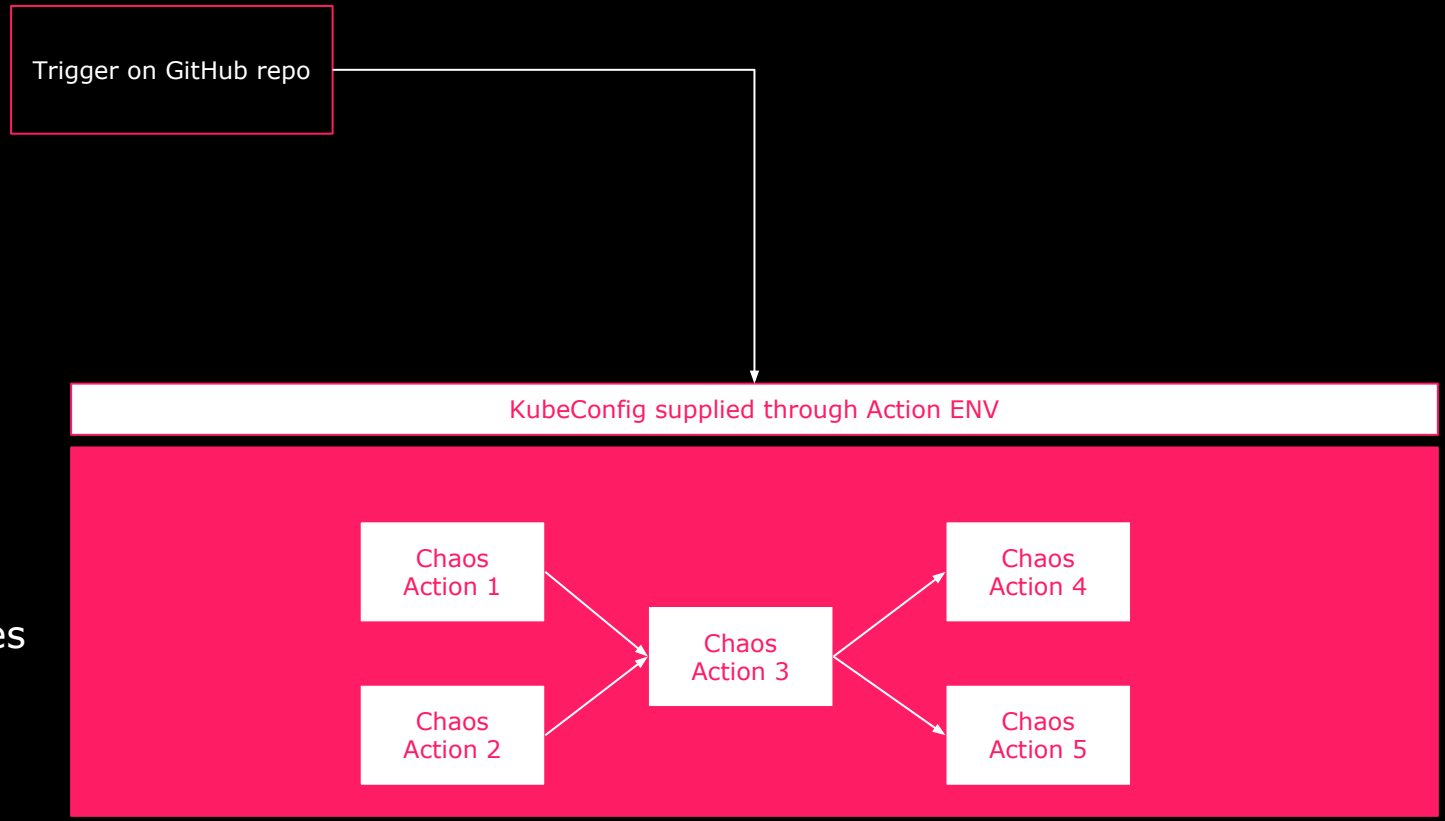


Actions in CI pipelines (on GitHub)



Actions in CI pipelines (On External K8s)



Lets see them in Action

Thank You