



KubeCon



CloudNativeCon

North America 2022

BUILDING FOR THE ROAD AHEAD

DETROIT 2022

What's New in Chaos Mesh and Deep Dive into Multi Clusters Support

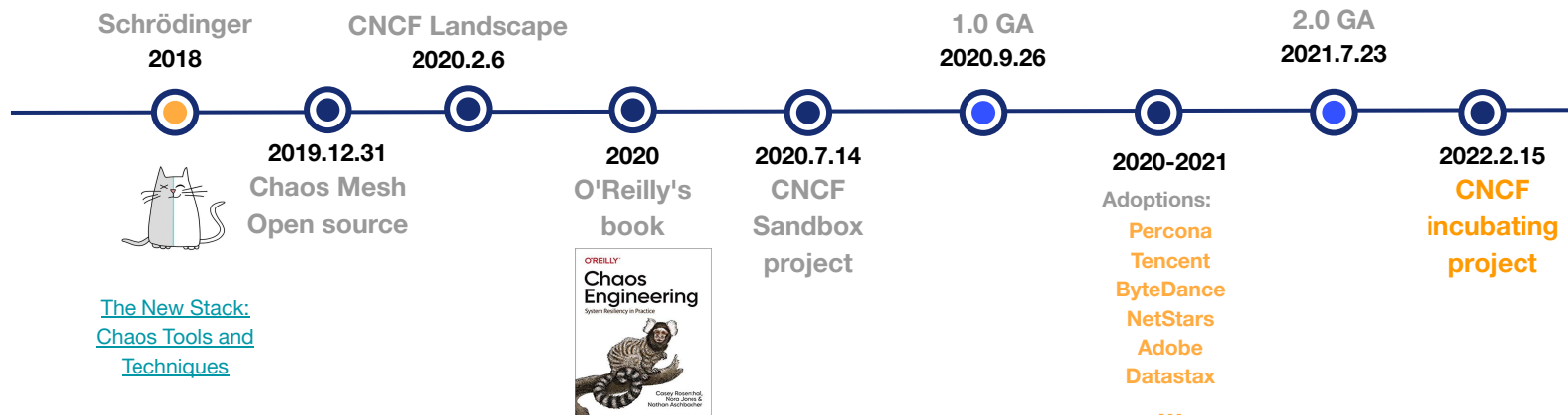
Ed Huang & Chao Zheng

Who are using Chaos Engineering?



What is Chaos Mesh

- An **open source** Cloud-Native Chaos Engineering platform on/off Kubernetes
 - Built for TiDB and loved by TiDB & its friends
 - Powerful chaos simulations covering **cloud** resources, **infra** level, and **application** level
 - Easy to customize chaos experiments with a **native workflow engine**
 - An **intuitive Web UI**



What's New?

What's New?

	Version 2.0		Version 2.4	
Chaos Types	PodChaos	NetworkChaos	...	AzureChaos
	IOChaos	TimeChaos	BlockChaos	PhysicalMachineChaos
	JVMChaos	KernelChaos		
	StressChaos	DNSChaos		
	HTTPChaos	AWSChaos		
	GCPChaos			
Status Check	No		Yes	
Workflow UI	Yes		Yes (New Version)	
Multi K8s Cluster	No		Yes	

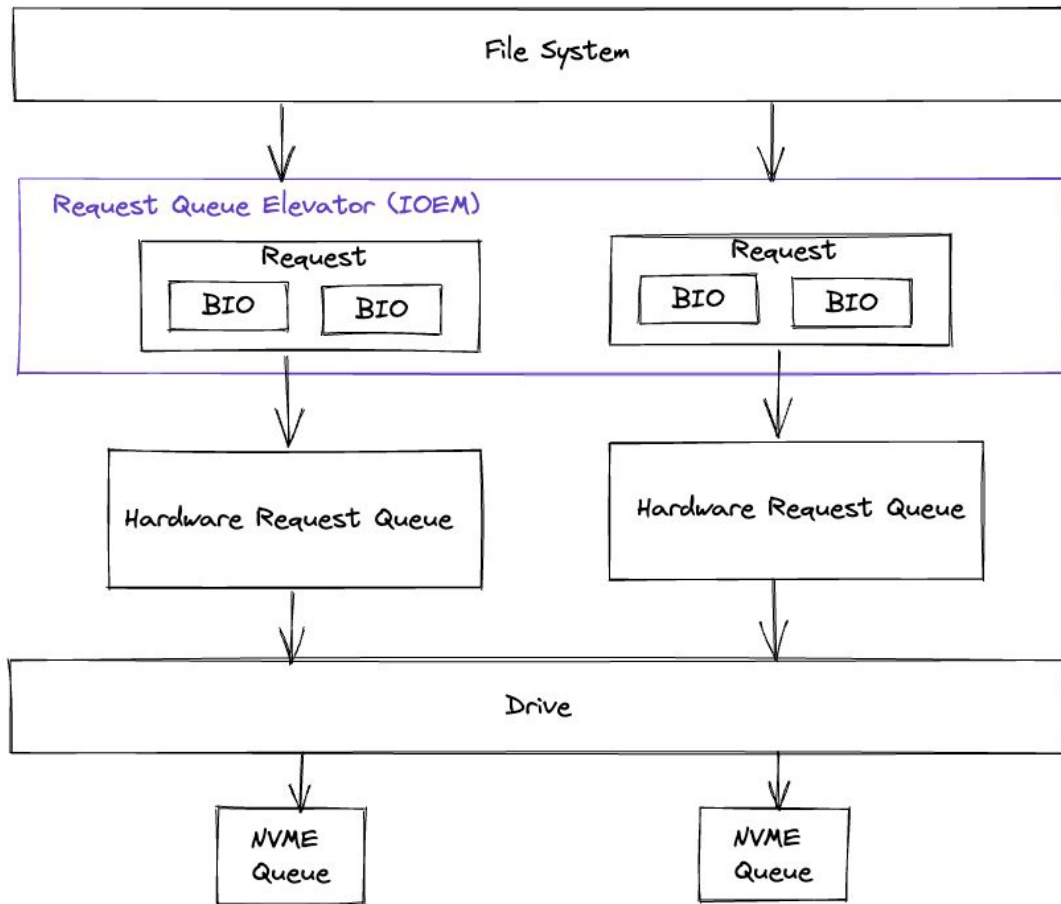
- **AzureChaos** - Simulate fault scenarios on the specified Azure instance.
 - **VM Stop**: stops the specified VM instance
 - **VM Restart**: restarts the specified VM instance
 - **Disk Detach**: uninstalls the data disk from the specified VM instance
- Steps
 - Configure Authentication
 - Define Chaos Experiment

```
apiVersion: chaos-mesh.org/v1alpha1
kind: AzureChaos
metadata:
  name: vm-restart-example
  namespace: chaos-testing
spec:
  action: vm-restart
  secretName: 'cloud-key-secret'
  subscriptionID: 'your-subscription-id'
  resourceGroupName: 'your-resource-group-name'
```

- **BlockChaos**: Simulate Block Device Incidents through IO Scheduler
 - **Delay**: Specifies the latency of the block device
 - **Limit IOPS (WIP)**: Specifies the IOPS of the block device
- **Why does it matter?**
 - Will it happen in real life?
 - Yes, it will, even on cloud storage.
 - We have fault tolerant design (heartbeat, replica, auto transfer...)!
 - Yes, but this helps you to test them.



How to Implement BlockChaos



IOEM: A special IO Scheduler designed to simulate IO fault

How to Implement BlockChaos



File System:

Hey! Please write “Chaos is Cool” to the 0x251136 sector!



IOEM Scheduler (An special IO scheduler):

Good! Received! I promise to write them to the disk.

(But 3ms later ☐)



Hardware Queue:

Give me the request please!

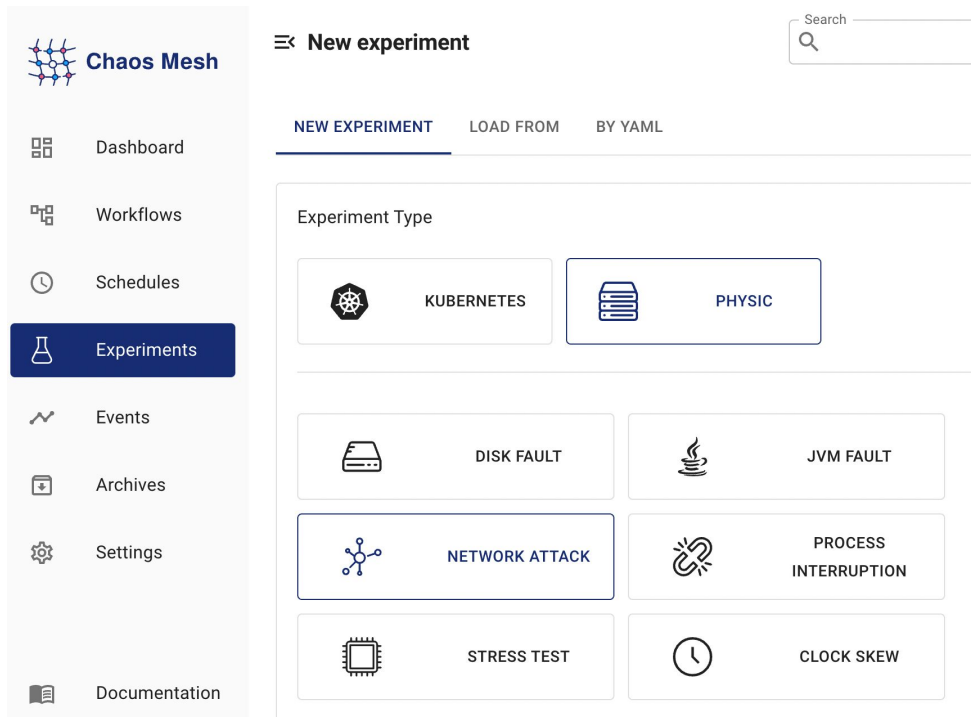


IOEM Scheduler:

No!

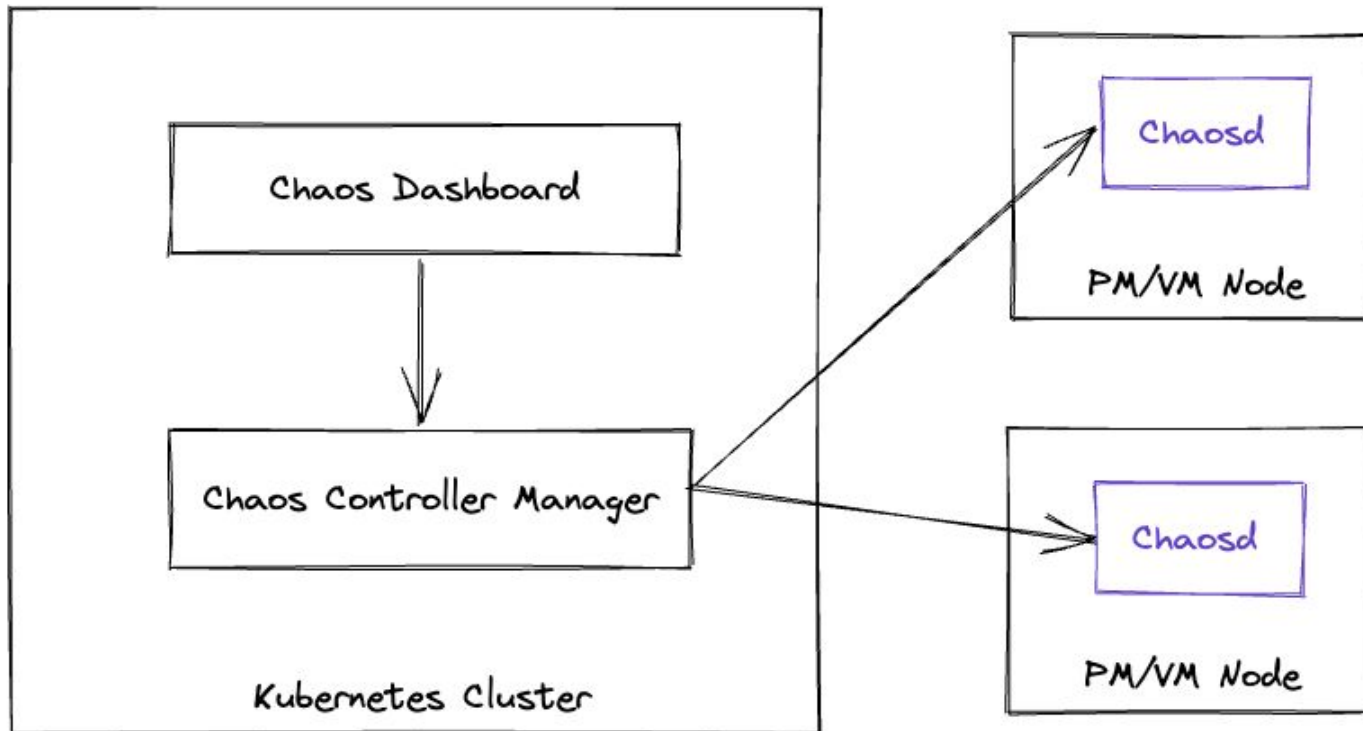
(Will give you 3ms later)

- **PhysicalMachineChaos**: simulate the faults of network, disk, pressure, JVM, time, and others in physical or virtual machines on Chaos Dashboard



The screenshot displays the Chaos Mesh dashboard interface. On the left is a sidebar with navigation links: Dashboard, Workflows, Schedules, Experiments (highlighted), Events, Archives, Settings, and Documentation. The main content area is titled 'New experiment' and includes a search bar. Below the title are tabs for 'NEW EXPERIMENT', 'LOAD FROM', and 'BY YAML'. The 'Experiment Type' section shows two main categories: 'KUBERNETES' and 'PHYSIC'. Under 'PHYSIC', there are eight specific experiment types: 'DISK FAULT', 'JVM FAULT', 'NETWORK ATTACK' (highlighted), 'PROCESS INTERRUPTION', 'STRESS TEST', and 'CLOCK SKEW'.

PhysicalMachineChaos



Status Check in Workflow

- **Status Check:** execute specified operations on external systems, such as application systems and monitoring systems, to obtain their statuses, and automatically **abort the Workflow** when it finds the system is **unhealthy**.
 - Supported types: HTTP Type

```
- name: workflow-status-check
  templateType: StatusCheck
  deadline: 20s
  abortWithStatusCheck: true
  statusCheck:
    mode: Continuous
    type: HTTP
    http:
      url: http://123.123.123.123
      method: GET
      criteria:
        statusCode: '200'
```

New Workflow UI

Deep Dive into Multi Clusters Support

Why Multi Clusters Support?

project-chaos-mesh ▾ A Powerful Chaos Engineering Platform for Kubernetes <https://chaos-mesh.org/>

A 654

2 Pinned + Add a bookmark

Thursday, 12 May ▾

01:50



Hello everyone. Quick question here, is chaos mesh able to run on multiple clusters with a single Chaos Dashboard controlling everything?

2 replies Last reply 5 months ago

project-chaos-mesh - 12 May View in channel

:58

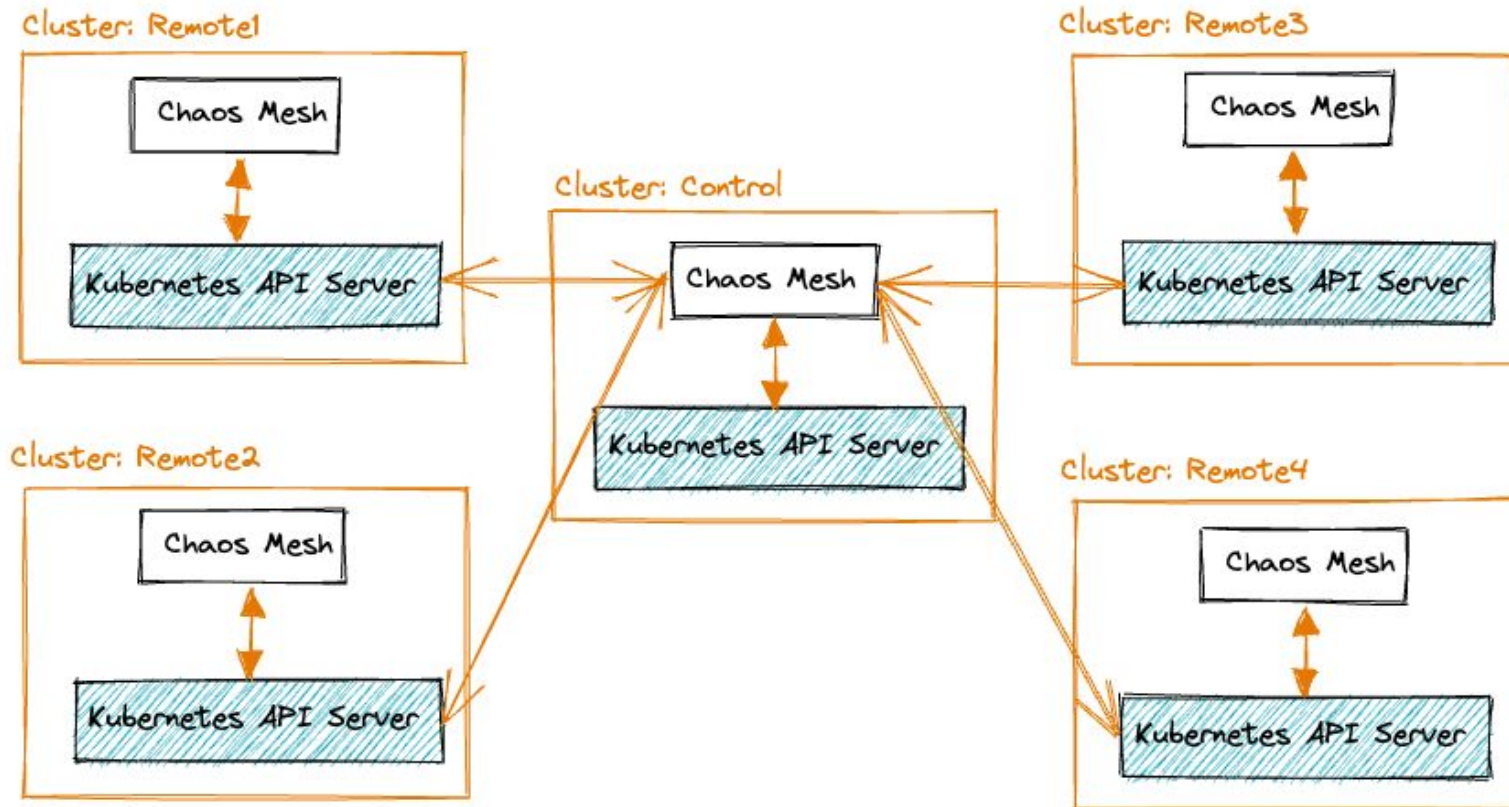


Thanks Zhou Zhiqiang and Yang Keao!

as the multi-cluster ecosystem doesn't have "standard solution"

Yup, we're discovering this as well, for our use cases, we're running multiple k8s clusters in OnPrem datacenters. There is some legacy apps on VMs that we'd also like to fuzz/inject ... Show more (edited)

Multi Clusters Support



Multi Clusters Support

- **Steps**

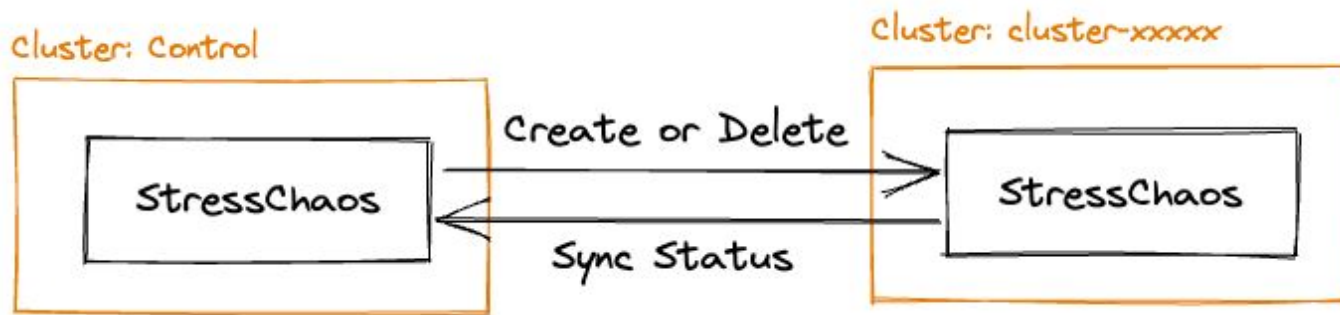
- Configure KUBECONFIG
- Deploy Remote Cluster
- Define Chaos Experiment and run it

```
apiVersion: chaos-mesh.org/v1alpha1
kind: RemoteCluster
metadata:
  name: cluster-xxxxxxx
spec:
  namespace: "chaos-mesh"
  kubeConfig:
    secretRef:
      name: "cluster-xxx-kubeconfig"
    key: xxx
  configOverride:
    chaosDaemon:
      runtime: containerd
status:
  currentVersion: "v2.4.1"
  conditions:
    - type: Running
      status: True
    - type: Ready
      status: True
```

Apply Experiment on RemoteCluster

```
apiVersion: chaos-mesh.org/v1alpha1
kind: StressChaos
metadata:
  name: burn-cpu
spec:
  remoteCluster: cluster-xxxxxxx
  mode: one
  selector:
    labelSelectors:
      "app.kubernetes.io/component": "tikv"
  stressors:
    cpu:
      workers: 1
      load: 100
      options: ["--cpu 2", "--timeout 600", "--hdd 1"]
  duration: "30s"
```

Sync Status



Future Plans

- Ease of use
 - More comprehensive status inspection mechanism and reports
 - Improve Observability via event logs and metrics
- Support more status check types, such as prometheus, Datadog
- Release multiple Kubernetes clusters support and support authorization
- Provide a plugin approach to extend complex chaos types, such as RabbitMQChaos, RedisChaos, ...
- Build a hub for users sharing their own chaos workflow and chaos types
- Provide more tutorials & plugins to make integrating with ecological tools easier

Session Q5 Codes will be sent via email

Thanks!