
KubeCon
CloudNativeCon
North America 2022
BUILDING FOR THE ROAD AHEAD
DETROIT 2022

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

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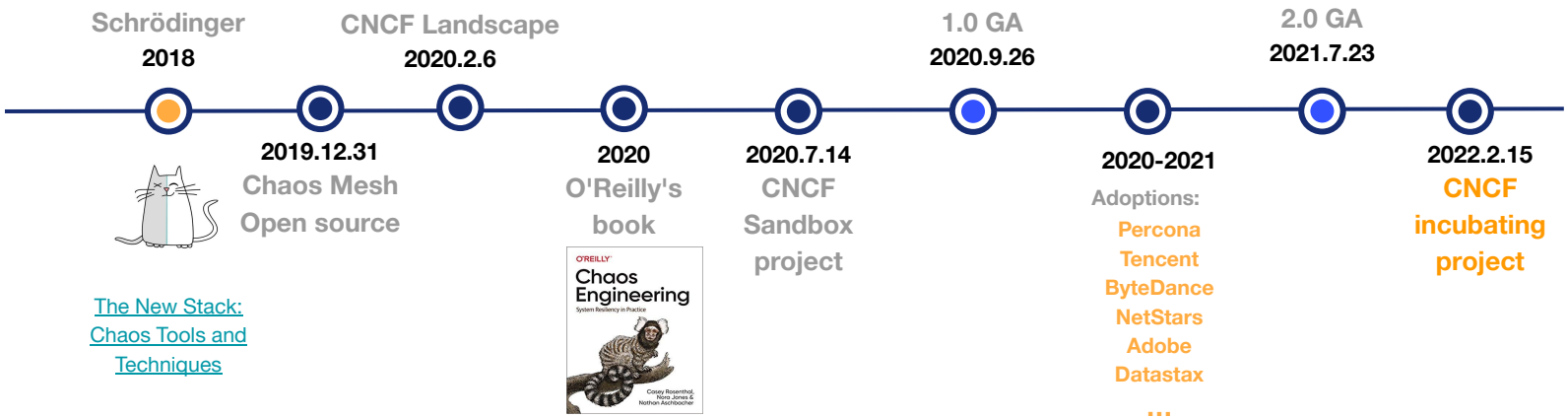
Who are using Chaos Engineering?

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?

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	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

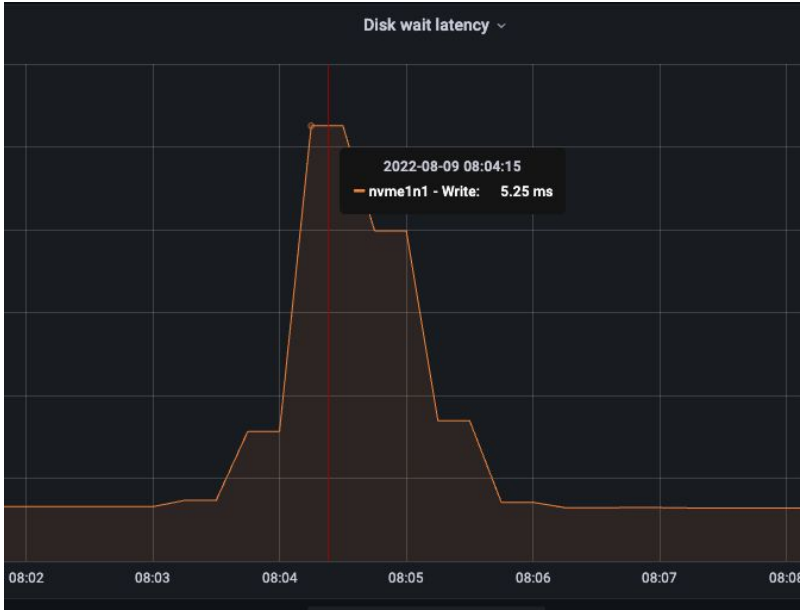
- **AzureChaos** - Simulate fault scenarios on the specificed Azure instance.
  - **VM Stop**: stops the specified VM instance
  - **VM Restart**: restarts the specifled VM instance
  - **Disk Detach**: uninstalls the data disk from the specified VM instance
- Steps
  - Configure Authentication
  - Define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

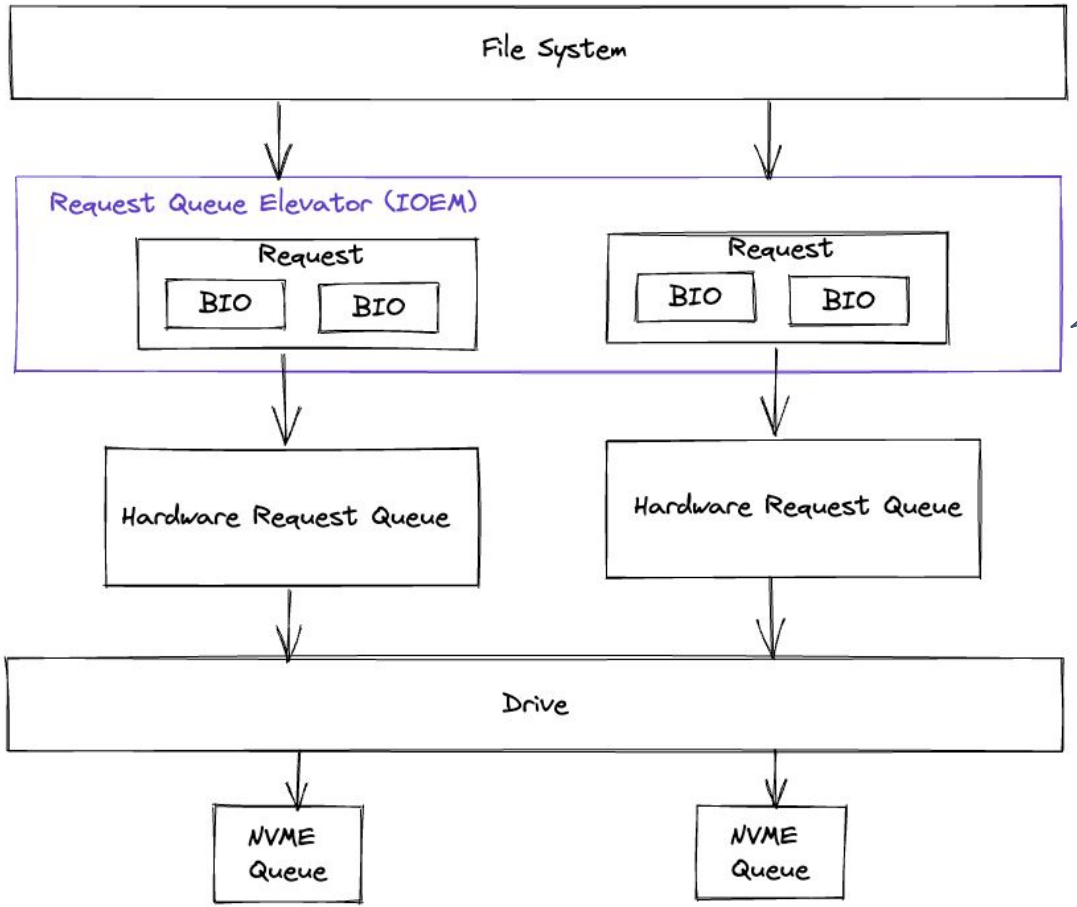
BlockChaos

- **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!

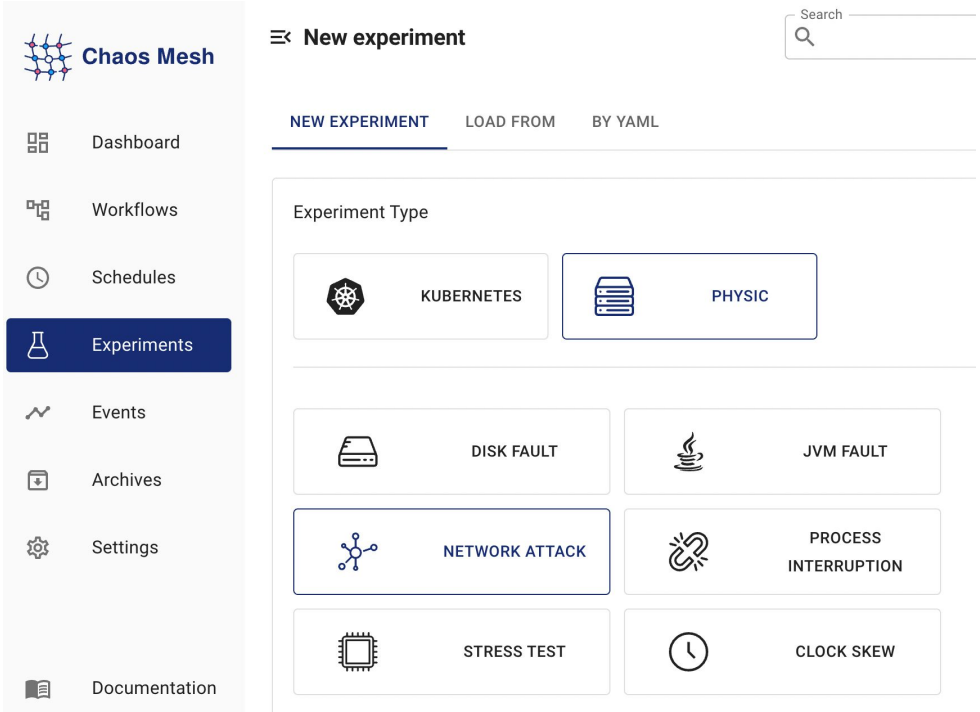
👾 IOEM Scheduler:

No!

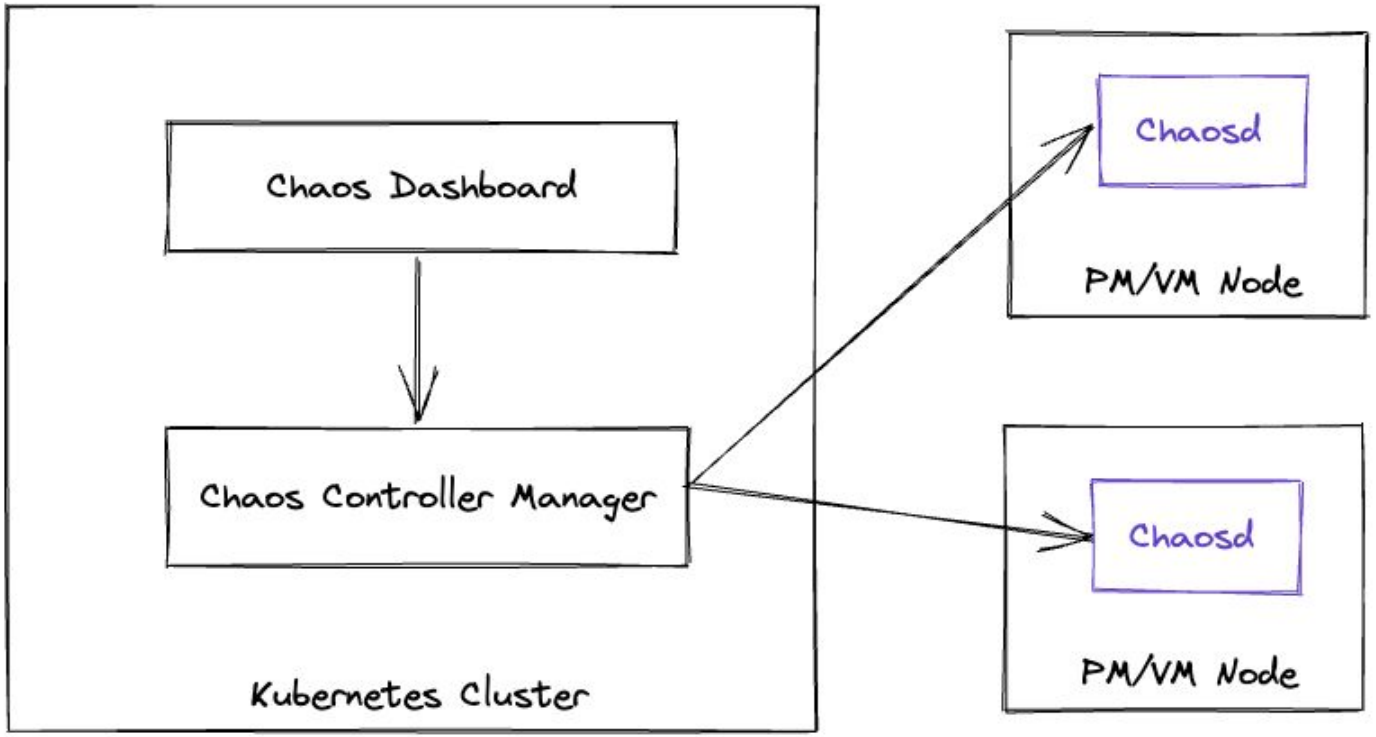
(Will give you 3ms later)

PhysicalMachineChaos

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



PhysicalMachineChaos

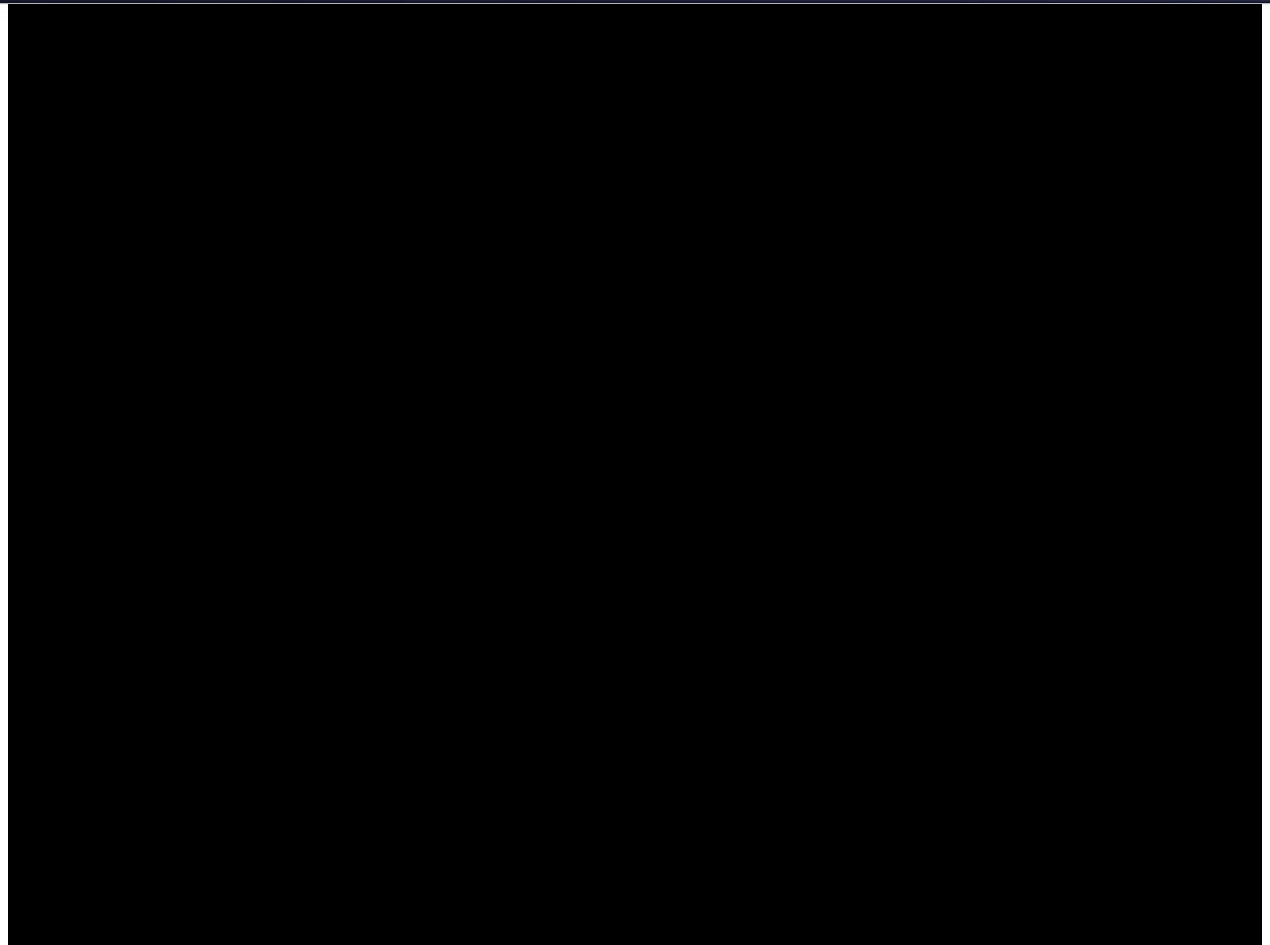


Status Check in Workflow

- **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



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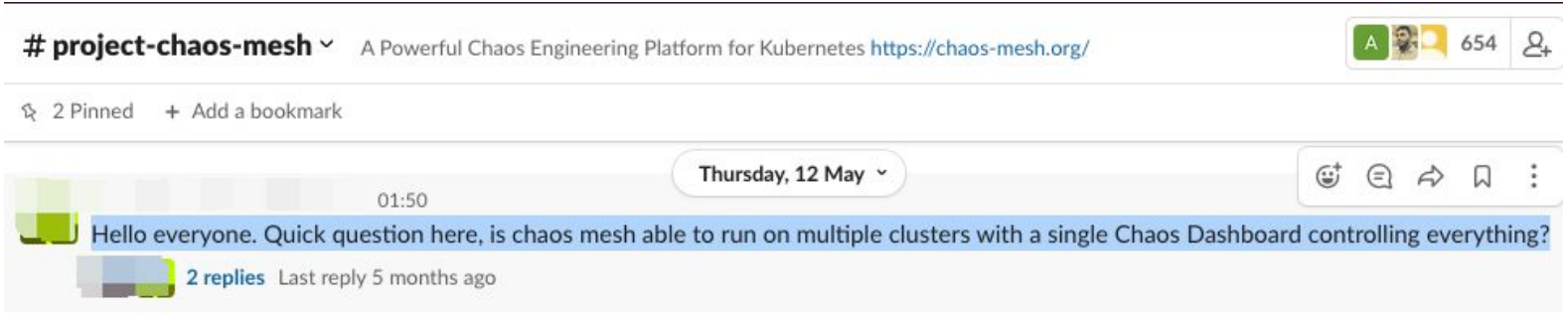
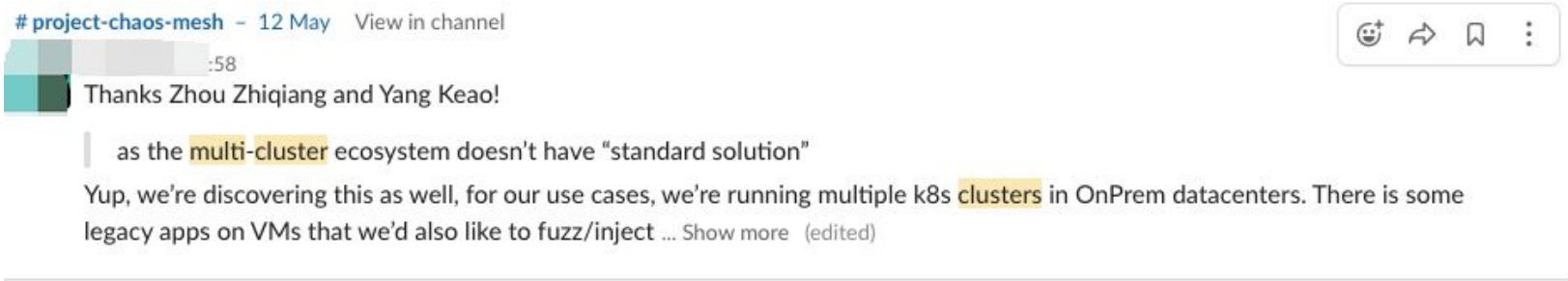
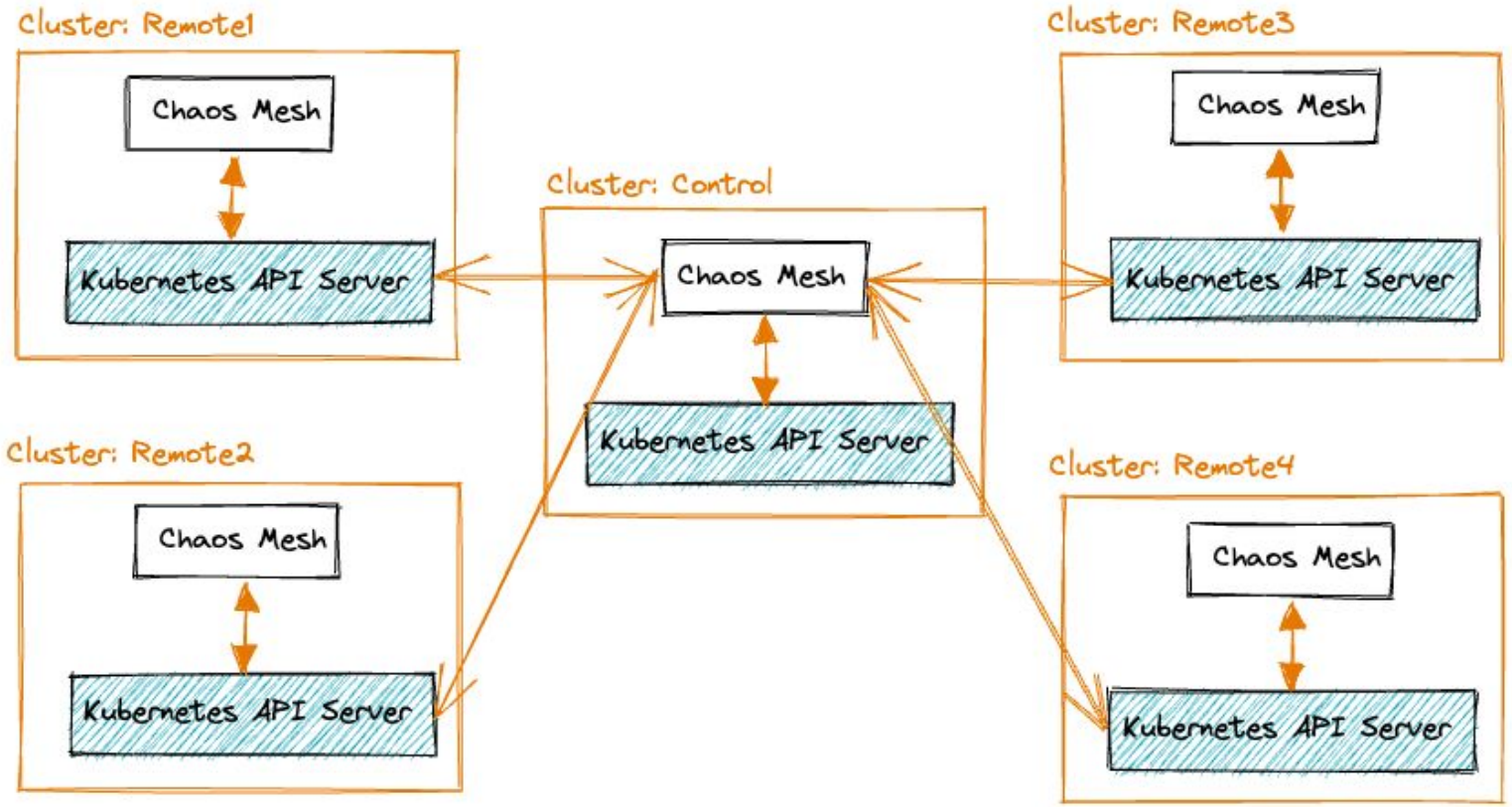
Deep Dive into Multi Clusters Support

Why Multi Clusters Support?





Multi Clusters Support



Multi Clusters Support

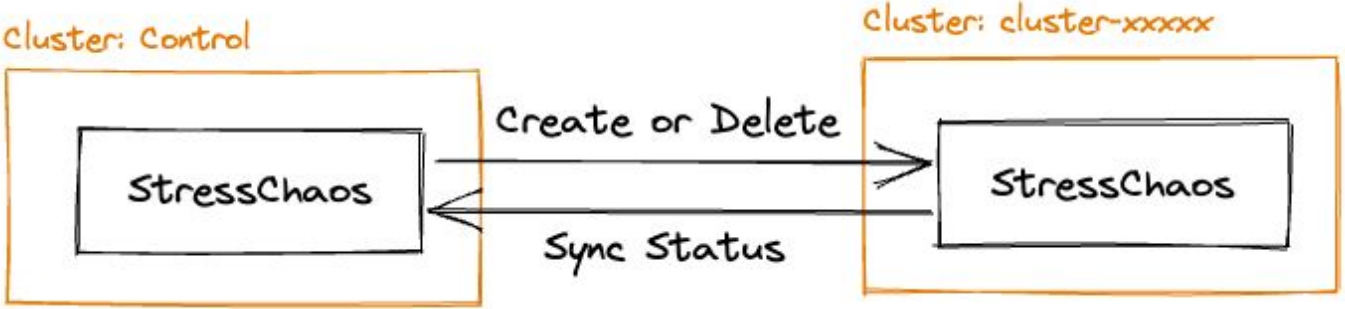
- **Steps**
  - Configure KUBECONFIG
  - Deploy Remote Cluster
  - Define Chaos Experiment and run it

```
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


```yaml
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


Cluster: Control
StressChaos
Create or Delete
Sync Status
Cluster: cluster-xxxxx
StressChaos

Future Plans

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 QR Codes will be sent via email

Thanks!