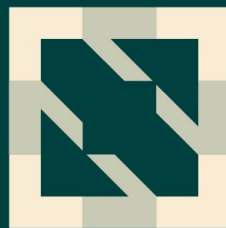


**KubeCon**



**CloudNativeCon**



**OPEN SOURCE SUMMIT**

**China 2023**



KubeCon



CloudNativeCon



OPEN SOURCE SUMMIT

China 2023

# KubeVirt v1.0: What It Means from an End-User Perspective

*Haolin Zhang – ARM China*

*Andrew Burden – Red Hat*

# KubeVirt v1.0 Release



[BLOGS](#) [VIDEOS](#) [GALLERY](#) [DOCS](#) [LABS](#)

## KubeVirt v1.0 has landed!

Author: KubeVirt Maintainers

Tags: [KubeVirt](#) | [v1.0](#) | [release](#) | [community](#) | [cncf](#) | [milestone](#) | [party time](#)

Publication Date: July 11, 2023

Category: news

The KubeVirt community is proud to announce the release of [KubeVirt v1.0](#)! This release demonstrates the accomplishment of widespread user adoption over the years and represents an important milestone for everyone involved.

### A brief history

The KubeVirt project started in Red Hat at the end of 2016, with the question: Can virtual machines (VMs) run in containers? It proved to be not only possible, but quickly emerged as a promising solution to the future of virtual machines in Kubernetes. KubeVirt joined the [CNCF](#) as a Sandbox project in September 2019, and an Incubating project in April 2022. From a small proof of concept, KubeVirt has grown into 45 active repositories, with the primary [kubevirt/kubevirt](#) repo having the most stars.

### What does v1.0 mean to the community?

The v1.0 release signifies the incredible growth that the community has gone through in the past six years from a small proof of concept to a full-fledged Virtual Machine Management solution. The next stage with v1.0 is the additional focus on maintaining APIs while continuing to improve the user experience.


# What is KubeVirt?

KubeVirt is a CNCF incubating project that extends the Kubernetes API and adds Custom Resource Definitions in order to enable the creation, migration, and management of virtual machines natively in a Kubernetes cluster.



# KubeVirt Initial Commit

## initial commit

 main  
 v1.0.0 ... v0.0.1-alpha.0

Doron Fediuck committed on Aug 11, 2016


Showing 1 changed file with 5 additions and 0 deletions.


▼ 5  README.md 

...	...	@@ -0,0 +1,5 @@
1	+	# KubeVirt
2	+	
3	+	## Initial repo
4	+	
5	+	This is the initial commit



0 comments on commit `95bc8ec`

# Second Commit

 v1.0.0 ... v0.0.1-alpha.0

 fabiand authored and rmohr committed on Aug 16, 2016

Showing 1 changed file with 1 addition and 0 deletions.

▼ 1  README 

...	...	@@ -0,0 +1 @@
1		+ Stuff for layering Vms on top of k8s

0 comments on commit `c8f6035`

# First Import Commit!

fabiaand authored and rmohr committed on Aug 16, 2016

Showing 4 changed files with 93 additions and 0 deletions.

Filter changed files

docs

- 1-run-vm.plantuml
- 2-run-vm-multi.plantuml
- 3-stop-vm.plantuml
- Makefile

docs/1-run-vm.plantuml

```
@@ -0,0 +1,31 @@
1 + @startuml
2 + == Run VM (single host) ==
3 +
4 + Engine -> vdsmd : runVM(spec)
5 +
6 + vdsmd -> kubernetes : createPod(domxml)
7 + + note right
8 + +     vdsmd tells kubernetes to
9 + +     create a virt-launcher pod
10 + + end note
11 +
12 + create pod
13 + kubernetes -> pod : schedulePod(pod_spec_w_domxm
14 + + note right
15 + +     Kubernetes schedules a pod on
16 + +     the cluster (with one host)
17 + + end note
18 +
19 + create virt_launcher
20 + pod -> virt_launcher
21 +
22 + virt_launcher -> libvirtd : define(domxml)
23 + virt_launcher -> libvirtd : wait_lifecycle_event
24 + + note right
25 + +     virt_launcher now waits until
26 + +     the VM is getting undefined
27 + + end note
28 +
29 + vdsmd -> libvirtd : monitorVM()
30 +
31 + @enduml
```

# Early KubeVirt



KubeCon



CloudNativeCon



OPEN SOURCE SUMMIT

China 2023





# Modern KubeVirt



KubeCon



CloudNativeCon



OPEN SOURCE SUMMIT

China 2023



KubeVirt Razor:

**"If something is useful for Pods,  
we should not implement it only  
for VMs."**

# First Release

Sep 4, 2017

 fabiand

 v0.0.2 

 997e34a

Compare ▾

## v0.0.2

This release follows v0.0.1-alpha.5 and consists of 378 changes, contributed by 16 people, leading to 267 files changed, 13559 insertions(+), 17180 deletions(-).

The source code and selected binaries are available for download at: <https://github.com/kubevirt/kubevirt/releases/tag/v0.0.2>.

The primary release artifact of KubeVirt is the git tree. The release tag is signed and can be verified using [git-evtag](#).

Pre-built containers are published on Docker Hub and can be viewed at <https://hub.docker.com/u/kubevirt/>.

## Notable changes

- Usage of CRDs
- Moved libvirt to a pod
- Introduction of `virtctl`
- Use glide instead of govendor

# 2019: KubeVirt becomes CNCF Project

## proposals: Proposal to add KubeVirt to the CNCF Sandbox #

Merged caniszczyk merged 7 commits into `cncf:master` from `fabiaand:proposing-kubevirt` on Sep 9, 2019

Conversation 26

Commits 7

Checks 0

Files changed 1



fabiaand commented on Jul 9, 2019

Contributor ...

This is a proposal to add KubeVirt to the CNCF Sandbox.

Signed-off-by: Fabian Deutsch [fabiaand@fedoraproject.org](mailto:fabiaand@fedoraproject.org)



63



13



14



1

proposals: Proposal to add KubeVirt to the CNCF Sandbox ...

Verified

0c9eca



caniszczyk added the `sandbox` label on Jul 9, 2019



caniszczyk added this to In progress (due diligence) in TOC Project Backlog 2019 Q3 via `automation` on Jul 9, 2019

# 2022: KubeVirt is Incubating

[About](#)[Projects](#)[Training](#)[Community](#)[Blog & News](#)

BLOG / STAFF POST

## KubeVirt becomes a CNCF incubating project

*Posted on April 19, 2022*

The CNCF **Technical Oversight Committee (TOC)** has voted to accept KubeVirt as a CNCF incubating project.

**KubeVirt** enables users to run virtual machine workloads on top of Kubernetes in a Kubernetes-native way. It allows the migration of legacy applications and supports building new applications with virtualization requirements, ultimately strengthening Kubernetes as the tool of choice for running compute workloads.

The KubeVirt project was founded in January 2017 at Red Hat. Since joining CNCF as a Sandbox project in September 2019, the project has added contributors from Amadeus, Apple, CloudFlare, Containership, Giant Swarm, Gitpod, IBM, Kubermatic, Lacoda, NEC, NVIDIA, SAP, Solidfire, SUSE, and independent developers. KubeVirt-based solutions have gone into production at multiple companies, including Arm, CIVO, CoreWeave, H3C, and Kubermatic. The



# Change to The Release Cadence


evirt / kubevirt

Issues 210 Pull requests 119 Actions Projects Wiki Security 8 Insights

Change KubeVirt to follow the Kubernetes release guidance #836

Merged kubevirt-bot merged 1 commit into kubevirt:main from rthallisey:virt-release-cadence on Sep 20, 2022

Conversation 62 Commits 1 Checks 0 Files changed 1

 rthallisey commented on Aug 25, 2022

Member

KubeVirt has been released monthly since its early days, but it might be time to settle into a slower release cycle. The high velocity of KubeVirt made sense to keep a monthly release cadence since the project's beginning. There were key features KubeVirt needed in order to be production ready those features needed to get into customer hands as soon as possible. However, KubeVirt has now reached production readiness, which is backed-up by the [many companies that use it in production](#), so it might be time for the community to pivot.

For vendors and end-users, a monthly release cadence puts pressure on teams to upgrade constantly. There's sometimes a security update, often new features, or some bug fixes that need to be rolled out by upgrading, but the question is always when. At a monthly cadence, it's too difficult to stay up to date. So vendors end up staying multiple releases behind latest and backport changes until it becomes too costly. The same issue is observed in the community, where desirable changes need to be backported 4, 5, or even 6 releases back, but aren't because it's too much of a burden.

My proposal is to change KubeVirt's release cycle to match the Kubernetes release cadence - 15 week releases or 3 releases a year. With fewer releases, the community will have additional time to pack more content into a release, which would relive vendors from feeling pressure to backport changes and incentivize waiting for the next release to upgrade.

Move KubeVirt to a 15 week release cadence

8 2

Reviewer

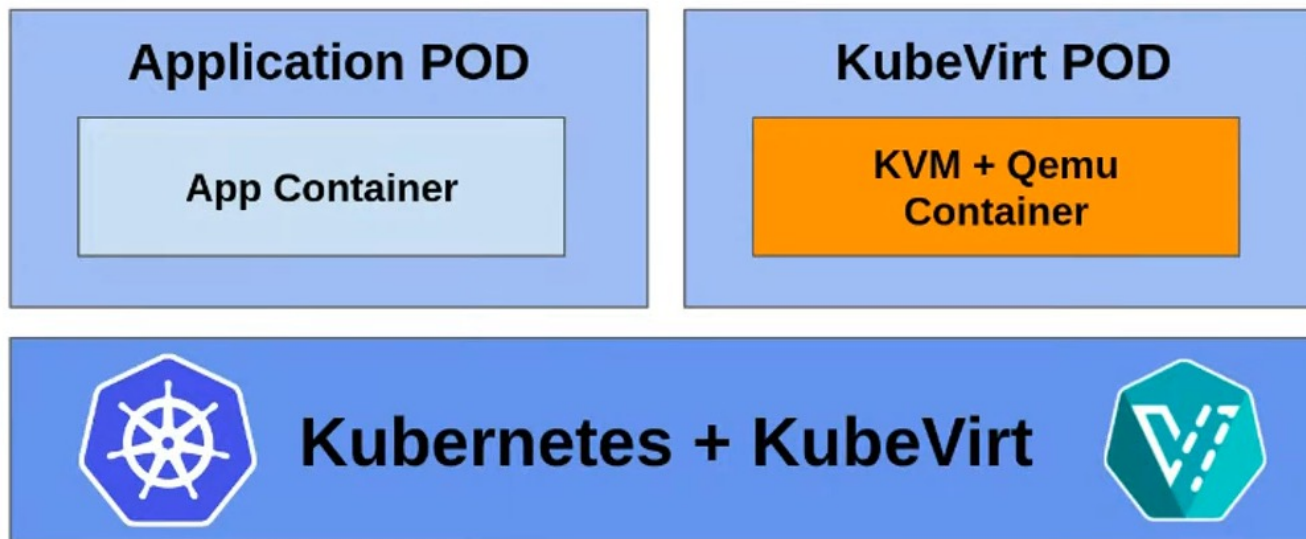
fabia david dhille fosse rmoH stu-g xpiva ihold mher awel

Assignee

fabia david dhille rmoH

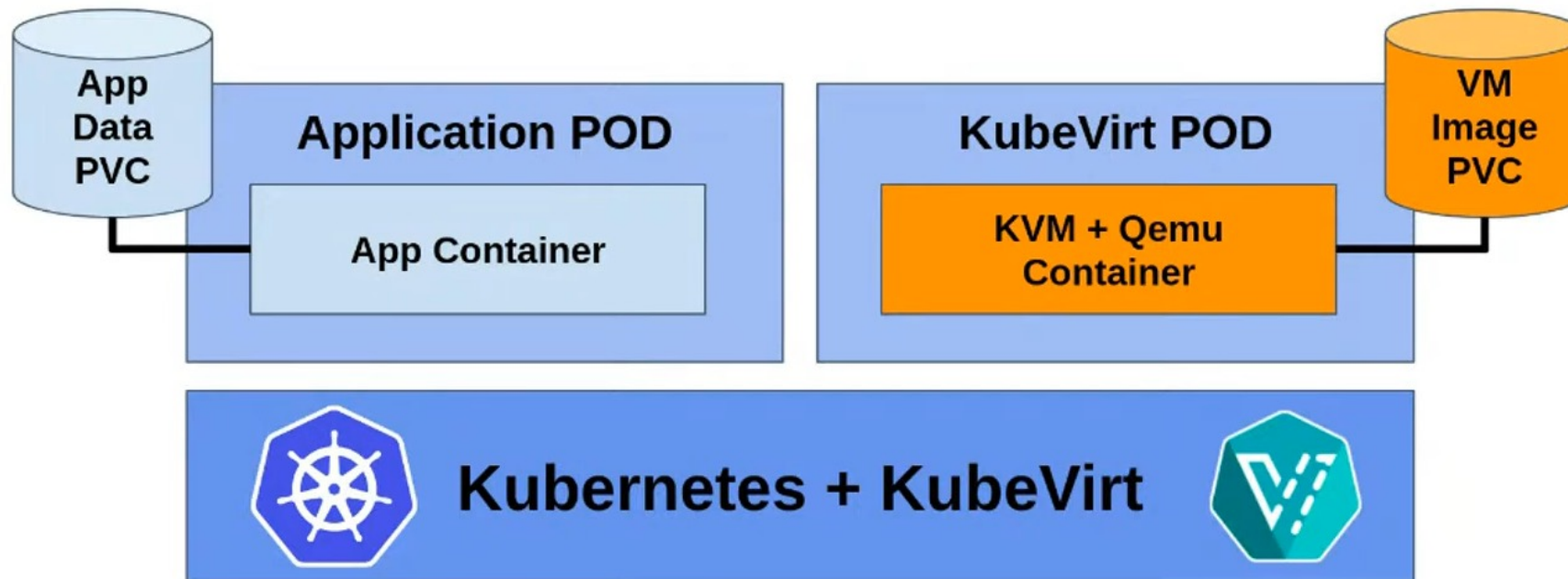
## Virtual Machines in Pods

- KubeVirt VM is a KVM+qemu process running inside a pod
- CRI independent (Works with docker, crio, etc...)



# VM storage as PVCs

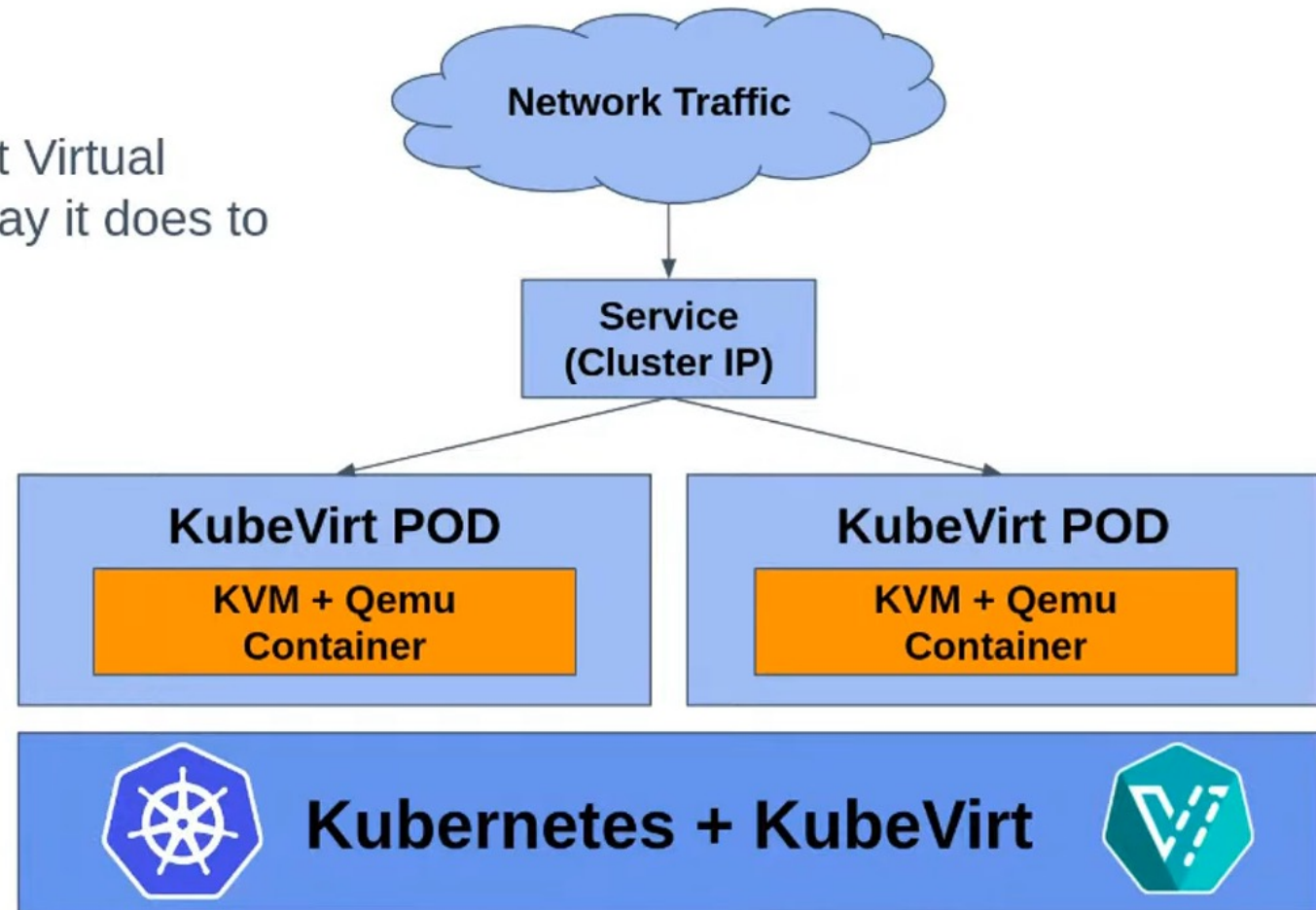
## VM storage as PVCs



# Use of Pod Network for VMs

## Use of Pod Network for VMs

Traffic routes to KubeVirt Virtual Machines in the same way it does to container workloads





# Virtual Machine Launch Flow

## Virtual Machine Launch Flow

kubectl

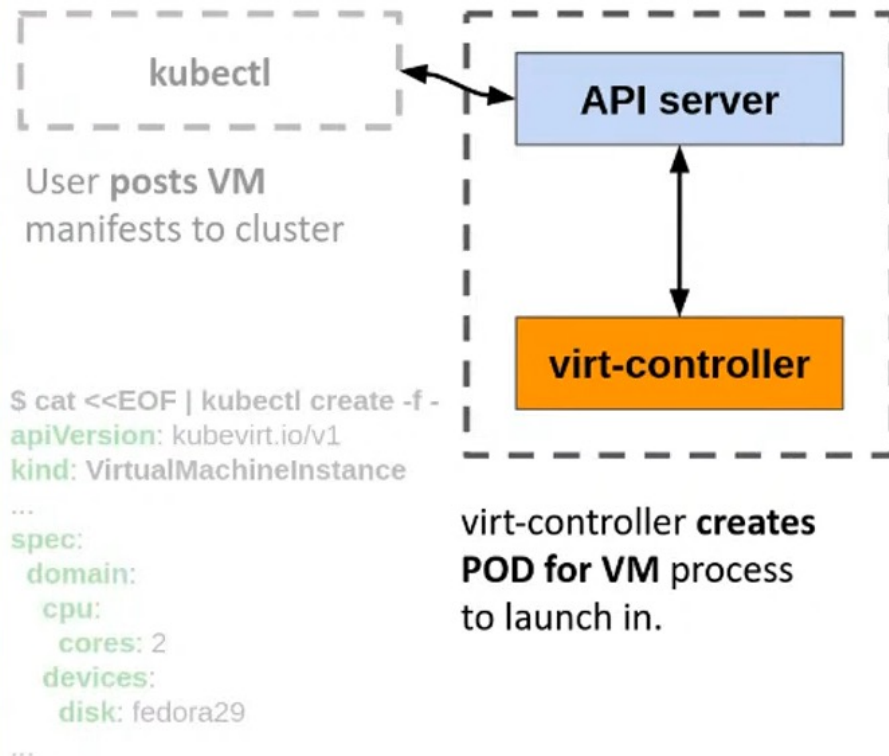
User **posts VM**  
manifests to cluster

```
$ cat <<EOF | kubectl create -f -
apiVersion: kubevirt.io/v1
kind: VirtualMachineInstance
...
spec:
  domain:
    cpu:
      cores: 2
    devices:
      disk: fedora29
...
```



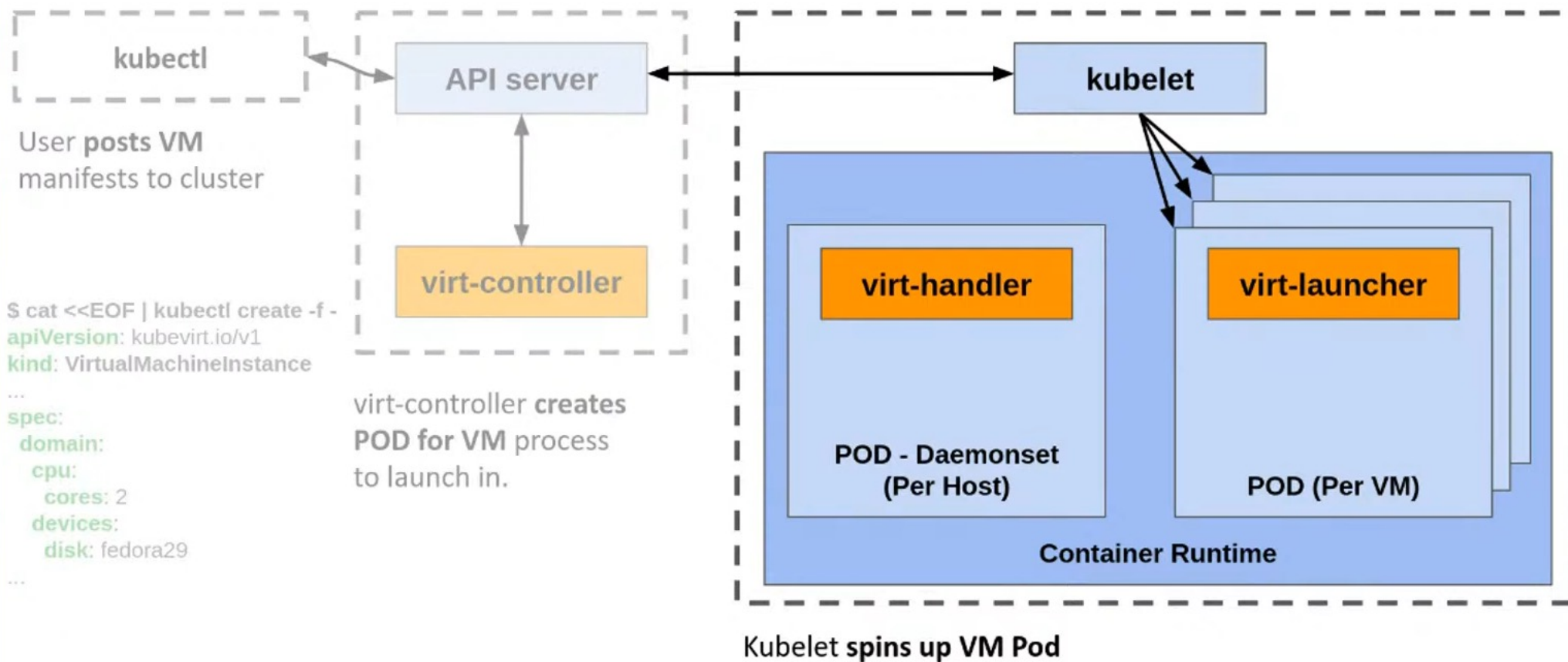
# Virtual Machine Launch Flow

## Virtual Machine Launch Flow



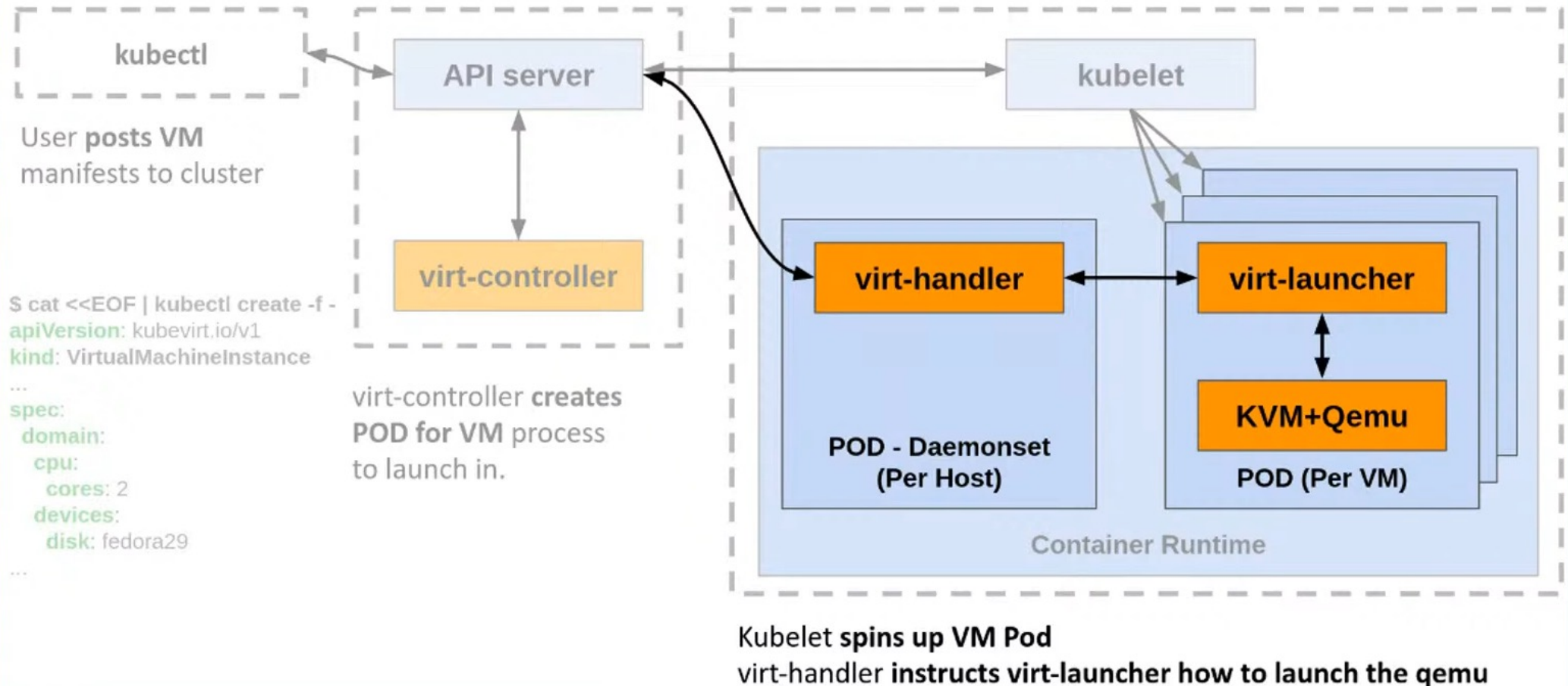
# Virtual Machine Launch Flow

## Virtual Machine Launch Flow



# Virtual Machine Launch Flow

## Virtual Machine Launch Flow



# Adjacent projects

- HyperConverged: Management operator
- containerized-data-importer(CDI): VM storage
- KuberVirt-Manager: Independent GUI
- cluster-api-provider-kubevirt (CAPK) :  
Cluster within a cluster

# Expected Virtualization features

- Live migration
- VM disk snapshots
- Disk hotplug and resize
- Secondary networks, inc SRIOV
- VM resources allocation, such as CPU pinning, NUMA, and Hugepages which together allow for real-time and DPDK workloads.
- And of course, VM Access



# Some benefits of the Kubernetes ecosystem

- Service Mesh integration
- Ansible collection
- Liveness and Readiness probes, as well as Exec probes (specific to VMs)
- ArgoCD
- Tekton Pipelines
- Prometheus

# Use cases

- Traditional virtualization replacement
- GPU provisioning
- Cluster within a cluster
- VMs as part of a Tekton pipeline

# Recent features: Compute/Core

- Non-root by default
- Memory overcommitment
- VSOCK
- Persistent vTPM device
- Numerous new enhancements of instance types & preferences to simplify VM creation
- Introduction of CPU Hotplug API
- Experimental support for SEV and variants of SEV (Confidential computing)

# Recent features: Continued

## Storage

- Provisioning VMs from snapshots
- Clone snapshot
- Simplify disaster recovery for vendors

## Scale/performance

- Longitudinal performance and scalability benchmarks

## Networking

- Introduction of Network Hotplug API

# Arm's Engagement on the KubeVirt Project

- In May 2020, Arm submitted its first pull request (PR) to KubeVirt
  - [PR #3415] Adjusted kubevirt code for arm64 support. No testing against arm64 has been performed at this stage.
  - [PR #5456] Enabled arm64 cross-compilation.
- Made KubeVirt works on Arm64 server
- Enabled cross build tool and made multi-arch KubeVirt image released
- Integrated Arm64 Unit tests and E2E tests into KubeVirt CI lane
- Authored comprehensive documentation specifically for the Arm architecture
  - [https://kubevirt.io/user-guide/operations/operations\\_on\\_Arm64/](https://kubevirt.io/user-guide/operations/operations_on_Arm64/)
  - [https://kubevirt.io/user-guide/virtual\\_machines/virtual\\_machines\\_on\\_Arm64/](https://kubevirt.io/user-guide/virtual_machines/virtual_machines_on_Arm64/)



# How do we collaborate with the community?

- KubeVirt communication channels:
  - Weekly community meetings
  - Weekly and bi-weekly SIG meetings (Storage, Scale & Performance)
  - Two Slack channels and a mailing group
  - GitHub Issues and PRs

## 2023-[MM-DD] MINUTES [TEMPLATE]

Recording:

Attendees:

Introductions: Welcome everyone to the KubeVirt weekly community meeting

- Join the community:
  - [Add your organization to ADOPTERS.md](#)
  - [Follow on Twitter](#)
  - [Community page](#)
  - Join as a [Github Project Member](#)
- Do we have any new members this week that would like to introduce themselves?

Schedule Check-in: <https://github.com/kubevirt/sig-release/blob/main/releases/v1.1/schedule.md>

Upcoming CfP Check-in: <https://github.com/kubevirt/community/wiki/Events>

Agenda and Notes:

- 

Open Floor:

- 

Pull Requests that need attention: <https://github.com/kubevirt/kubevirt/pulls>

- 

Mailing list review: <https://groups.google.com/g/kubevirt-dev>

- 

Bug scrub: <https://github.com/kubevirt/kubevirt/issues?q=is%3Aopen+is%3Aissue>  
(/triage {accepted | build-watcher | duplicate | needs-information | not-reproducible | unresolved})

-

# Thank You