What is KubeVirt
Kubernetes Based RHV

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About Kubernetes

1. Kubernetes is an open source system for manage containerized applications across multiples hosts, providing basic mechanisms for deployment, maintenance, and scaling of applications.

2. Kubernetes works based Go and Docker environment.

About KubeVirt

1. KubeVirt is a virtual machine management add-on for Kubernetes. The aim is to provide a common ground for virtualization solutions on top of Kubernetes.

2. Now, KubeVirt extends Kubernetes by adding additional virtualization resource type (especially the VM type) through Kubernetes's third party resource concept. By using this mechanism, the Kubernetes API can be used to manager these VM resource alongside all other resources Kubernetes provides.

KubeVirt Extended

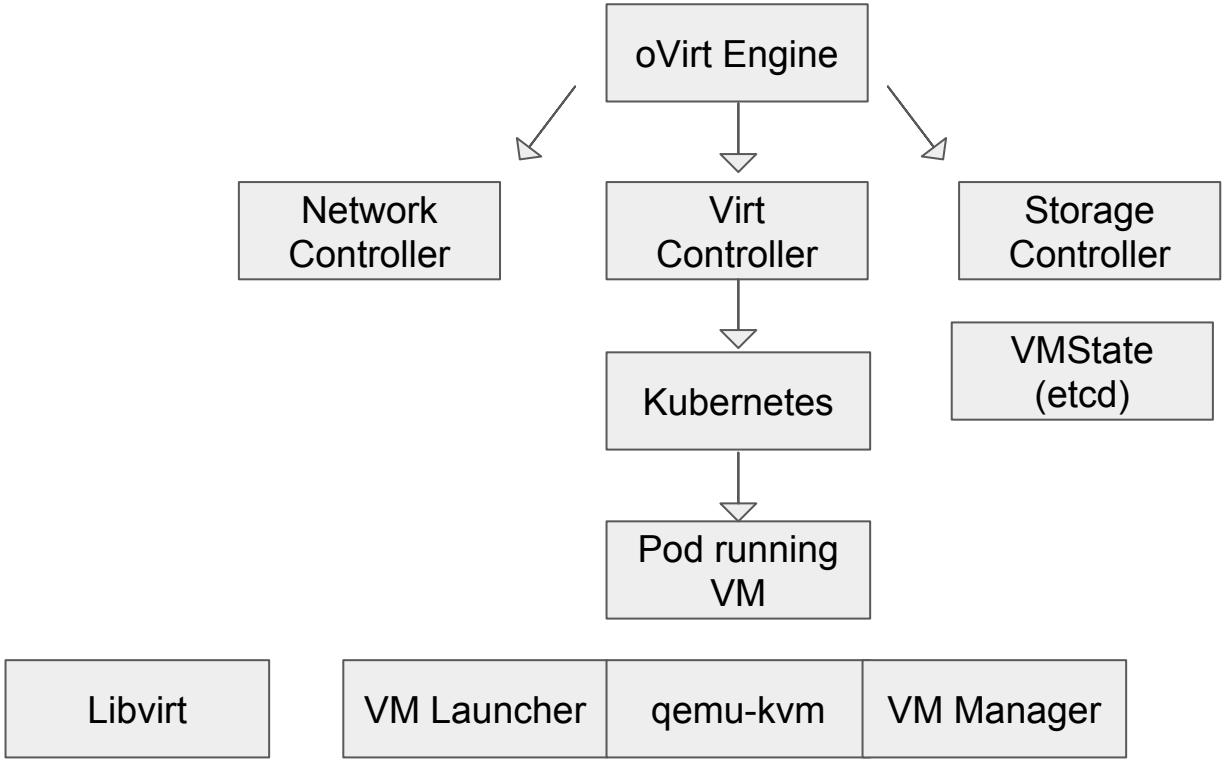
Does what different from Kubernetes:

1. Create a predefined VM
2. Schedule a VM on a Kubernetes cluster
3. Launch a VM
4. Stop a VM
5. Delete a VM
6. * Use Cockpit to manage resource like hosts, VMs ,logs, services, pods...

Example Flow: Create and delete a VM

1. A client posts a new VM definition to the K8s API Server
2. The K8s API Server validates the input and creates a `VM` 3rd party resource (TPR) object.
3. The `virt-controller` observes the creation of the new `VM` object and creates a corrsponding pod.
4. Kubernetes is scheduling the pod on a host
5. The `virt-controller` observes that a pod for the `VM` got started and updates the `nodeName` field in the`VM` object. Now that the `nodeName` is set, the responsibility transitions to the `virt-handler` for any further action.
6. The `virt-handler` (*DaemonSet*) observes that a `VM` got assigned to the host where it is running on.
7. The `virt-handler` is using the *VM Specification* and creates a corresponding domain using the local `libvirtd` instance.
8. A client deletes the `VM` object through the `virt-api-server`.
9. The `virt-handler` observes the deletion and turns off the domain.

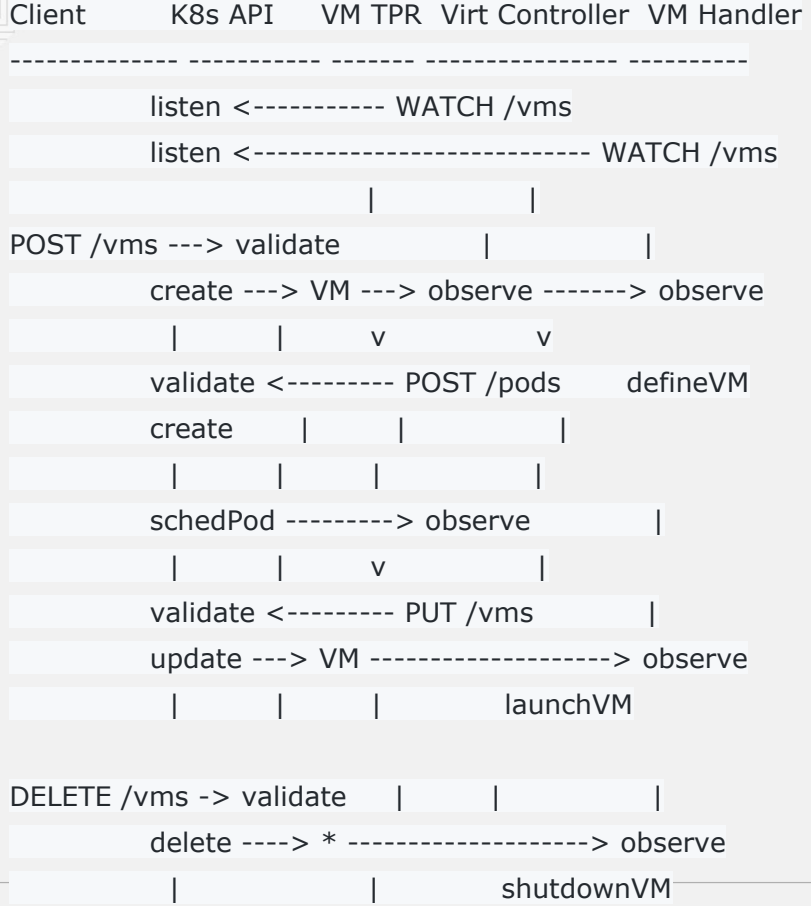
End Goal Architecture



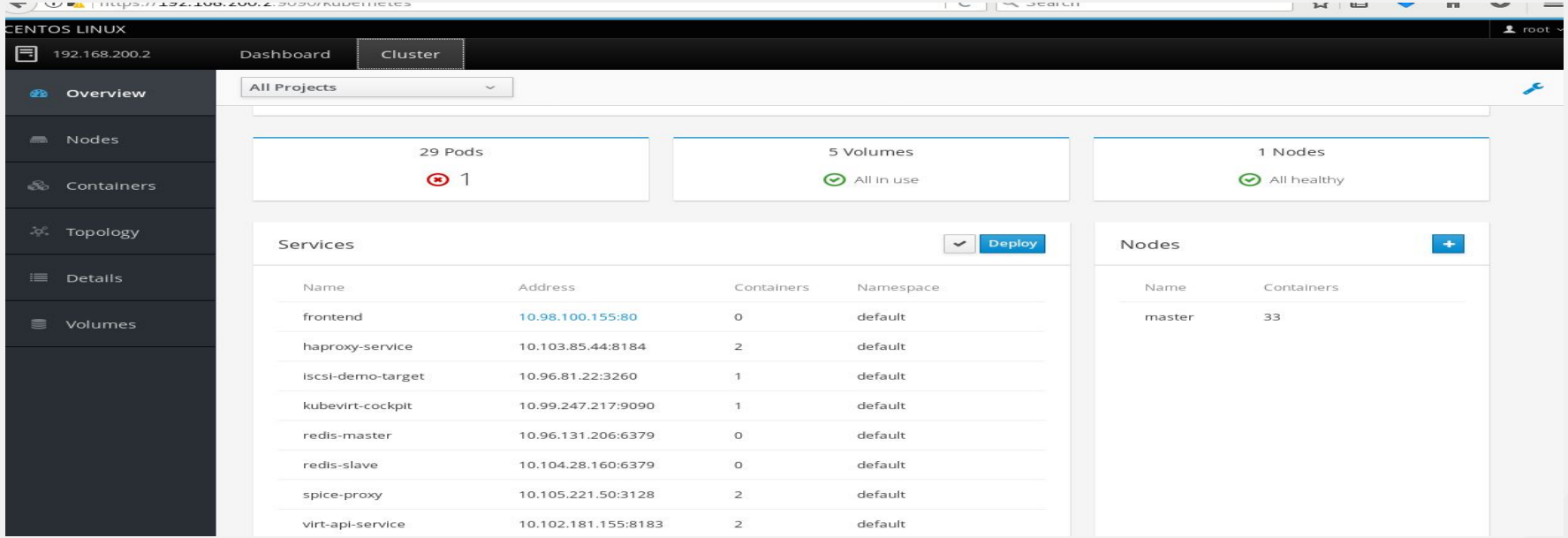
Legend

Network Controller	Handles network related logic which is missing elsewhere
Storage Controller	Handles storage related logic which is missing elsewhere
VMState (etcd)	Keeps VM definitions, used for requests and updates.
Virt Controller	Relevant portions of Engine logic for abstracting virt over Kubernetes
VM Launcher	A simple process used to launch QEMU and handle basic interrupts
VM Manager	Handles VMs at the host level. Should cover for various VM related actions.

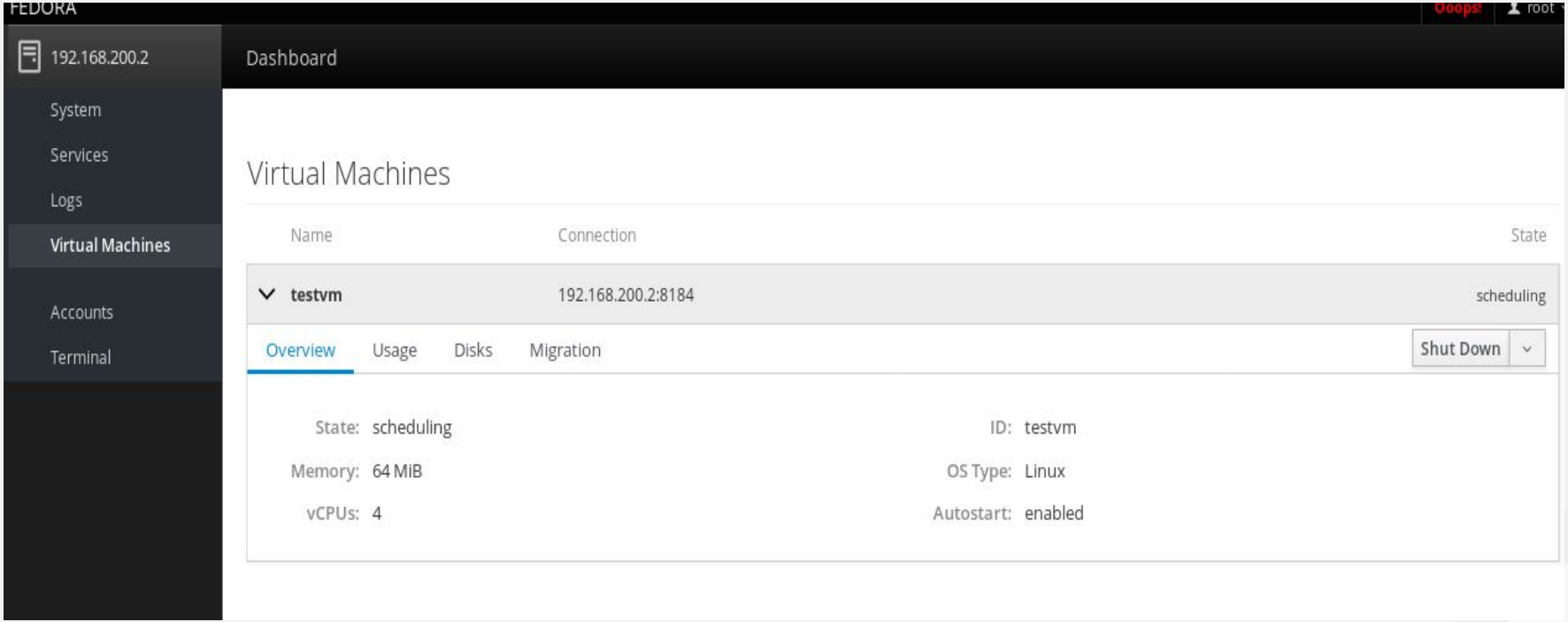
Flow



Cockpit--resource like pods, logs, services...



Cockpit-- VMs

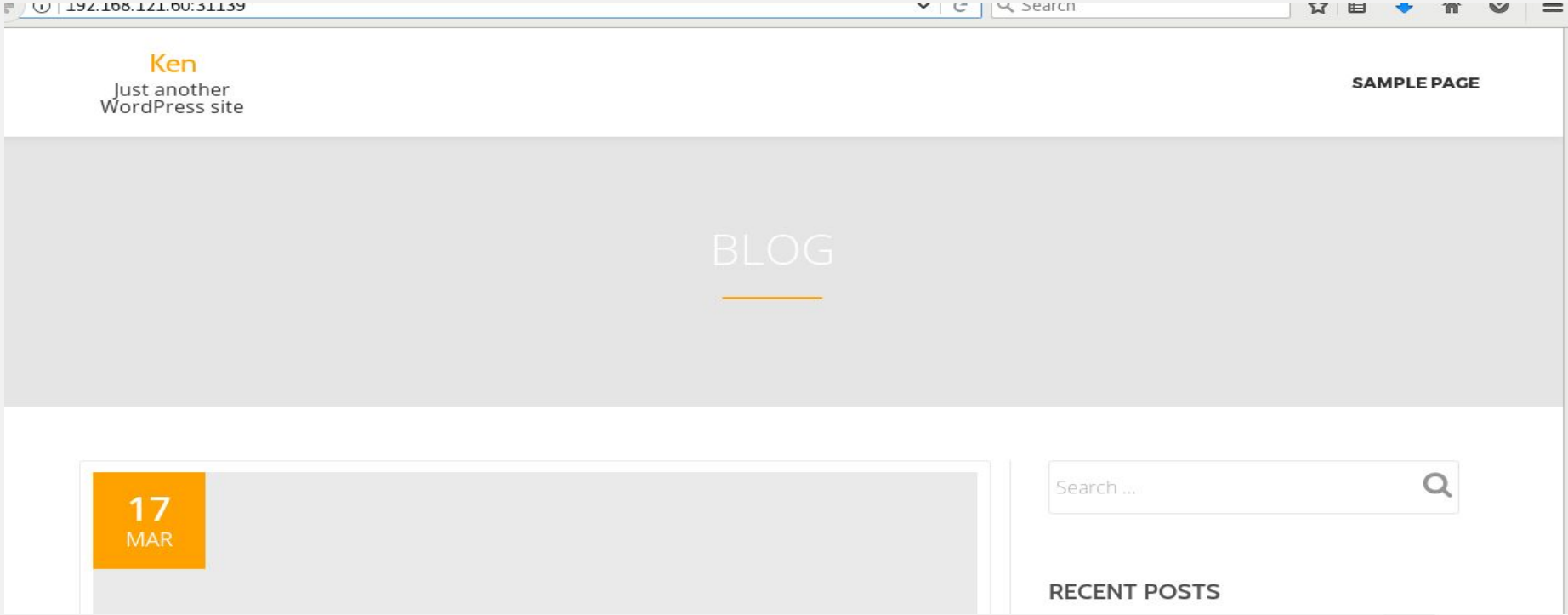


Master, Terminal -- pods, VMs

```
[root@master ~]# kubectl get pods --all-namespaces
NAMESPACE     NAME                                    READY     STATUS    RESTARTS   AGE
default       haproxy                                 1/1       Running   15         13d
default       haproxy-2737689567-lphrs                1/1       Running   0          1d
default       iscsi-demo-target-tgtd-474016847-gd8hf  1/1       Running   0          1d
default       kubevirt-cockpit-3405564194-wy0gd       1/1       Running   0          1d
default       spice-proxy                             1/1       Running   6          13d
default       spice-proxy-3576158421-k0jw7            1/1       Running   0          1d
default       virt-api                                1/1       Running   5          13d
default       virt-api-988471961-u8lmq                1/1       Running   0          1d
default       virt-controller                         1/1       Running   6          13d
default       virt-controller-1177942624-tzrsg        1/1       Running   0          1d
default       virt-handler-vwb39                      1/1       Running   0          1d
default       wordpress-1618093523-de8zj              1/1       Running   8          42d
default       wordpress-mysql-2379610080-5p0e6        1/1       Running   8          42d
kube-system   dummy-2088944543-lxi8s                  1/1       Running   8          43d
kube-system   etcd-master                             1/1       Running   9          43d
kube-system   kube-apiserver-master                   1/1       Running   13         43d
kube-system   kube-controller-manager-master          1/1       Running   10         43d
kube-system   kube-discovery-3670776889-793t6         1/1       Running   9          43d
kube-system   kube-dns-2924299975-8ic0c               4/4       Running   30         43d
kube-system   kube-proxy-ufd6z                        1/1       Running   8          43d
kube-system   kube-scheduler-master                   1/1       Running   10         43d
kube-system   weave-net-tvs1l                         2/2       Running   18         43d
```

```
                                                    root@master:~
[root@master ~]# kubectl get vms
NAME      KIND
testvm    VM.v1alpha1.kubevirt.io
[root@master ~]#
```

Simple App Example



Try KubeVirt

Follow the Github : https://github.com/kubevirt/kubevirt/blob/master/docs/getting-started.md

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If any problems, discuss with me and improve together.