k0s — Yet Another Kubernetes Distro !!

saiyampathak.medium.com/k0s-yet-another-kubernetes-distro-7201ea425165

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Yes, you heard it right, yesterday Mirantis launched **kos** a frictionless kubernetes distribution. kos is a single binary that is packed with all the components to run the Kubernetes cluster in very little time by just having the binary on all the hosts.

Now by this time you already must have started making comparisons of kos with k3s which is a CNCF sandbox project & a CNCF certified kubernetes distribution. But first let us see what kos has to offer, its vision, a demo, and then a comparison with k3s.

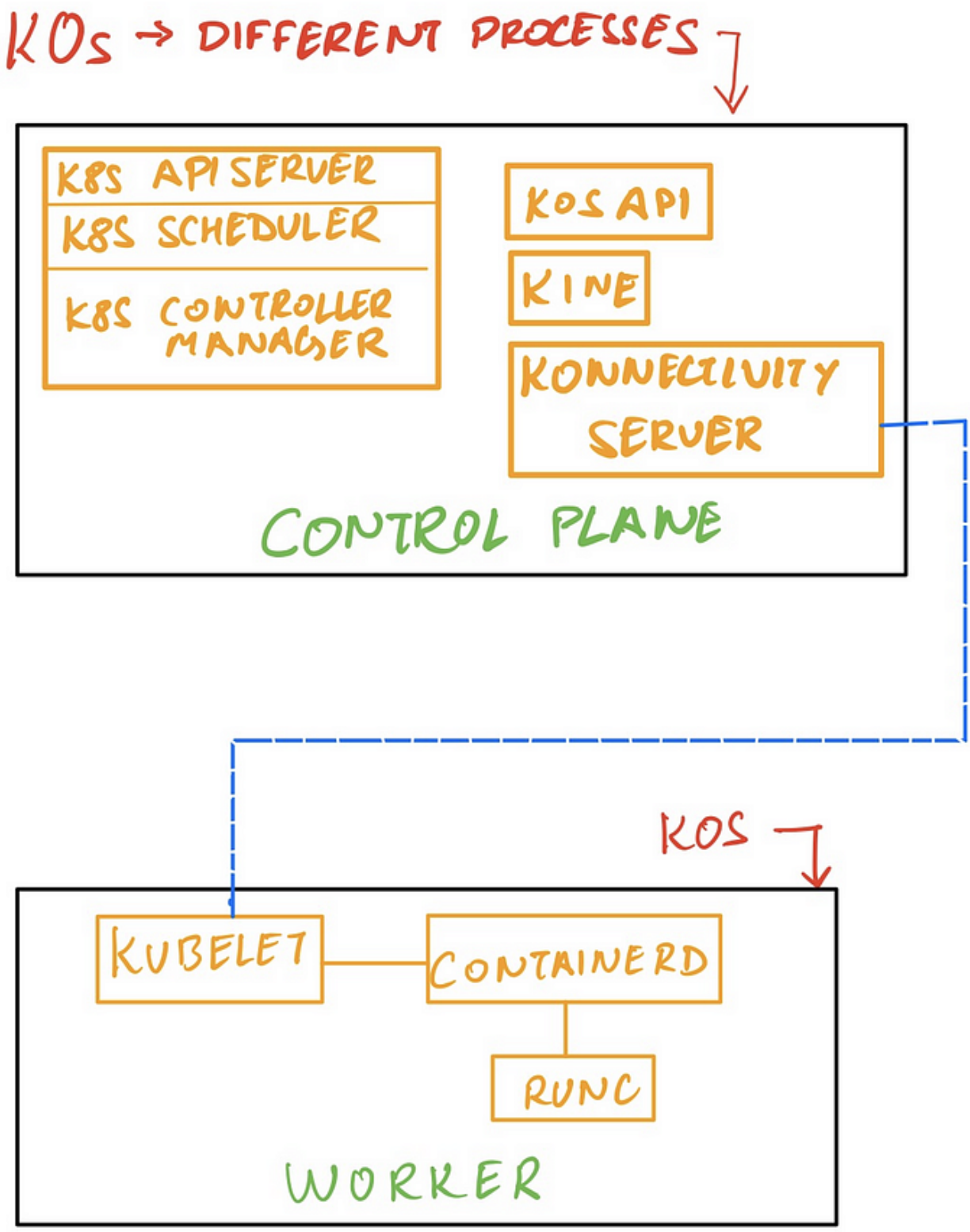
What is behind the name?- Zero friction meaning anyone can install without any kubernetes expertise.
- Zero OS dependencies
- Zero cost as its open-source
- Zero Downtime as it comes with automated cluster lifecycle management

F**eatures:**

- It is a single binary(around 165 mb) with no OS dependencies
- [FIPS security compliance](https://www.sdxcentral.com/security/definitions/what-does-mean-fips-compliant/) = kos kubernetes core components + OS dependencies + components packaged on top
- Isolated Control Plane - the server will not have a container engine or kubelet running by default, meaning no workload can run on the server.
- Custom worker profiles
- Future native cluster backup/restore and other features

Note - Components included in binary will be explained in the comparison with k3s section

A**rchitecture:**



kos uses Rancher's [Kine](https://github.com/rancher/kine/) to allow a wide variety of backend data stores to be used such as MySQL, PostgreSQL, SQLite, and dqlite.
kos uses **Konnectivity** by default that is responsible for the control plane and worker bidirectional communication.

Other Notable points -

- From the commits kos was previously called MKE (Mirantis kubernetes/container engine I suppose)

- It is claimed to be a successor of Pharos Project.
- k0s can be run as docker as well.
- k0s allows extending the functionality of kubernetes cluster by using extensions -> atm only helm CRD's can be used.

D**emo** - For this demo, we will take 2 CentOs plain Virtual machines and create a Kubernetes cluster using k0s

Installing the binary Download the k0s binary on both the nodes:

```
curl -sSfL k0s.sh | shDownloading k0s from URL:
```

Run the server on the node(the machine where you want the Control plane to be) with default config

```
k0s server
```

you can see all the control plane components running as processes

```
root     11169 11009  1 19:03 pts/0   00:00:00 root     11175 11169  5 19:03 pts/0
00:00:02 ...root     11184 11169  6 19:03 pts/0   00:00:02 /var/lib/k0s/bin/ ...root
11187 11169 36 19:03 pts/0   00:00:12 /var/lib/k0s/bin/...root     11191 11169  0 19:03
pts/0   00:00:00 /var/lib/k0s/bin/...root     11196 11169  3 19:03 pts/0   00:00:01
/var/lib/k0s/bin/...root     11209 11169  0 19:03 pts/0   00:00:00 k0s api --
config=/root/k0s.yaml```
```

Create the token for worker

```
k0s token create --role=worker
```

On the worker node run the join command with the token just generated

```
k0s worker <token>
```

you can see the k0s processes on the worker node as well:

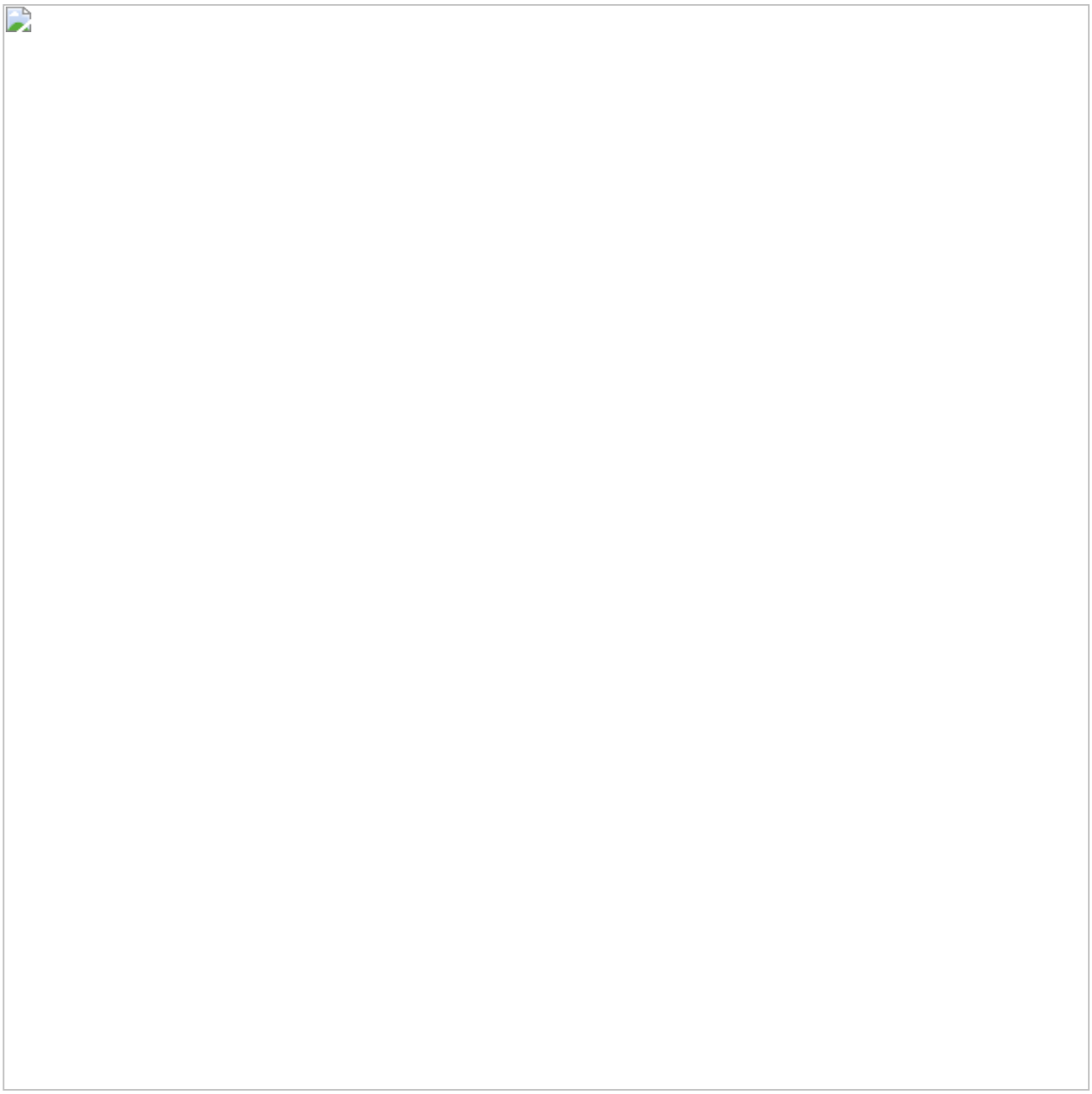
```
ps -ef | grep k0sroot     12430 12356  2 19:09 pts/0    00:00:02 k0s worker ....root
12436 12430 18 19:09 pts/0    00:00:17 /var/lib/k0s/bin/containerd ...root     12441
12430  3 19:09 pts/0    00:00:02 /var/lib/k0s/bin/kubelet ...root     12523     1  0
19:09 pts/0    00:00:00 /var/lib/k0s/bin/containerd-shim-runc ...
|                      |                       |root     13504     1  0 19:10 pts/0
00:00:00 /var/lib/k0s/bin/containerd-shim-runc-```
```

From the control plane, you can see the status of the worker node (after installing **kubectl** as it is not packaged within the binary)

```
curl -LO " -s "chmod +x kubectl mv kubectl /usr/local/bin/mkdir ~/.kubecp
/var/lib/k0s/pki/admin.conf ~/.kube/configNAME   STATUS   ROLES    AGE    VERSIONtest
Ready    <none>   7m1s   v1.19.3
```

Now we have a Kubernetes cluster up and running with the Kubernetes version v1.19.3

C**omparison with k3s:**



Note: kos does not run on Arch Linux(thanks to

Let me know your thoughts on it in comments or on reddit.

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