Welcome to CIALUG, we will be starting soon

Welcome to LUG

Linux News

Linux News

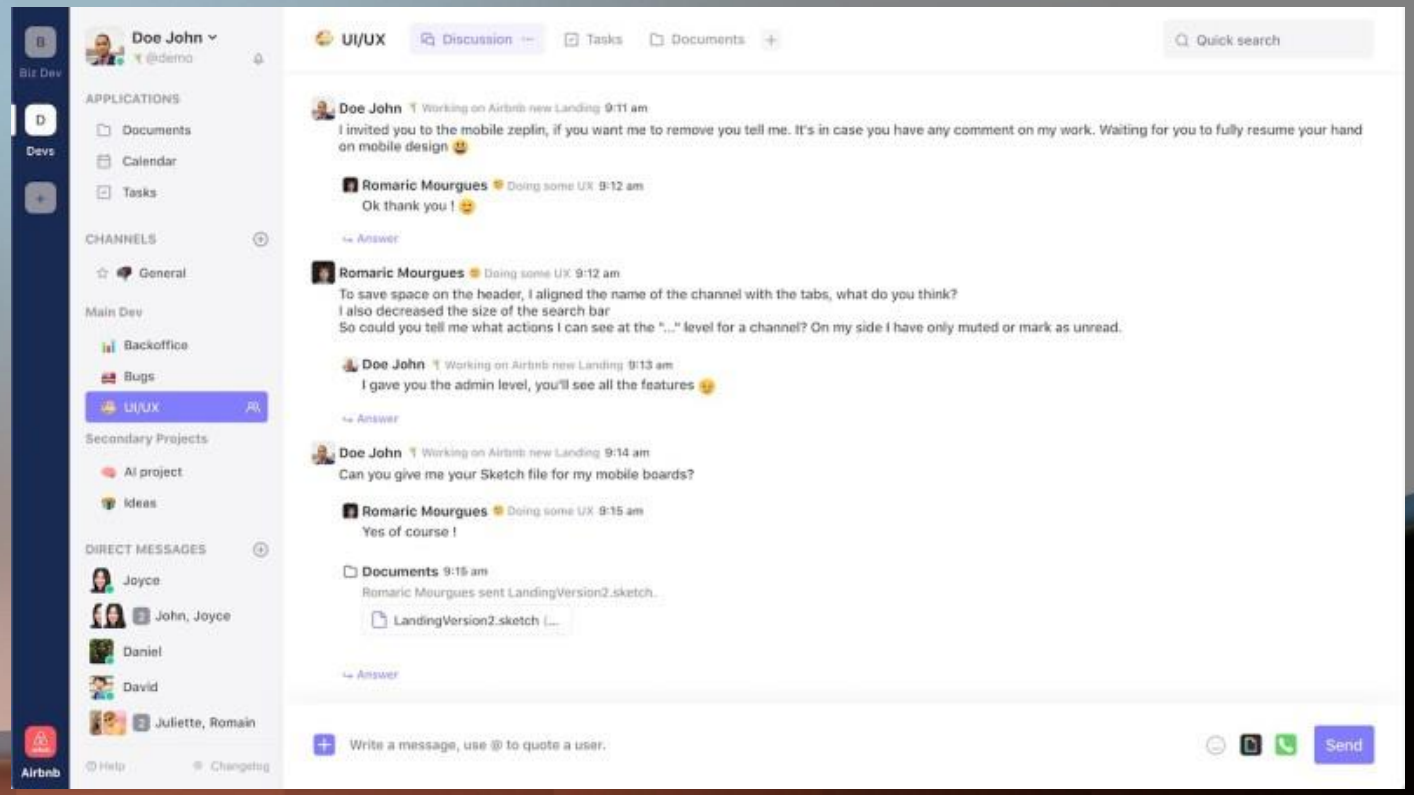
- Linux 5.10 released and is LTS until 2026
  - Drivers
  - significant performance bump to btrfs fsync()
  - Ext4 performance bump
  - Amd zen3 processor support
  - Purism librem5 linux smart phone
  - Creative soundblaster ae-7 support
  - Support for the Switch Joy Cons controller and sega Saturn controller
  - Mips processors can boot kernels compressed with zstd RISC-V boot with EFI firmware
  - Faster Hibernate and resumes (batching of I/O Requests)

Linux News

- Rasberry PI OS release
  - Pulse Audio now instead of ALSA (now Bluetooth audio works out of the box)
  - CUPS installed by default w/ system-config-printer
  - Orca Screen reader improvements
  - Config tool to for LED lights
  - Chromium update to v84
  - Thonny python updated to v 3.3
  - Flash Player updated to the last one
  - Low voltage warnings added to battery monitor
  - Other bug fixes
  - Still using Linux 5.4 LTS kernel under the hood

Linux News

- Independent System vendor ZaReason shuts down due to COVID-19 (link)
- Twake (A modern Open Source Collaboration Platform (next cloud alternative)
- https://itsfoss.com/twake-app/

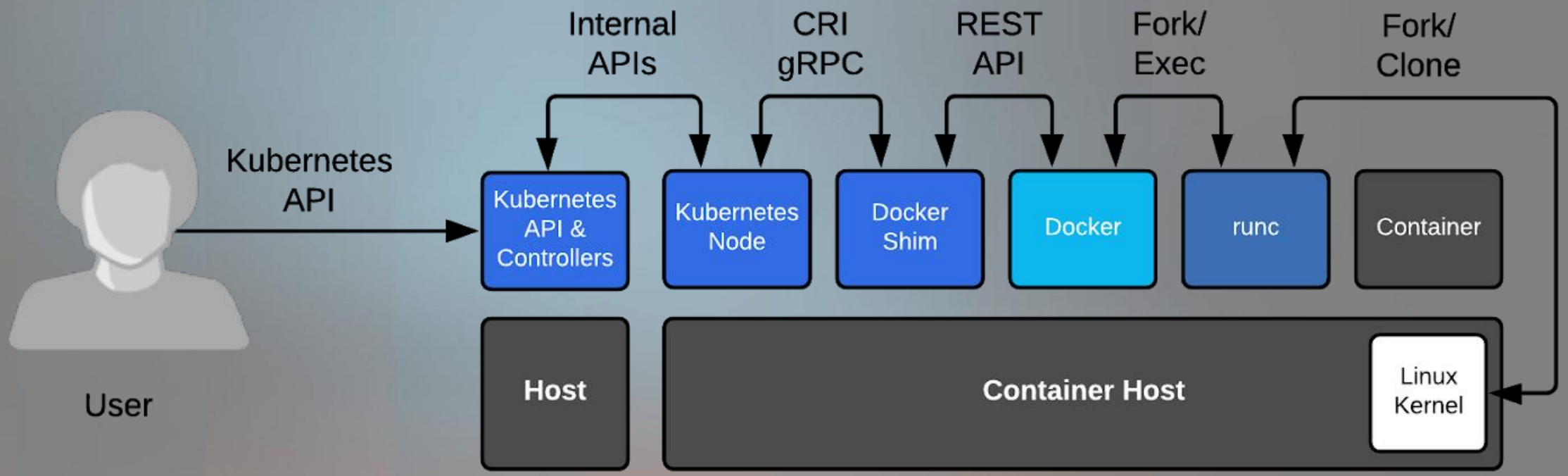


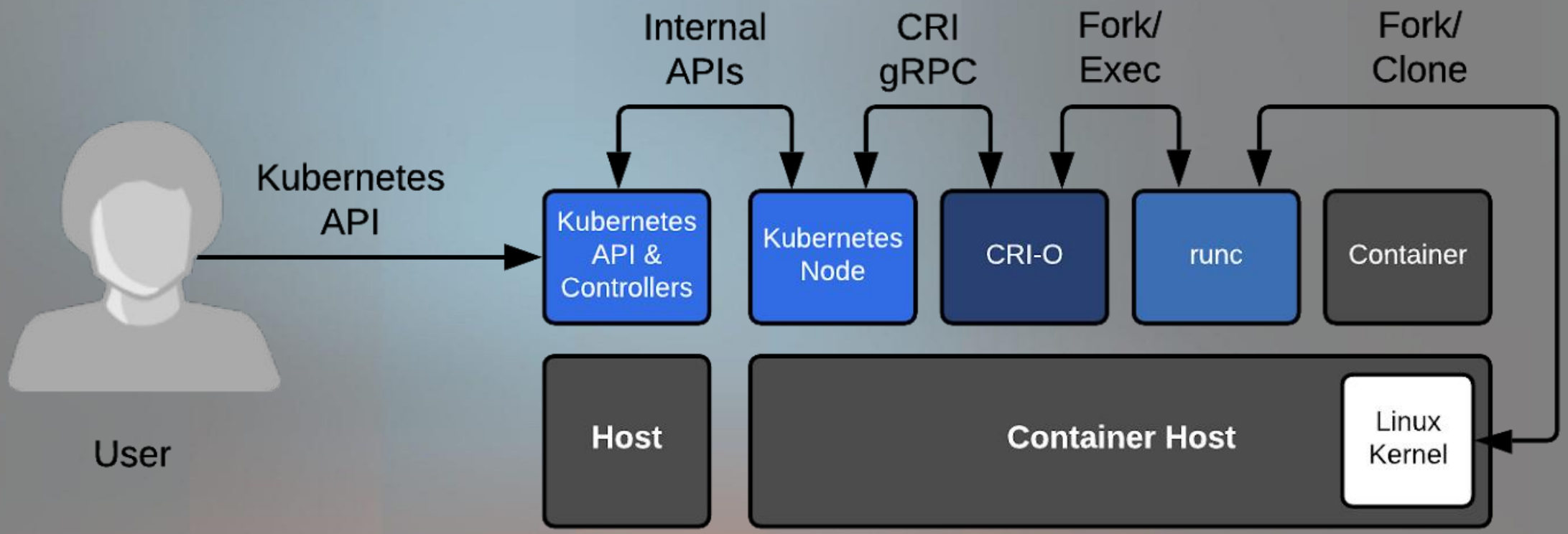
IM FREAKING OUT MAN

You are freaking out... MAAN.

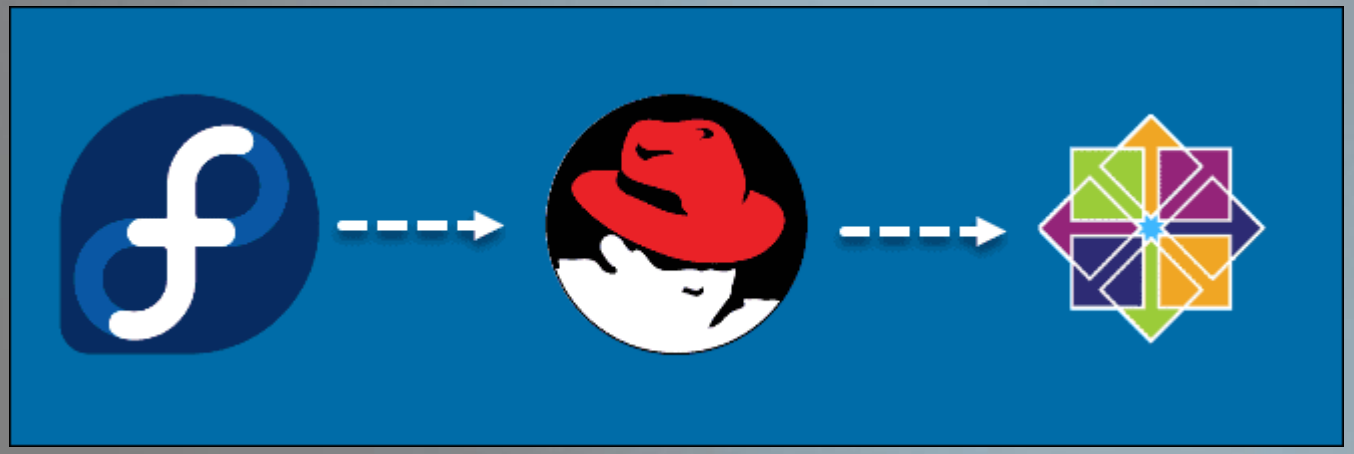
Linux News

- Kubernetes and docker
  - https://www.openshift.com/blog/kubernetes-is-removing-docker-support-kubernetes-is-not-removing-docker-support
  - TL;DR: as of Kubernetes 1.20, support of the Docker container engine is deprecated, but users will still be able to use Docker container images and registries, as well as create containers that look identical at runtime.
  - Command line now can use cri-ctl instead of docker http://crunchtools.com/what-is-crictl-and-why-should-you-care/


Internal APIs
CRI gRPC
REST API
Fork/ Exec
Fork/ Clone
Kubernetes API
Kubernetes API & Controllers
Kubernetes Node
Docker Shim
Docker
runc
Container
User
Host
Container Host
Linux Kernel


Internal APIs
CRI gRPC
Fork/ Exec
Fork/ Clone
Kubernetes API
Kubernetes API & Controllers
Kubernetes Node
CRI-O
runc
Container
User
Host
Container Host
Linux Kernel

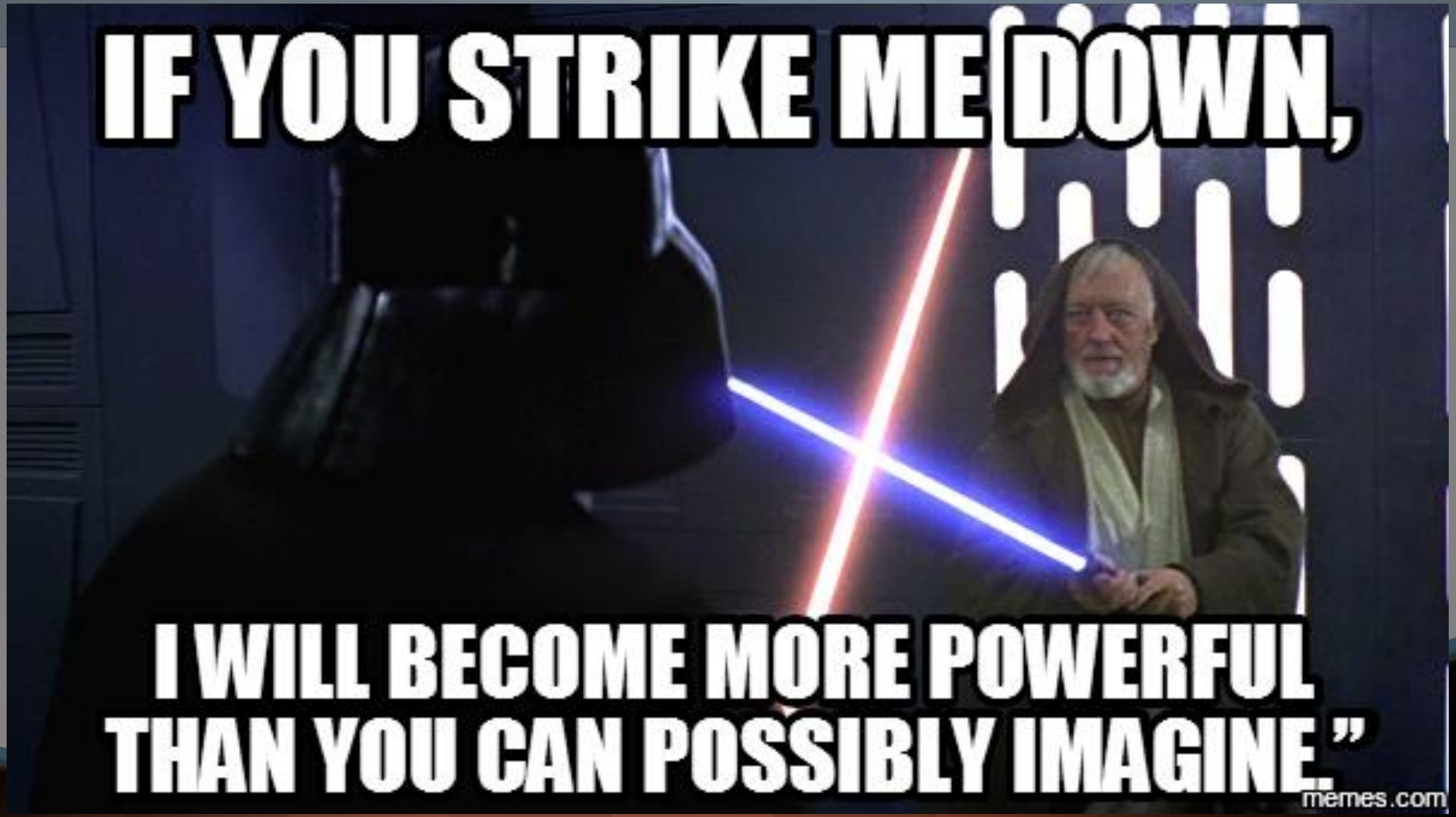
Linux News –Redhat/Centos



Linux news--CentOS

- Previous EOL was 2029 now last release EOL is December 2021
- RHEL will not release any new CentOS distro only CentOS stream

- New potential Forks on the way
  - Rocky Linux
  - Cloud Linux


IF YOU STRIKE ME DOWN,
I WILL BECOME MORE POWERFUL
THAN YOU CAN POSSIBLY IMAGINE."
memes.com


Did I miss anything?

About me

- By day a Software Specialist by night a linux guy
- Slides will be posted to http://denner.co
- Twitter: @adenner

Local Kubernetes for dummies

So you want to move from docker-compose?

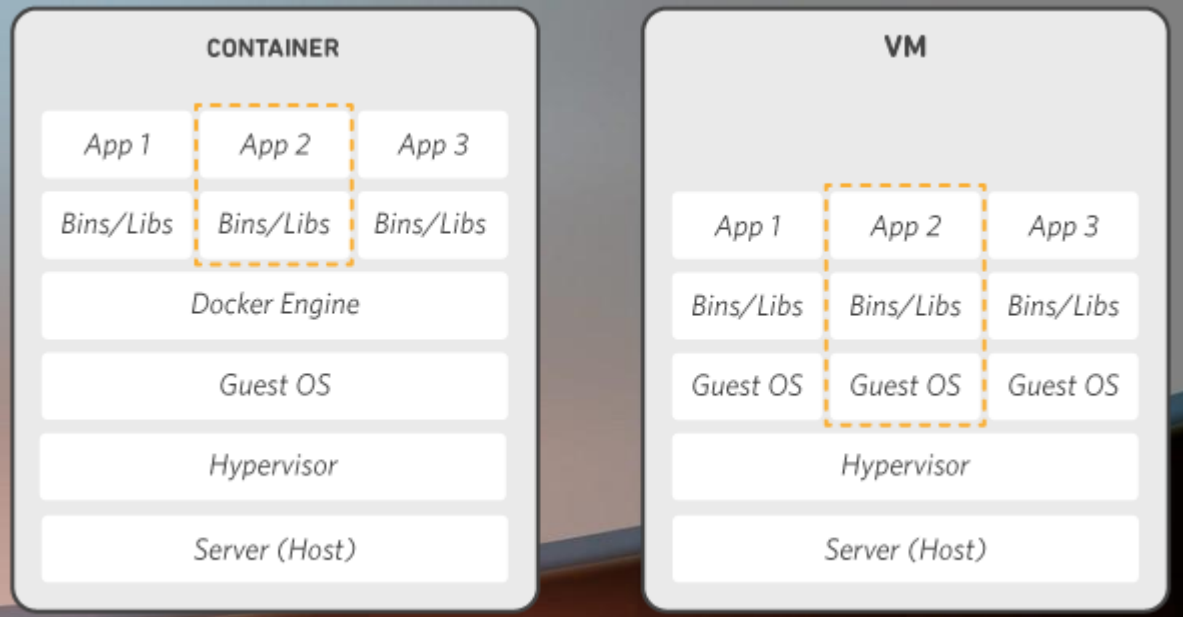
Andrew Denner
Central Iowa Linux Users Group
December 2020

Where we have been…

- Back in April we talked a bit about K8s…
- But last month several folks expressed interest in how to move from docker compose yaml files to a k8s instead
- Admittedly I was one of them

Brief review

- Docker
  - Docker is a software platform that allows you to build, test, and deploy applications quickly. Docker packages software into standardized units called containers that have everything the software needs to run including libraries, system tools, code, and runtime. Using Docker, you can quickly deploy and scale applications into any environment and know your code will run.

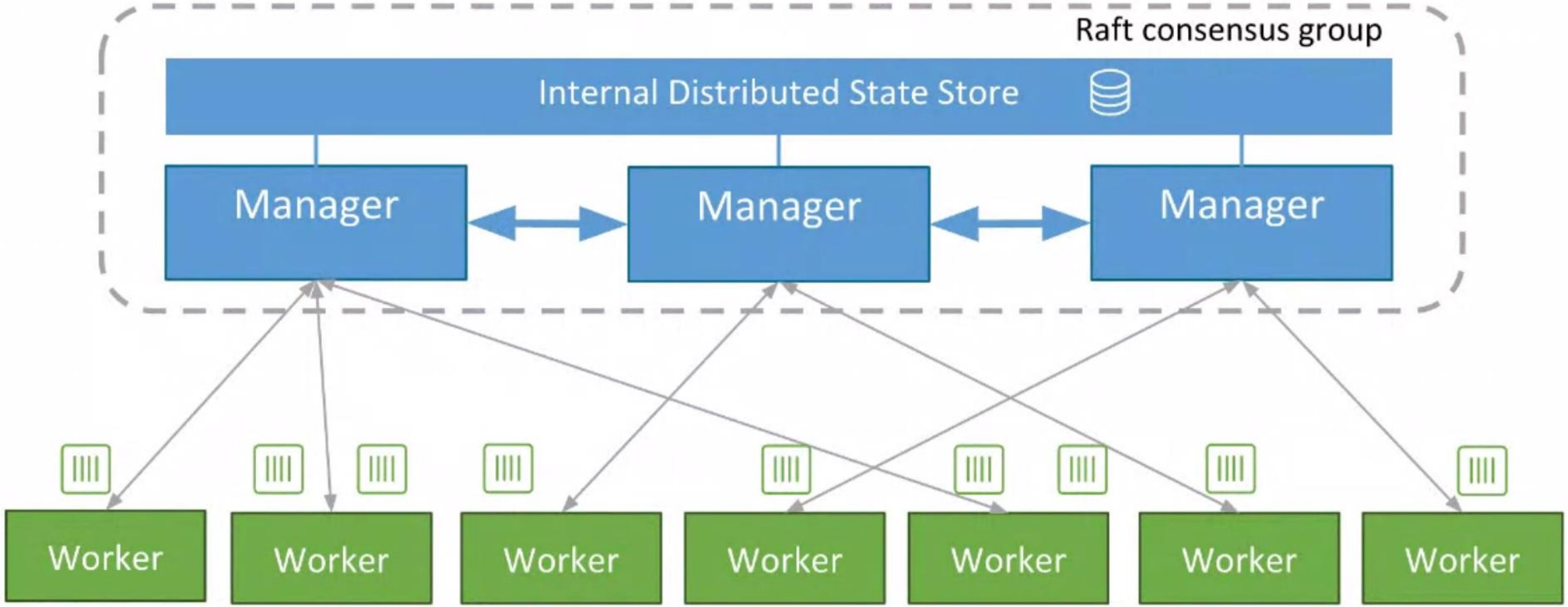


Brief review

- Docker’s shortcomings
  - Orchestration of multiple containers
  - Networking headaches
  - Shifting of the snowflake
  - Communication between docker images on different machines
  - Still just one machine, eventually you want more.

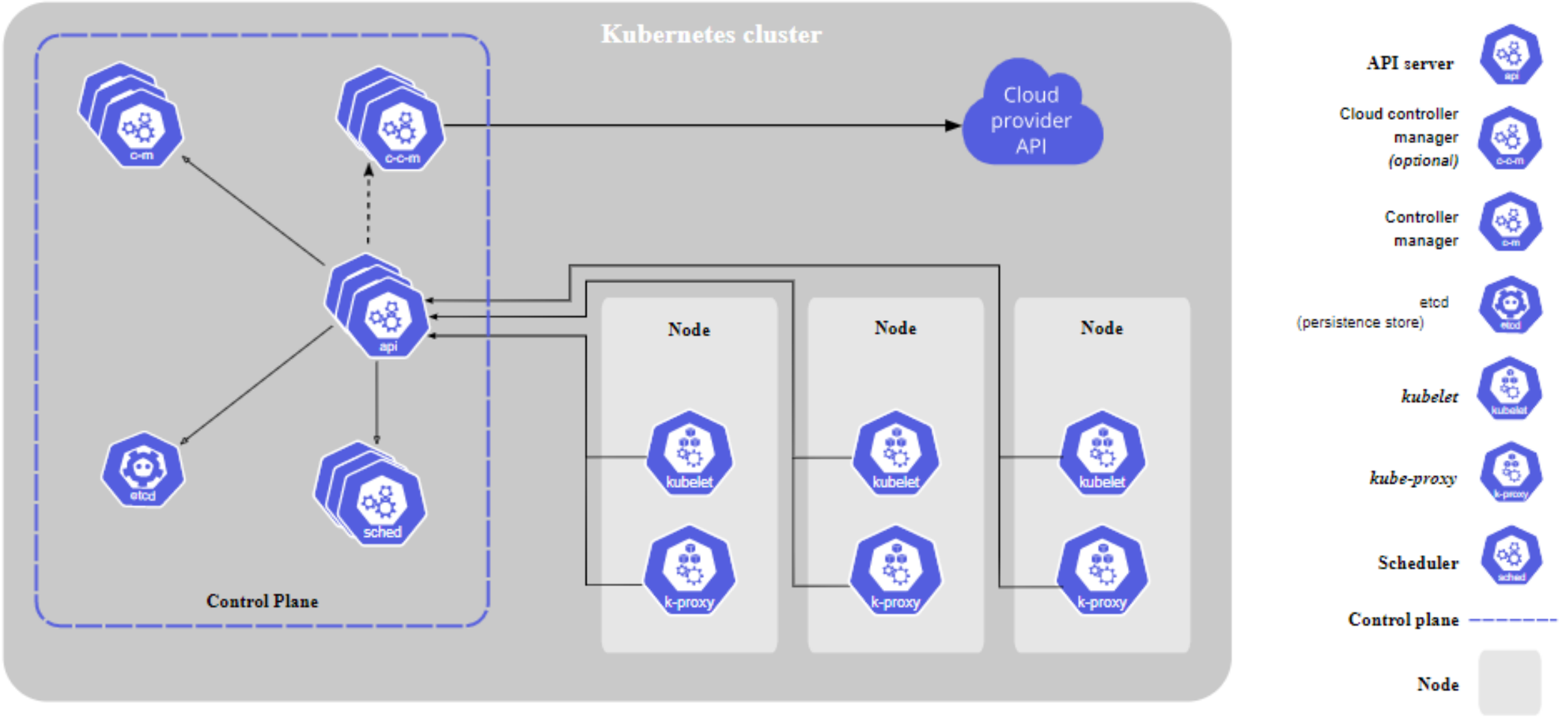

You're gonna need a bigger boat.

Swarm Architecture



Brief review

- Kubernetes (k8s) is an open source ecosystem for automating deployment scaling and management of containerized applications
- Planet Scale
- Never outgrow
- Run it anywhere
  - On-prem
  - Hybrid
  - Public cloud


Kubernetes cluster
c-m
c-c-m
Cloud provider API
api
etcd
sched
Control Plane
Node
kubelet
k-proxy
Node
kubelet
k-proxy
Node
kubelet
k-proxy
API server
Cloud controller manager (optional)
Controller manager
etcd (persistence store)
kubelet
kube-proxy
Scheduler
Control plane
Node

So why Kubernetes?

- Industry standard
- More support and documentation
- Can run anywhere (multi cloud, desktop, pi etc.)
- It was the winner of the battle of the clusters (much as docker protests)

Orchestration

Docker Compose

- Easy orchestration of docker containers
- Simple YAML
- At the base level one instance of docker
- Can hit docker-swarm
- Or apparently also k8s but not really standard link

```
version: "3.8"
services:
  dev-web:
     build: dev-web/.
     volumes:
        - "$PWD/dev-web/etc-caddy:/etc/caddy"
        - "$PWD/dev-web/www:/var/www/localhost/htdocs"
     networks:
        - proxy_net
  proxy:
     image: "caddy:alpine"
     ports:
        - "80:80"
        - "443:443"
     volumes:
        - "$PWD/ProxyEtc/:/etc/caddy/"
     networks:
        - proxy_net
networks:
        proxy_net:
                driver: bridge
```

Helm

- Helm is a tool for managing K8 packages called charts.
- Three concepts:
  - Chart
  - Config
  - Release
- With helm you can:
  - Create new charts from scratch
  - Package charts into chart archive (tgz) files
  - Interact with chart repos
  - Install and uninstall charts into k8s cluster
  - Manage Release cycle of charts

How do I get K8s and Helm?

How to get K8s

- You can install the full install of Kubernetes… this is hard and messy
- Minikube (https://minikube.sigs.k8s.io/)
  - 2 CPUs or more
  - 2GB of free memory
  - 20GB of free disk space
  - Internet connection

x86

Binary download

```
curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64
sudo install minikube-linux-amd64 /usr/local/bin/minikube
```

Debian package

```
curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube_latest_amd64.deb
sudo dpkg -i minikube_latest_amd64.deb
```

RPM package

```
curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-latest.x86_64.rpm
sudo rpm -ivh minikube-latest.x86_64.rpm
```

ARM

Binary download

```
curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-linux-arm64
sudo install minikube-linux-arm64 /usr/local/bin/minikube
```

Debian package

```
curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube_latest_arm64.deb
sudo dpkg -i minikube_latest_arm64.deb
```

RPM package

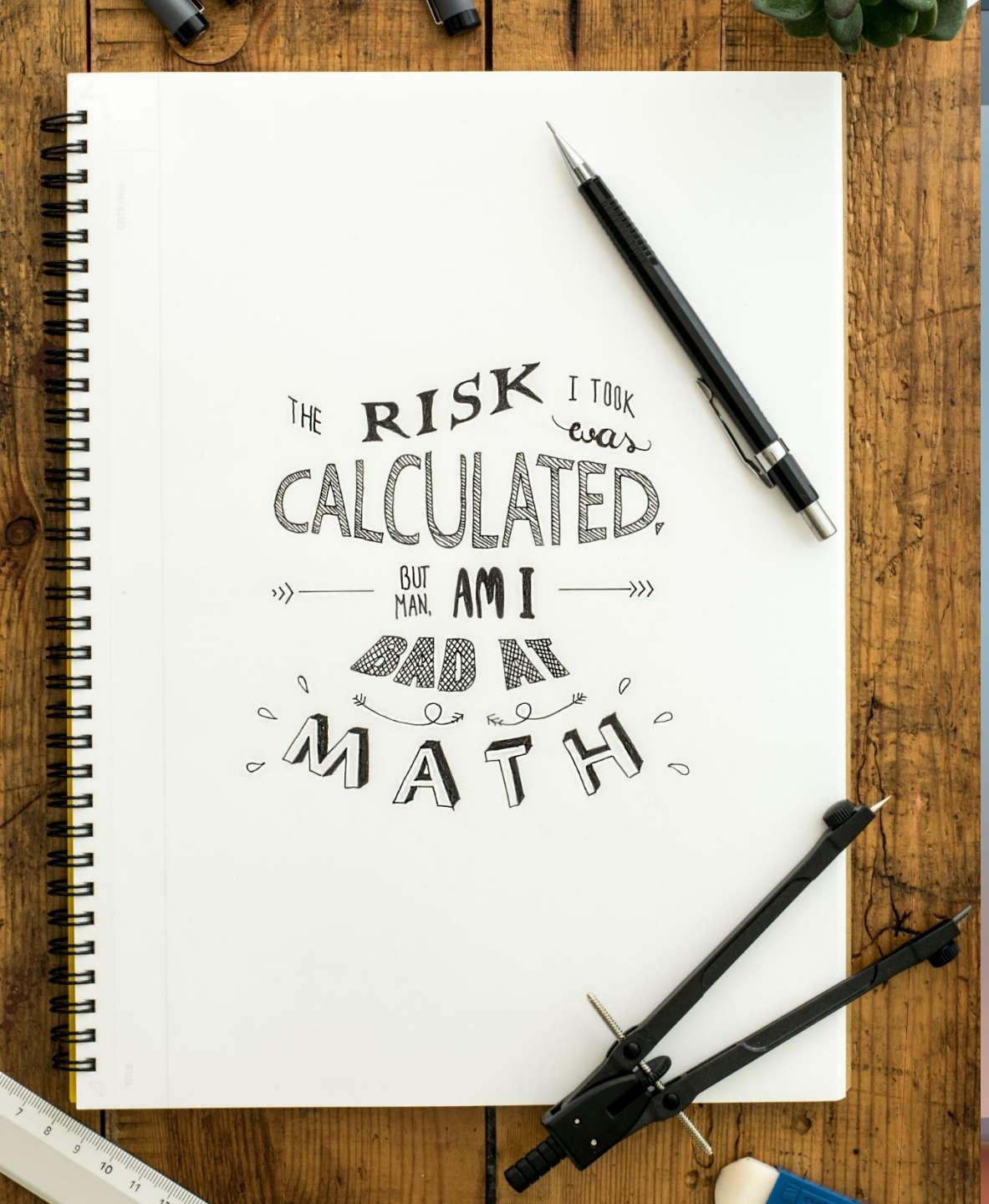
```
curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-latest.aarch64.rpm
sudo rpm -ivh minikube-latest.aarch64.rpm
```

Copy

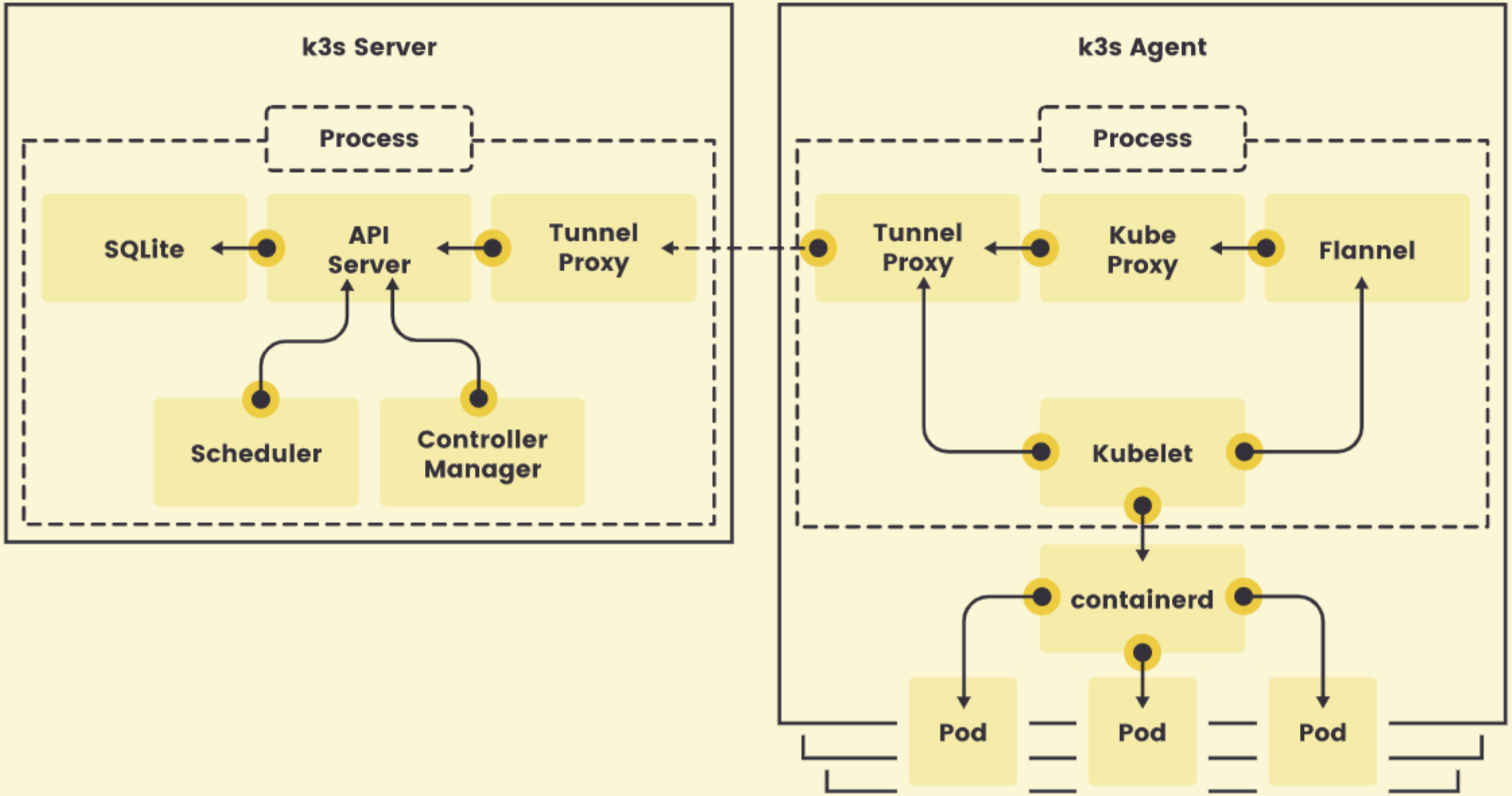
How to get K8s

- K3s https://k3s.io/
  - Even lighter weight (100 MB)
  - Targeted at:
    - Edge
    - IoT
    - CI
    - Development
    - ARM
    - Embedding K8s
  - Situations where a PhD in K8s clusterology is infeasible

```
curl -sfL https://get.k3s.io | sh -
# Check for Ready node,
takes maybe 30 seconds
k3s kubectl get node
```

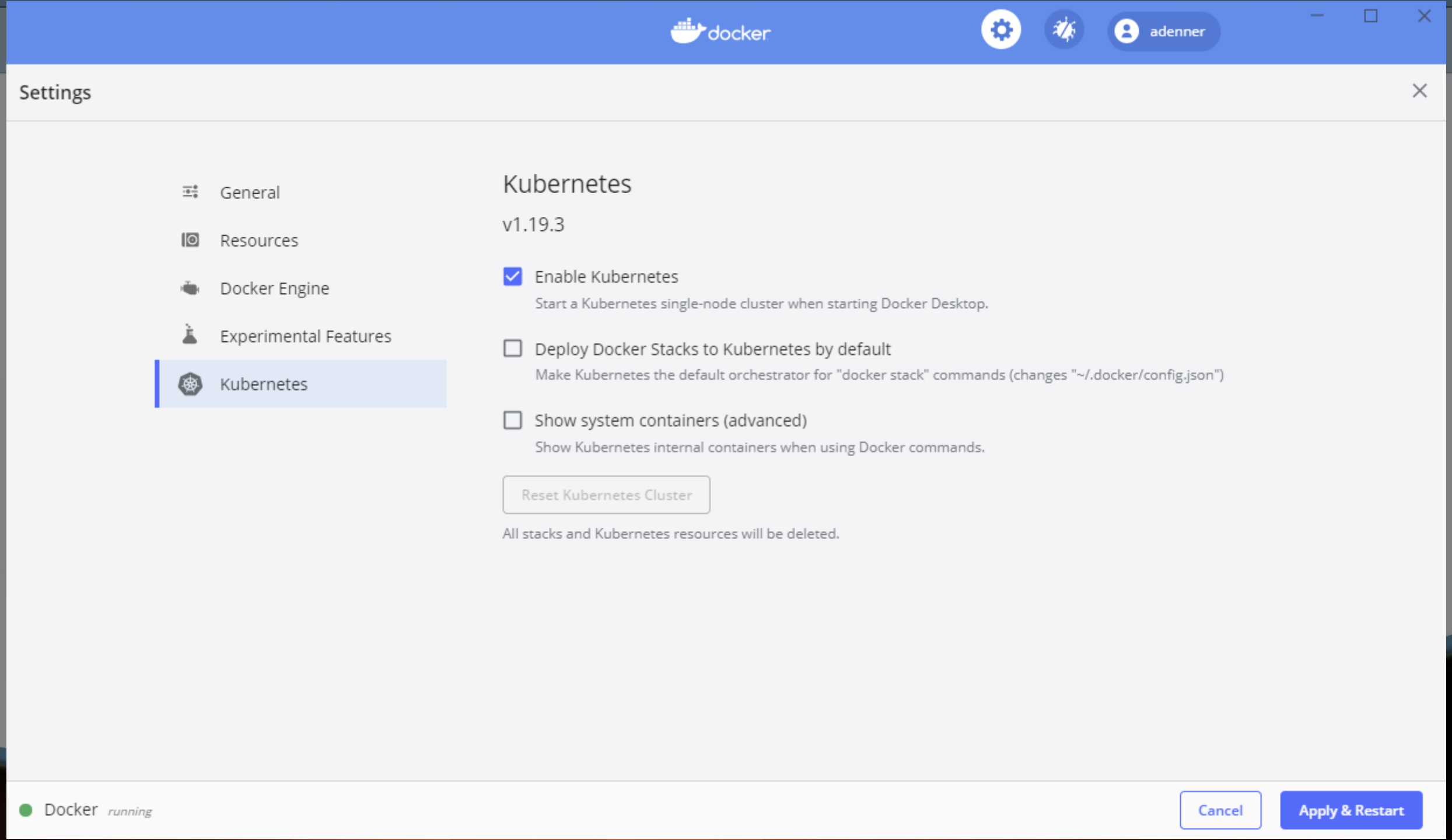


Yolo


k3s Server
Process
SQLite
API Server
Tunnel Proxy
Scheduler
Controller Manager
k3s Agent
Process
Tunnel Proxy
Kube Proxy
Flannel
Kubelet
containerd
Pod
Pod
Pod

Or if you have docker desktop

Yes, I know this is windows but I am using WSL2 so it kinda counts…


docker
adenner
Settings
General
Resources
Docker Engine
Experimental Features
Kubernetes
Kubernetes
v1.19.3
Enable Kubernetes
Start a Kubernetes single-node cluster when starting Docker Desktop.
Deploy Docker Stacks to Kubernetes by default
Make Kubernetes the default orchestrator for "docker stack" commands (changes "~/.docker/config.json")
Show system containers (advanced)
Show Kubernetes internal containers when using Docker commands.
Reset Kubernetes Cluster
All stacks and Kubernetes resources will be deleted.
Docker running
Cancel
Apply & Restart

Install helm via script

```
$ curl -fsSL -o get_helm.sh https://raw.githubusercontent.com/helm/helm/master/scripts/get-helm-3
$ chmod 700 get_helm.sh
$ ./get_helm.sh
```

OR

```
curl https://raw.githubusercontent.com/helm/helm/master/scripts/get-helm-3 | bash
```

```
adenner@DESKTOP-PMDKKHP:/mnt/c/Users/the_d$ curl https://baltocdn.com/helm/signing.asc | sudo apt-key add -
pt-get install apt-transport-https --yes
echo "deb https://baltocdn.com/helm/stable/debian/ all main" | sudo tee /etc/apt/sources.list.d/helm-stable-debian.list
sudo apt-get update
sudo apt-get install helm  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  1700  100  1700    0     0   3744      0 --:--:-- --:--:-- --:--:--  3744
OK
adenner@DESKTOP-PMDKKHP:/mnt/c/Users/the_d$ sudo apt-get install apt-transport-https --yes
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  apt-transport-https
0 upgraded, 1 newly installed, 0 to remove and 24 not upgraded.
Need to get 1708 B of archives.
After this operation, 161 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 apt-transport-https all 2.0.2ubuntu0.2 [1708 B]
Fetched 1708 B in 0s (3481 B/s)
Selecting previously unselected package apt-transport-https.
(Reading database ... 34344 files and directories currently installed.)
Preparing to unpack .../apt-transport-https_2.0.2ubuntu0.2_all.deb ...
Unpacking apt-transport-https (2.0.2ubuntu0.2) ...
Setting up apt-transport-https (2.0.2ubuntu0.2) ...
adenner@DESKTOP-PMDKKHP:/mnt/c/Users/the_d$
```