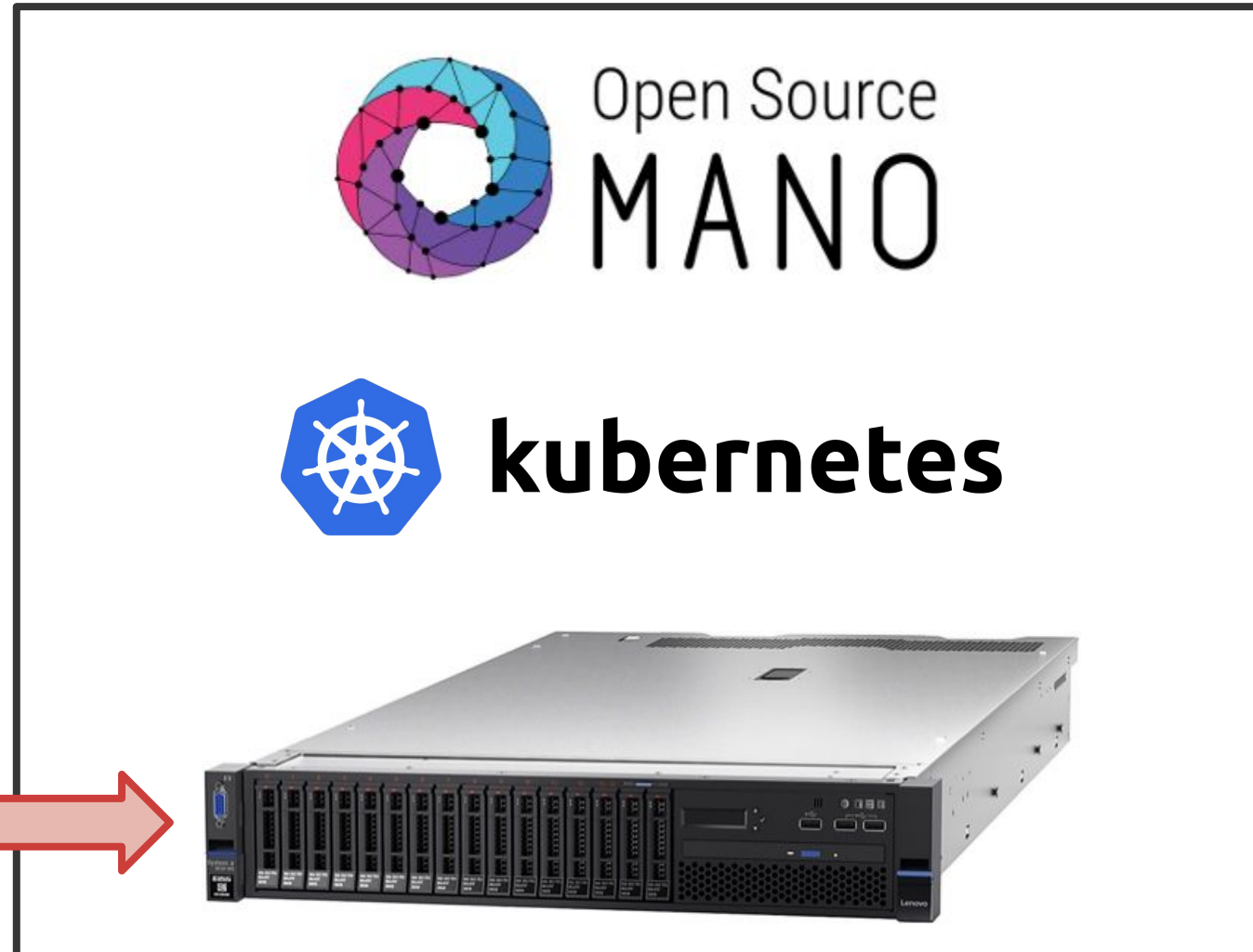


# Open Source MANO

Highly available, Production Ready  
Blueprint for OSM

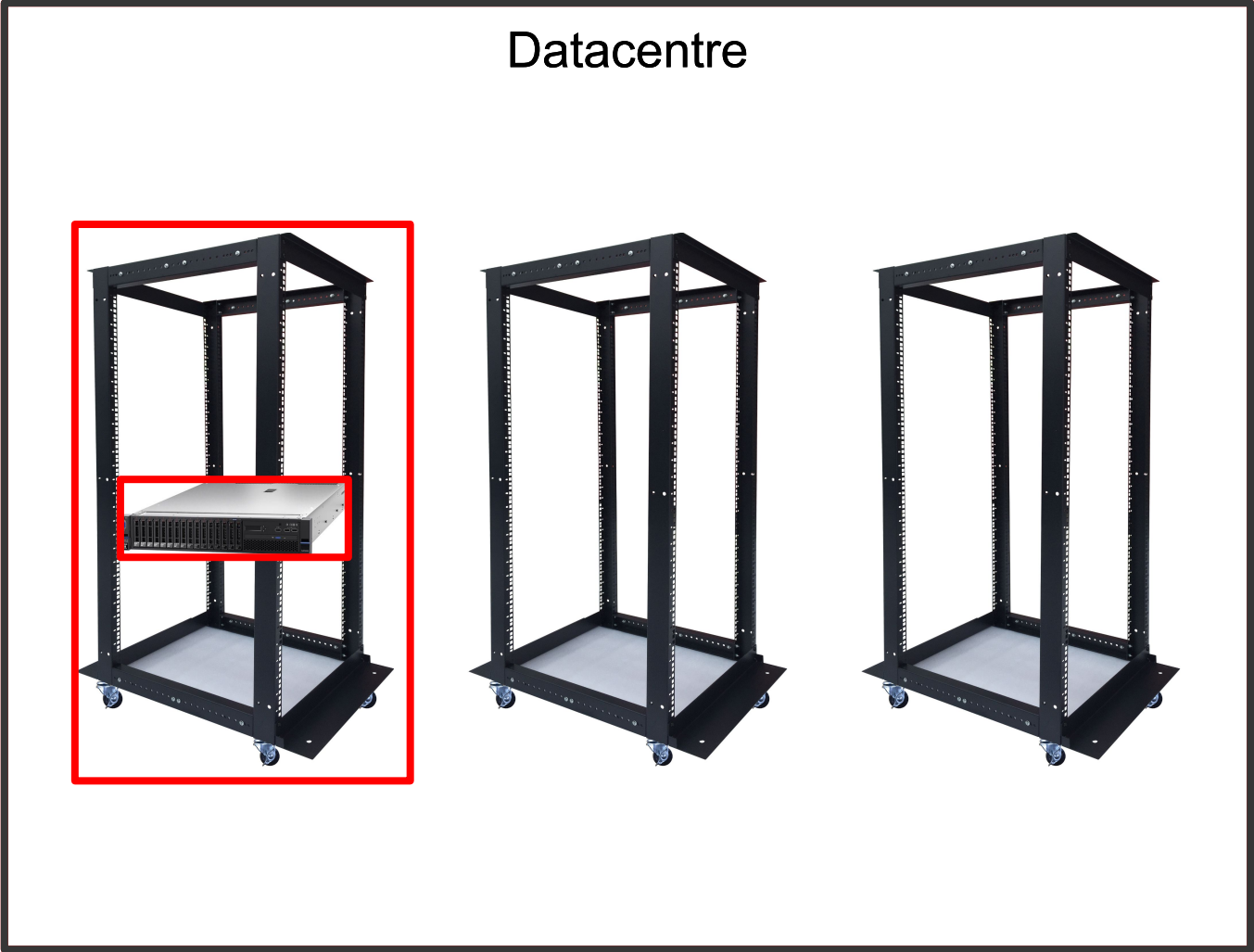
Mark Beierl  
Canonical

# Fault Domains



Single Point of Failure

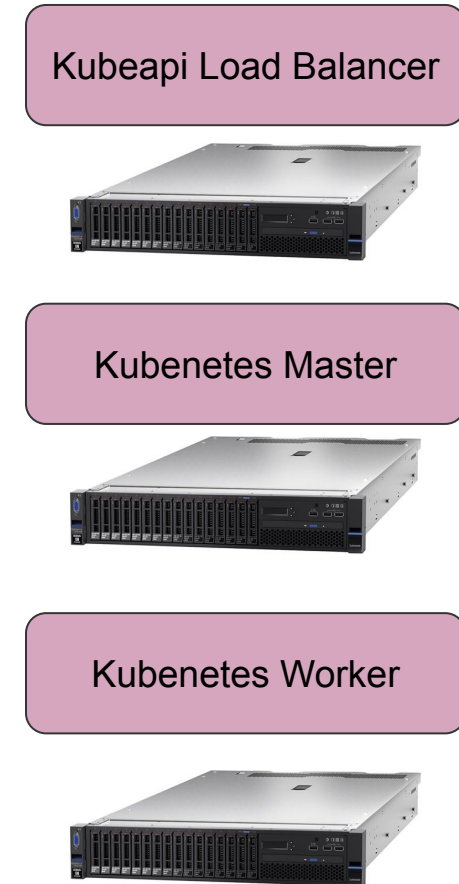
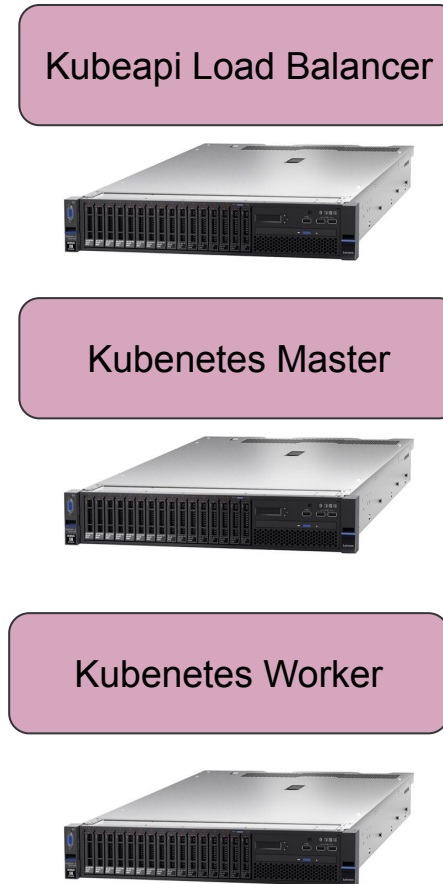
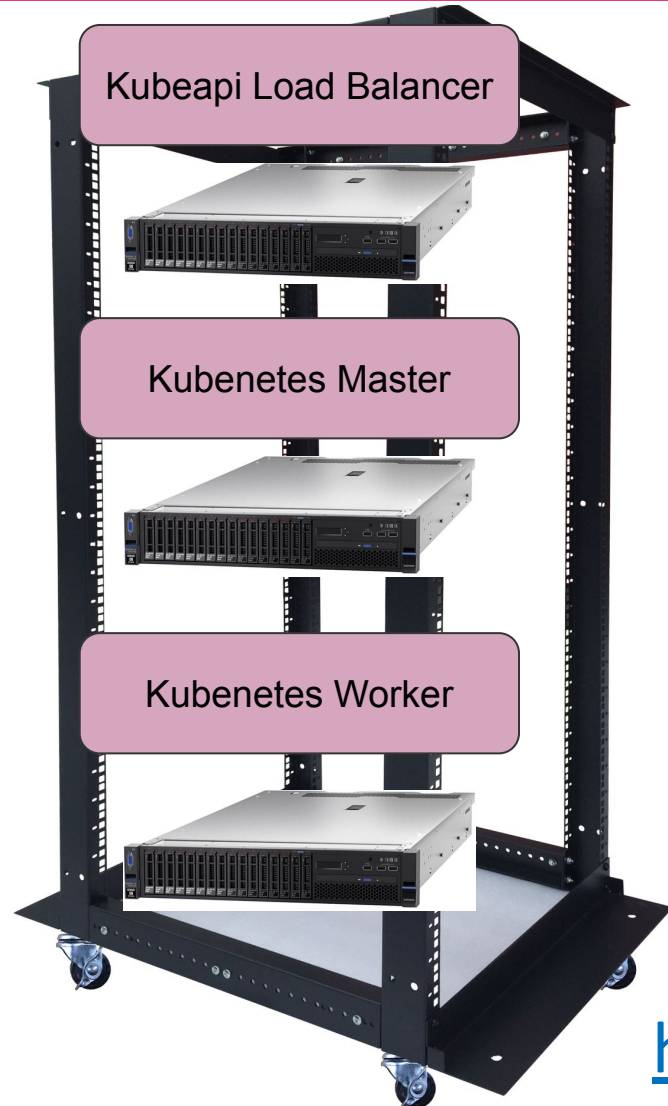
# Fault Domains



# Software Fault Domains

- Kubernetes
- Databases
- OSM Core Software
- OSM VCA

# K8s Cluster Domain



<https://ubuntu.com/kubernetes/docs/high-availability>

# K8s Cluster Domain

Kubernetes Master



 etcd



Kubernetes Master



 etcd



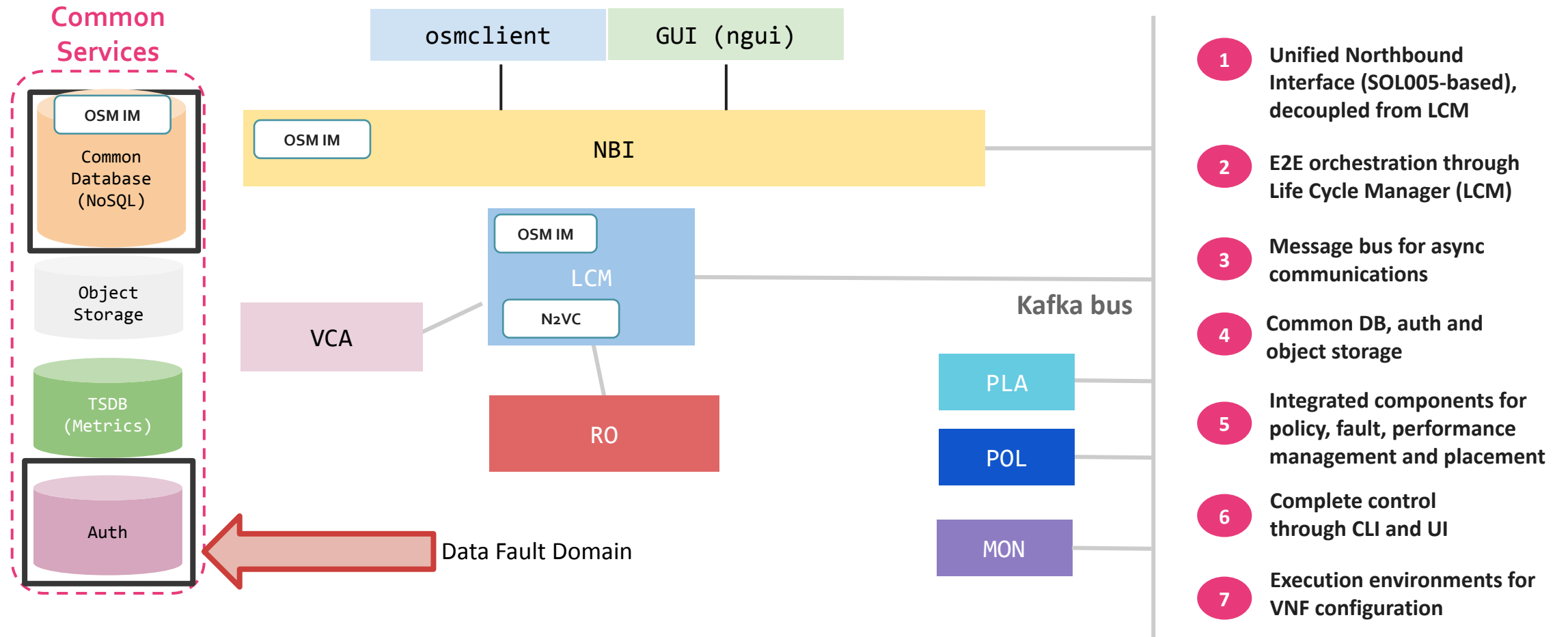
Kubernetes Master



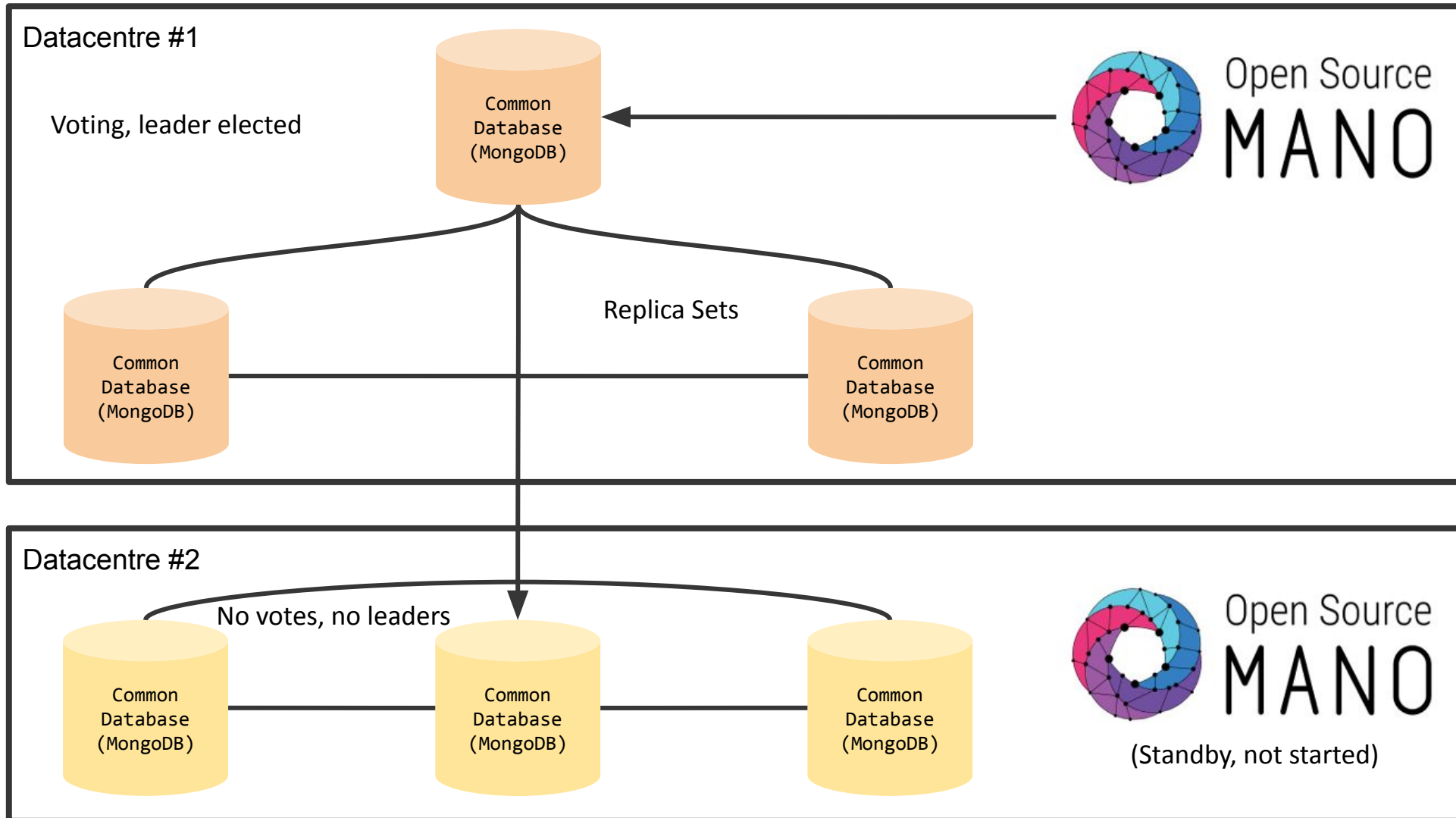
 etcd



# OSM Architecture

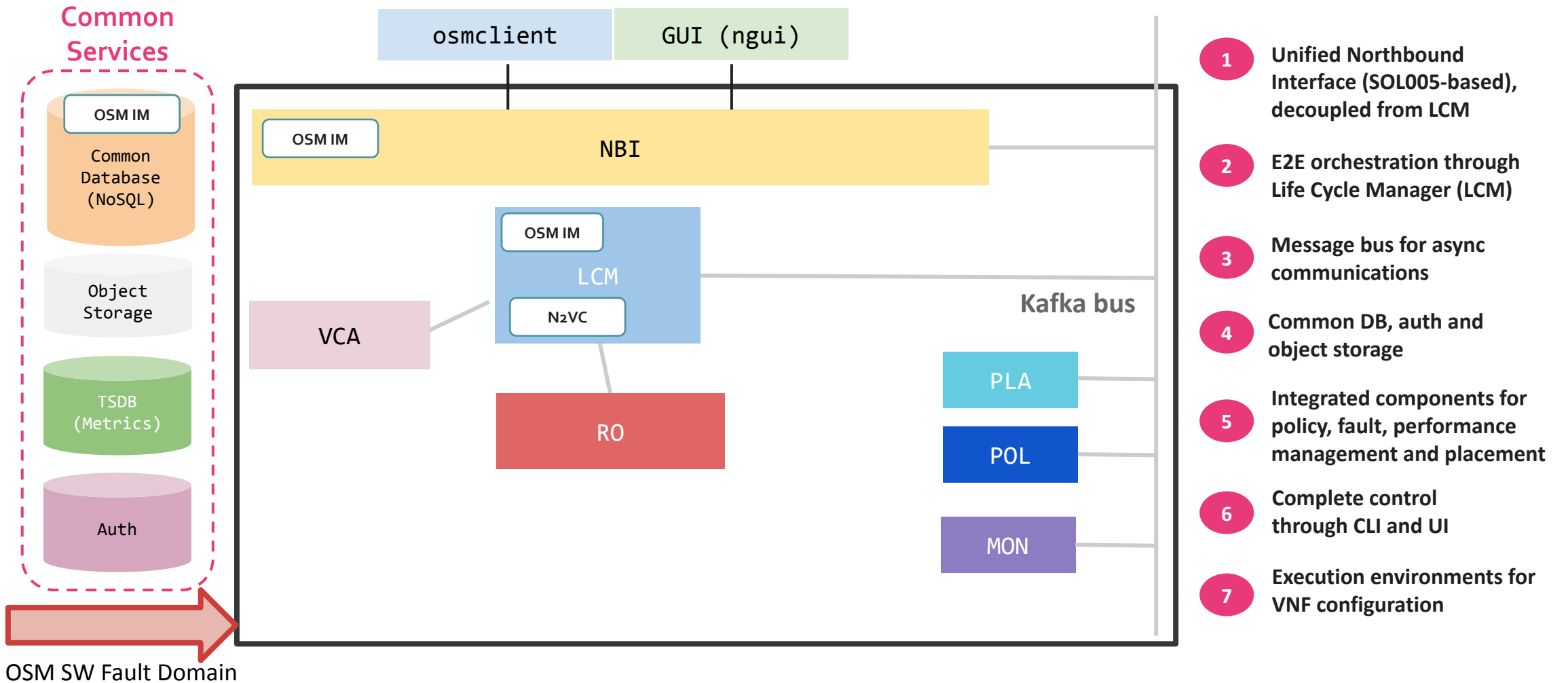


# Data Domain



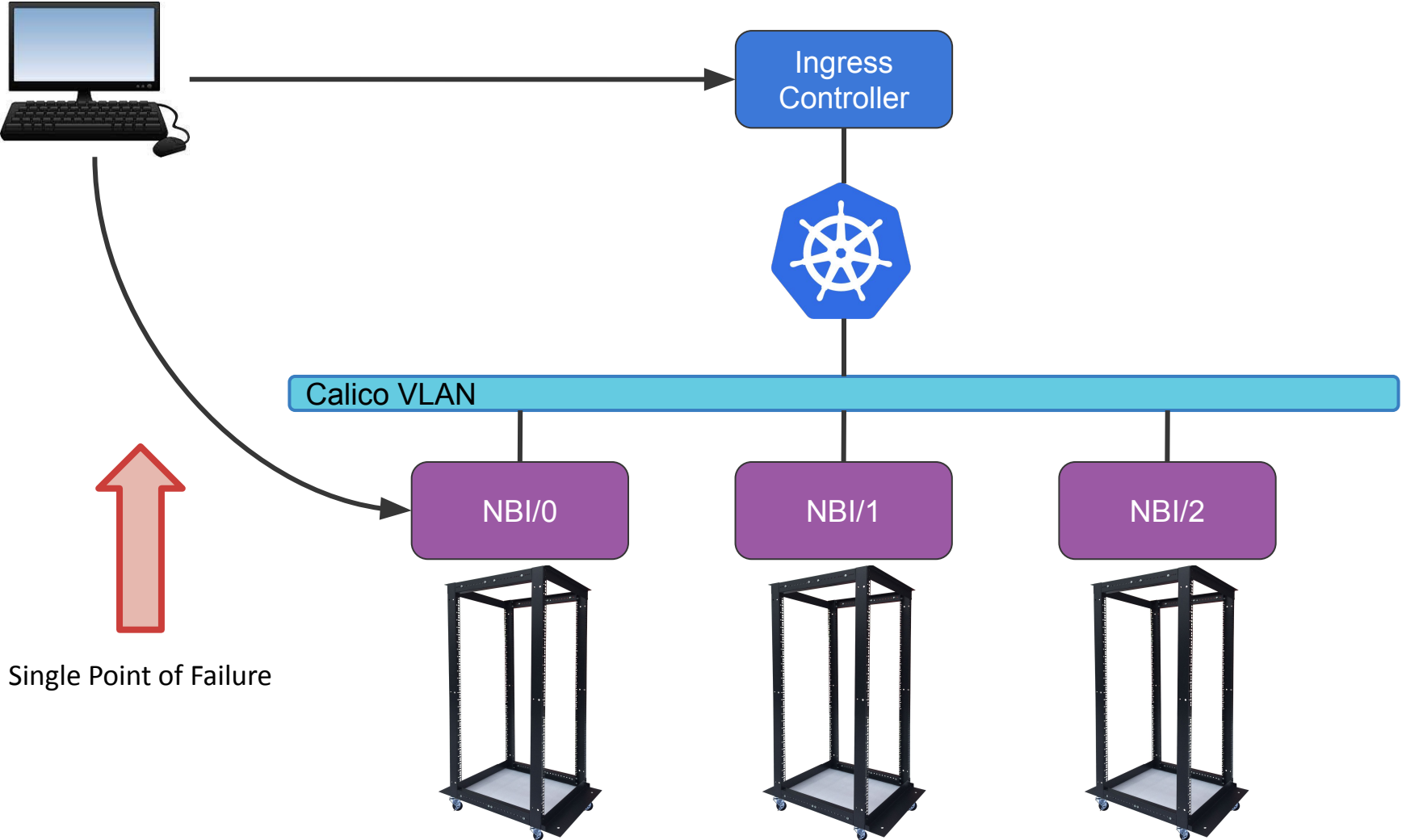


# OSM architecture

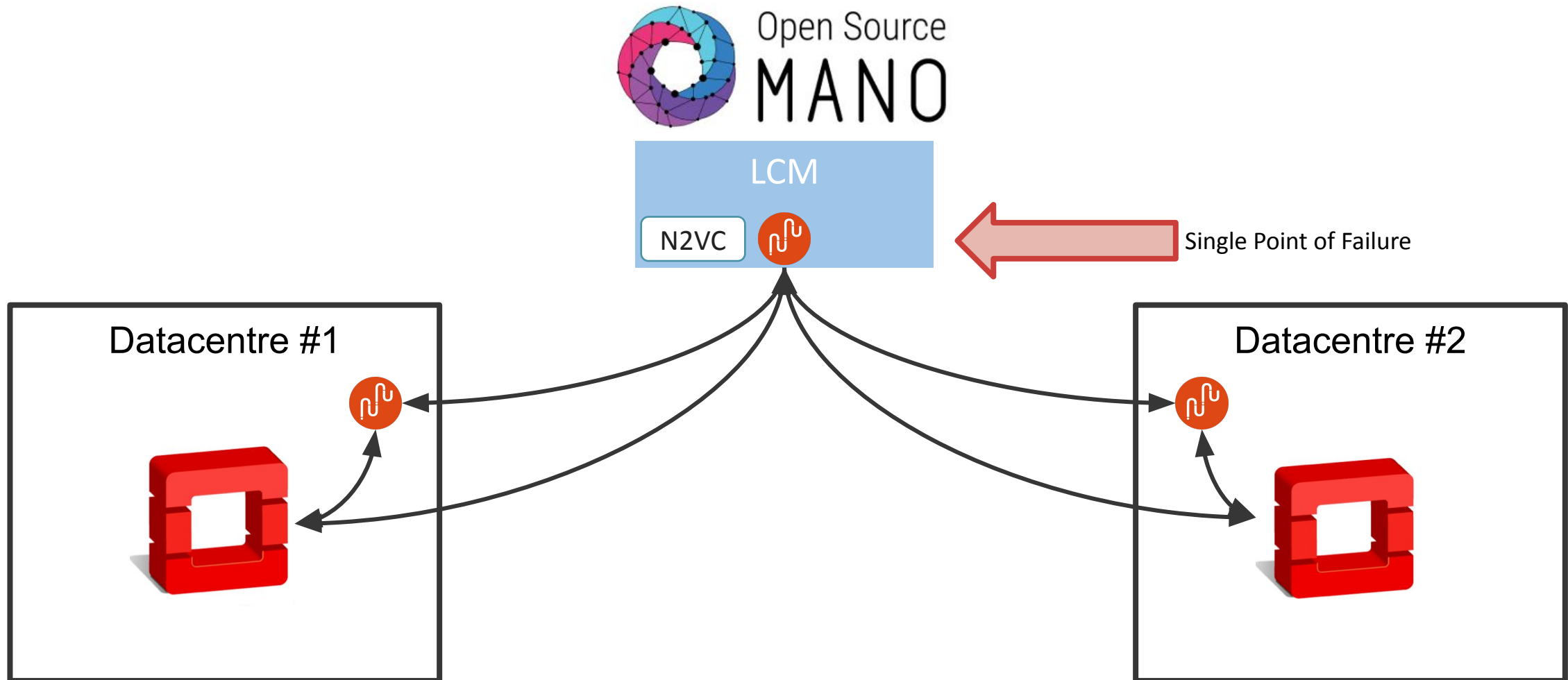


- 1 Unified Northbound Interface (SOL005-based), decoupled from LCM
- 2 E2E orchestration through Life Cycle Manager (LCM)
- 3 Message bus for async communications
- 4 Common DB, auth and object storage
- 5 Integrated components for policy, fault, performance management and placement
- 6 Complete control through CLI and UI
- 7 Execution environments for VNF configuration

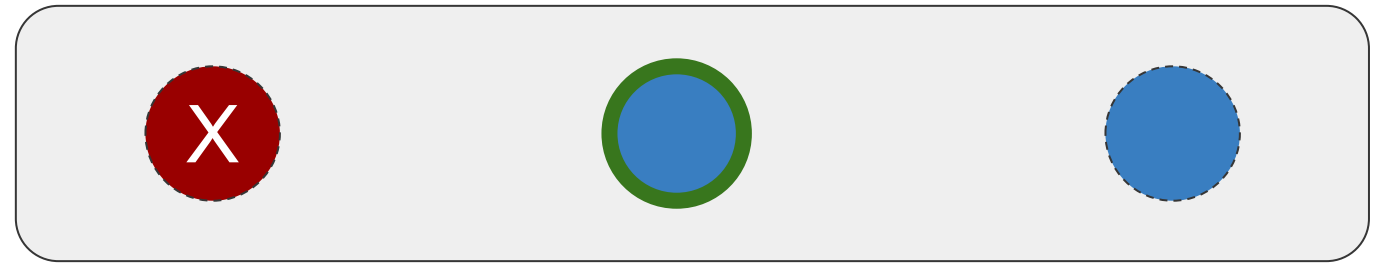
# OSM Software Replicas



# Distributed VCA

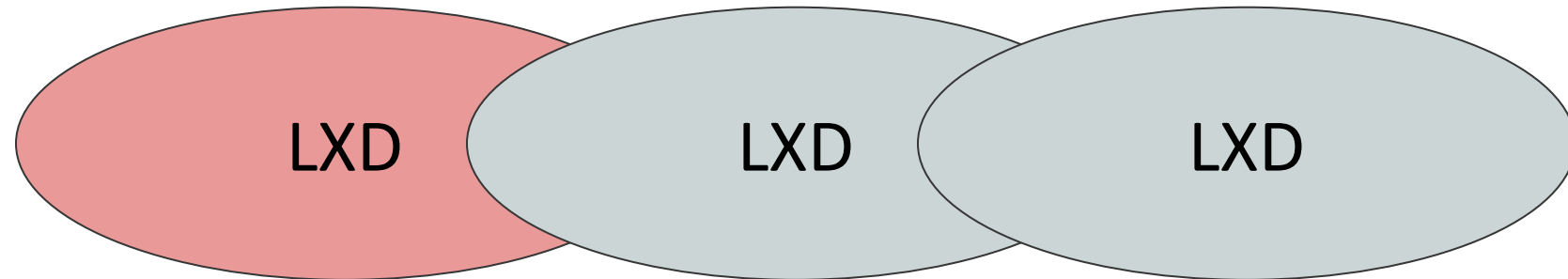


# High Available Charms



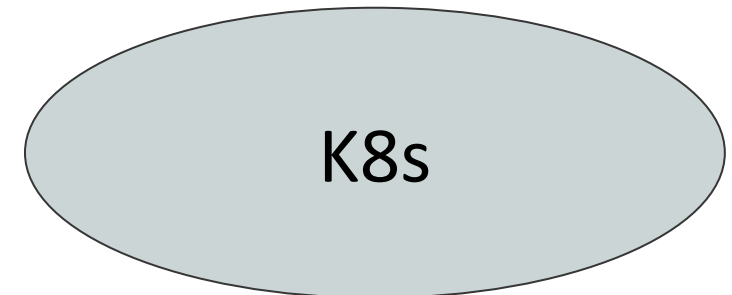
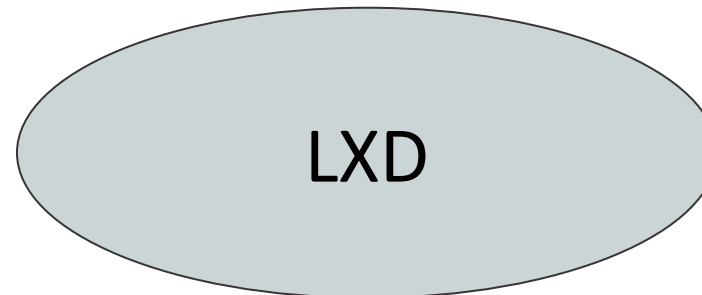
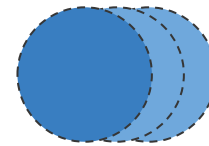
failed  
node

newly elected leader



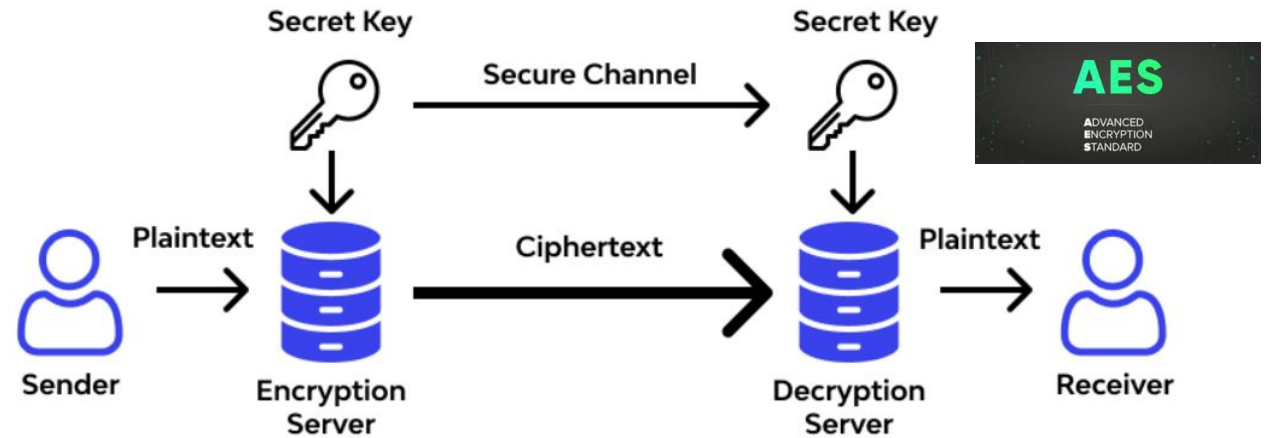
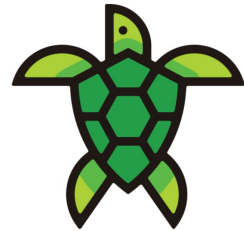
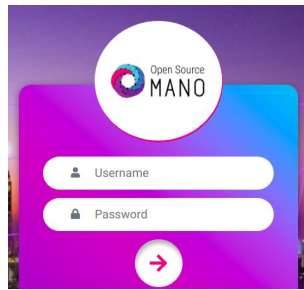
HA CLUSTER

# Resiliency in exactly the same way for K8s Charms



Use K8s native mechanisms for storage, resiliency

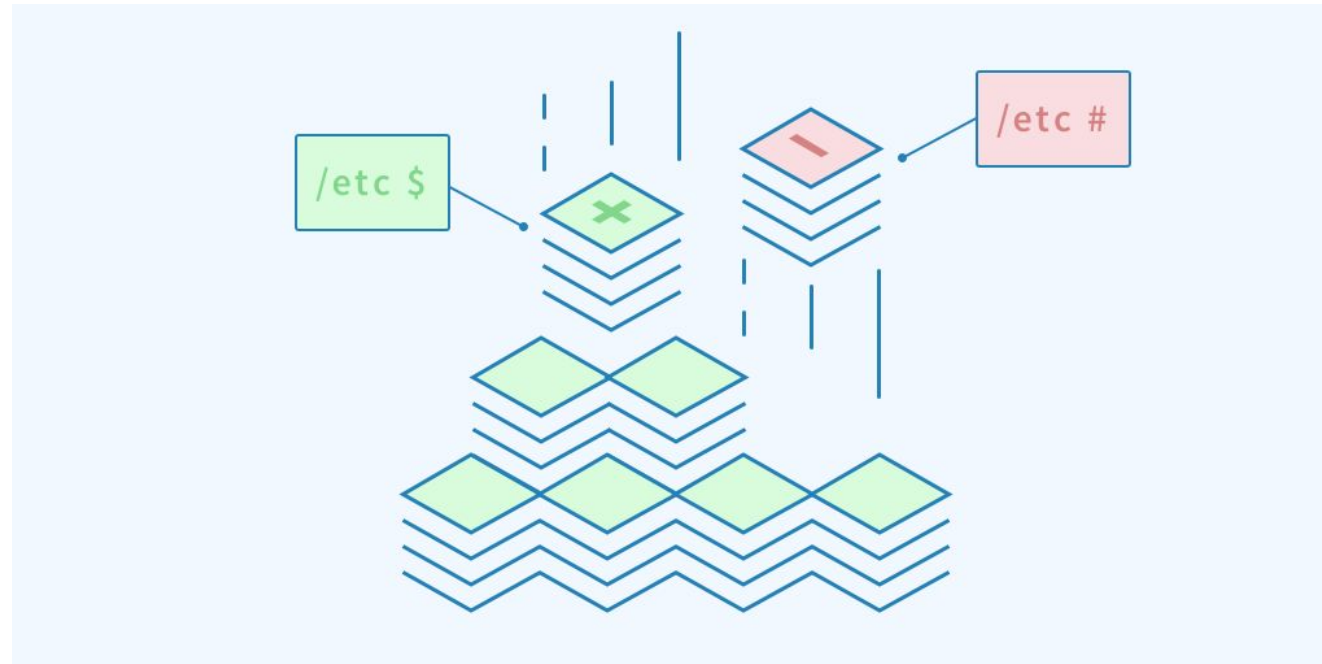
# Security



- No default password
- Random passwords are generated as 16 hexadecimal digit string for each installation

- Private keys are encrypted with symmetric AES before storing in DB

OSM containers runs with unprivileged (non-root) users



Running the containers with `non-root` user adds an extra layer of security.  
Limits the processes that can be executed and who can execute them

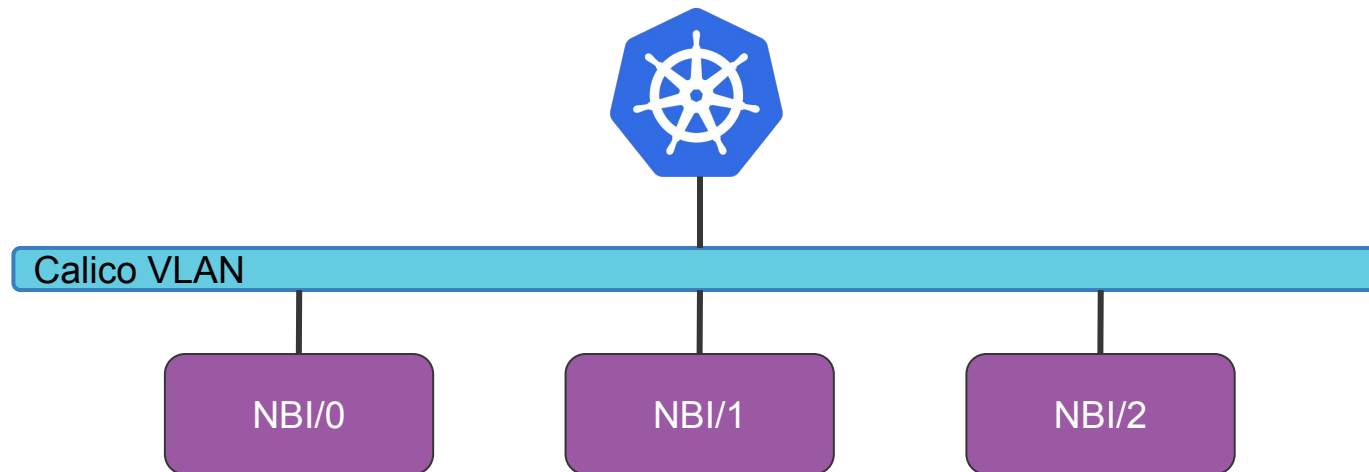
- Open Source, upstream installer
  - --charmed option  
[https://osm.etsi.org/gitlab/osm/devops/-/blob/master/installers/charmed\\_install.sh](https://osm.etsi.org/gitlab/osm/devops/-/blob/master/installers/charmed_install.sh)
- OSM Services deployed as Charms
- Management of Kubernetes ingress
- Scales from single node to many with replicas for HA  
<https://osm.etsi.org/gitlab/osm/devops/-/blob/master/installers/charm/bundles/osm-ha/bundle.yaml>
- Configured with replicas

```
applications:  
  zookeeper:  
    charm: zookeeper-k8s  
    channel: latest/edge  
    scale: 3  
    storage:  
      data: 100M
```



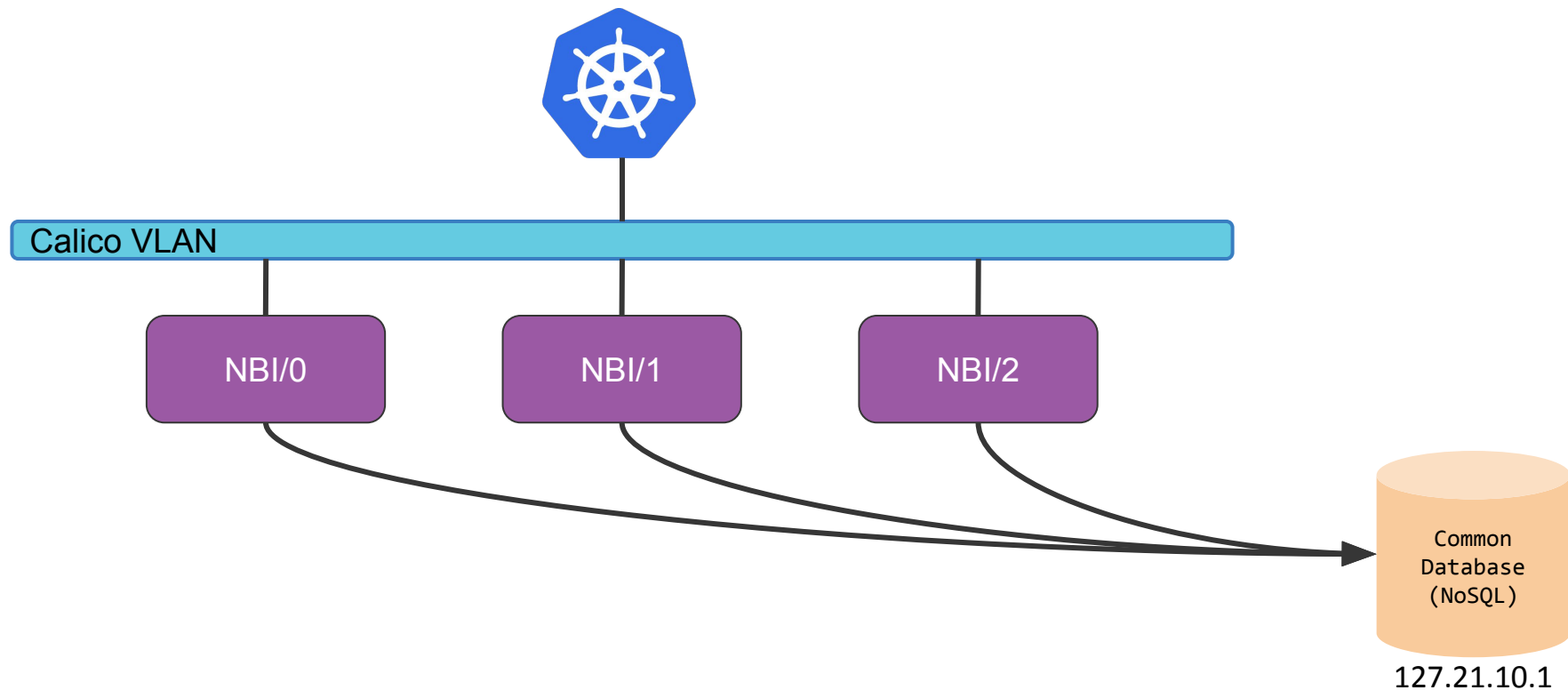
# Ease of Scaling Applications

```
juju scale-application -m osm nbi 3
```

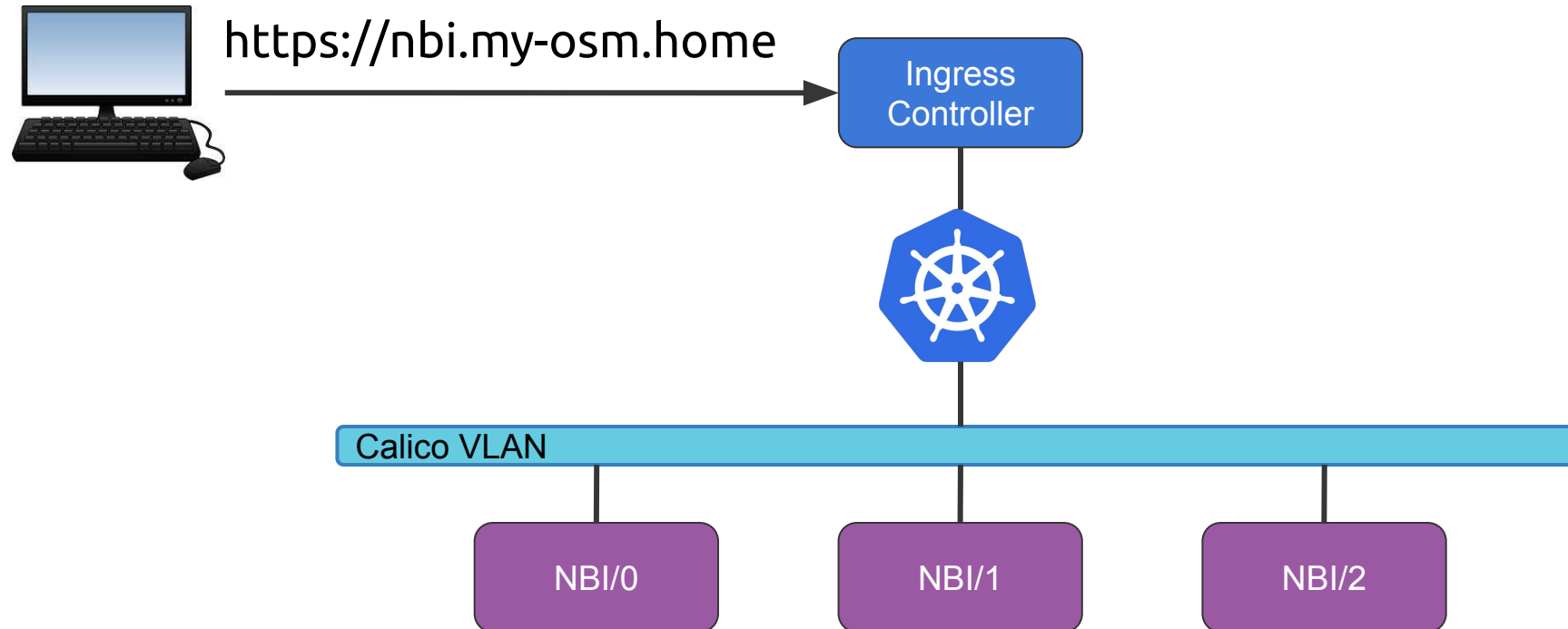


# Database Connection Strings

```
juju config -m osm nbi mongodb_url="mongodb://172.21.10.1"
```

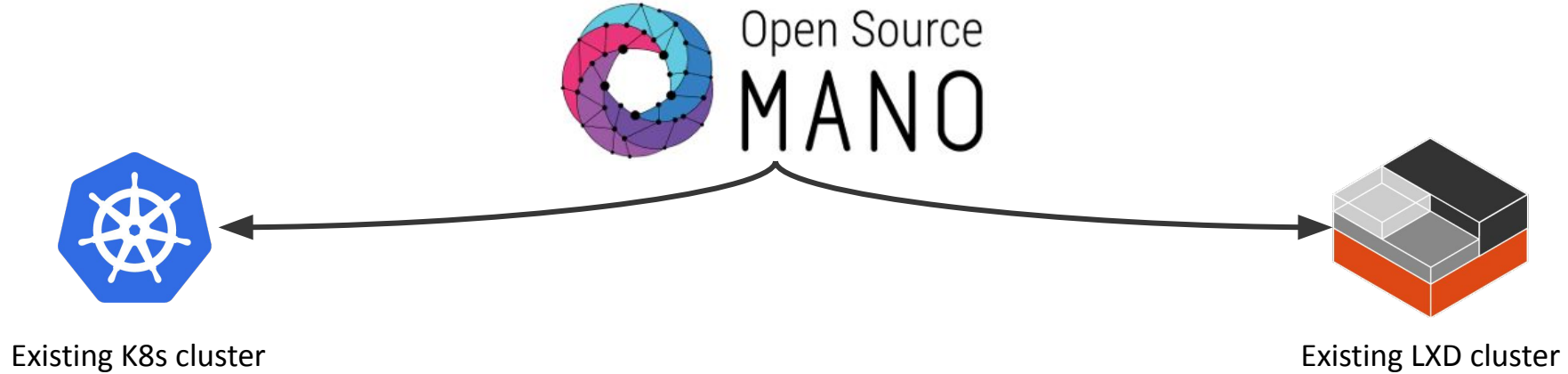


# Virtual Hosts for Ingress Controller

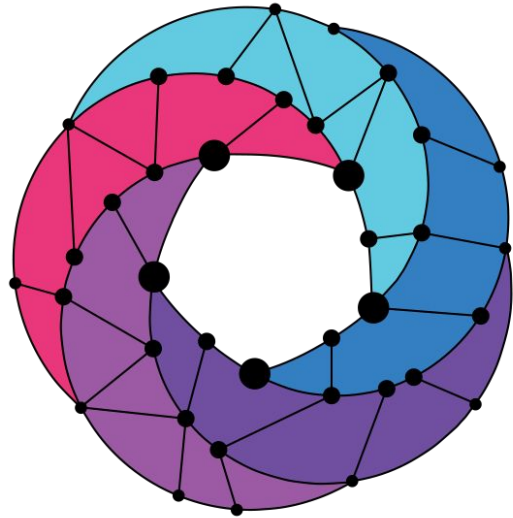


```
juju config -m osm nbi site_url=https://nbi.my-osm.home
```

# Additional Infrastructure Support



```
./install_osm.sh --charmed --k8s kubecfg.yaml --lxd lxd.yaml
```



# Open Source MANO

Thank you!