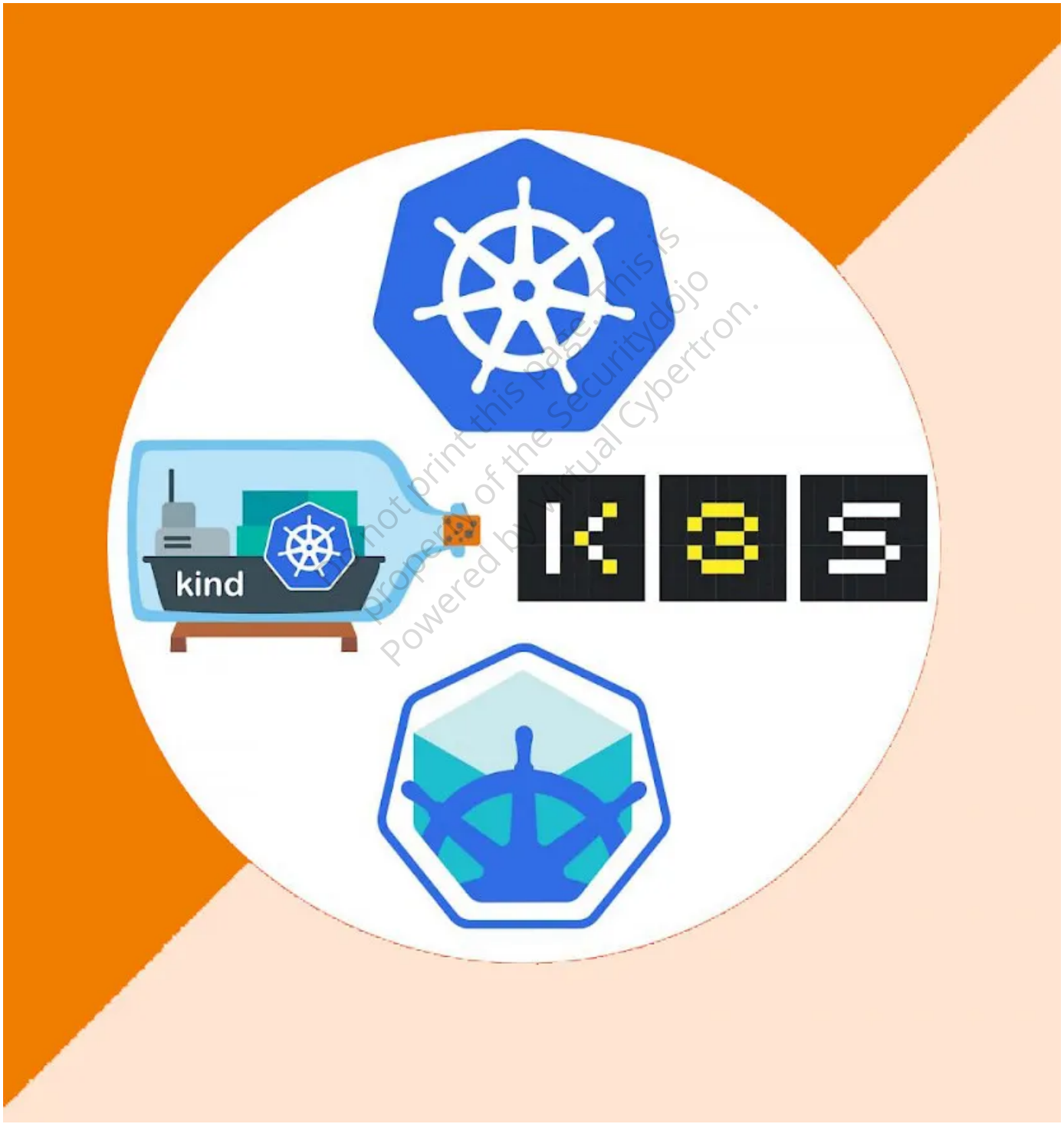
Difference between minikube, k3s , Kind & kubeadm

Minikube, k3s, Kind, and kubeadm are tools used for creating and managing Kubernetes clusters.



MiniKube

- MiniKube is the first Kubernetes technology as it is referred in the Kubernetes official documentation. It offers a tutorial to deploy the first cluster using miniKube.
- Minimum requirements for the host machine: -CPU: 2
    - Memory: 2 GB
    - Disk space: 20 GB
- This is the easiest way to start to familiarize yourself with the command line kubectl.

Kubeadm

- Kubeadm is the “hard way” to begin with Kubernetes. With this solution, it is possible to bootstrap a minimum viable Kubernetes cluster. The cluster minimal size is composed of the two nodes.
    - Master node
    - Worker node
- Kubeadm is quite heavy in terms of memory requirements. Each node should be deployed in a VM and the minimal requirements are:
- Minimum requirements for the host machine:
    - Memory: 2 GB
    - CPU: 2 (only for the master)

Kind

- Kind is another easy tool to deploy a Kubernetes cluster locally. Its specificity is that the cluster will be deployed inside a Docker container.
- This solution allows you to deploy all type of clusters:
    - Single node: 1 master and several workers

K3S

- K3S is a light Kubernetes version developed by Rancher.
- It has been created for production use on small servers, IoT appliances, etc. The binary is less than 50 Mb.
- The minimal requirements are:
    - Linux 3.10+
    - 512 MB of ram per server
    - 75 MB of ram per node
    - 200 MB of disk space

For our labs we are using Kind as it is easy to deploy and run, however CTF lab is created using Kubeadm.

Reference