Security Aspects of Container Orchestration

Patrick Deutschmann, 28 June 2019

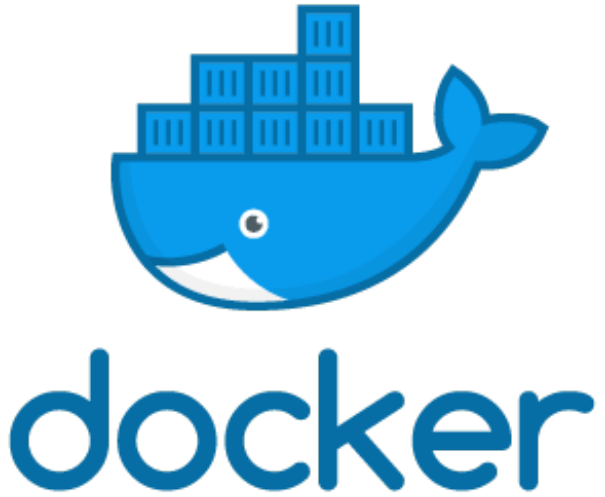


Image Source: docker.com, accessed 20 June 2019

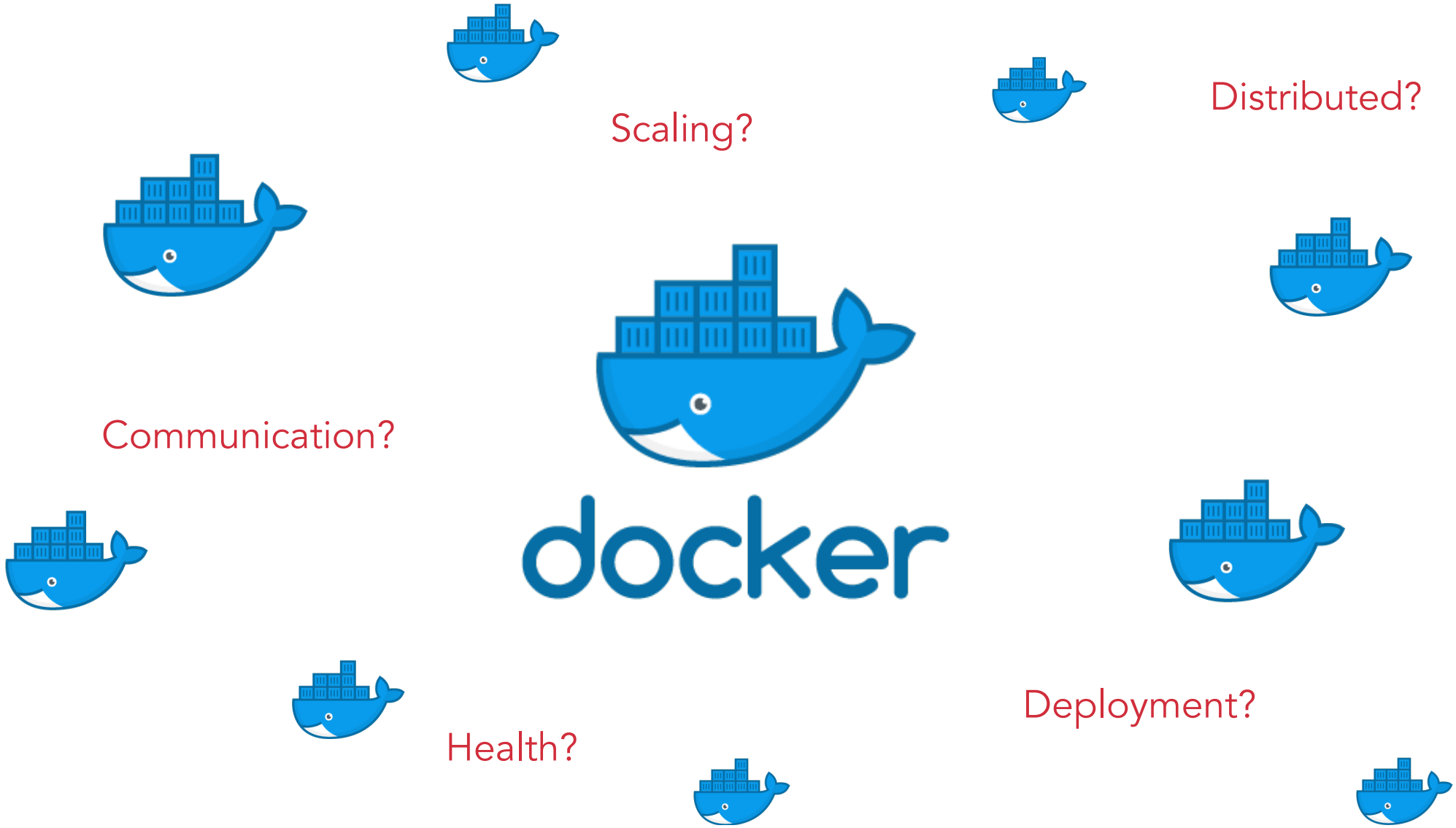


Image Source: docker.com, accessed 20 June 2019

kubernetes

Image Source: kubernetes.io, accessed 20 June 2019

Image Source: kubernetes.io, accessed 20 June 2019

Configuration Management

Service Discovery

Load Balancing

Storage Orchestration

Healing

kubernetes

Scaling

Auto-Rollout

Image Source: kubernetes.io, accessed 20 June 2019

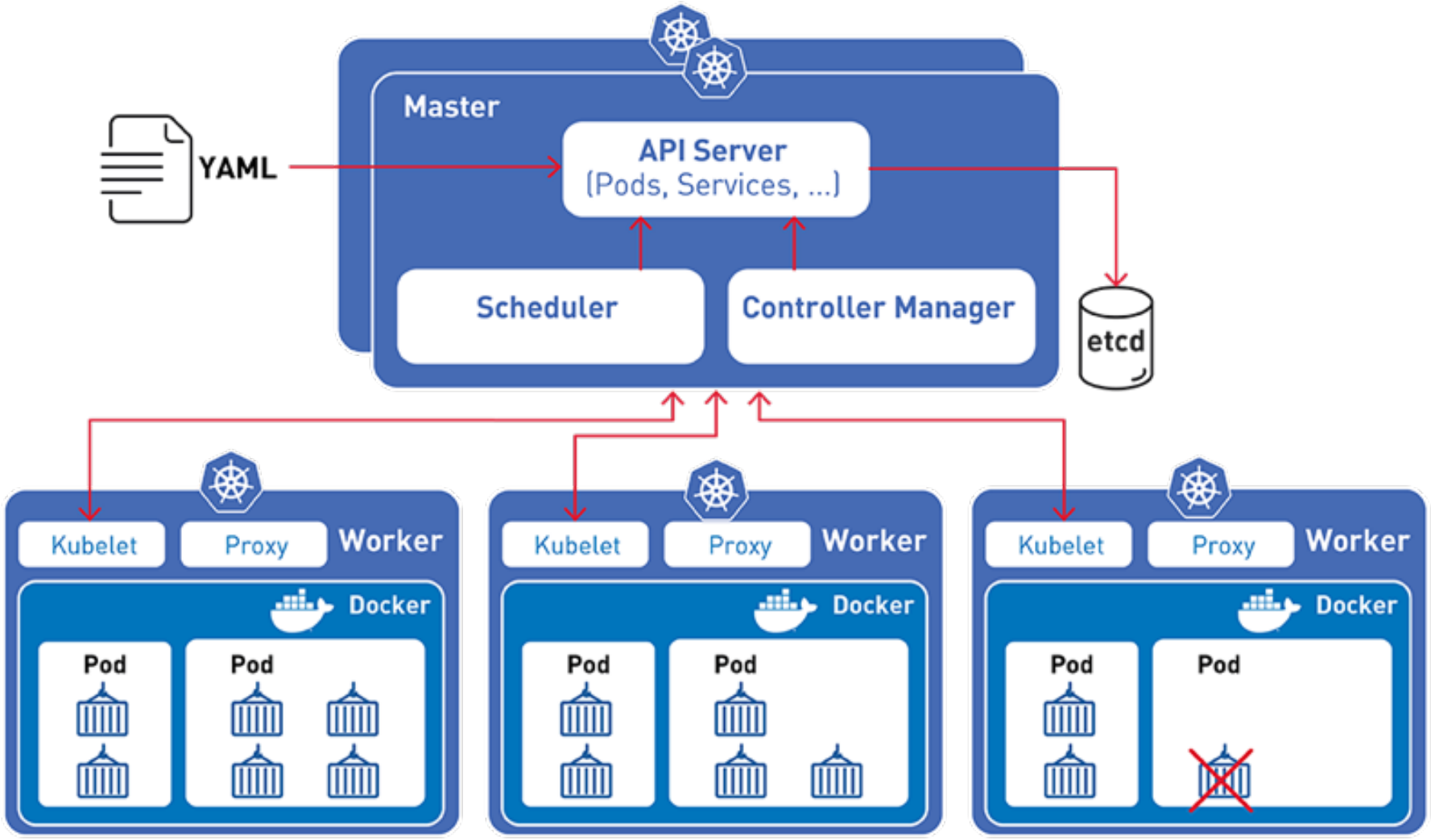
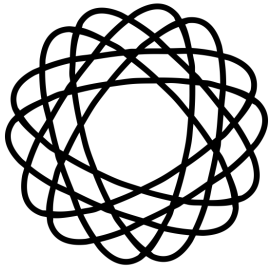


Image Source: https://mapr.com/blog/kubernetes-kafka-event-sourcing-architecture-patterns-and-use-case-examples/, accessed 20 June 2019



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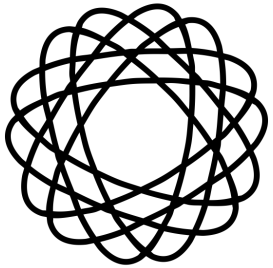
from Noun Project

Complexity



Created by anbileru adaleru
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Created by Adrien Coquet
from Noun Project

Complexity → Security?

Kubernetes Security

Created by Aenne Brielmann
from Noun Project

Where to start?

Kubernetes Security

1 Base Infrastructure

Kubernetes Security

2 Kubernetes Infrastructure

1 Base Infrastructure

Kubernetes Security

3 Kubernetes Security Controls

2 Kubernetes Infrastructure

1 Base Infrastructure

Kubernetes Security

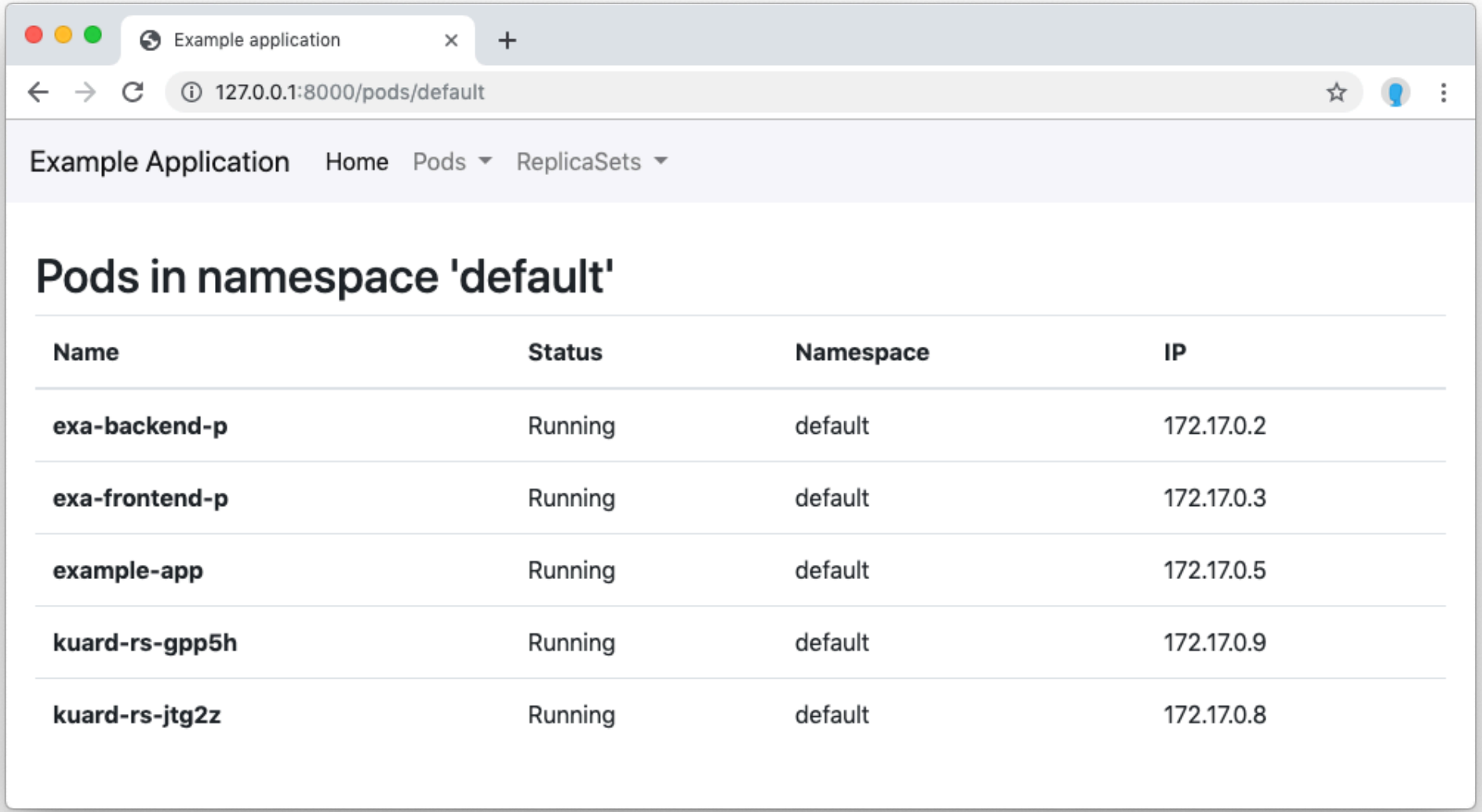
4 App and Container Security

3 Kubernetes Security Controls

2 Kubernetes Infrastructure

1 Base Infrastructure

Time for an example!


Example application
127.0.0.1:8000/pods/default
Example Application
Home
Pods
ReplicaSets
Pods in namespace 'default'
Name
Status
Namespace
IP
exa-backend-p
Running
default
172.17.0.2
exa-frontend-p
Running
default
172.17.0.3
example-app
Running
default
172.17.0.5
kuard-rs-gpp5h
Running
default
172.17.0.9
kuard-rs-jtg2z
Running
default
172.17.0.8

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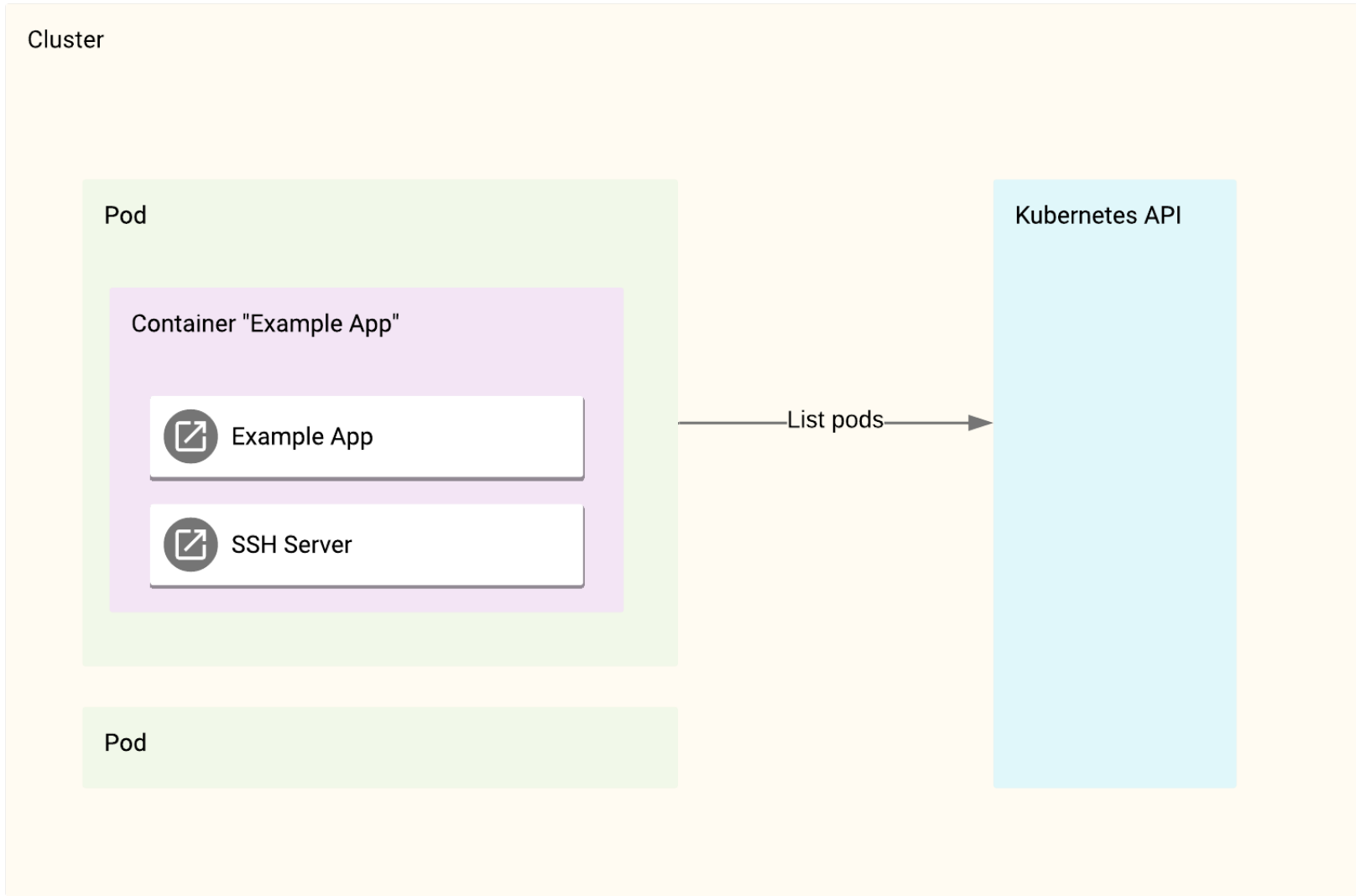
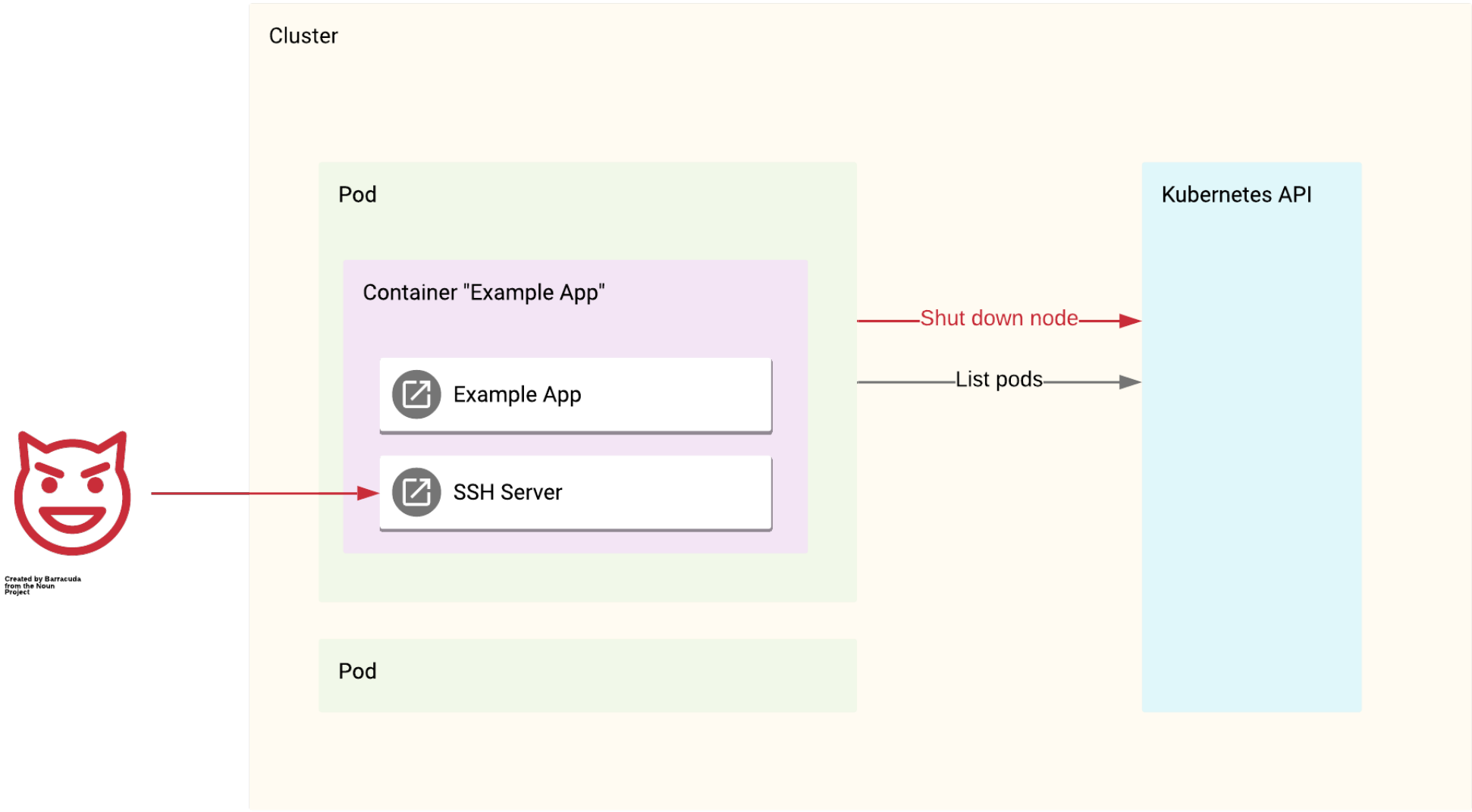

Cluster
Pod
Container "Example App"
Example App
SSH Server
Pod
List pods
Kubernetes API

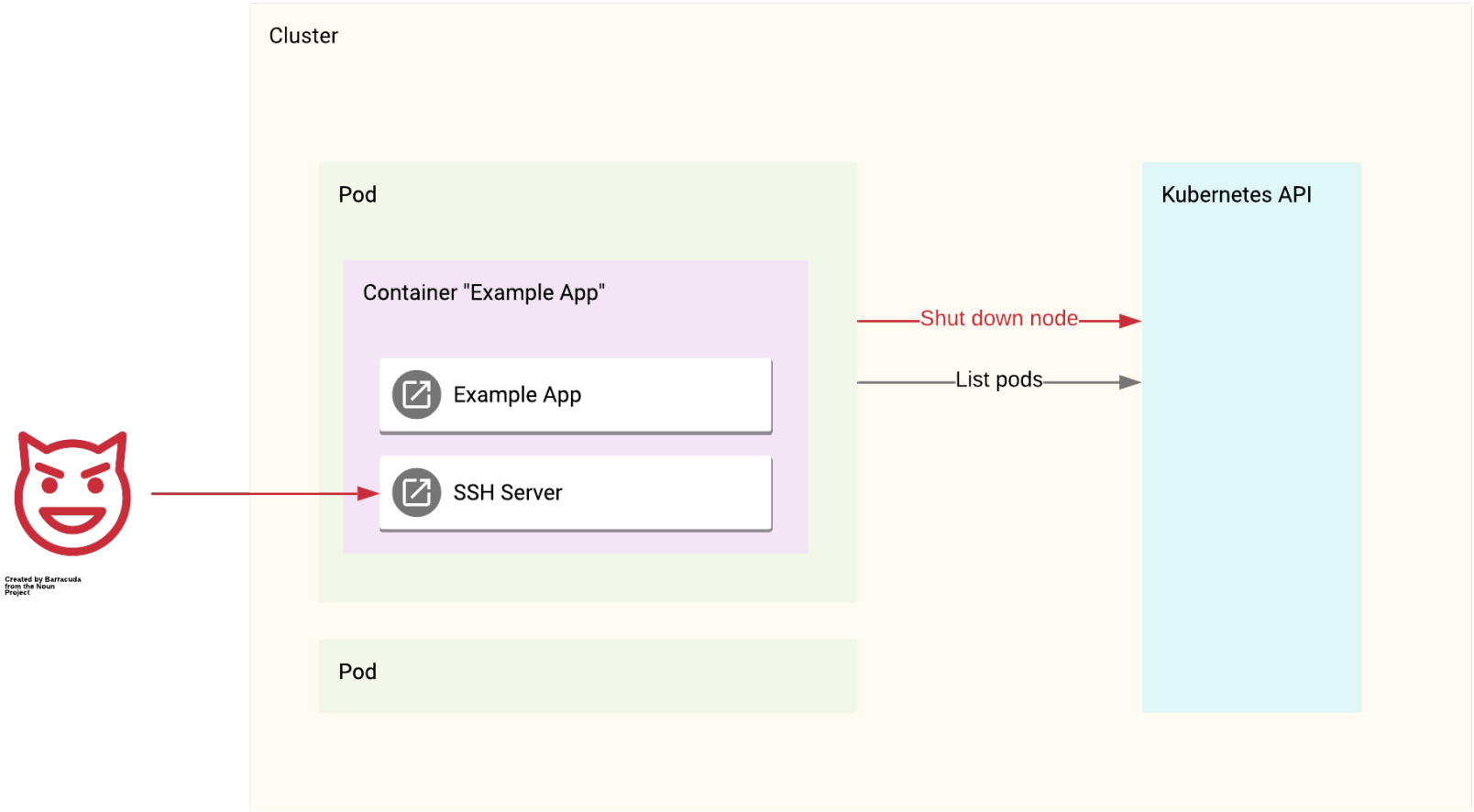

Cluster
Pod
Container "Example App"
Example App
SSH Server
Pod
Kubernetes API
Shut down node
List pods
Created by Barracuda from the Noun Project

4 App and Container Security

3 Kubernetes Security Controls

2 Kubernetes Infrastructure

1 Base Infrastructure



4 App and Container Security

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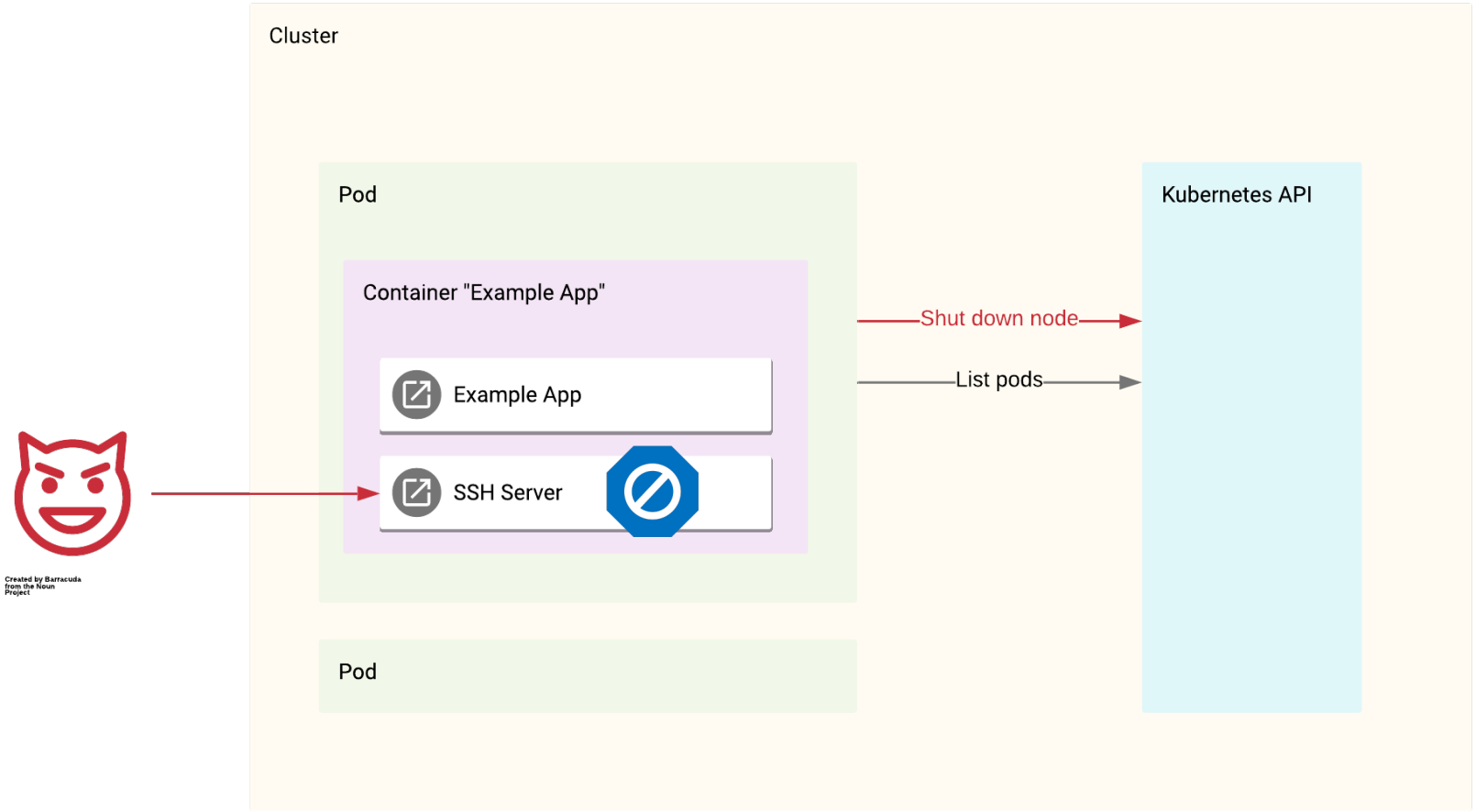

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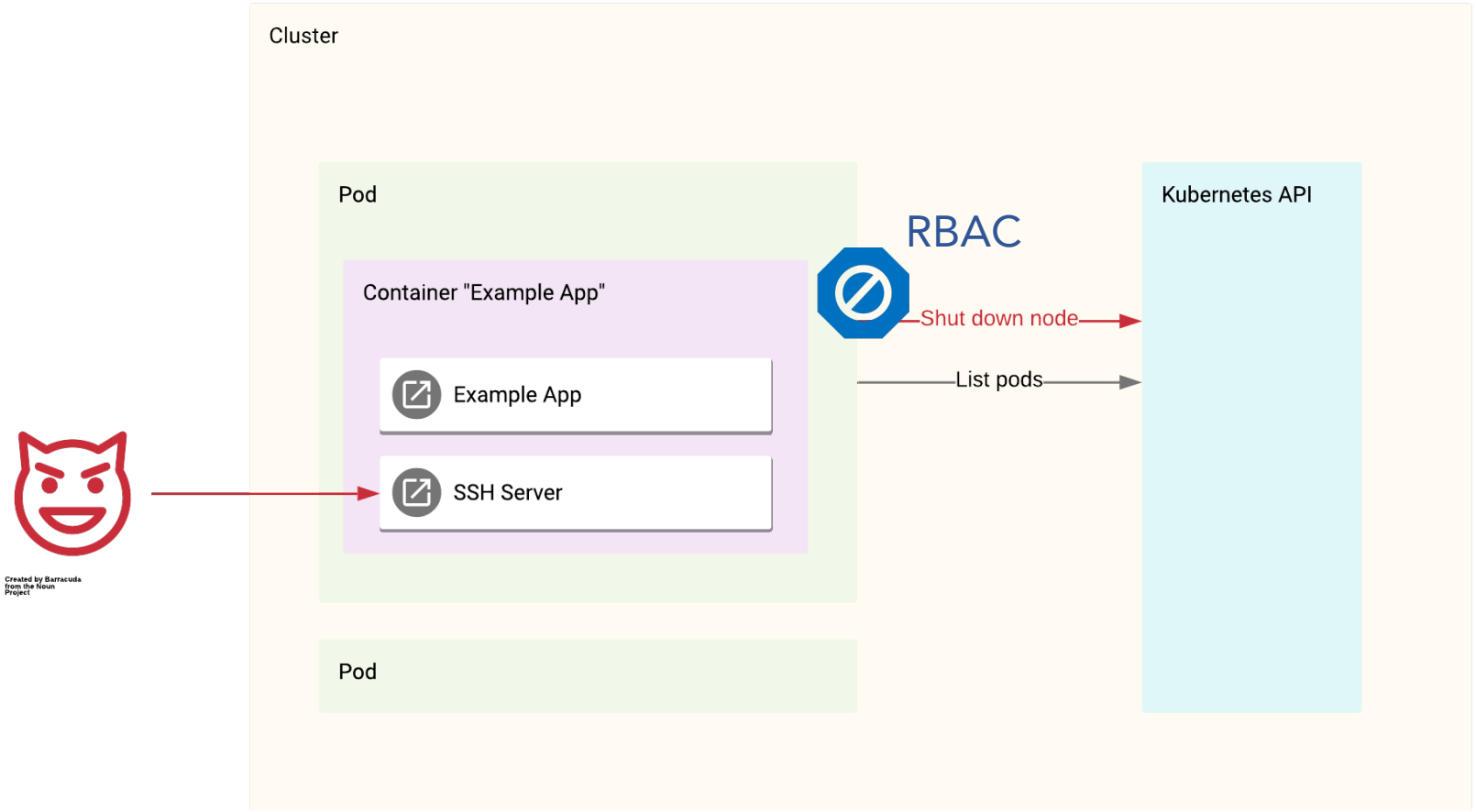

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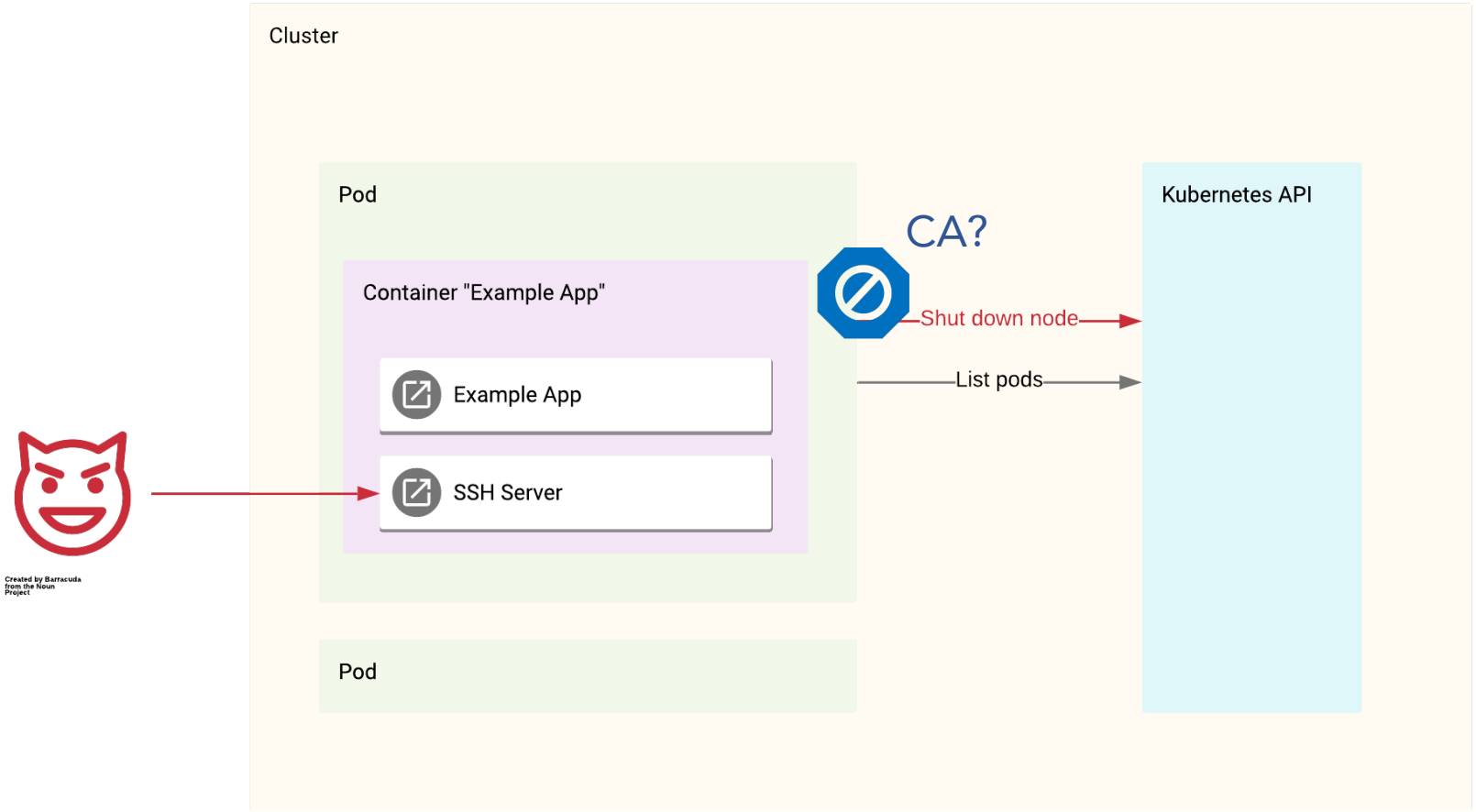

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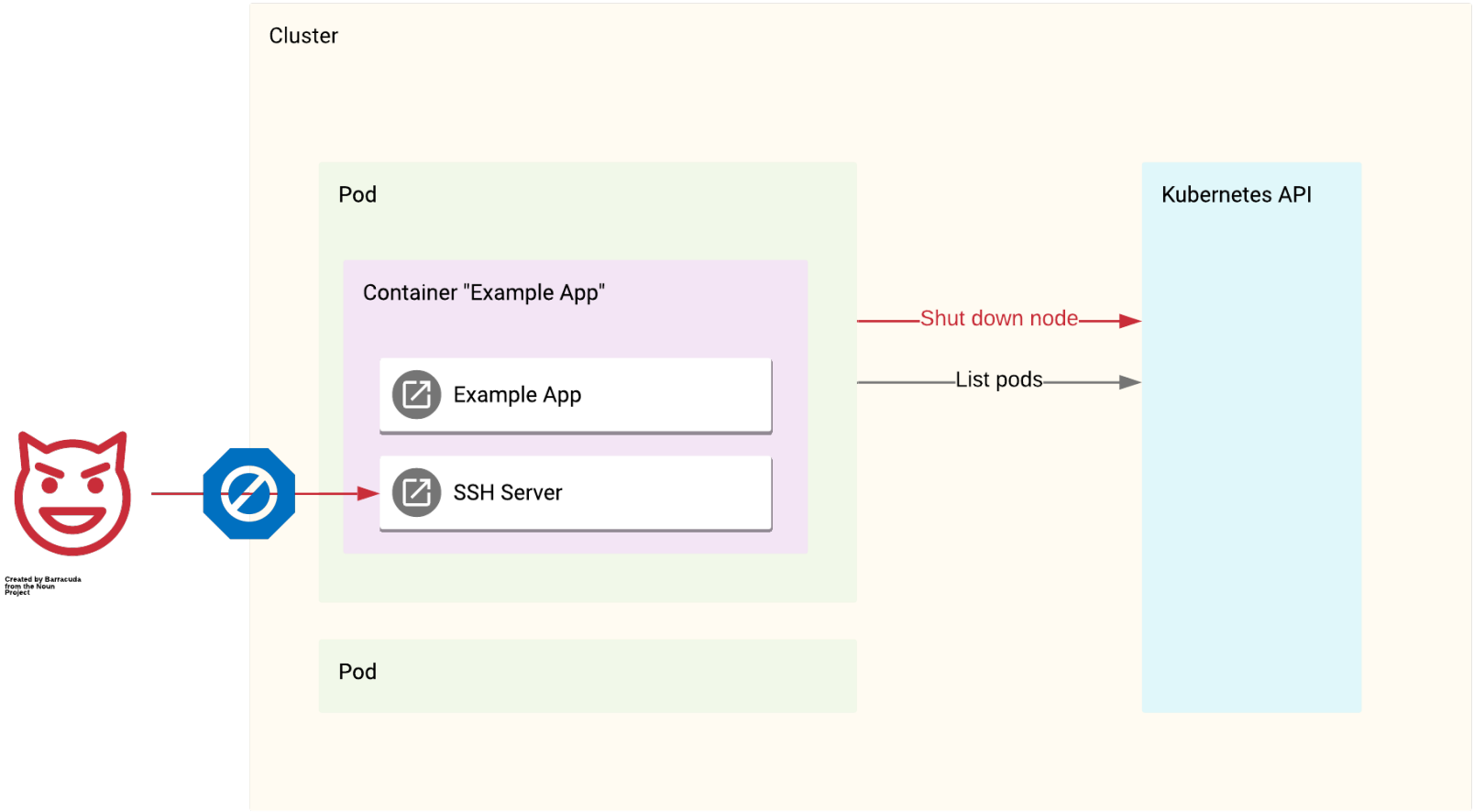

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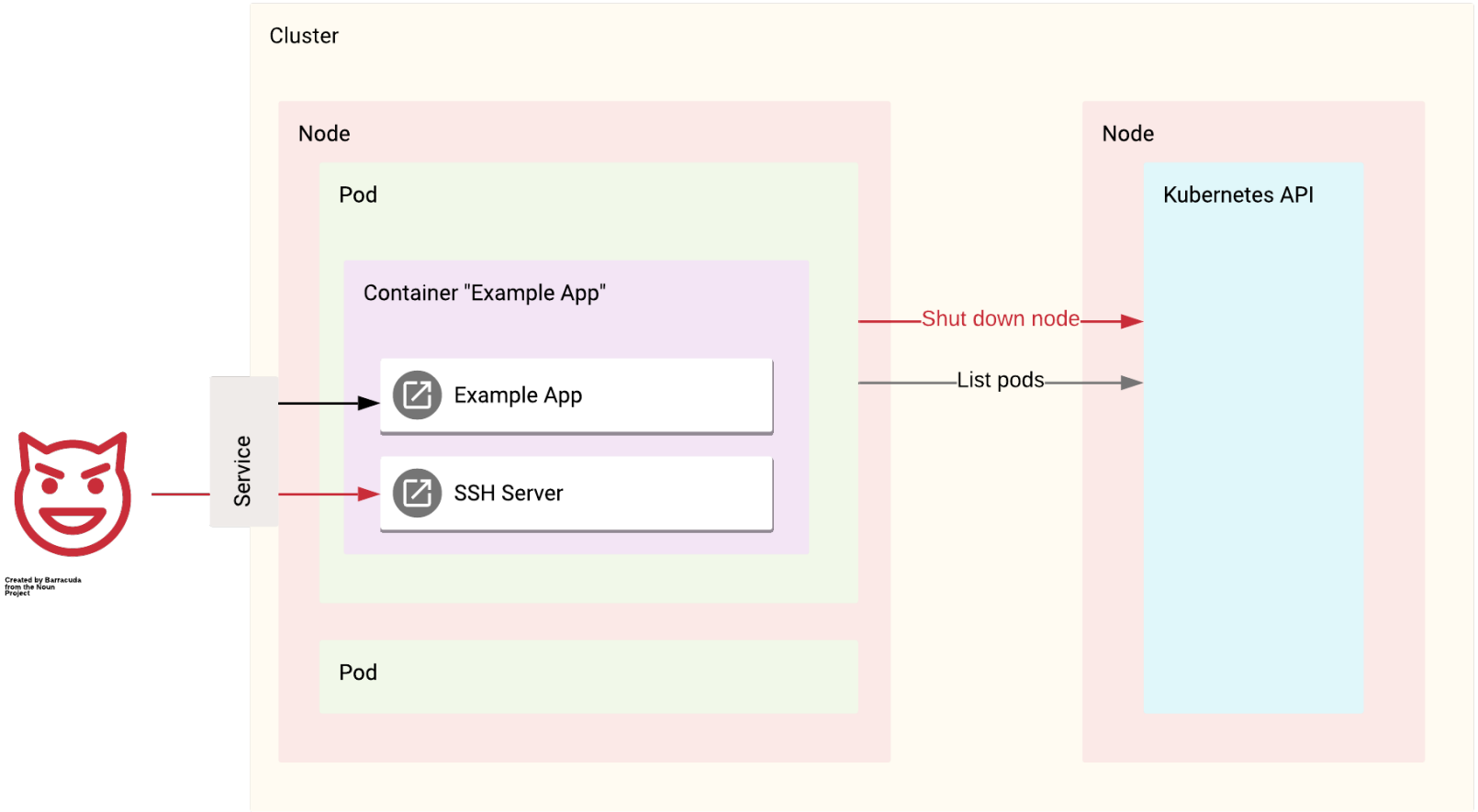

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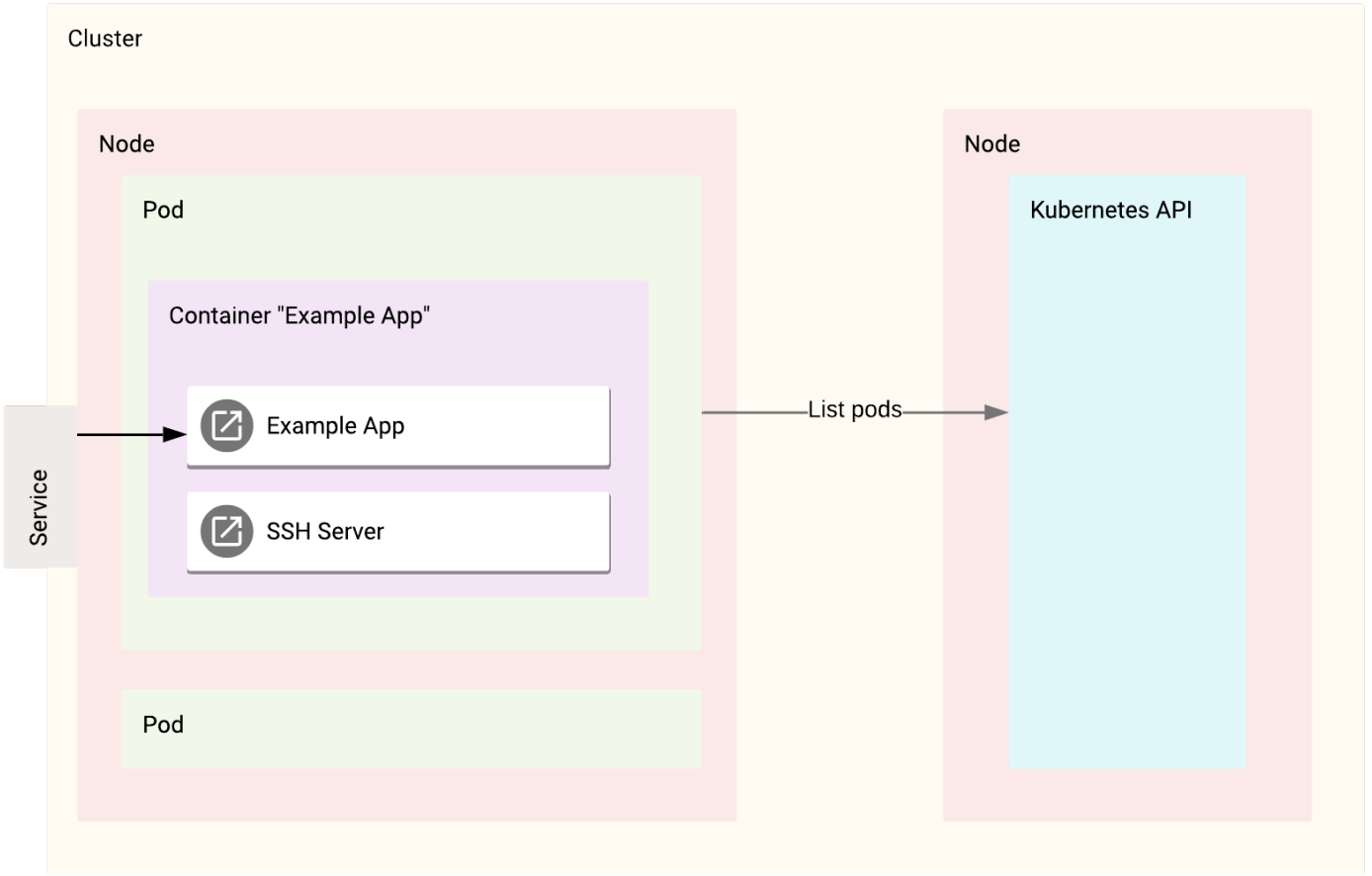
1 Base Infrastructure