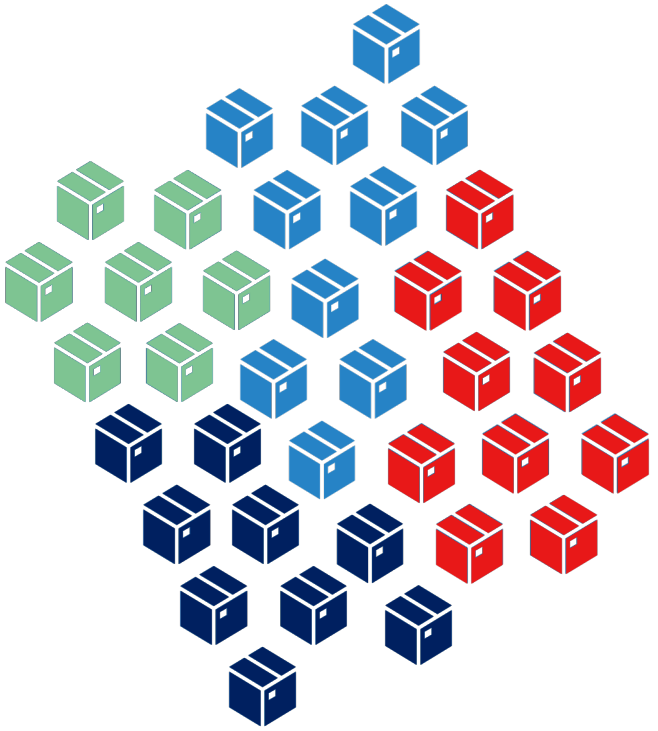
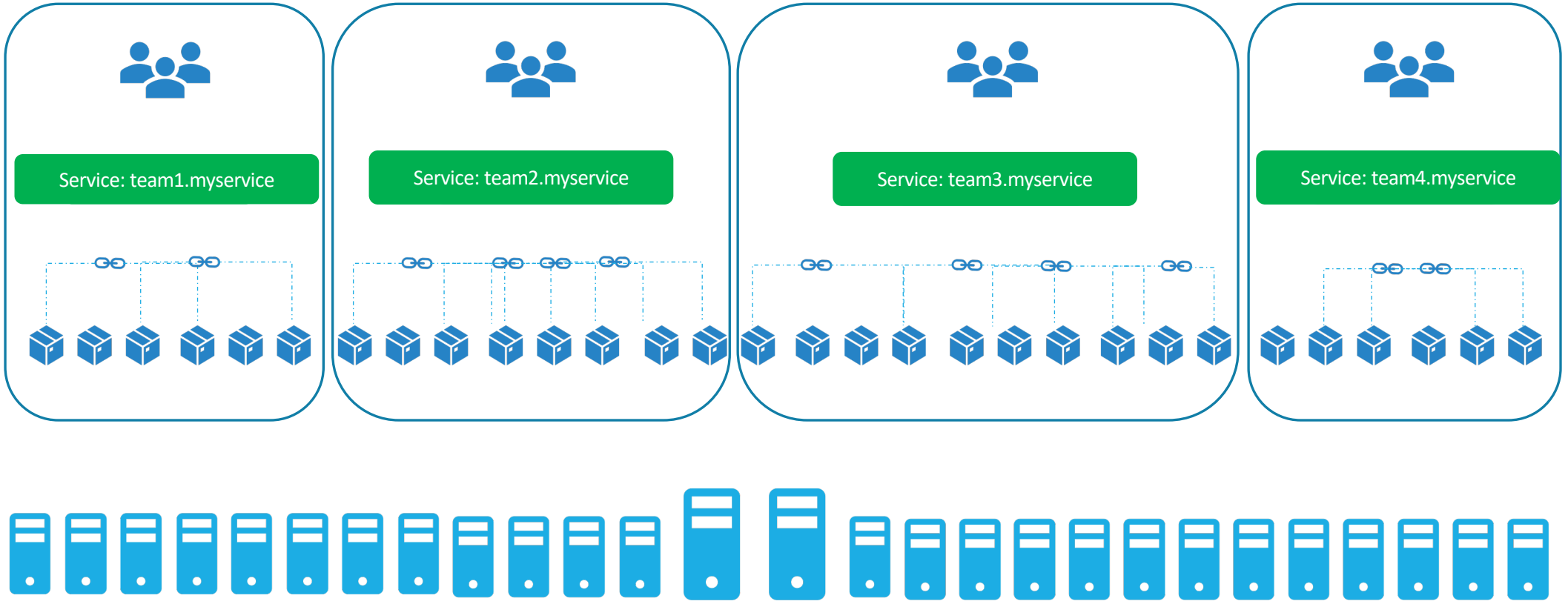
Namespace



Namespace


Service: team1.myservice
Service: team2.myservice
Service: team3.myservice
Service: team4.myservice

View Namespaces

```
> kubectl get namespaces
NAME          STATUS   AGE
default       Active   20m
kube-system   Active   20m
```

View Resources in a Namespace

```
> kubectl get pods
NAME            READY     STATUS    RESTARTS   AGE
myapp-pod       1/1       Running   0          20s
```

```
> kubectl get pods --namespace=kube-system
NAME                                READY     STATUS    RESTARTS   AGE
etcd-kubemaster                     1/1       Running   2          14d
kube-apiserver-kubemaster           1/1       Running   4          14d
kube-controller-manager-kubemaster  1/1       Running   4          14d
kube-dns-86f4d74b45-zgh8p           3/3       Running   10         14d
kube-flannel-ds-gmg5r               1/1       Running   4          14d
kube-flannel-ds-kt74d               1/1       Running   4          14d
kube-flannel-ds-qtlg8               1/1       Running   4          14d
kube-proxy-4nkb6                    1/1       Running   3          14d
kube-proxy-b6wnm                    1/1       Running   3          14d
kube-proxy-rph7b                    1/1       Running   2          14d
kube-scheduler-kubemaster           1/1       Running   3          14d
metrics-server-6fbfb84cdd-jt5q9     1/1       Running   0          3d
```

Create Namespace

namespace-definition.yml

```yaml
apiVersion: v1
kind: Namespace
metadata:
  name: team1

spec:
```

```
kubectl create -f namespace-definition.yml
```

```
namespace “team1” created
```

Assign Objects to Namespace

```
kubectl create -f pod-definition.yml  --namespace=team1
pod “myapp-pod” created
```

```
kubectl create -f pod-definition.yml
pod “myapp-pod” created
```

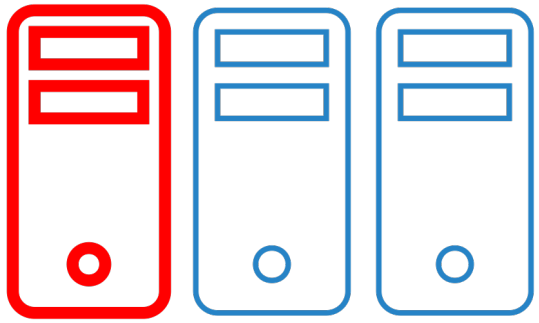
pod-definition.yml

```yaml
apiVersion: v1
kind: Pod
metadata:
  name: myapp-pod
  namespace: team1
  labels:
    app: myapp
    type: front-end
spec:
  containers:
  - name: nginx-container
    image: nginx
```

Demo

Namespace

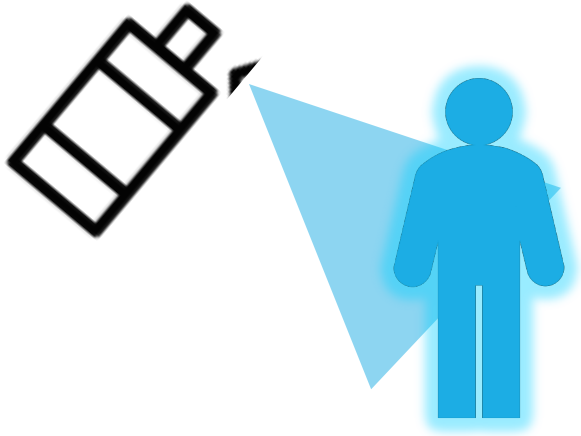
Taints And Tolerations



2

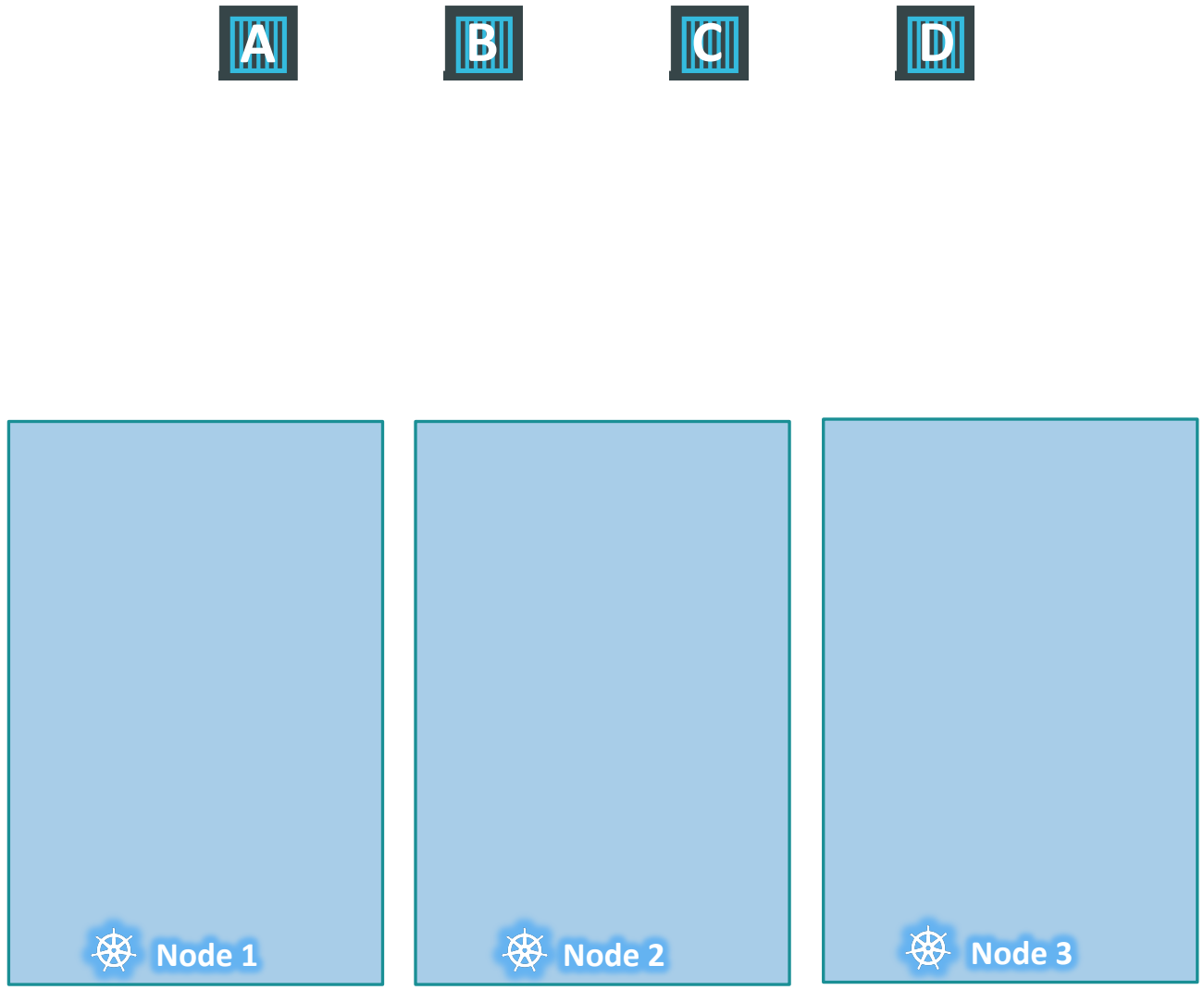
Intolerant

Tolerant

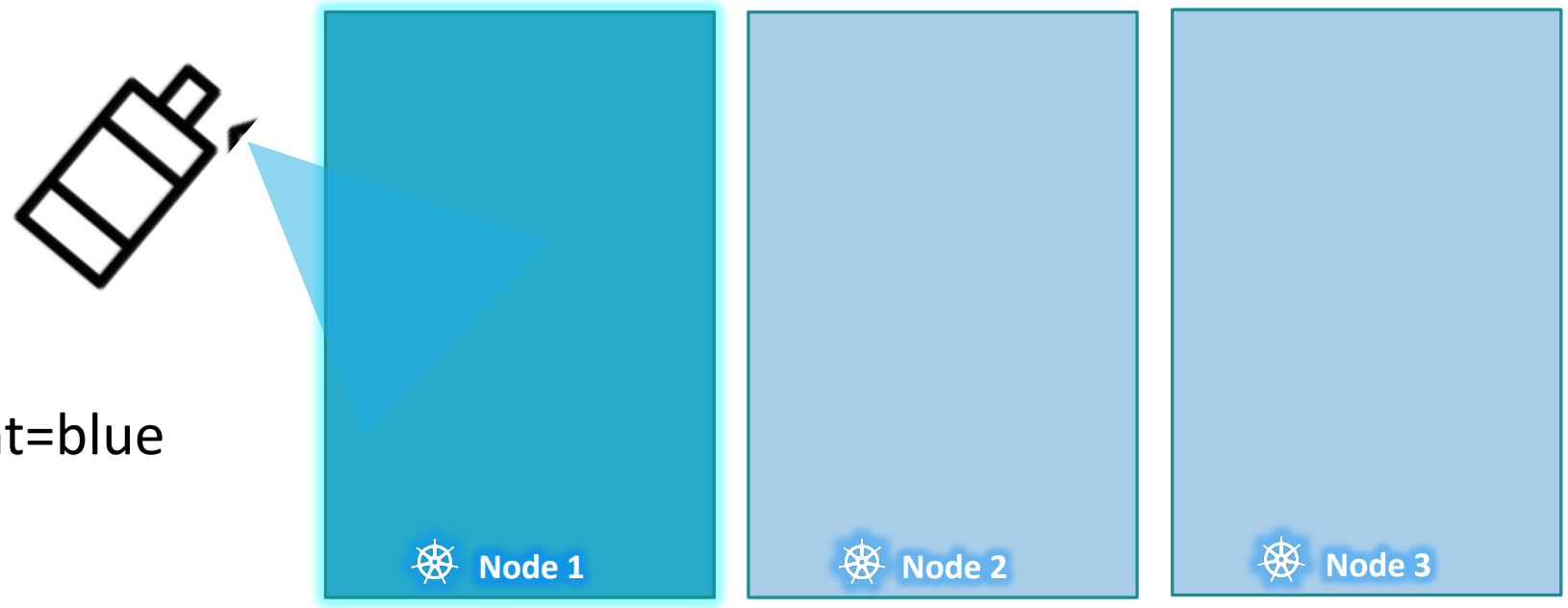


1

Taint


A
B
C
D
Node 1
Node 2
Node 3

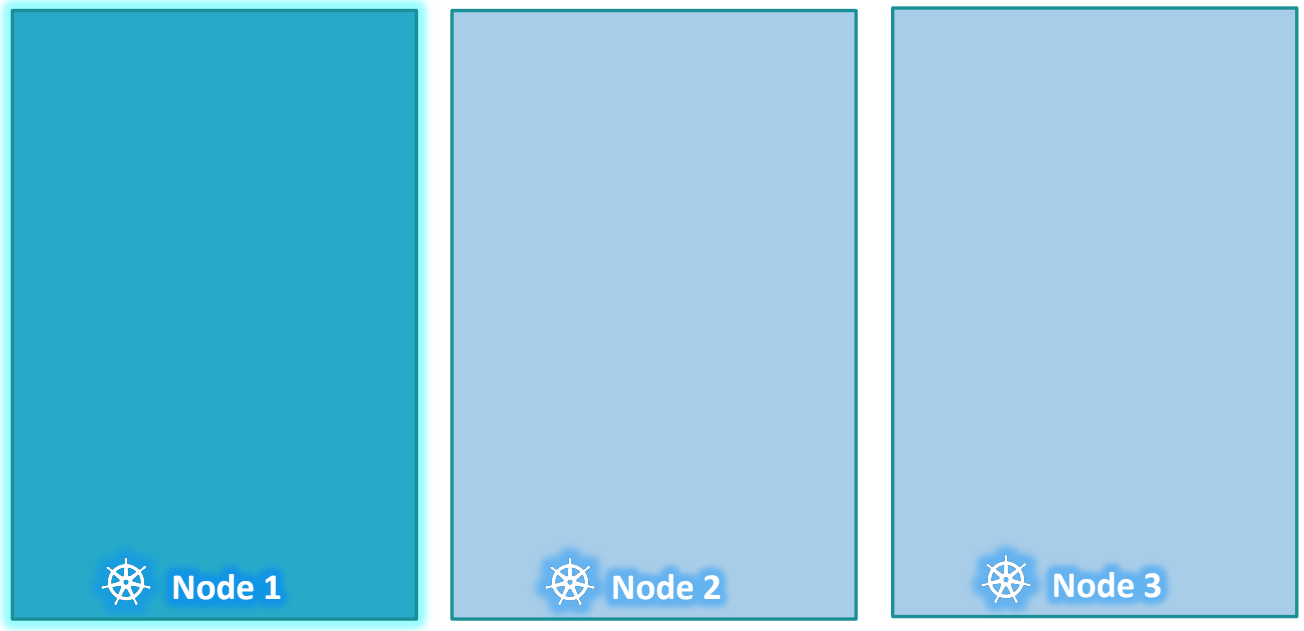
2



Taint=blue

1

Taint=blue



Taints - Node

```
kubectl taint nodes node-name key=value:taint-effect
```

```
NoSchedule | PreferNoSchedule | NoExecute
```

What happens to PODs that do not tolerate this taint?

```
kubectl taint nodes node1 app=myapp:NoSchedule
```

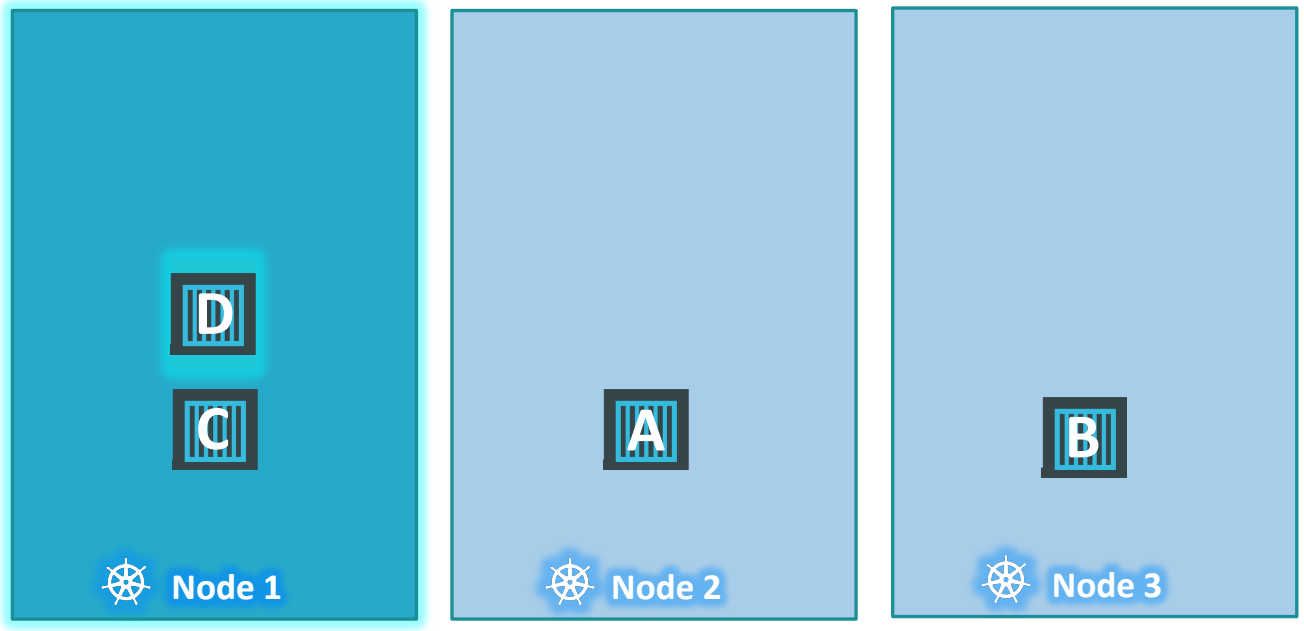
Tolerations - PODs

```
kubectl taint nodes node1 app=myapp:NoSchedule
```

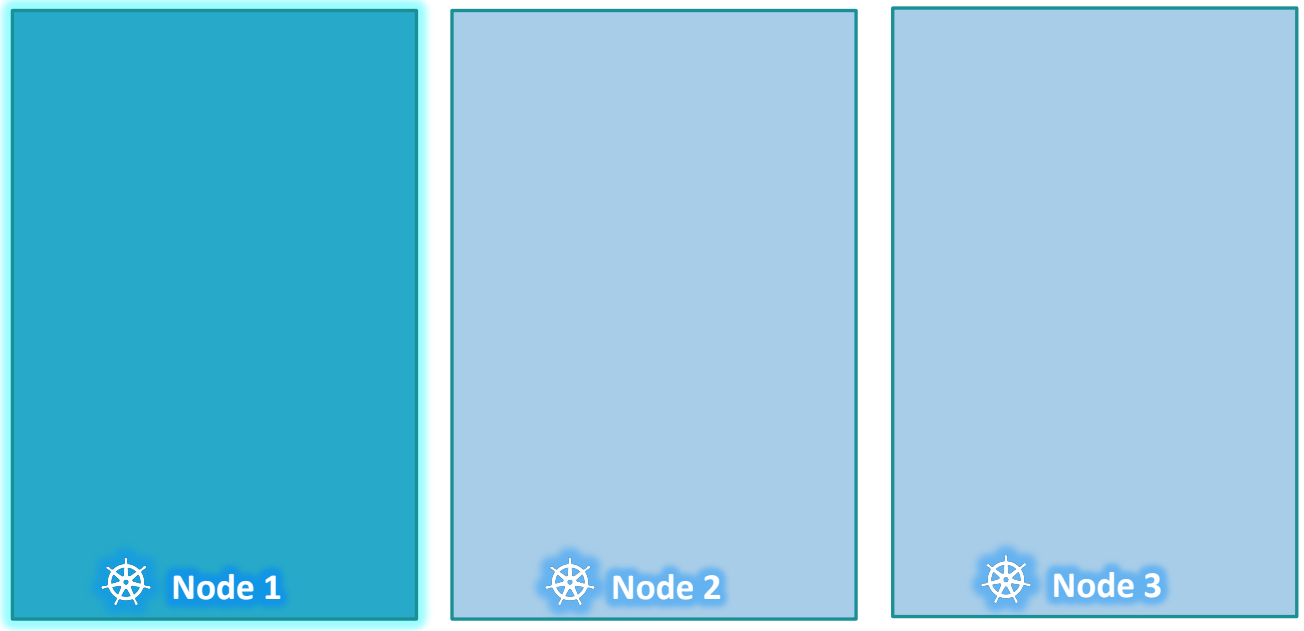
pod-definition.yml

```
apiVersion:
kind: Pod
metadata:
 name: myapp-pod
spec:
  containers:
  - name: nginx-container
    image: nginx

  tolerations:
  - key:"    "
    operator:"Equal"
    value:"    "
    effect:"          "
```

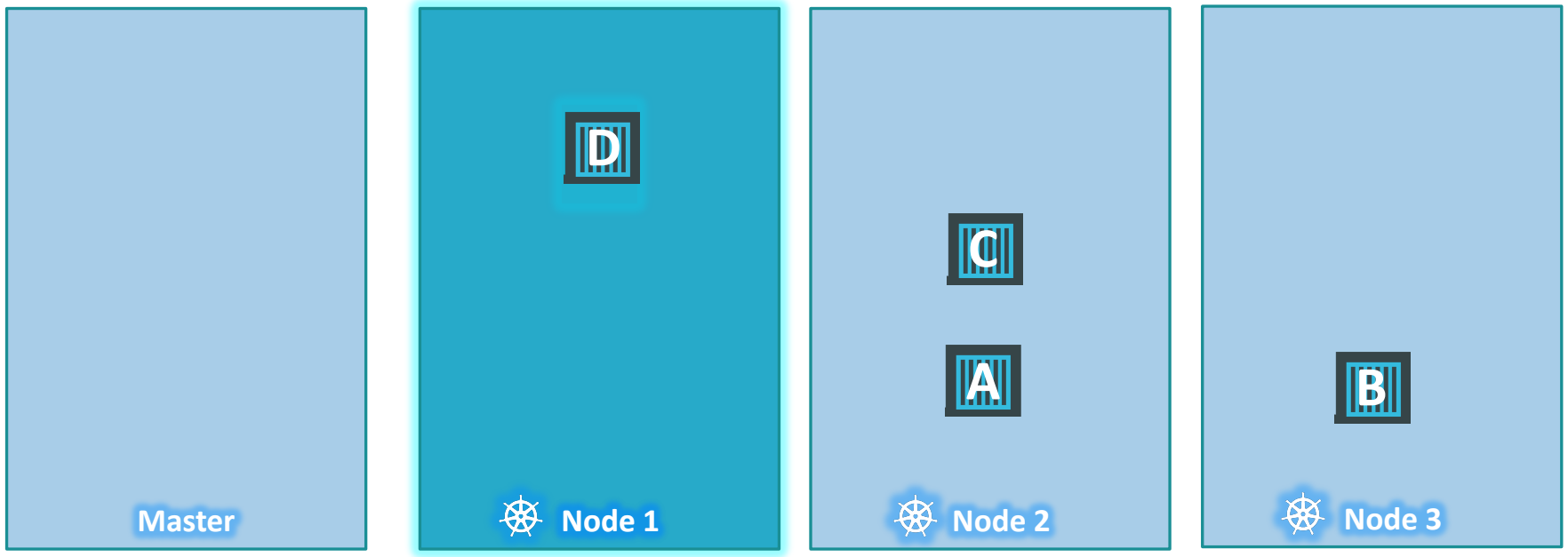
Taint - NoExecute



Taint=blue



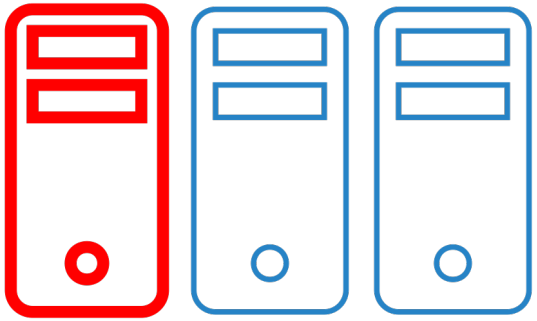
```
kubectl describe node kubemaster | grep Taint
Taints:             node-role.kubernetes.io/master:NoSchedule
```

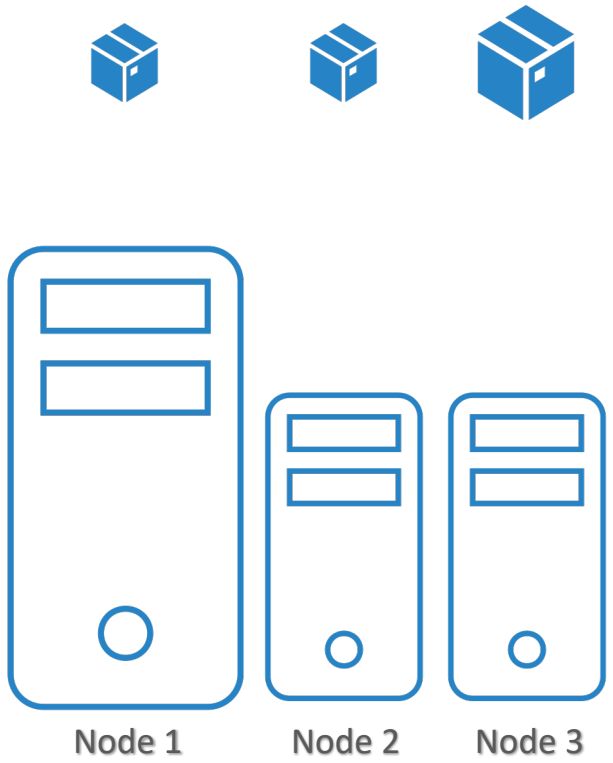


Demo

Taints and Tolerations

Node Selectors

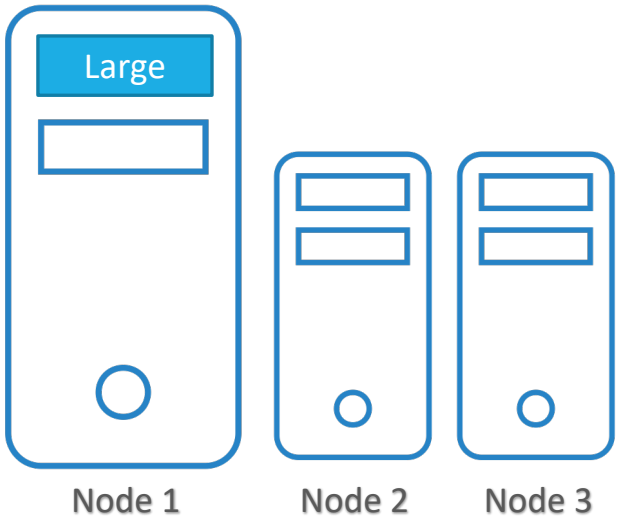



Node 1
Node 2
Node 3

Node Selectors

pod-definition.yml

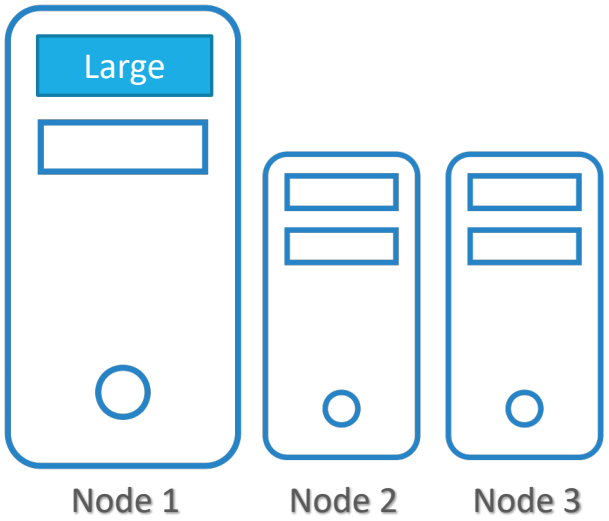
```
apiVersion:
kind: Pod
metadata:
  name: myapp-pod
spec:
  containers:
  - name: data-processor
    image: data-processor

  nodeSelector:
    size: Large
```



Label Nodes

```
kubectl label nodes <node-name> <label-key>=<label-value>
```

```
kubectl label nodes node-1 size=Large
```



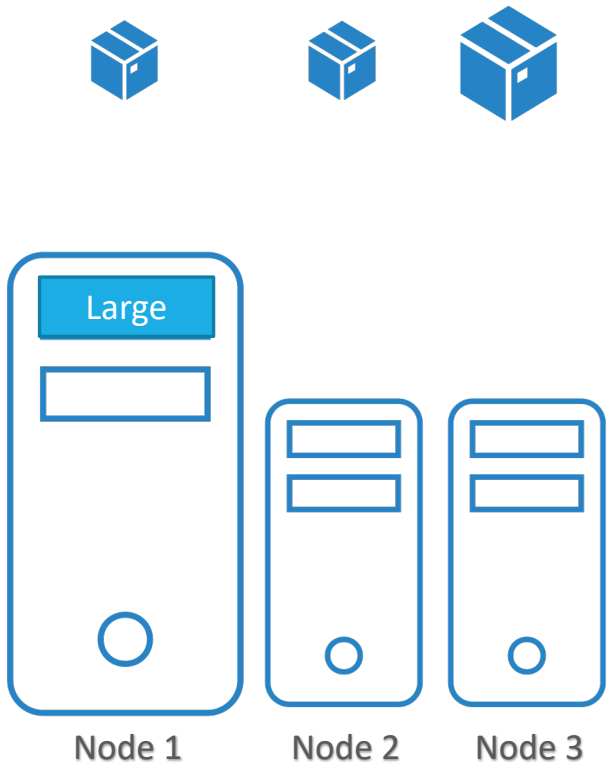
Node Selector

pod-definition.yml

```yaml
apiVersion:
kind: Pod
metadata:
 name: myapp-pod
spec:
  containers:
  - name: data-processor
    image: data-processor

  nodeSelector:
    size: Large
```

```
kubectl create -f pod-definition.yml
```

Node Selector

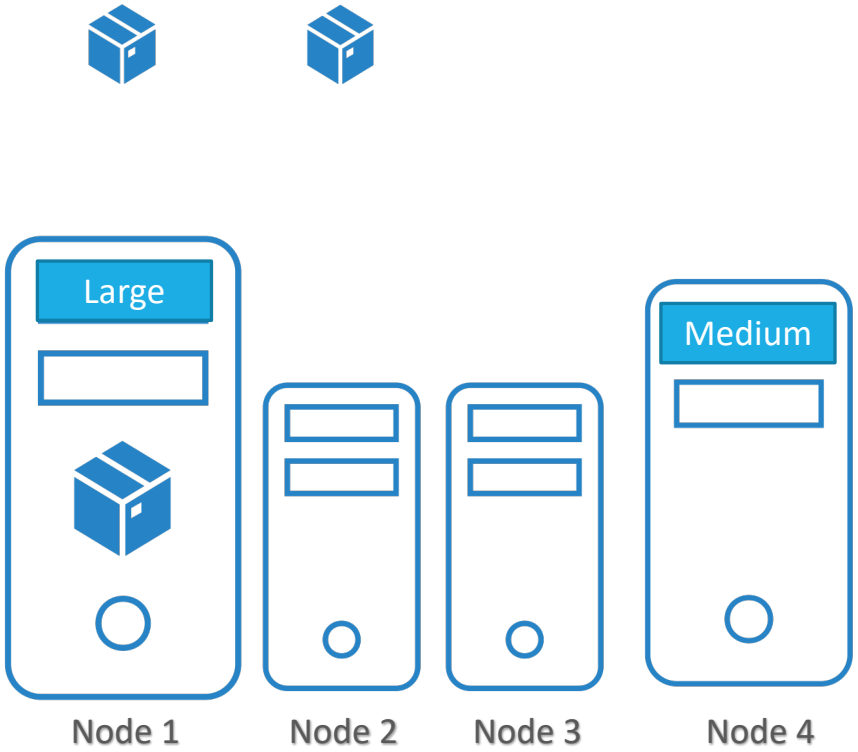


pod-definition.yml

```yaml
apiVersion:
kind: Pod
metadata:
  name: myapp-pod
spec:
  containers:
  - name: data-processor
    image: data-processor

  nodeSelector:
    size: Large
```

```
kubectl create -f pod-definition.yml
```

Node Selector - Limitations

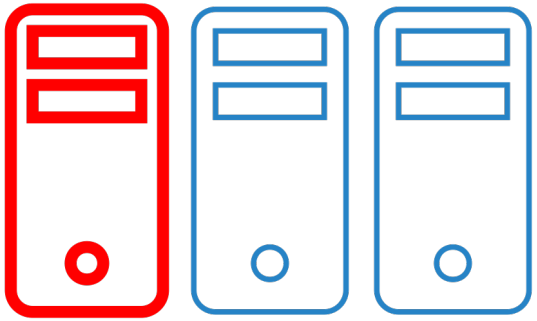


- Large OR Medium?
- NOT Small

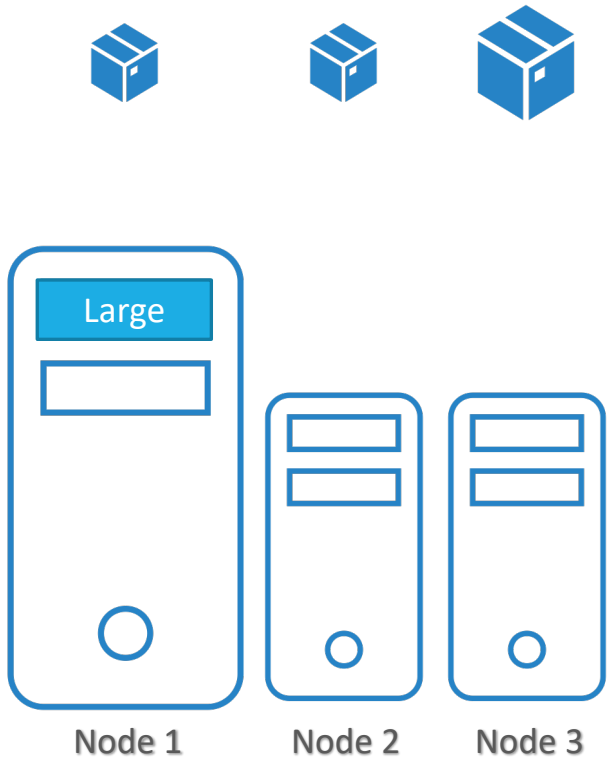
Demo

Taints and Tolerations

Node Affinity



PODs to Nodes



Node Selectors

pod-definition.yml

```
apiVersion:
kind: Pod
metadata:
 name: myapp-pod
spec:
  containers:
  - name: data-processor
    image: data-processor

  nodeSelector:
    size: Large
```

- Large OR Medium?
- NOT Small

Node Affinity

pod-definition.yml

```yaml
apiVersion:
kind: Pod

metadata:
 name: myapp-pod
spec:

  containers:
  - name: data-processor
    image: data-processor

  nodeSelector:
    size: Large
```

pod-definition.yml

```yaml
apiVersion:
kind:

metadata:
 name: myapp-pod
spec:

 containers:
  - name: data-processor
    image: data-processor

 affinity:
  nodeAffinity:
    requiredDuringSchedulingIgnoredDuringExecution:
      nodeSelectorTerms:
      - matchExpressions:
        - key: size
          operator: In
          values:
          - Large
```

Node Affinity

pod-definition.yml

```yaml
apiVersion:
kind:

metadata:
 name: myapp-pod
spec:

 containers:
  - name: data-processor
    image: data-processor
 affinity:
  nodeAffinity:
    requiredDuringSchedulingIgnoredDuringExecution:
      nodeSelectorTerms:
      - matchExpressions:

        - key: size
          operator: Exists
```

Node Affinity Types

Available:

`requiredDuringSchedulingIgnoredDuringExecution`

`preferredDuringSchedulingIgnoredDuringExecution`

Planned:

`requiredDuringSchedulingRequiredDuringExecution`

Node Affinity Types

Available:

requiredDuringSchedulingIgnoredDuringExecution

preferredDuringSchedulingIgnoredDuringExecution

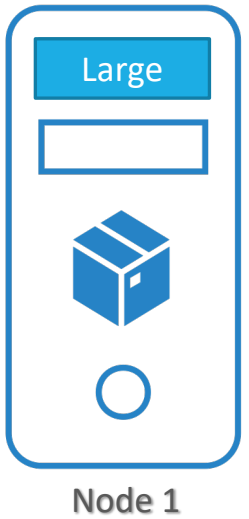
	DuringScheduling	DuringExecution
Type 1	Required	Ignored
Type 2	Preferred	Ignored

Node Affinity Types

Planned:

requiredDuringSchedulingRequiredDuringExecution

	DuringScheduling	DuringExecution
Type 1	Required	Ignored
Type 2	Preferred	Ignored
Type 3	Required	Required



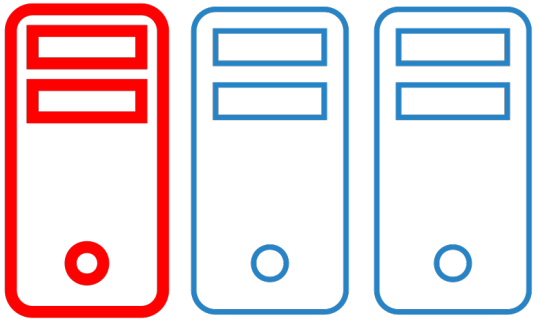
Demo

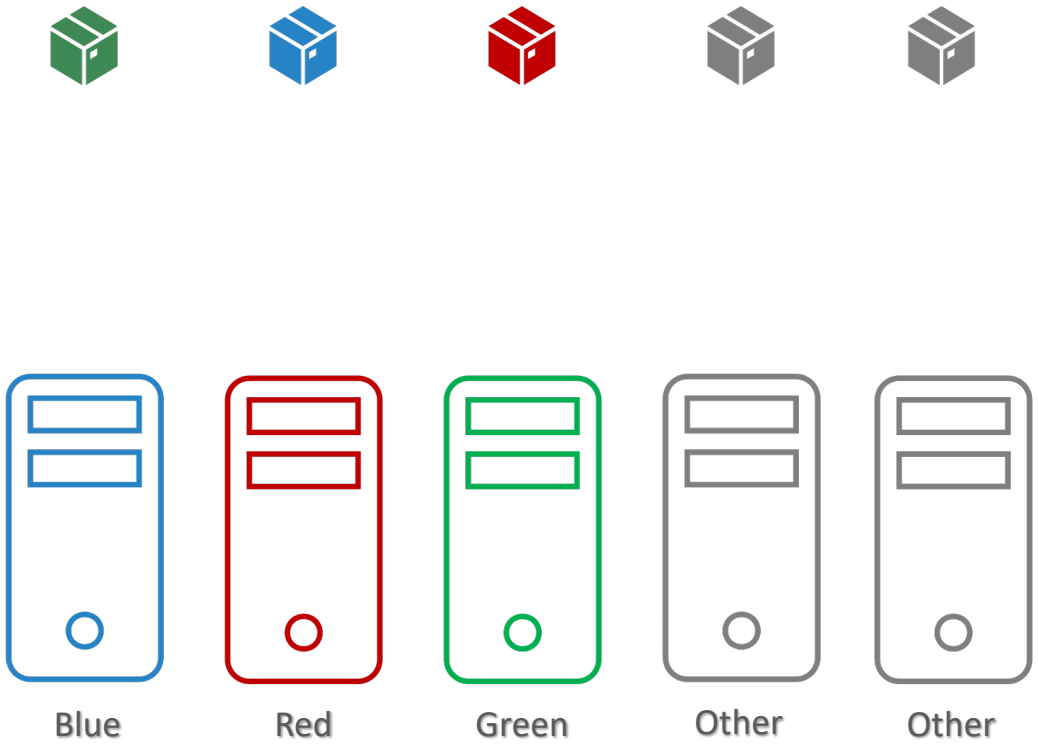
Taints and Tolerations

References

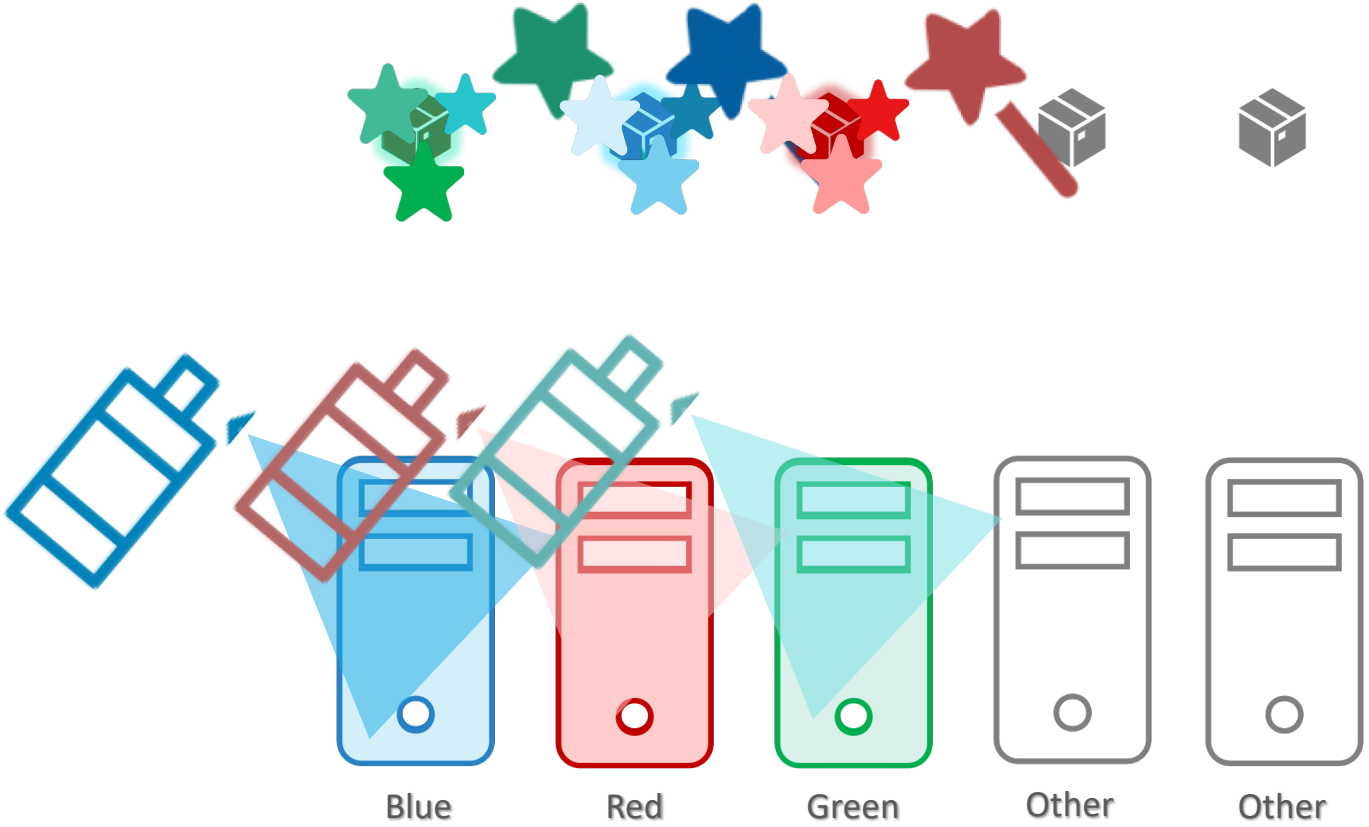
https://kubernetes.io/docs/concepts/configuration/assign-pod-node/

Node Affinity
vs
Taints and Tolerations

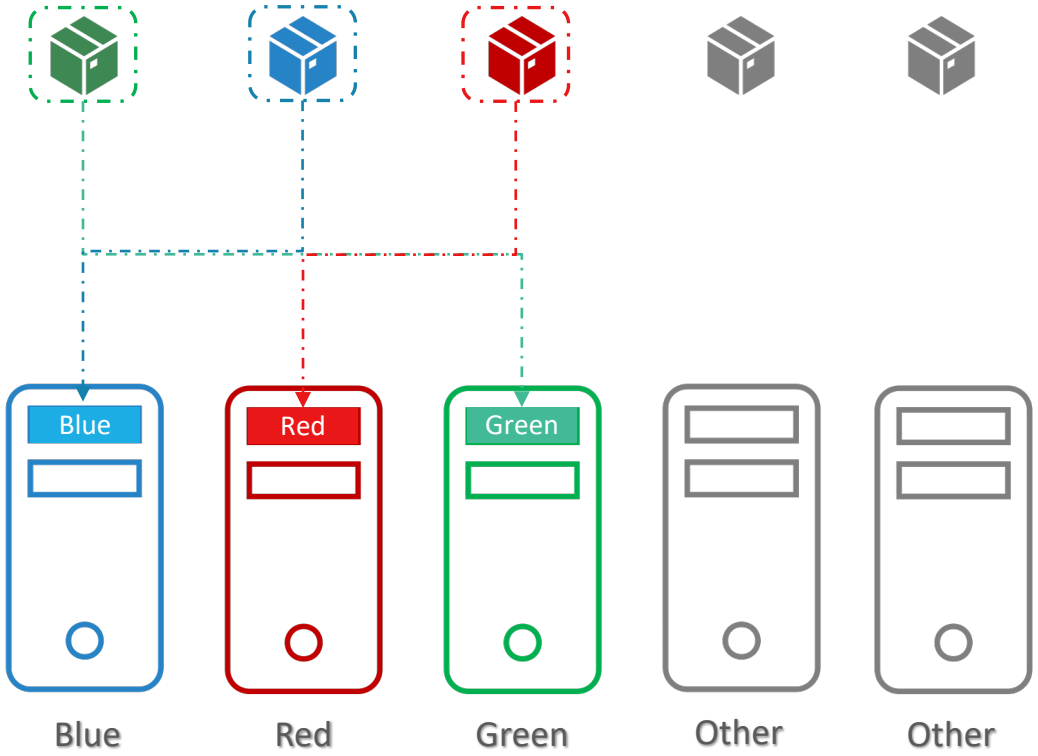
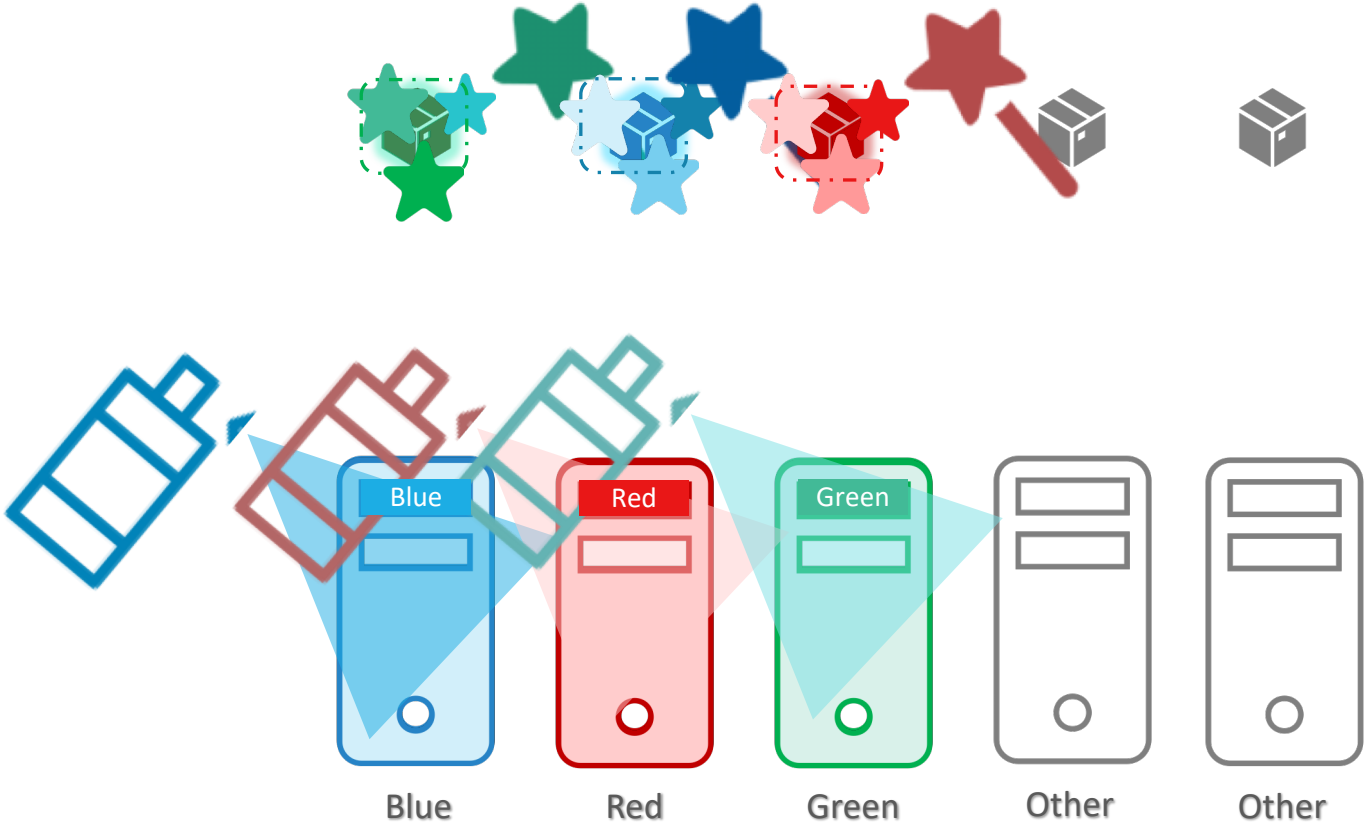



Blue
Red
Green
Other
Other

Taints and Tolerations



Node Affinity



Taints/Tolerations and Node Affinity