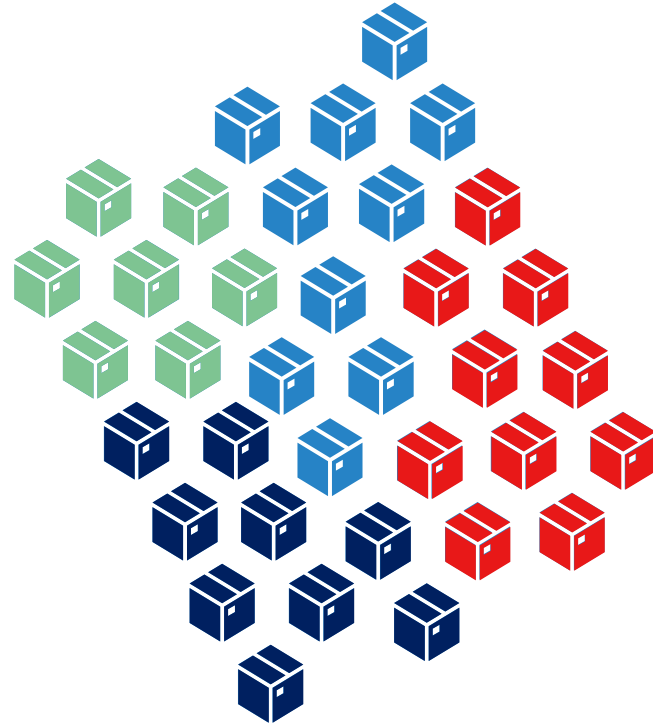


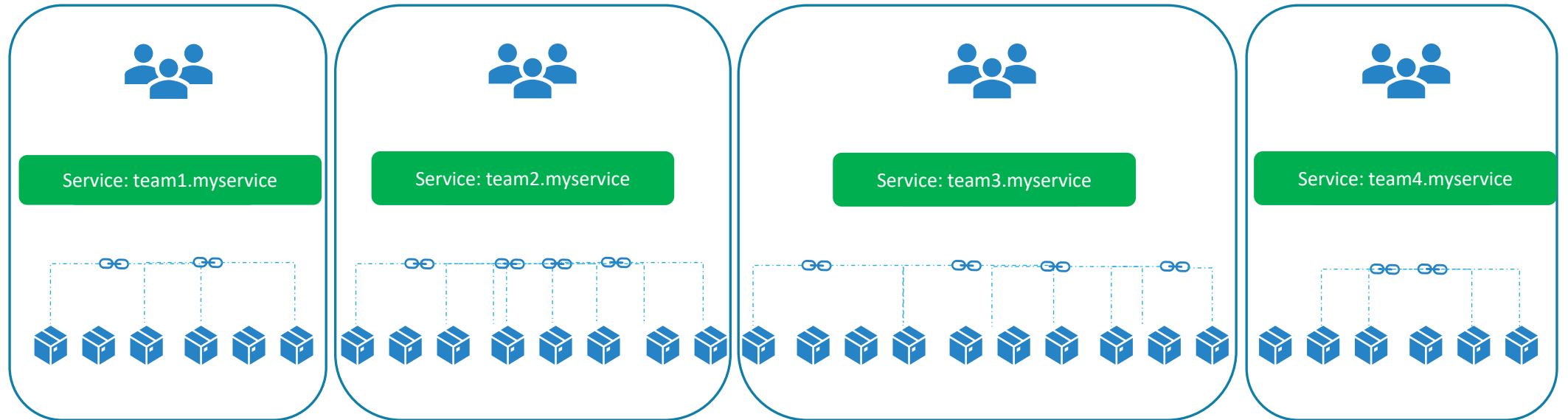


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Namespace



Namespace



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-qt1g8	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
```

```
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
```

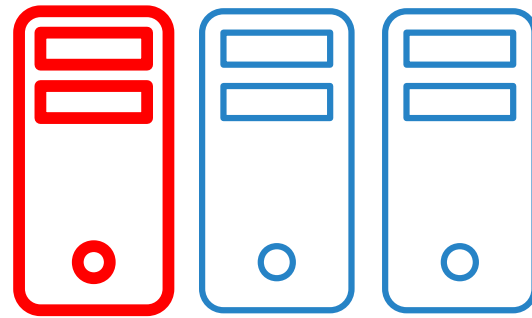
```
pod-definition.yml  
  
apiVersion: v1  
kind: Pod  
metadata:  
  name: myapp-pod  
  namespace: team1  
  labels:  
    app: myapp  
    type: front-end  
spec:  
  containers:  
  - name: nginx-container  
    image: nginx
```



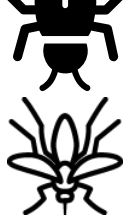


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Taints And Tolerations



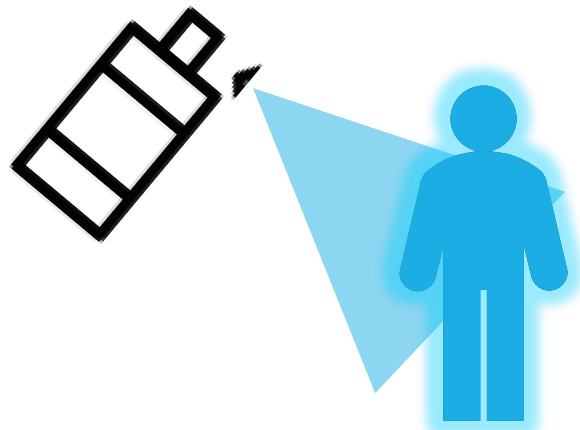
2



Intolerant

Tolerant

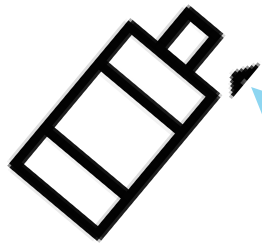
1



Taint

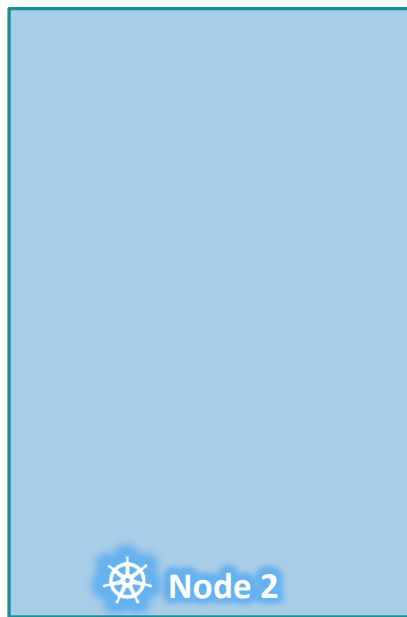


2



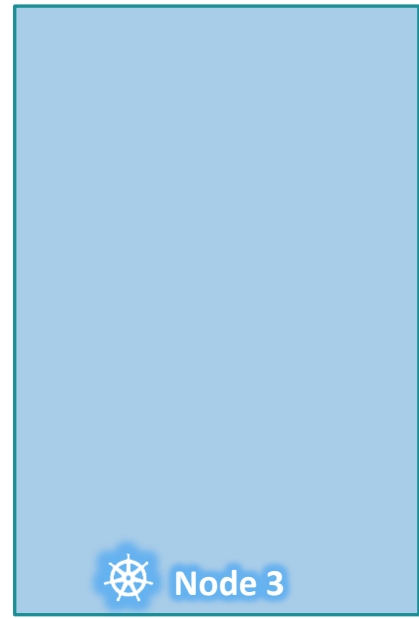
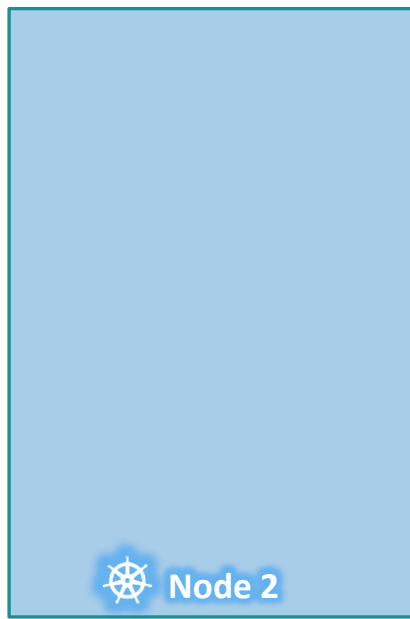
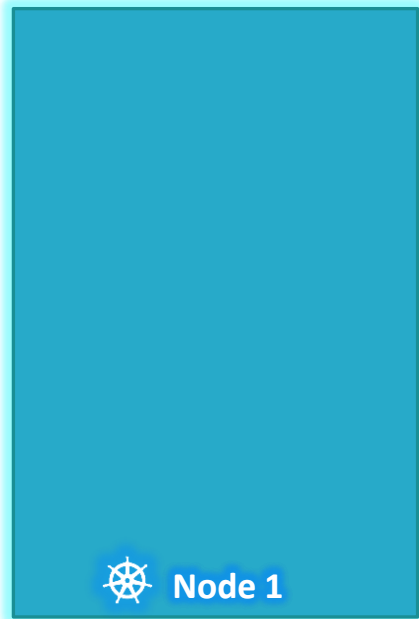
Taint=blue

1





Taint=blue



Taints - Node

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

NoSchedule | PreferNoSchedule | NoExecute

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

What happens to PODs
that do not tolerate this taint?



✦ Tolerations - PODs

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

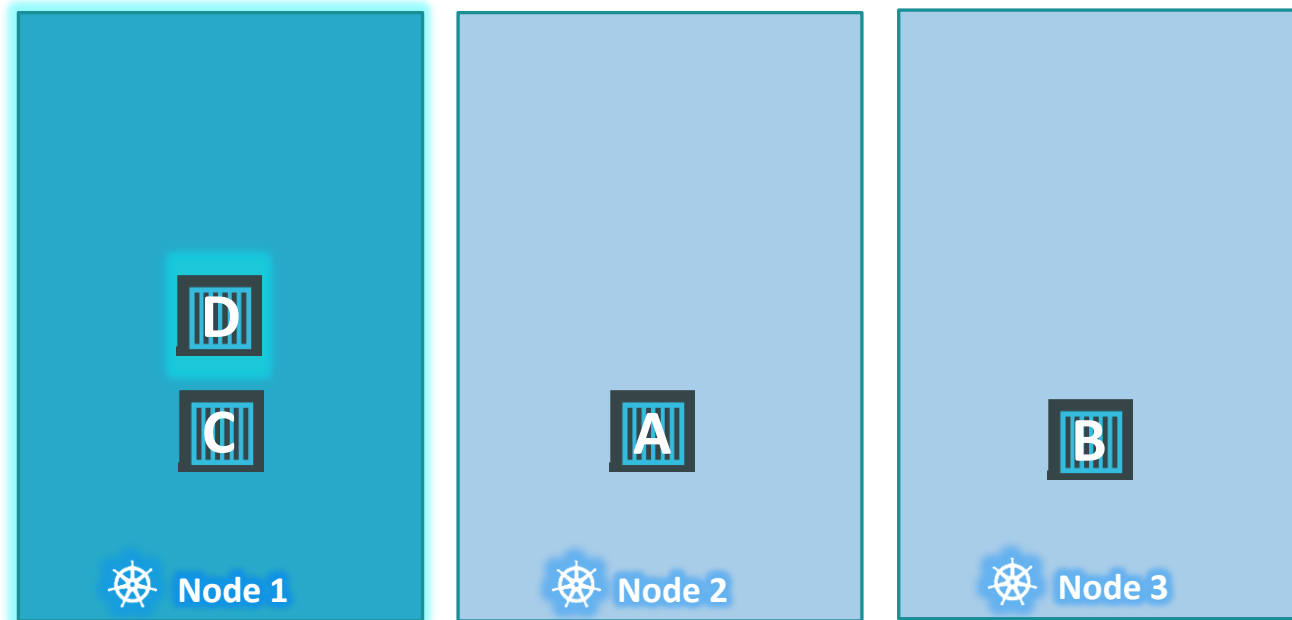
```
pod-definition.yml
```

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

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

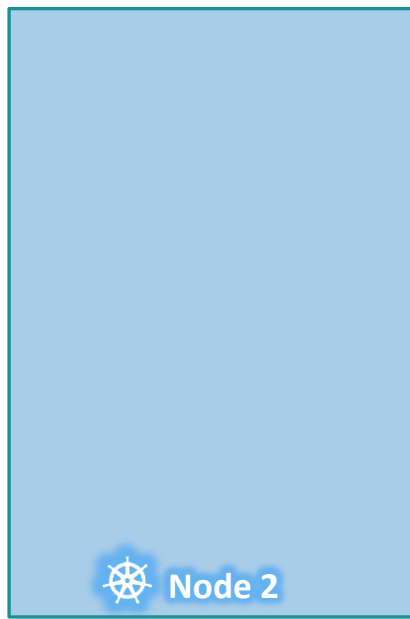
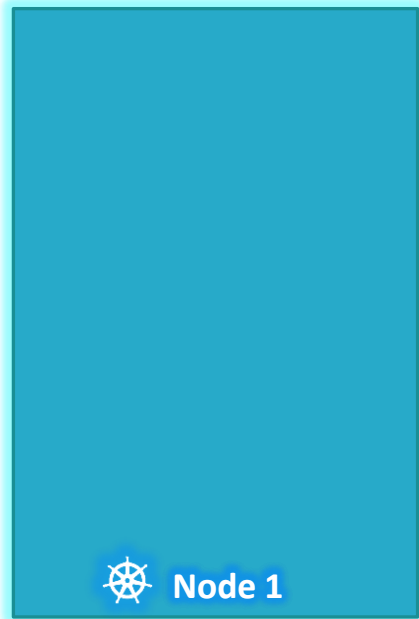


Taint - NoExecute



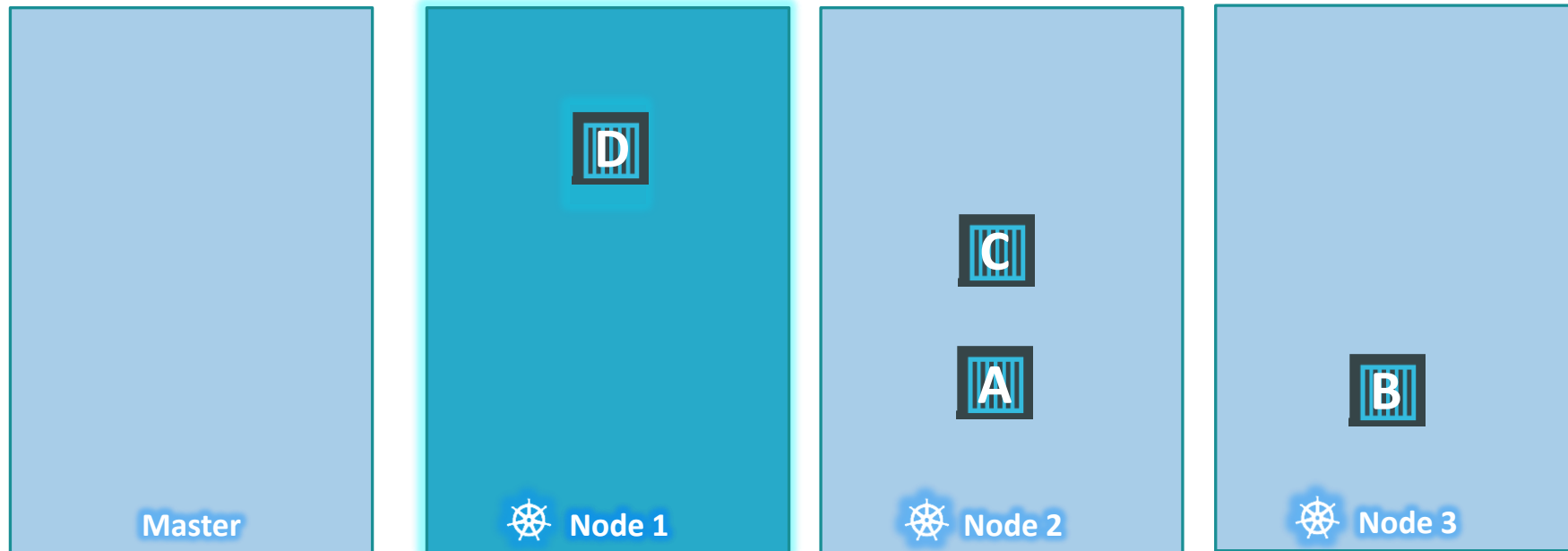


Taint=blue




```
kubectl describe node kubemaster | grep Taint
```

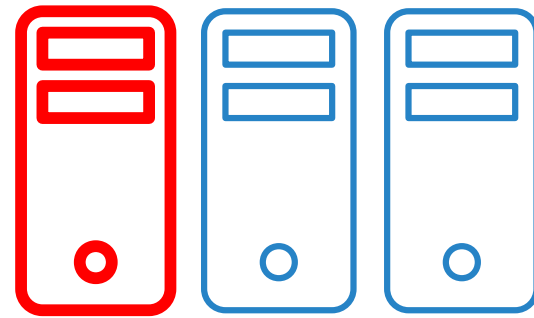
```
Taints:                node-role.kubernetes.io/master:NoSchedule
```

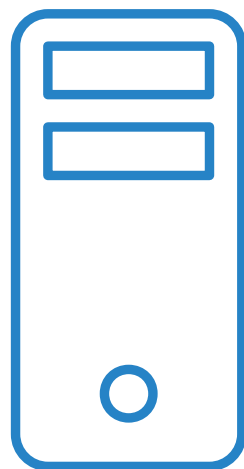




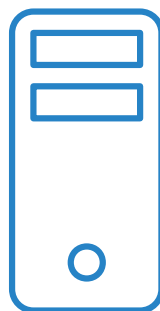
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Node Selectors

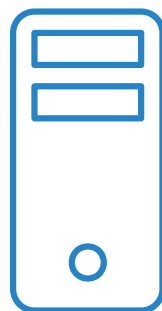




Node 1



Node 2



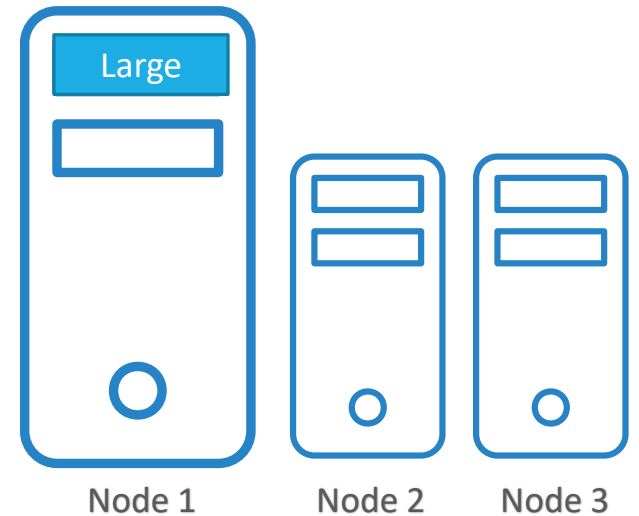
Node 3



Node Selectors

pod-definition.yml

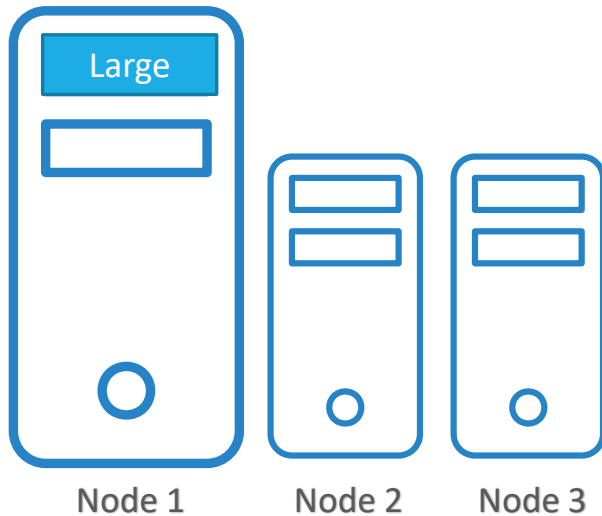
```
apiVersion:  
kind: Pod  
metadata:  
  name: myapp-pod  
spec:  
  containers:  
  - name: data-processor  
    image: data-processor  
  nodeSelector:  
    size: Large
```



Label Nodes

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

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



Node Selector

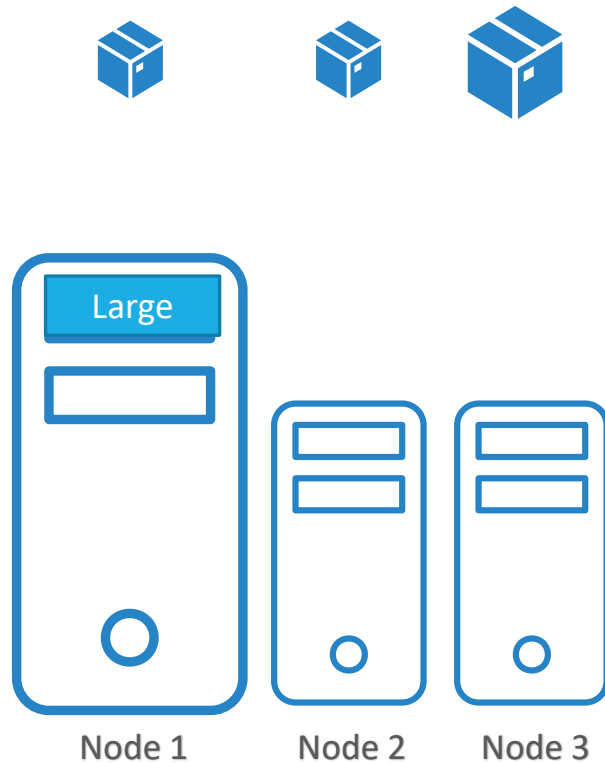
pod-definition.yml

```
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

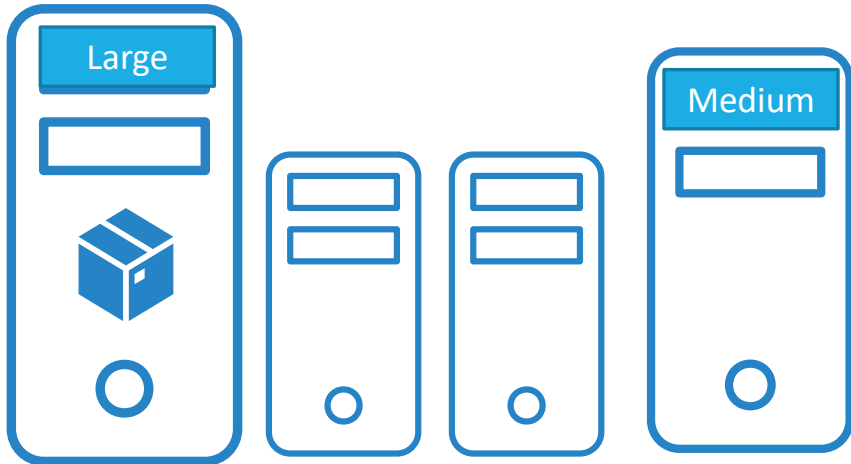


```
pod-definition.yml
```

```
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



Node 1

Node 2

Node 3

Node 4

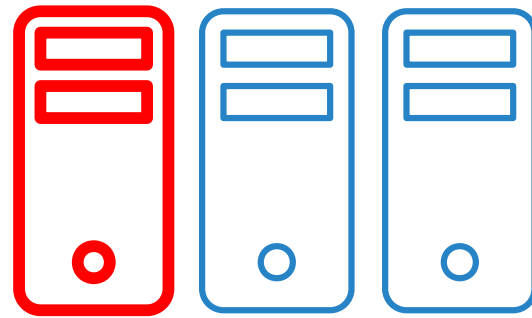
- Large OR Medium?
- NOT Small



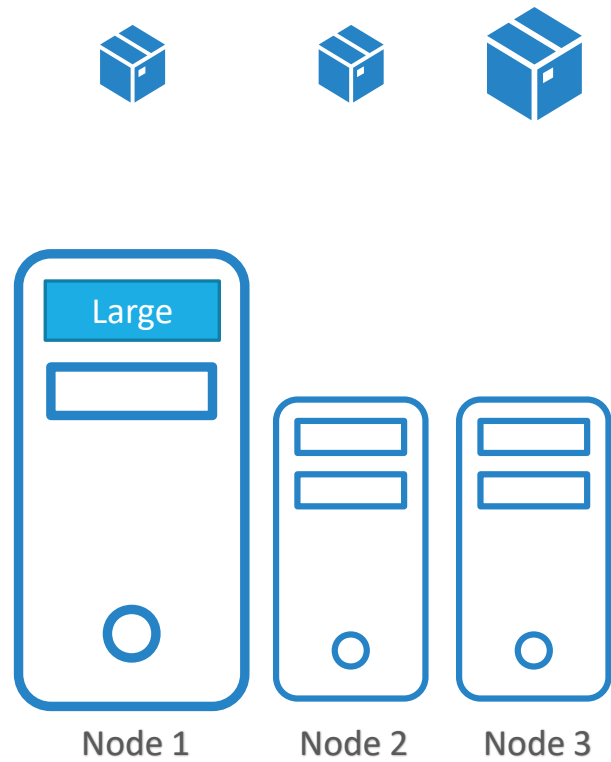


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Node Affinity



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

```
apiVersion:
kind: Pod

metadata:
  name: myapp-pod

spec:

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

  nodeSelector:
    size: Large
```

pod-definition.yml

```
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

```
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:

required **DuringScheduling** **Ignored** **DuringExecution**

preferred **DuringScheduling** **Ignored** **DuringExecution**

	DuringScheduling	DuringExecution
Type 1	Required	Ignored
Type 2	Preferred	Ignored

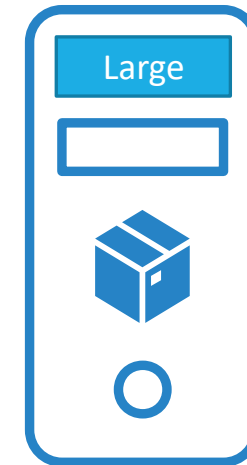


Node Affinity Types

Planned:

required During Scheduling **Required** During Execution

	During Scheduling	During Execution
Type 1	Required	Ignored
Type 2	Preferred	Ignored
Type 3	Required	Required



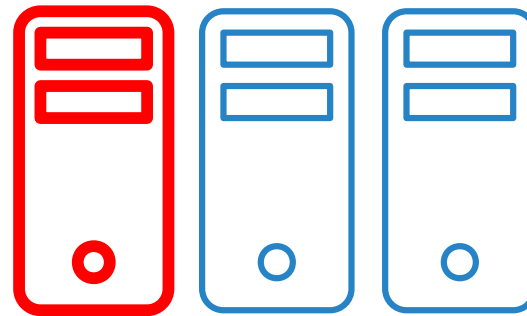
Node 1

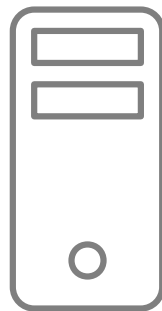
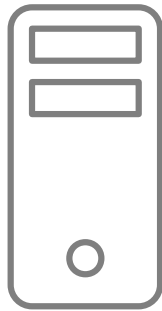
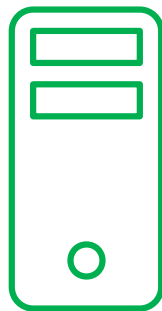
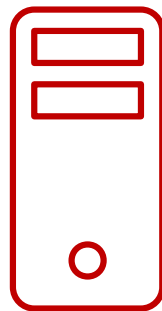
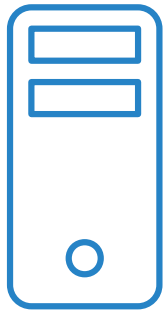




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Node Affinity vs Taints and Tolerations





Blue

Red

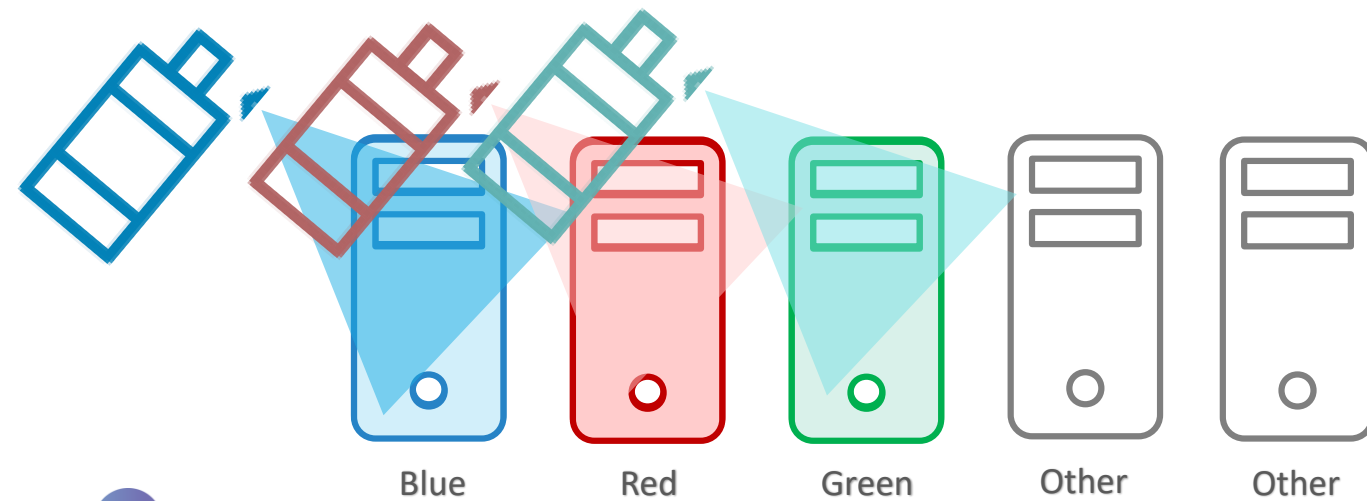
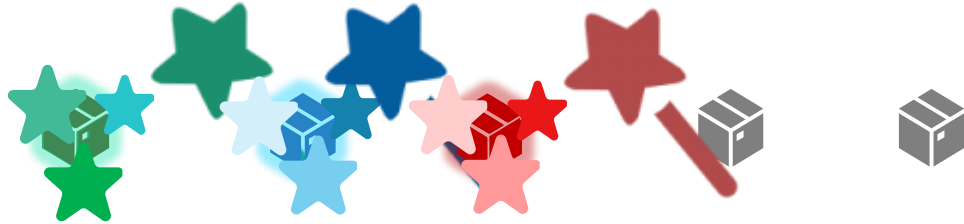
Green

Other

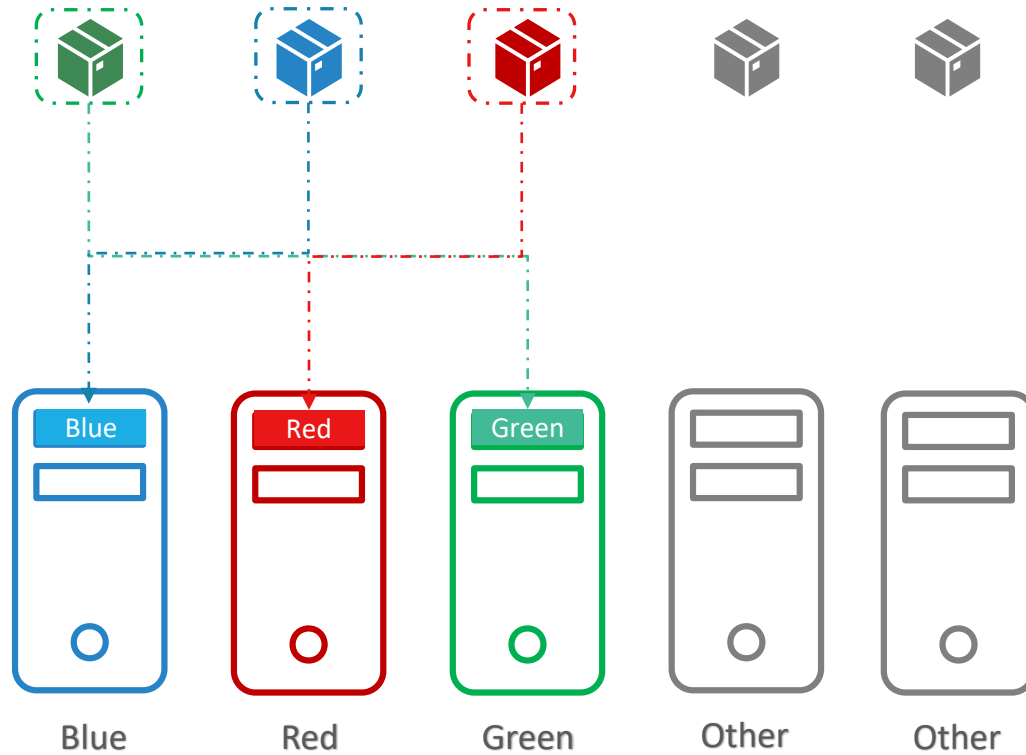
Other



Taints and Tolerations



Node Affinity



Taints/Tolerations and Node Affinity

