

1- How many DaemonSets are created in the cluster in all namespaces?

```
Administrator: Windows PowerShell
PS C:\WINDOWS\system32> kubectl get daemonsets
No resources found in default namespace.
PS C:\WINDOWS\system32>
```

2- what DaemonSets exist on the kube-system namespace?

```
PS C:\WINDOWS\system32> kubectl get daemonsets -n kube-system
NAME          DESIRED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SELECTOR   AGE
kube-proxy    1         1         1       1             1           kubernetes.io/os=linux  3d16h
PS C:\WINDOWS\system32>
```

3- What is the image used by the POD deployed by the kube-proxy DaemonSet ?

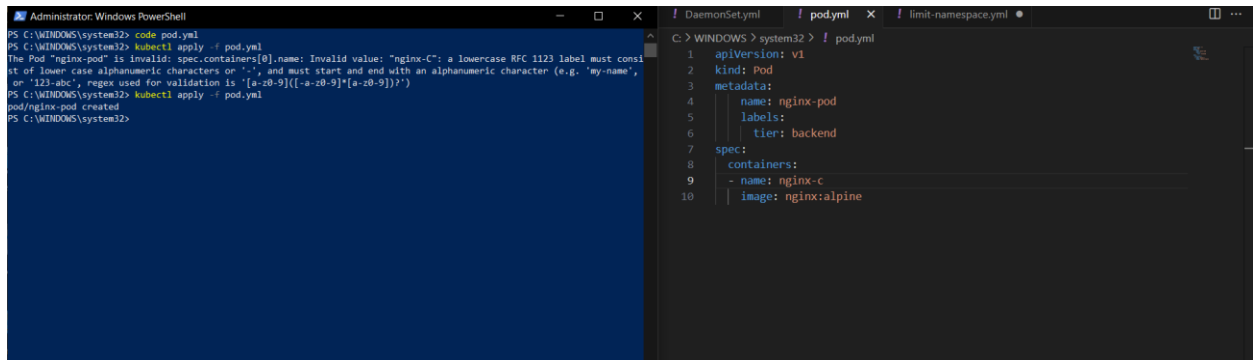
```
Administrator: Windows PowerShell
PS C:\WINDOWS\system32> kubectl describe daemonset -n kube-system
Name:          kube-proxy
Selector:      k8s-app=kube-proxy
Node-Selector: kubernetes.io/os=linux
Labels:       k8s-app=kube-proxy
Annotations:   deprecated.daemonset.template.generation: 1
Desired Number of Nodes Scheduled: 1
Current Number of Nodes Scheduled: 1
Number of Nodes Scheduled with Up-to-date Pods: 1
Number of Nodes Scheduled with Available Pods: 1
Number of Nodes Misscheduled: 0
Pods Status:  1 Running / 0 Waiting / 0 Succeeded / 0 Failed
Pod Template:
  Labels:      k8s-app=kube-proxy
  Service Account: kube-proxy
  Containers:
    kube-proxy:
      Image:   registry.k8s.io/kube-proxy:v1.32.0
```

4- Deploy a DaemonSet for FluentD Logging. Use the given specifications. Name: elasticsearch
Namespace: kube-system Image: k8s.gcr.io/fluentd-elasticsearch:1.20

```
Administrator: Windows PowerShell
PS C:\WINDOWS\system32> kubectl apply -f DaemonSet.yml
daemonset.apps/elasticsearch created
PS C:\WINDOWS\system32>
```

```
DaemonSet.yml
1  apiVersion: apps/v1
2  kind: DaemonSet
3  metadata:
4    name: elasticsearch
5    namespace: kube-system
6  spec:
7    selector:
8      matchLabels:
9        name: fluentd
10   template:
11     metadata:
12       labels:
13         name: fluentd
14     spec:
15       containers:
16         - name: elasticsearch
17           image: k8s.gcr.io/fluentd-elasticsearch:1.20
```

5- Deploy a pod named nginx-pod using the nginx:alpine image with the labels set to tier=backend



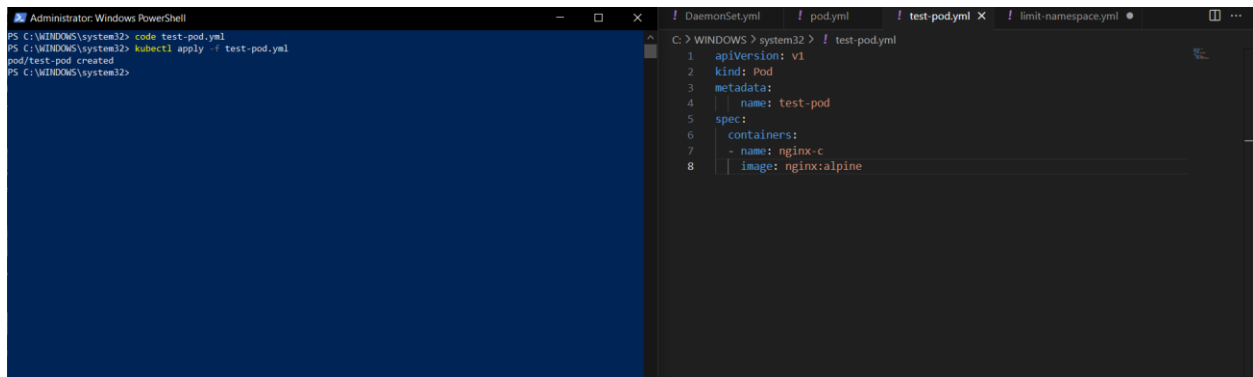
The screenshot shows a Windows PowerShell terminal window on the left and a code editor on the right. The terminal window displays the following commands and output:

```
PS C:\WINDOWS\system32> code pod.yml
PS C:\WINDOWS\system32> kubectl apply -f pod.yml
The Pod "nginx-pod" is invalid: spec.containers[0].name: Invalid value: "nginx-C": a lowercase RFC 1123 label must consist of lower case alphanumeric characters or '-', and must start and end with an alphanumeric character (e.g. 'my-name', or '123-abc', regex used for validation is '[a-z0-9]([-a-z0-9]*[a-z0-9])?')
PS C:\WINDOWS\system32> kubectl apply -f pod.yml
pod/nginx-pod created
PS C:\WINDOWS\system32>
```

The code editor on the right shows the content of the `pod.yml` file:

```
1 apiVersion: v1
2 kind: Pod
3 metadata:
4   name: nginx-pod
5   labels:
6     tier: backend
7 spec:
8   containers:
9     - name: nginx-c
10     image: nginx:alpine
```

6- Deploy a test pod using the nginx:alpine image.



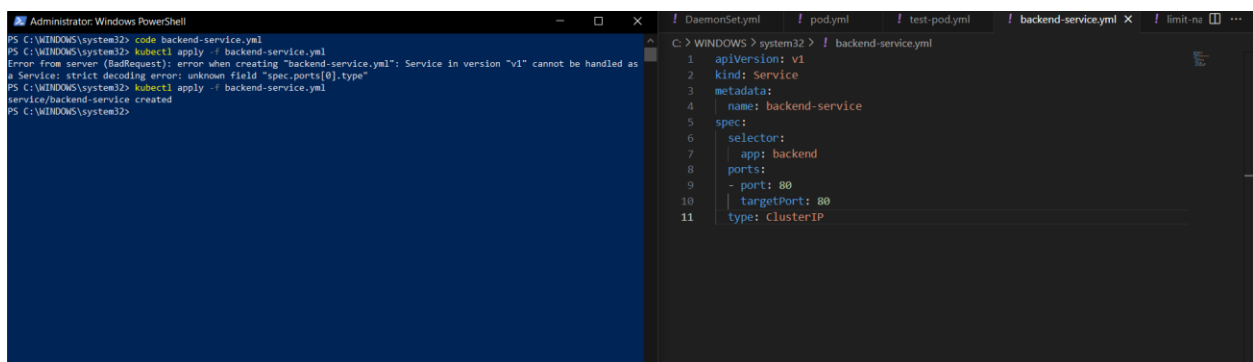
The screenshot shows a Windows PowerShell terminal window on the left and a code editor on the right. The terminal window displays the following commands and output:

```
PS C:\WINDOWS\system32> code test-pod.yml
PS C:\WINDOWS\system32> kubectl apply -f test-pod.yml
pod/test-pod created
PS C:\WINDOWS\system32>
```

The code editor on the right shows the content of the `test-pod.yml` file:

```
1 apiVersion: v1
2 kind: Pod
3 metadata:
4   name: test-pod
5 spec:
6   containers:
7     - name: nginx-c
8     image: nginx:alpine
```

7- Create a service backend- 7- Create a service backend-service to expose the backend application within the cluster on port 80. to expose the backend



The screenshot shows a Windows PowerShell terminal window on the left and a code editor on the right. The terminal window displays the following commands and output:

```
PS C:\WINDOWS\system32> code backend-service.yml
PS C:\WINDOWS\system32> kubectl apply -f backend-service.yml
Error from server (BadRequest): error when creating "backend-service.yml": Service in version "v1" cannot be handled as a Service: strict decoding error: unknown field "spec.ports[0].type"
PS C:\WINDOWS\system32> kubectl apply -f backend-service.yml
service/backend-service created
PS C:\WINDOWS\system32>
```

The code editor on the right shows the content of the `backend-service.yml` file:

```
1 apiVersion: v1
2 kind: Service
3 metadata:
4   name: backend-service
5 spec:
6   selector:
7     app: backend
8   ports:
9     - port: 80
10     targetPort: 80
11   type: ClusterIP
```

8- try to curl the backend-service from the test pod. What is the response?

```
PS C:\WINDOWS\system32> kubectl exec -it test-pod -- sh
/ # curl backend-service
<!DOCTYPE html>
<html>
<head>
<title>Welcome to nginx!</title>
<style>
html { color-scheme: light dark; }
body { width: 35em; margin: 0 auto;
font-family: Tahoma, Verdana, Arial, sans-serif; }
</style>
</head>
<body>
<h1>Welcome to nginx!</h1>
<p>If you see this page, the nginx web server is successfully installed and
working. Further configuration is required.</p>

<p>For online documentation and support please refer to
<a href="http://nginx.org/">nginx.org</a>.<br/>
Commercial support is available at
<a href="http://nginx.com/">nginx.com</a>.</p>

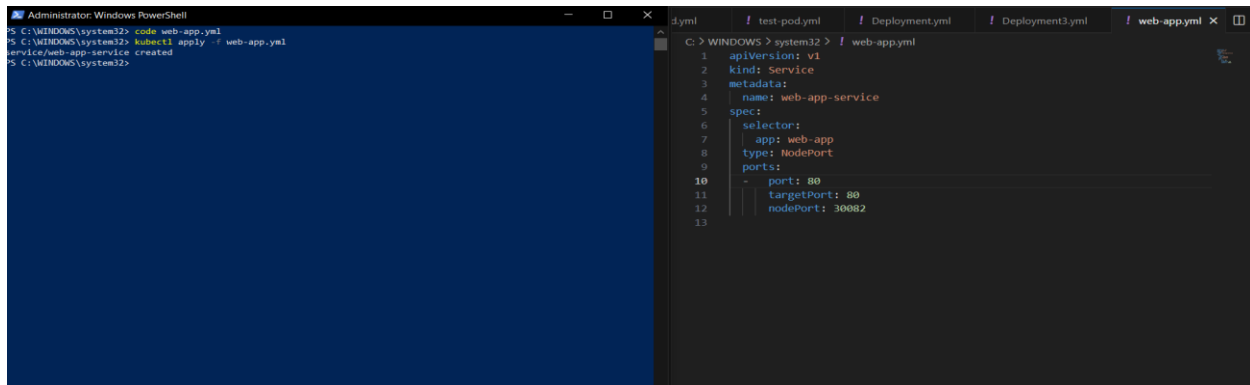
<p><em>Thank you for using nginx.</em></p>
</body>
</html>
/ #
```

9- Create a deployment named web-app using the image nginx with 2 replicas

```
Administrator: Windows PowerShell
PS C:\WINDOWS\system32> code Deployment3.yml
PS C:\WINDOWS\system32> kubectl apply -f Deployment3.yml
The Deployment "nginx" is invalid:
* spec.selector: Required value
* spec.template.metadata.labels: Invalid value: map[string]string(nil): 'selector' does not match template 'labels'
PS C:\WINDOWS\system32> kubectl apply -f Deployment3.yml
deployment.apps/nginx created
PS C:\WINDOWS\system32>

C:\WINDOWS\system32> Deployment3.yml
1  apiVersion: apps/v1
2  kind: Deployment
3  metadata:
4    name: nginx
5  spec:
6    replicas: 2
7    selector:
8      matchLabels:
9        app: nginx
10   template:
11     metadata:
12       name: nginx
13       labels:
14         app: nginx
15   spec:
16     containers:
17       - name: nginx
18         image: nginx
19
```

10- Expose the web-app as service web-app-service application on port 80 and nodeport 30082 on the nodes on the cluster



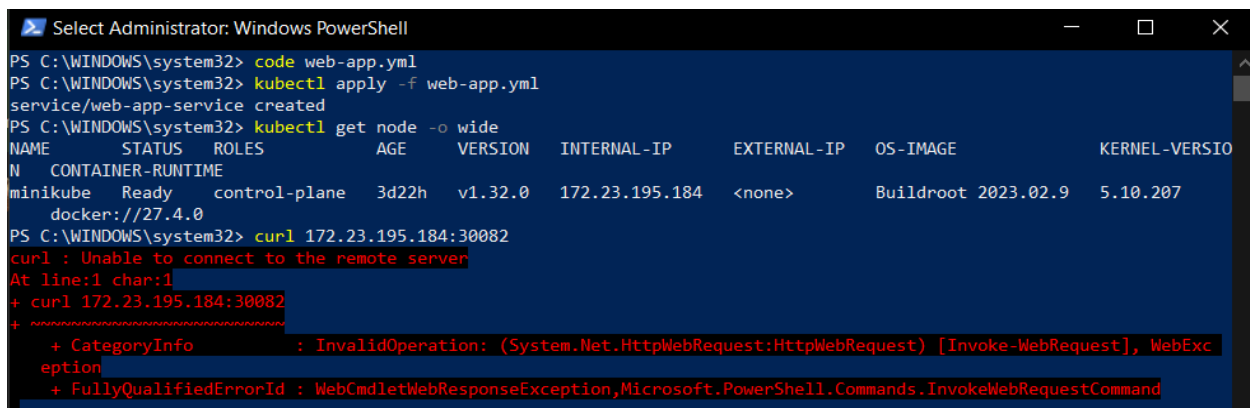
The screenshot shows two windows. The left window is an Administrator: Windows PowerShell terminal with the following commands and output:

```
PS C:\WINDOWS\system32> code web-app.yml
PS C:\WINDOWS\system32> kubectl apply -f web-app.yml
service/web-app-service created
PS C:\WINDOWS\system32>
```

The right window is a code editor showing the content of `web-app.yml`:

```
1 apiVersion: v1
2 kind: Service
3 metadata:
4   name: web-app-service
5 spec:
6   selector:
7     app: web-app
8   type: NodePort
9   ports:
10    - port: 80
11      targetPort: 80
12      nodePort: 30082
13
```

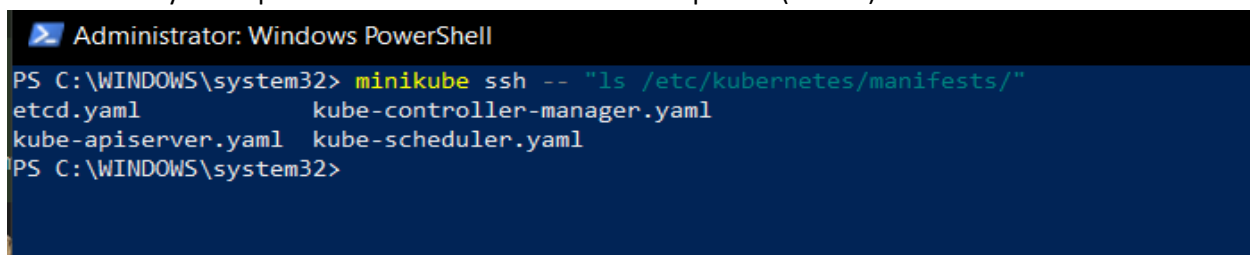
11- access the web app from the node



The screenshot shows an Administrator: Windows PowerShell terminal with the following commands and output:

```
Select Administrator: Windows PowerShell
PS C:\WINDOWS\system32> code web-app.yml
PS C:\WINDOWS\system32> kubectl apply -f web-app.yml
service/web-app-service created
PS C:\WINDOWS\system32> kubectl get node -o wide
NAME          STATUS    ROLES    AGE    VERSION    INTERNAL-IP    EXTERNAL-IP    OS-IMAGE    KERNEL-VERSI
N    CONTAINER-RUNTIME
minikube      Ready     control-plane 3d22h   v1.32.0    172.23.195.184 <none>         Buildroot 2023.02.9   5.10.207
docker://27.4.0
PS C:\WINDOWS\system32> curl 172.23.195.184:30082
curl : Unable to connect to the remote server
At line:1 char:1
+ curl 172.23.195.184:30082
+ ~~~~~
+ CategoryInfo          : InvalidOperation: (System.Net.HttpWebRequest:HttpWebRequest) [Invoke-WebRequest], WebExc
eption
+ FullyQualifiedErrorId : WebCmdletWebResponseException,Microsoft.PowerShell.Commands.InvokeWebRequestCommand
```

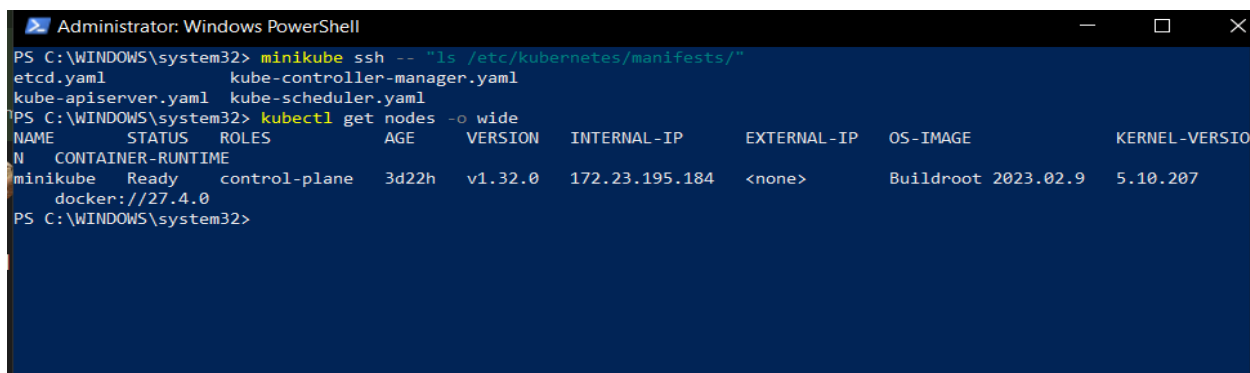
12- How many static pods exist in this cluster in all namespaces? (search)



The screenshot shows an Administrator: Windows PowerShell terminal with the following commands and output:

```
Select Administrator: Windows PowerShell
PS C:\WINDOWS\system32> minikube ssh -- "ls /etc/kubernetes/manifests/"
etcd.yaml          kube-controller-manager.yaml
kube-apiserver.yaml kube-scheduler.yaml
PS C:\WINDOWS\system32>
```

13-On which nodes are the static pods created currently?



The screenshot shows an Administrator: Windows PowerShell terminal with the following commands and output:

```
Select Administrator: Windows PowerShell
PS C:\WINDOWS\system32> minikube ssh -- "ls /etc/kubernetes/manifests/"
etcd.yaml          kube-controller-manager.yaml
kube-apiserver.yaml kube-scheduler.yaml
PS C:\WINDOWS\system32> kubectl get nodes -o wide
NAME          STATUS    ROLES    AGE    VERSION    INTERNAL-IP    EXTERNAL-IP    OS-IMAGE    KERNEL-VERSI
N    CONTAINER-RUNTIME
minikube      Ready     control-plane 3d22h   v1.32.0    172.23.195.184 <none>         Buildroot 2023.02.9   5.10.207
docker://27.4.0
PS C:\WINDOWS\system32>
```