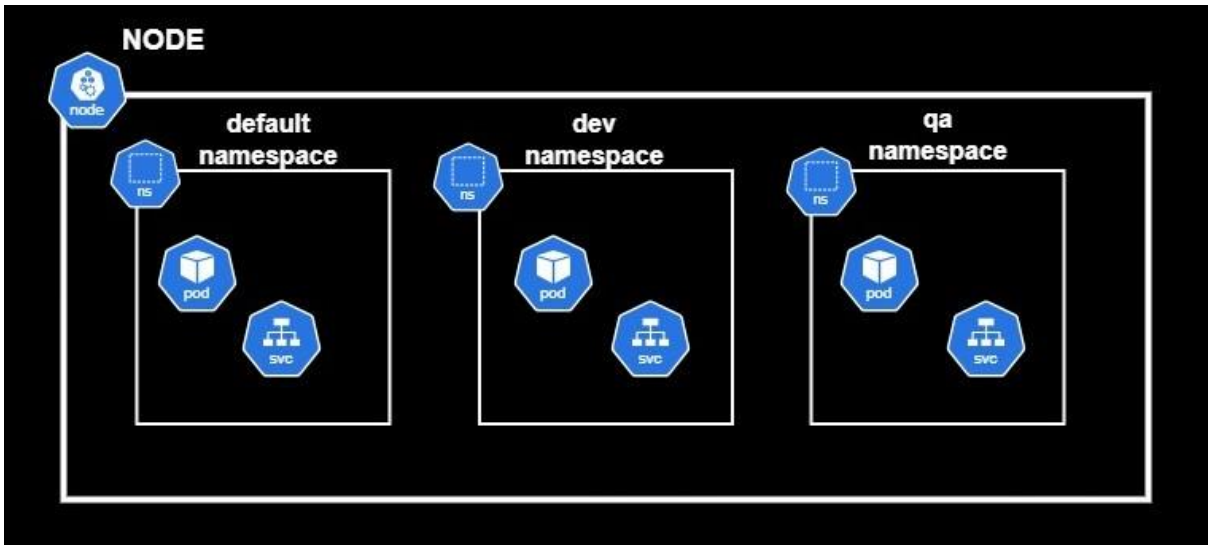
KUBERNETES NAMESPACE

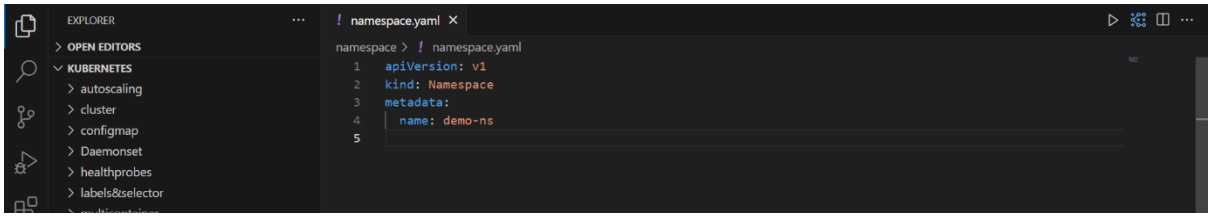
Namespace is a logical partition that provides a way to divide cluster resources between multiple users or teams. Namespaces are useful for organizing resources within a cluster and can be used for various purposes, such as:

1. **Isolation**: Namespaces help isolate resources (like pods, services, and deployments) within the same cluster. This is particularly useful in multi-tenant environments.
2. **Resource Quotas**: You can set resource limits and quotas on a per-namespace basis to prevent any single team or application from consuming too many resources.
3. **Environment Separation**: Namespaces can represent different environments (e.g., development, testing, production), making it easier to manage configurations and resources specific to each environment.
4. **Access Control**: Role-Based Access Control (RBAC) can be applied at the namespace level, allowing you to control who can access and modify resources within a namespace.



Note:

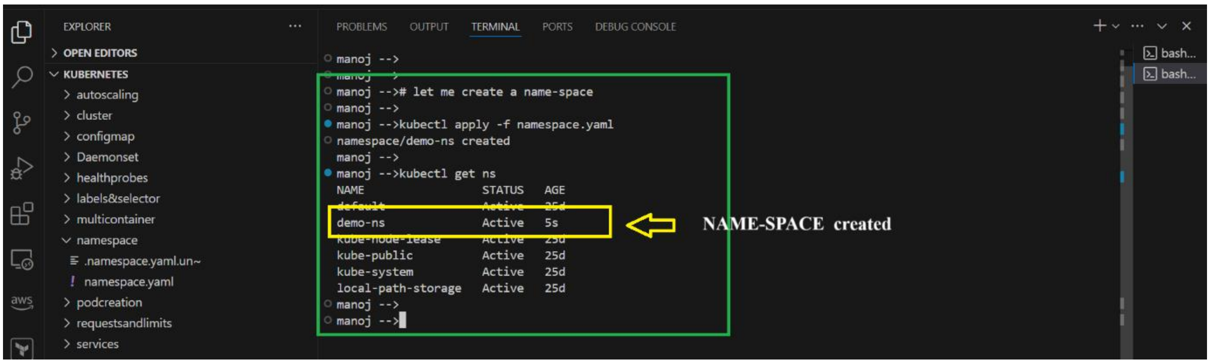
- Pod needs to communicate with in same namespace it can easily interact using “host-name”
- Pod needs to communicate with pod present in different namespace (eg. Dev, QA), we need to use “fully qualified domain name” [FQDA].



Kubectl apply -f namespace.yaml (or) kubectl create namespace <namespace-name>

Kubectl get ns

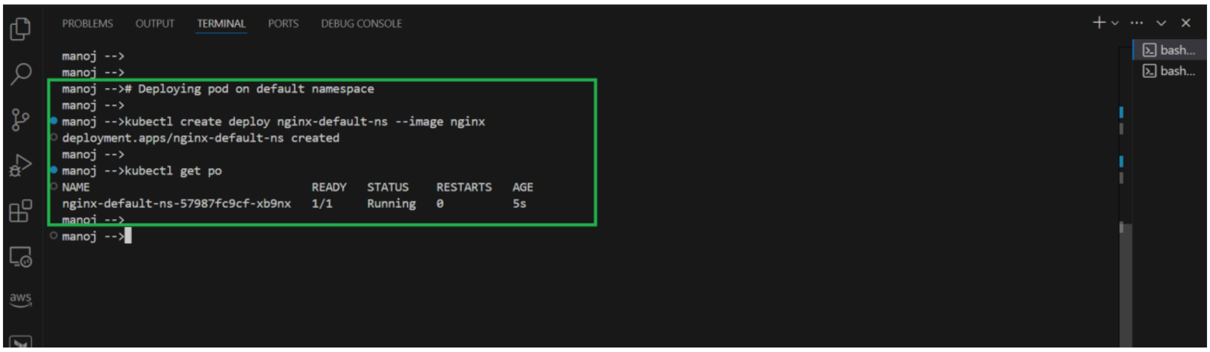
KUBERNETES NAMESPACE

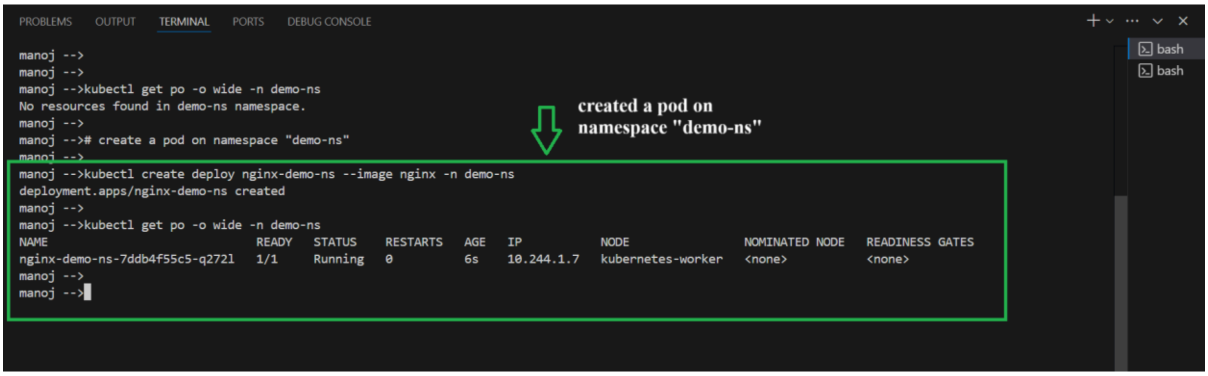


Now I want to create a pod inside namespace

Kubectl create deploy <name of pod> --image <image-name> -n < namespace>

Kubectl get pod -n <namespace>





KUBERNETES NAMESPACE

Now let me check <demo-namespace> can reach default namespace, using container ip

```
manoj -->
manoj -->kubectl get po -n demo-ns -o wide
NAME                                READY   STATUS    RESTARTS   AGE     IP           NODE                NOMINATED NODE   READINESS GATES
nginx-demo-ns-7ddb4f55c5-q2721   1/1     Running   0          2m24s   10.244.1.7   kubernetes-worker   <none>           <none>
manoj -->
manoj -->kubectl exec -it nginx-demo-ns-7ddb4f55c5-q272l -n demo-ns bash
kubectl exec [POD] [COMMAND] is DEPRECATED and will be removed in a future version. Use kubectl exec [POD] -- [COMMAND] instead.
root@nginx-demo-ns-7ddb4f55c5-q2721:/#
root@nginx-demo-ns-7ddb4f55c5-q2721:/#
root@nginx-demo-ns-7ddb4f55c5-q2721:/# #now let try to reach default name-space from demo-ns
root@nginx-demo-ns-7ddb4f55c5-q2721:/#
root@nginx-demo-ns-7ddb4f55c5-q2721:/# # curl < ip of default namespace pod >
root@nginx-demo-ns-7ddb4f55c5-q2721:/#
root@nginx-demo-ns-7ddb4f55c5-q2721:/# curl 10.244.1.6
<!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>
root@nginx-demo-ns-7ddb4f55c5-q2721:/# # we can reach the default namespace using ip
```

trying to reach to default namespace

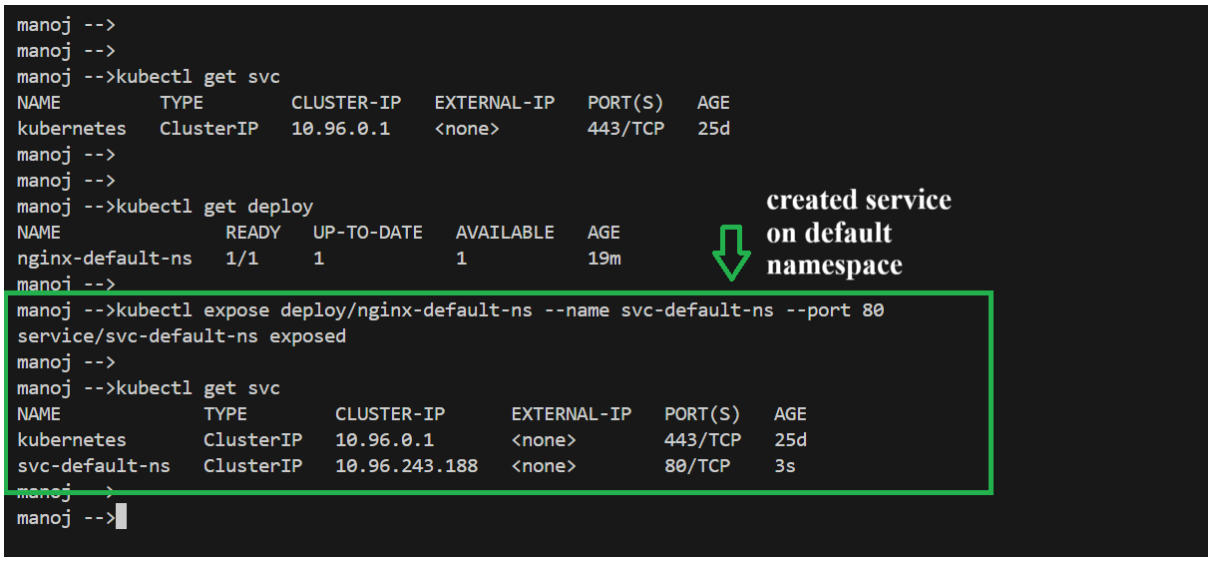
we can reach the default namespace using ip address

```
manoj -->
manoj -->kubectl get po -o wide
NAME                                READY   STATUS    RESTARTS   AGE     IP           NODE                NOMINATED NODE   READINESS GATES
nginx-default-ns-57987fc9cf-xb9nx   1/1     Running   0          9m47s   10.244.1.6   kubernetes-worker   <none>           <none>
manoj -->
manoj -->kubectl exec -it nginx-default-ns-57987fc9cf-xb9nx bash
kubectl exec [POD] [COMMAND] is DEPRECATED and will be removed in a future version. Use kubectl exec [POD] -- [COMMAND] instead.
root@nginx-default-ns-57987fc9cf-xb9nx:/#
root@nginx-default-ns-57987fc9cf-xb9nx:/# # try to reach namespace "demo-ns" from default namespace
root@nginx-default-ns-57987fc9cf-xb9nx:/#
root@nginx-default-ns-57987fc9cf-xb9nx:/# # curl < ip of pod in demo-ns >
root@nginx-default-ns-57987fc9cf-xb9nx:/#
root@nginx-default-ns-57987fc9cf-xb9nx:/# curl 10.244.1.7
<!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>
root@nginx-default-ns-57987fc9cf-xb9nx:/#
root@nginx-default-ns-57987fc9cf-xb9nx:/# #we can reach the demo-ns namespace using ip address
```

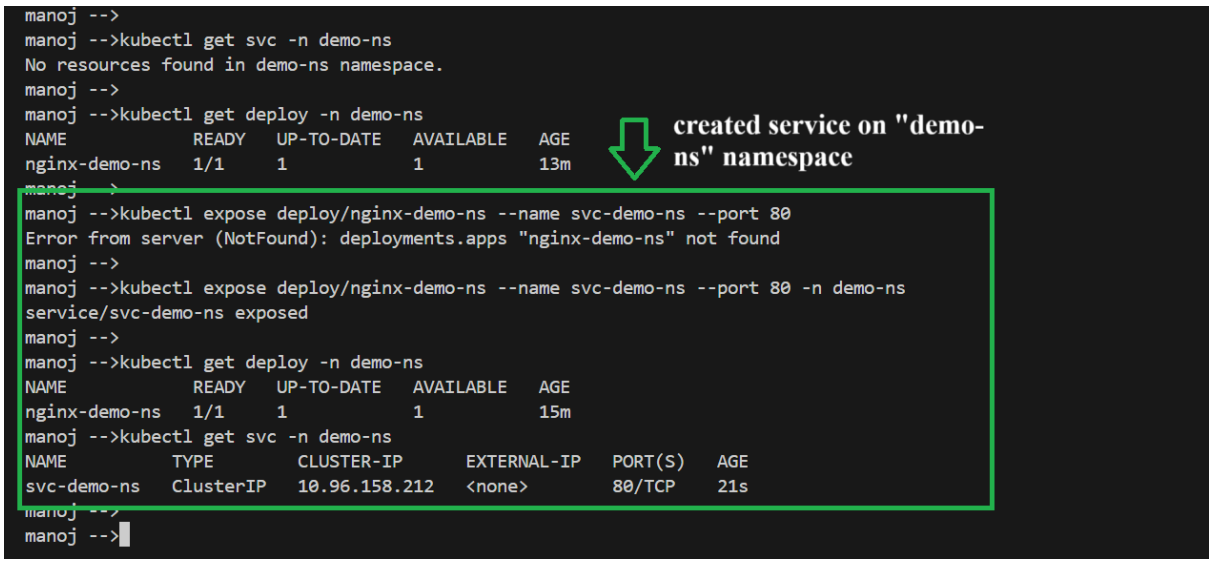
trying to reach "demo-ns" from default namespace using ip address.

KUBERNETES NAMESPACE

Now let me expose “service” in both deployment.




```
manoj -->
manoj -->
manoj -->kubectl get svc
NAME         TYPE        CLUSTER-IP    EXTERNAL-IP   PORT(S)   AGE
kubernetes   ClusterIP   10.96.0.1     <none>        443/TCP   25d
manoj -->
manoj -->
manoj -->kubectl get deploy
NAME              READY   UP-TO-DATE   AVAILABLE   AGE
nginx-default-ns  1/1     1            1           19m
manoj -->
manoj -->kubectl expose deploy/nginx-default-ns --name svc-default-ns --port 80
service/svc-default-ns exposed
manoj -->
manoj -->kubectl get svc
NAME             TYPE        CLUSTER-IP      EXTERNAL-IP   PORT(S)   AGE
kubernetes       ClusterIP   10.96.0.1       <none>        443/TCP   25d
svc-default-ns   ClusterIP   10.96.243.188   <none>        80/TCP    3s
manoj -->
manoj -->
```




```
manoj -->
manoj -->kubectl get svc -n demo-ns
No resources found in demo-ns namespace.
manoj -->
manoj -->kubectl get deploy -n demo-ns
NAME            READY   UP-TO-DATE   AVAILABLE   AGE
nginx-demo-ns   1/1     1            1           13m
manoj -->
manoj -->kubectl expose deploy/nginx-demo-ns --name svc-demo-ns --port 80
Error from server (NotFound): deployments.apps "nginx-demo-ns" not found
manoj -->
manoj -->kubectl expose deploy/nginx-demo-ns --name svc-demo-ns --port 80 -n demo-ns
service/svc-demo-ns exposed
manoj -->
manoj -->kubectl get deploy -n demo-ns
NAME            READY   UP-TO-DATE   AVAILABLE   AGE
nginx-demo-ns   1/1     1            1           15m
manoj -->kubectl get svc -n demo-ns
NAME          TYPE        CLUSTER-IP      EXTERNAL-IP   PORT(S)   AGE
svc-demo-ns   ClusterIP   10.96.158.212   <none>        80/TCP    21s
manoj -->
manoj -->
```

Now let me check can I access service present in default namespace from the “dev/qa namespace”


```
manoj -->
manoj -->kubectl get po -n demo-ns
NAME                              READY   STATUS    RESTARTS   AGE
nginx-demo-ns-7ddb4f55c5-q272l    1/1     Running   0          17m
manoj -->
manoj -->kubectl exec -it nginx-demo-ns-7ddb4f55c5-q272l -n demo-ns bash
kubectl exec [POD] [COMMAND] is DEPRECATED and will be removed in a future version. Use kubectl exec [POD] -- [COMMAND] instead.
root@nginx-demo-ns-7ddb4f55c5-q272l:/#
root@nginx-demo-ns-7ddb4f55c5-q272l:/# # try to reach the service present in default namespace
root@nginx-demo-ns-7ddb4f55c5-q272l:/#
root@nginx-demo-ns-7ddb4f55c5-q272l:/# curl svc-default-ns
curl: (6) Could not resolve host: svc-default-ns
root@nginx-demo-ns-7ddb4f55c5-q272l:/#
root@nginx-demo-ns-7ddb4f55c5-q272l:/# # we can't reach the default service using "host-name"
root@nginx-demo-ns-7ddb4f55c5-q272l:/#
root@nginx-demo-ns-7ddb4f55c5-q272l:/# # to access we need fully qualified domain name [ FQDN ]
root@nginx-demo-ns-7ddb4f55c5-q272l:/#
root@nginx-demo-ns-7ddb4f55c5-q272l:/# curl svc-default-ns.default.svc.cluster.local
<!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>
```

KUBERNETES NAMESPACE

Using “fully qualified domain name” I can access the service present in different namespace.