

```
ahmedkhalid@AhmedKhalid: ~$ kubectl create deployment nginx --image=nginx --replicas=1
deployment.apps/nginx created
ahmedkhalid@AhmedKhalid: ~$
ahmedkhalid@AhmedKhalid: ~$
ahmedkhalid@AhmedKhalid: ~$ kubectl scale deployment nginx --replicas=3
deployment.apps/nginx scaled
ahmedkhalid@AhmedKhalid: ~$
ahmedkhalid@AhmedKhalid: ~$
ahmedkhalid@AhmedKhalid: ~$ kubectl expose deployment nginx --type=ClusterIP --port=80
service/nginx exposed
ahmedkhalid@AhmedKhalid: ~$
ahmedkhalid@AhmedKhalid: ~$
```

```
ahmedkhalid@AhmedKhalid: ~$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-7854ff8877-5msq7              1/1     Running   0           2m56s
nginx-7854ff8877-rpkhv              1/1     Running   0           2m56s
nginx-7854ff8877-t8s6c              1/1     Running   0           3m1s
ahmedkhalid@AhmedKhalid: ~$
ahmedkhalid@AhmedKhalid: ~$ kubectl describe pod nginx-7854ff8877-5msq7
Name:                               nginx-7854ff8877-5msq7
Namespace:                         default
Priority:                           0
Service Account:                   default
Node:                              ahmedkhalid/172.25.41.176
Start Time:                        Fri, 02 Aug 2024 18:31:18 +0300
Labels:                            app=nginx
                                   pod-template-hash=7854ff8877
Annotations:                        <none>
Status:                             Running
IP:                                10.42.0.24
IPs:                               10.42.0.24
Controlled By:                     ReplicaSet/nginx-7854ff8877
Containers:
  nginx:
    Container ID:   containerd://4052087365ac9d5800ef8005e5d27a7c70d82d6ca972177513c1d48da670e10a
    Image:          nginx
    Image ID:       docker.io/library/nginx@sha256:6af79ae5de407283dcea8b00d5c37ace95441fd58a8b1d2aa1ed93f5511bb18c
    Port:           <none>
    Host Port:      <none>
    State:          Running
      Started:      Fri, 02 Aug 2024 18:31:21 +0300
      Ready:        True
      Restart Count: 0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-c5dzt (ro)
Conditions:
  Type              Status
  PodReadyToStartContainers  True
  Initialized         True
```

```
ahmedkhalid@AhmedKhalid: ~$ kubectl exec -it $(kubectl get pod -l app=nginx -o jsonpath='{.items[0].metadata.name}') -c nginx --
/var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-c5dzt (ro)
Conditions:
  Type              Status
  PodReadyToStartContainers  True
  Initialized        True
  Ready              True
  ContainersReady     True
  PodScheduled       True
Volumes:
  kube-api-access-c5dzt:
    Type:              Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds: 3607
    ConfigMapName:      kube-root-ca.crt
    ConfigMapOptional:  <nil>
    DownwardAPI:        true
QoS Class:           BestEffort
Node-Selectors:      <none>
Tolerations:         node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                     node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:
  Type       Reason      Age   From          Message
  ----       -
  Normal    Scheduled   3m11s default-scheduler Successfully assigned default/nginx-7854ff8877-5msq7 to ahmedkhalid
  Normal    Pulling     3m11s kubelet        Pulling image "nginx"
  Normal    Pulled      3m9s  kubelet        Successfully pulled image "nginx" in 1.973s (1.973s including waiting)
  Normal    Created     3m9s  kubelet        Created container nginx
  Normal    Started     3m9s  kubelet        Started container nginx
ahmedkhalid@AhmedKhalid:~$
ahmedkhalid@AhmedKhalid:~$
ahmedkhalid@AhmedKhalid:~$ curl 172.25.41.176:80
404 page not found
ahmedkhalid@AhmedKhalid:~$ curl 10.42.0.24:80
<!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/">http://nginx.org/</a>.<br/>
Commercial support is available at
<a href="http://nginx.com/">http://nginx.com/</a>.</p>

<p><em>Thank you for using nginx.</em></p>
</body>
</html>
ahmedkhalid@AhmedKhalid:~$
ahmedkhalid@AhmedKhalid:~$
ahmedkhalid@AhmedKhalid:~$ kubectl describe svc nginx
Name:         nginx
Namespace:    default
Labels:       app=nginx
Annotations:  <none>
Selector:     app=nginx
Type:         ClusterIP
IP Family Policy: SingleStack
IP Families:  IPv4
IP:           10.43.239.196
IPs:          10.43.239.196
Port:         <unset> 80/TCP
```

```
ahmedkhalid@AhmedKhalid: ~$ kubectl exec -it $(kubectl get pod -l app=nginx -o jsonpath='{.items[0].metadata.name}') -c nginx --
ahmedkhalid@AhmedKhalid:~$ curl 172.25.41.176:80
404 page not found
ahmedkhalid@AhmedKhalid:~$ curl 10.42.0.24:80
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Namespace: default
Labels: app=nginx
Annotations: <none>
Selector: app=nginx
Type: ClusterIP
IP Family Policy: SingleStack
IP Families: IPv4
IP: 10.43.239.196
IPs: 10.43.239.196
Port: <unset> 80/TCP
TargetPort: 80/TCP
Endpoints: 10.42.0.22:80,10.42.0.23:80,10.42.0.24:80
Session Affinity: None
Events: <none>
ahmedkhalid@AhmedKhalid:~$
ahmedkhalid@AhmedKhalid:~$
ahmedkhalid@AhmedKhalid:~$ curl 10.43.239.196:80
<!DOCTYPE html>
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```

```
ahmedkhalid@AhmedKhalid:~$
ahmedkhalid@AhmedKhalid:~$ kubectl delete pods -l app=nginx
pod "nginx-7854ff8877-5msq7" deleted
pod "nginx-7854ff8877-rpkhv" deleted
pod "nginx-7854ff8877-t8s6c" deleted
ahmedkhalid@AhmedKhalid:~$
ahmedkhalid@AhmedKhalid:~$ kubectl get deployments
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
nginx     3/3     3             3           71m
ahmedkhalid@AhmedKhalid:~$
ahmedkhalid@AhmedKhalid:~$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-7854ff8877-fbp88              1/1     Running   0           48s
nginx-7854ff8877-hmb7g              1/1     Running   0           48s
nginx-7854ff8877-v972g              1/1     Running   0           48s
ahmedkhalid@AhmedKhalid:~$
ahmedkhalid@AhmedKhalid:~$
ahmedkhalid@AhmedKhalid:~$ kubectl exec -it nginx-7854ff8877-fbp88 -- /bin/sh
# ps aux
/bin/sh: 1: ps: not found
# apt install ps
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
E: Unable to locate package ps
# apt-get update
Get:1 http://deb.debian.org/debian bookworm InRelease [151 kB]
Get:2 http://deb.debian.org/debian bookworm-updates InRelease [55.4 kB]
Get:3 http://deb.debian.org/debian-security bookworm-security InRelease [48.0 kB]
Get:4 http://deb.debian.org/debian bookworm/main amd64 Packages [8788 kB]
Get:5 http://deb.debian.org/debian bookworm-updates/main amd64 Packages [13.8 kB]
Get:6 http://deb.debian.org/debian-security bookworm-security/main amd64 Packages [169 kB]
Fetched 9225 kB in 8s (1162 kB/s)
Reading package lists... Done
#
# apt install ps
```

```
ahmedkhalid@AhmedKhalid: ~  
# apt-get install procps  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following additional packages will be installed:  
  libbgpm2 libncursesw6 libproc2-0 psmisc  
Suggested packages:  
  gpm  
The following NEW packages will be installed:  
  libbgpm2 libncursesw6 libproc2-0 procps psmisc  
0 upgraded, 5 newly installed, 0 to remove and 0 not upgraded.  
Need to get 1178 kB of archives.  
After this operation, 3778 kB of additional disk space will be used.  
Do you want to continue? [Y/n] y  
Get:1 http://deb.debian.org/debian bookworm/main amd64 libncursesw6 amd64 6.4-4 [134 kB]  
Get:2 http://deb.debian.org/debian bookworm/main amd64 libproc2-0 amd64 2:4.0.2-3 [62.8 kB]  
Get:3 http://deb.debian.org/debian bookworm/main amd64 procps amd64 2:4.0.2-3 [709 kB]  
Get:4 http://deb.debian.org/debian bookworm/main amd64 libbgpm2 amd64 1.20.7-10+b1 [14.2 kB]  
Get:5 http://deb.debian.org/debian bookworm/main amd64 psmisc amd64 23.6-1 [259 kB]  
Fetched 1178 kB in 2s (604 kB/s)  
debconf: delaying package configuration, since apt-utils is not installed  
Selecting previously unselected package libncursesw6:amd64.  
(Reading database ... 7581 files and directories currently installed.)  
Preparing to unpack .../libncursesw6_6.4-4_amd64.deb ...  
Unpacking libncursesw6:amd64 (6.4-4) ...  
Selecting previously unselected package libproc2-0:amd64.  
Preparing to unpack .../libproc2-0_2:4.0.2-3_amd64.deb ...  
Unpacking libproc2-0:amd64 (2:4.0.2-3) ...  
Selecting previously unselected package procps.  
Preparing to unpack .../procps_2:4.0.2-3_amd64.deb ...  
Unpacking procps (2:4.0.2-3) ...  
Selecting previously unselected package libbgpm2:amd64.  
Preparing to unpack .../libbgpm2_1.20.7-10+b1_amd64.deb ...  
Unpacking libbgpm2:amd64 (1.20.7-10+b1) ...  
Selecting previously unselected package psmisc.  
Preparing to unpack .../psmisc_23.6-1_amd64.deb ...  
Unpacking psmisc (23.6-1) ...  
Setting up libbgpm2:amd64 (1.20.7-10+b1) ...  
Setting up psmisc (23.6-1) ...  
Setting up libproc2-0:amd64 (2:4.0.2-3) ...  
Setting up procps (2:4.0.2-3) ...  
Setting up libncursesw6:amd64 (6.4-4) ...  
Processing triggers for libc-bin (2.36-9+deb12u7) ...  
#  
# p  
/bin/sh: 8: p: not found  
#  
#  
# ps aux  
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND  
root         1   0.0  0.0  11404  7724 ?        Ss   16:42   0:00 nginx: master process nginx -g daemon off;  
nginx    29   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    30   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    31   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    32   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    33   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    34   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    35   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    36   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    37   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    38   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    39   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    40   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
root     41   0.0  0.0   2576   928 pts/0    Ss   16:44   0:00 /bin/sh  
root    238   0.0  0.0   8112  4088 pts/0    R+   16:46   0:00 ps aux  
#  
#  
# kill 1  
# command terminated with exit code 137  
ahmedkhalid@AhmedKhalid:~$  
ahmedkhalid@AhmedKhalid:~$  
ahmedkhalid@AhmedKhalid:~$ kubectl get pods  
NAME                                READY   STATUS    RESTARTS   AGE   AGE  
nginx-7854ff8877-fbp88             1/1     Running   1 (12s ago)  5m7s  
nginx-7854ff8877-hmb7g             1/1     Running   0           5m7s  
nginx-7854ff8877-v972g             1/1     Running   0           5m7s  
ahmedkhalid@AhmedKhalid:~$ |
```

```
ahmedkhalid@AhmedKhalid: ~  
Setting up psmisc (23.6-1) ...  
Setting up libproc2-0:amd64 (2:4.0.2-3) ...  
Setting up libncursesw6:amd64 (6.4-4) ...  
Setting up procps (2:4.0.2-3) ...  
Processing triggers for libc-bin (2.36-9+deb12u7) ...  
#  
# p  
/bin/sh: 8: p: not found  
#  
#  
# ps aux  
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND  
root         1   0.0  0.0  11404  7724 ?        Ss   16:42   0:00 nginx: master process nginx -g daemon off;  
nginx    29   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    30   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    31   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    32   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
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nginx    35   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    36   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    37   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    38   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    39   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
nginx    40   0.0  0.0  11868  2848 ?        Ss   16:42   0:00 nginx: worker process  
root     41   0.0  0.0   2576   928 pts/0    Ss   16:44   0:00 /bin/sh  
root    238   0.0  0.0   8112  4088 pts/0    R+   16:46   0:00 ps aux  
#  
#  
# kill 1  
# command terminated with exit code 137  
ahmedkhalid@AhmedKhalid:~$  
ahmedkhalid@AhmedKhalid:~$  
ahmedkhalid@AhmedKhalid:~$ kubectl get pods  
NAME                                READY   STATUS    RESTARTS   AGE   AGE  
nginx-7854ff8877-fbp88             1/1     Running   1 (12s ago)  5m7s  
nginx-7854ff8877-hmb7g             1/1     Running   0           5m7s  
nginx-7854ff8877-v972g             1/1     Running   0           5m7s  
ahmedkhalid@AhmedKhalid:~$ |
```