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Lab 4

The screenshot shows the 'Launch an instance' page in the AWS Management Console. The page is divided into several sections: 'Name and tags', 'Application and OS Images (Amazon Machine Image)', and a 'Summary' panel on the right. The 'Name and tags' section has a text input field with 'sujal-lab4'. The 'Application and OS Images' section shows a search bar and a grid of AMIs including Amazon Linux, macOS, Ubuntu, Windows, Red Hat, and SUSE Linux. The 'Summary' panel on the right displays configuration details: 'Number of instances' is 1, 'Software Image (AMI)' is Canonical, Ubuntu, 24.04, amd64...read more, 'Virtual server type (instance type)' is t2.micro, 'Firewall (security group)' is New security group, and 'Storage (volumes)' is 1 volume(s) - 8 GiB. A 'Free tier' notification box is also visible, stating that in the first year, it includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 750 hours of public IPv4 address usage per month, 30 GiB of EBS storage, 2 million I/Os, 1 GiB of snapshots, and 100 GB of bandwidth to the internet. At the bottom of the summary panel are 'Cancel' and 'Launch instance' buttons, along with a 'Preview code' link.

The screenshot shows the 'Instances' page in the AWS Management Console. It features a table with columns: Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, Public IPv4 DNS, Public IPv4..., and Elastic IP. The table contains one instance named 'Experiment-4' with Instance ID 'i-094f7128514b50f1d', which is in the 'Running' state, of type 't2.micro', and is currently 'Initializing'. The table also shows the instance's availability zone as 'us-east-1d', its public IPv4 DNS as 'ec2-54-166-238-27.co...', and its public IPv4 address as '54.166.238.27'. The table has a search bar at the top and a 'Launch instances' button at the bottom right.

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4...	Elastic IP
Experiment-4	i-094f7128514b50f1d	Running	t2.micro	Initializing	View alarms	us-east-1d	ec2-54-166-238-27.co...	54.166.238.27	-

The screenshot shows the 'Instances' page in the AWS Management Console. It features a table with columns: Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, Public IPv4 DNS, Public IPv4..., and Elastic IP. The table contains one instance named 'sujal-lab4' with Instance ID 'i-06fc60ead0b416b7b', which is in the 'Running' state, of type 't2.micro', and is currently 'Initializing'. The table also shows the instance's availability zone as 'us-east-1d', its public IPv4 DNS as 'ec2-54-166-238-27.co...', and its public IPv4 address as '54.166.238.27'. The table has a search bar at the top and a 'Launch instances' button at the bottom right.

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4...	Elastic IP
sujal-lab4	i-06fc60ead0b416b7b	Running	t2.micro	Initializing	View alarms	us-east-1d	ec2-54-166-238-27.co...	54.166.238.27	-

```
Get:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]
Get:9 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [378 kB]
Get:10 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [82.0 kB]
Get:11 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [4528 B]
Get:12 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Components [3871 kB]
Get:13 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [271 kB]
Get:14 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [115 kB]
Get:15 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [8632 B]
Get:16 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [10.1 kB]
Get:17 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [353 kB]
Get:18 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [68.1 kB]
Get:19 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 c-n-f Metadata [428 B]
Get:20 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [10.9 kB]
Get:21 http://security.ubuntu.com/ubuntu noble-security/multiverse Translation-en [2808 B]
Get:22 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [208 B]
Get:23 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 c-n-f Metadata [344 B]
Get:24 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 c-n-f Metadata [301 kB]
Get:25 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [269 kB]
Get:26 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse Translation-en [118 kB]
Get:27 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Components [35.0 kB]
Get:28 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 c-n-f Metadata [8328 B]
Get:29 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [531 kB]
Get:30 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [129 kB]
Get:31 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 c-n-f Metadata [8600 B]
Get:32 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [374 kB]
Get:33 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [154 kB]
Get:34 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [45.0 kB]
Get:35 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [14.6
kB]
Get:36 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [353 kB]
Get:37 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [68.1 kB]
Get:38 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 c-n-f Metadata [42
4 B]
Get:39 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [14.4 kB]
Get:40 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse Translation-en [3608 B]
Get:41 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [212 B]
Get:42 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 c-n-f Metadata [53
2 B]
Get:43 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [208 B]
Get:44 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 c-n-f Metadata [112 B]
Get:45 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Packages [10.6 kB]
Get:46 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe Translation-en [10.8 kB]
Get:47 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [17.6 k
B]
Get:48 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 c-n-f Metadata [11
04 B]
Get:49 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [216
B]
Get:50 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 c-n-f Metadata [
116 B]
Get:51 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212
B]
Get:52 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 c-n-f Metadata [
116 B]
Fetched 29.1 MB in 4s (7907 kB/s)
Reading package lists... Done
root@ip-172-31-82-74: /home/ubuntu# |
```

```

root@ip-172-31-82-74: /home/ubuntu
Preparing to unpack .../1-containerd.io_1.7.22-1_amd64.deb ...
Unpacking containerd.io (1.7.22-1) ...
Selecting previously unselected package docker-buildx-plugin.
Preparing to unpack .../2-docker-buildx-plugin_0.17.1-1~ubuntu.24.04~noble_amd64.deb ...
Unpacking docker-buildx-plugin (0.17.1-1~ubuntu.24.04~noble) ...
Selecting previously unselected package docker-ce-cli.
Preparing to unpack .../3-docker-ce-cli_5%3a27.3.1-1~ubuntu.24.04~noble_amd64.deb ...
Unpacking docker-ce-cli (5:27.3.1-1~ubuntu.24.04~noble) ...
Selecting previously unselected package docker-ce.
Preparing to unpack .../4-docker-ce_5%3a27.3.1-1~ubuntu.24.04~noble_amd64.deb ...
Unpacking docker-ce (5:27.3.1-1~ubuntu.24.04~noble) ...
Selecting previously unselected package docker-ce-rootless-extras.
Preparing to unpack .../5-docker-ce-rootless-extras_5%3a27.3.1-1~ubuntu.24.04~noble_amd64.deb ...
Unpacking docker-ce-rootless-extras (5:27.3.1-1~ubuntu.24.04~noble) ...
Selecting previously unselected package docker-compose-plugin.
Preparing to unpack .../6-docker-compose-plugin_2.29.7-1~ubuntu.24.04~noble_amd64.deb ...
Unpacking docker-compose-plugin (2.29.7-1~ubuntu.24.04~noble) ...
Selecting previously unselected package libltdl7:amd64.
Preparing to unpack .../7-libltdl7_2.4.7-7build1_amd64.deb ...
Unpacking libltdl7:amd64 (2.4.7-7build1) ...
Selecting previously unselected package libslirp0:amd64.
Preparing to unpack .../8-libslirp0_4.7.0-1ubuntu3_amd64.deb ...
Unpacking libslirp0:amd64 (4.7.0-1ubuntu3) ...
Selecting previously unselected package slirp4netns.
Preparing to unpack .../9-slirp4netns_1.2.1-1build2_amd64.deb ...
Unpacking slirp4netns (1.2.1-1build2) ...
Setting up docker-buildx-plugin (0.17.1-1~ubuntu.24.04~noble) ...
Setting up containerd.io (1.7.22-1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/containerd.service → /usr/lib/systemd/system/containerd.service.
Setting up docker-compose-plugin (2.29.7-1~ubuntu.24.04~noble) ...
Setting up libltdl7:amd64 (2.4.7-7build1) ...
Setting up docker-ce-cli (5:27.3.1-1~ubuntu.24.04~noble) ...
Setting up libslirp0:amd64 (4.7.0-1ubuntu3) ...
Setting up pigz (2.8-1) ...
Setting up docker-ce-rootless-extras (5:27.3.1-1~ubuntu.24.04~noble) ...
Setting up slirp4netns (1.2.1-1build2) ...
Setting up docker-ce (5:27.3.1-1~ubuntu.24.04~noble) ...
Created symlink /etc/systemd/system/multi-user.target.wants/docker.service → /usr/lib/systemd/system/docker.service.
Created symlink /etc/systemd/system/sockets.target.wants/docker.socket → /usr/lib/systemd/system/docker.socket.
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu8.2) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.

```

```

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-82-74:/home/ubuntu# sudo mkdir -p /etc/docker
root@ip-172-31-82-74:/home/ubuntu# cat <<EOF | sudo tee /etc/docker/daemon.json
{
"exec-opts": ["native.cgroupdriver=systemd"]
}
EOF
{
"exec-opts": ["native.cgroupdriver=systemd"]
}
root@ip-172-31-82-74:/home/ubuntu# |

```

```
Executing: /usr/lib/systemd/systemd-sysv-install enable docker
root@ip-172-31-82-74:/home/ubuntu# sudo systemctl daemon-reload
root@ip-172-31-82-74:/home/ubuntu# sudo systemctl restart docker
root@ip-172-31-82-74:/home/ubuntu# |
```

```
root@ip-172-31-82-74:/home/ubuntu# curl -fsSL https://pkgs.k8s.io/core:/stable:/v1.31/deb/Release.key |
sudo gpg --dearmor -o /etc/apt/keyrings/kubernetes-apt-keyring.gpg
root@ip-172-31-82-74:/home/ubuntu# |
```

```
root@ip-172-31-82-74:/home/ubuntu
"exec-opts": ["native.cgroupdriver=systemd"]
}
root@ip-172-31-82-74:/home/ubuntu# sudo systemctl enable docker
Synchronizing state of docker.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable docker
root@ip-172-31-82-74:/home/ubuntu# sudo systemctl daemon-reload
root@ip-172-31-82-74:/home/ubuntu# sudo systemctl restart docker
root@ip-172-31-82-74:/home/ubuntu# curl -fsSL https://pkgs.k8s.io/core:/stable:/v1.31/deb/Release.key |
sudo gpg --dearmor -o
/etc/apt/keyrings/kubernetes-apt-keyring.gpg
gpg: missing argument for option "-o"
bash: /etc/apt/keyrings/kubernetes-apt-keyring.gpg: No such file or directory
root@ip-172-31-82-74:/home/ubuntu# ^C
root@ip-172-31-82-74:/home/ubuntu# curl -fsSL https://pkgs.k8s.io/core:/stable:/v1.31/deb/Release.key |
sudo gpg --dearmor -o /etc/apt/keyrings/kubernetes-apt-keyring.gpg
root@ip-172-31-82-74:/home/ubuntu# echo 'deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg]
https://pkgs.k8s.io/core:/stable:/v1.31/deb/ /' | sudo tee /etc/apt/sources.list.d/kubernetes.list
deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg]
https://pkgs.k8s.io/core:/stable:/v1.31/deb/ /
root@ip-172-31-82-74:/home/ubuntu# sudo apt-get update
E: Malformed entry 1 in list file /etc/apt/sources.list.d/kubernetes.list (URI)
E: The list of sources could not be read.
root@ip-172-31-82-74:/home/ubuntu# ^C
root@ip-172-31-82-74:/home/ubuntu# deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg] https://
/pkgs.k8s.io/core:/stable:/v1.31/deb/ /
Command 'deb' not found, did you mean:
  command 'den' from snap den (1.2.0-0)
  command 'dub' from snap dub (1.19.0)
  command 'dab' from deb bsdgames (2.17-30)
  command 'dub' from deb dub (1.34.0-1)
  command 'edb' from deb edb-debugger (1.3.0-2.1)
  command 'debi' from deb devscripts (2.23.7)
  command 'debc' from deb devscripts (2.23.7)
  command 'dex' from deb dex (0.9.0-2)
  command 'deb3' from deb quilt (0.67+really0.67-4)
  command 'dcb' from deb iproute2 (6.1.0-1ubuntu2)
  command 'derb' from deb icu-devtools (74.2-1ubuntu3.1)
See 'snap info <snapname>' for additional versions.
root@ip-172-31-82-74:/home/ubuntu# sudo nano /etc/apt/sources.list.d/kubernetes.list
root@ip-172-31-82-74:/home/ubuntu# sudo apt-get update
E: Malformed entry 1 in list file /etc/apt/sources.list.d/kubernetes.list (URI)
E: The list of sources could not be read.
root@ip-172-31-82-74:/home/ubuntu# sudo nano /etc/apt/sources.list.d/kubernetes.list
root@ip-172-31-82-74:/home/ubuntu# sudo apt-get update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:4 https://download.docker.com/linux/ubuntu noble InRelease
Hit:6 http://security.ubuntu.com/ubuntu noble-security InRelease
Get:5 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.31/deb InRelease
[1186 B]
Get:7 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.31/deb Packages
[4865 B]
Fetched 6051 B in 1s (11.5 kB/s)
Reading package lists... Done
root@ip-172-31-82-74:/home/ubuntu# |
```



```
The following NEW packages will be installed:
  conntrack cri-tools kubeadm kubectl kubelet kubernetescni
0 upgraded, 6 newly installed, 0 to remove and 142 not upgraded.
Need to get 87.4 MB of archives.
After this operation, 314 MB of additional disk space will be used.
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 conntrack amd64 1:1.4.8-1ubuntu1
[37.9 kB]
Get:2 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.31/deb cri-tools
1.31.1-1.1 [15.7 MB]
Get:3 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.31/deb kubeadm 1
.31.1-1.1 [11.4 MB]
Get:4 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.31/deb kubectl 1
.31.1-1.1 [11.2 MB]
Get:5 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.31/deb kubernetescni 1.5.1-1.1 [33.9 MB]
Get:6 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.31/deb kubelet 1
.31.1-1.1 [15.2 MB]
Fetched 87.4 MB in 1s (85.4 MB/s)
Selecting previously unselected package conntrack.
(Reading database ... 68007 files and directories currently installed.)
Preparing to unpack .../0-conntrack_1%3a1.4.8-1ubuntu1_amd64.deb ...
Unpacking conntrack (1:1.4.8-1ubuntu1) ...
Selecting previously unselected package cri-tools.
Preparing to unpack .../1-cri-tools_1.31.1-1.1_amd64.deb ...
Unpacking cri-tools (1.31.1-1.1) ...
Selecting previously unselected package kubeadm.
Preparing to unpack .../2-kubeadm_1.31.1-1.1_amd64.deb ...
Unpacking kubeadm (1.31.1-1.1) ...
Selecting previously unselected package kubectl.
Preparing to unpack .../3-kubectl_1.31.1-1.1_amd64.deb ...
Unpacking kubectl (1.31.1-1.1) ...
Selecting previously unselected package kubernetescni.
Preparing to unpack .../4-kubernetescni_1.5.1-1.1_amd64.deb ...
Unpacking kubernetescni (1.5.1-1.1) ...
Selecting previously unselected package kubelet.
Preparing to unpack .../5-kubelet_1.31.1-1.1_amd64.deb ...
Unpacking kubelet (1.31.1-1.1) ...
Setting up conntrack (1:1.4.8-1ubuntu1) ...
Setting up kubectl (1.31.1-1.1) ...
Setting up cri-tools (1.31.1-1.1) ...
Setting up kubernetescni (1.5.1-1.1) ...
Setting up kubeadm (1.31.1-1.1) ...
Setting up kubelet (1.31.1-1.1) ...
Processing triggers for man-db (2.12.0-4build2) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-82-74: /home/ubuntu#
```

```

root@ip-172-31-82-74:/home/ubuntu# sudo apt-mark hold kubelet kubeadm kubectl
kubelet set on hold.
kubeadm set on hold.
kubectl set on hold.
root@ip-172-31-82-74:/home/ubuntu# sudo systemctl enable --now kubelet
root@ip-172-31-82-74:/home/ubuntu# sudo kubeadm init --pod-network-cidr=10.244.0.0/16
[init] Using Kubernetes version: v1.31.0
[preflight] Running pre-flight checks
W0926 08:45:24.774275 4285 checks.go:1080] [preflight] WARNING: Couldn't create the interface used for
or talking to the container runtime: failed to create new CRI runtime service: validate service connect
ion: validate CRI v1 runtime API for endpoint "unix:///var/run/containerd/containerd.sock": rpc error:
code = Unimplemented desc = unknown service runtime.v1.RuntimeService
[WARNING FileExisting-socat]: socat not found in system path
[preflight] Pulling images required for setting up a Kubernetes cluster
[preflight] This might take a minute or two, depending on the speed of your internet connection
[preflight] You can also perform this action beforehand using 'kubeadm config images pull'
error execution phase preflight: [preflight] Some fatal errors occurred:
failed to create new CRI runtime service: validate service connection: validate CRI v1 runtime API for
endpoint "unix:///var/run/containerd/containerd.sock": rpc error: code = Unimplemented desc = unknown s
ervice runtime.v1.RuntimeService[preflight] If you know what you are doing, you can make a check non-fa
tal with '--ignore-preflight-errors=...'
To see the stack trace of this error execute with --v=5 or higher
root@ip-172-31-82-74:/home/ubuntu#

```

```

root@ip-172-31-82-74:/home/ubuntu# sudo apt-get install -y containerd
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  docker-buildx-plugin docker-ce-cli docker-ce-rootless-extras docker-compose-plugin libltdl7
  libsllp0 pigz slirp4netns
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  runc
The following packages will be REMOVED:
  containerd.io docker-ce
The following NEW packages will be installed:
  containerd runc
0 upgraded, 2 newly installed, 2 to remove and 142 not upgraded.
Need to get 47.2 MB of archives.
After this operation, 53.1 MB disk space will be freed.
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 runc amd64 1.1.12-0ubuntu
3.1 [8599 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 containerd amd64 1.7.12-0
ubuntu4.1 [38.6 MB]
Fetched 47.2 MB in 1s (78.9 MB/s)
(Reading database ... 68064 files and directories currently installed.)
Removing docker-ce (5:27.3.1-1~ubuntu.24.04~noble) ...
Removing containerd.io (1.7.22-1) ...
Selecting previously unselected package runc.
(Reading database ... 68044 files and directories currently installed.)
Preparing to unpack .../runc_1.1.12-0ubuntu3.1_amd64.deb ...
Unpacking runc (1.1.12-0ubuntu3.1) ...
Selecting previously unselected package containerd.
Preparing to unpack .../containerd_1.7.12-0ubuntu4.1_amd64.deb ...
Unpacking containerd (1.7.12-0ubuntu4.1) ...
Setting up runc (1.1.12-0ubuntu3.1) ...
Setting up containerd (1.7.12-0ubuntu4.1) ...
Processing triggers for man-db (2.12.0-4build2) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-82-74:/home/ubuntu#

```

```
root@ip-172-31-82-74:/home/ubuntu# sudo mkdir -p /etc/containerd
sudo containerd config default | sudo tee /etc/containerd/config.toml
disabled_plugins = []
imports = []
oom_score = 0
plugin_dir = ""
required_plugins = []
root = "/var/lib/containerd"
state = "/run/containerd"
temp = ""
version = 2

[cgroup]
  path = ""

[debug]
  address = ""
  format = ""
  gid = 0
  level = ""
  uid = 0

[grpc]
  address = "/run/containerd/containerd.sock"
  gid = 0
  max_recv_message_size = 16777216
  max_send_message_size = 16777216
  tcp_address = ""
  tcp_tls_ca = ""
  tcp_tls_cert = ""
  tcp_tls_key = ""
  uid = 0

[metrics]
  address = ""
  grpc_histogram = false

[plugins]

[plugins."io.containerd.gc.v1.scheduler"]
  deletion_threshold = 0
  mutation_threshold = 100
  pause_threshold = 0.02
  schedule_delay = "0s"
  startup_delay = "100ms"

[plugins."io.containerd.grpc.v1.cri"]
  cdi_spec_dirs = ["/etc/cdi", "/var/run/cdi"]
  device_ownership_from_security_context = false
  disable_apparmor = false
  disable_cgroup = false
  disable_hugetlb_controller = true
  disable_proc_mount = false
  disable_tcp_service = true
  drain_exec_sync_io_timeout = "0s"
```

...

```

root@ip-172-31-82-74:/home/ubuntu# sudo systemctl restart containerd
sudo systemctl enable containerd
root@ip-172-31-82-74:/home/ubuntu# sudo systemctl status containerd
● containerd.service - containerd container runtime
   Loaded: loaded (/usr/lib/systemd/system/containerd.service; enabled; preset: enabled)
   Active: active (running) since Thu 2024-09-26 08:47:02 UTC; 18s ago
     Docs: https://containerd.io
   Main PID: 4682 (containerd)
      Tasks: 7
     Memory: 13.8M (peak: 14.3M)
        CPU: 111ms
    CGroup: /system.slice/containerd.service
            └─4682 /usr/bin/containerd

Sep 26 08:47:02 ip-172-31-82-74 containerd[4682]: time="2024-09-26T08:47:02.292205693Z" level=info msg>
Sep 26 08:47:02 ip-172-31-82-74 containerd[4682]: time="2024-09-26T08:47:02.292247111Z" level=info msg>
Sep 26 08:47:02 ip-172-31-82-74 containerd[4682]: time="2024-09-26T08:47:02.292297409Z" level=info msg>
Sep 26 08:47:02 ip-172-31-82-74 containerd[4682]: time="2024-09-26T08:47:02.292314172Z" level=info msg>
Sep 26 08:47:02 ip-172-31-82-74 containerd[4682]: time="2024-09-26T08:47:02.292322854Z" level=info msg>
Sep 26 08:47:02 ip-172-31-82-74 containerd[4682]: time="2024-09-26T08:47:02.292329036Z" level=info msg>
Sep 26 08:47:02 ip-172-31-82-74 containerd[4682]: time="2024-09-26T08:47:02.292225859Z" level=info msg>
Sep 26 08:47:02 ip-172-31-82-74 containerd[4682]: time="2024-09-26T08:47:02.292401004Z" level=info msg>
Sep 26 08:47:02 ip-172-31-82-74 systemd[1]: Started containerd.service - containerd container runtime.
lines 1-21/21 (END)

```

```

root@ip-172-31-82-74:/home/ubuntu# sudo apt-get install -y socat
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  docker-buildx-plugin docker-ce-cli docker-ce-rootless-extras docker-compose-plugin libltdl7
  libslirp0 pigz slirp4netns
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  socat
0 upgraded, 1 newly installed, 0 to remove and 142 not upgraded.
Need to get 374 kB of archives.
After this operation, 1649 kB of additional disk space will be used.
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 socat amd64 1.8.0.0-4build3 [374
kB]
Fetched 374 kB in 0s (16.8 MB/s)
Selecting previously unselected package socat.
(Reading database ... 68108 files and directories currently installed.)
Preparing to unpack .../socat_1.8.0.0-4build3_amd64.deb ...
Unpacking socat (1.8.0.0-4build3) ...
Setting up socat (1.8.0.0-4build3) ...
Processing triggers for man-db (2.12.0-4build2) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-82-74:/home/ubuntu#

```



```

root@ip-172-31-82-74:/home/ubuntu# sudo kubeadm init --pod-network-cidr=10.244.0.0/16
[init] Using Kubernetes version: v1.31.0
[preflight] Running pre-flight checks
[preflight] Pulling images required for setting up a Kubernetes cluster
[preflight] This might take a minute or two, depending on the speed of your internet connection
[preflight] You can also perform this action beforehand using 'kubeadm config images pull'
W0926 08:48:37.791398 4906 checks.go:846] detected that the sandbox image "registry.k8s.io/pause:3.8"
of the container runtime is inconsistent with that used by kubeadm. It is recommended to use "registry.k8s.io/pause:3.10" as the CRI sandbox image.
[certs] Using certificateDir folder "/etc/kubernetes/pki"
[certs] Generating "ca" certificate and key
[certs] Generating "apiserver" certificate and key
[certs] apiserver serving cert is signed for DNS names [ip-172-31-82-74.kubernetes.kubernetes.default.kubernetes.default.svc.kubernetes.default.svc.cluster.local] and IPs [10.96.0.1 172.31.82.74]
[certs] Generating "apiserver-kubelet-client" certificate and key
[certs] Generating "front-proxy-ca" certificate and key
[certs] Generating "front-proxy-client" certificate and key
[certs] Generating "etcd/ca" certificate and key
[certs] Generating "etcd/server" certificate and key
[certs] etcd/server serving cert is signed for DNS names [ip-172-31-82-74.localhost] and IPs [172.31.82.74 127.0.0.1 ::1]
[certs] Generating "etcd/peer" certificate and key
[certs] etcd/peer serving cert is signed for DNS names [ip-172-31-82-74.localhost] and IPs [172.31.82.74 127.0.0.1 ::1]
[certs] Generating "etcd/healthcheck-client" certificate and key
[certs] Generating "apiserver-etcd-client" certificate and key
[certs] Generating "sa" key and public key
[kubeconfig] Using kubeconfig folder "/etc/kubernetes"
[kubeconfig] Writing "admin.conf" kubeconfig file
[kubeconfig] Writing "super-admin.conf" kubeconfig file
[kubeconfig] Writing "kubelet.conf" kubeconfig file
[kubeconfig] Writing "controller-manager.conf" kubeconfig file
[kubeconfig] Writing "scheduler.conf" kubeconfig file
[etcd] Creating static Pod manifest for local etcd in "/etc/kubernetes/manifests"
[control-plane] Using manifest folder "/etc/kubernetes/manifests"
[control-plane] Creating static Pod manifest for "kube-apiserver"
[control-plane] Creating static Pod manifest for "kube-controller-manager"
[control-plane] Creating static Pod manifest for "kube-scheduler"
[kubelet-start] Writing kubelet environment file with flags to file "/var/lib/kubelet/kubeadm-flags.env"
[kubelet-start] Writing kubelet configuration to file "/var/lib/kubelet/config.yaml"
[kubelet-start] Starting the kubelet

```

```

root@ip-172-31-82-74:/home/ubuntu# mkdir -p $HOME/.kube
root@ip-172-31-82-74:/home/ubuntu# sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
root@ip-172-31-82-74:/home/ubuntu# sudo chown $(id -u):$(id -g) $HOME/.kube/config
root@ip-172-31-82-74:/home/ubuntu# |

```

```

root@ip-172-31-82-74:/home/ubuntu# mkdir -p $HOME/.kube
root@ip-172-31-82-74:/home/ubuntu# sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
root@ip-172-31-82-74:/home/ubuntu# sudo chown $(id -u):$(id -g) $HOME/.kube/config
root@ip-172-31-82-74:/home/ubuntu# kubectl apply -f
https://raw.githubusercontent.com/coreos/flannel/master/Documentation/kube-flannel.yml
error: flag needs an argument: 'f' in -f
See 'kubectl apply --help' for usage.
bash: https://raw.githubusercontent.com/coreos/flannel/master/Documentation/kube-flannel.yml: No such file or directory
root@ip-172-31-82-74:/home/ubuntu# kubectl apply -f https://raw.githubusercontent.com/coreos/flannel/master/Documentation/kube-flannel.yml
namespace/kube-flannel created
clusterrole.rbac.authorization.k8s.io/flannel created
clusterrolebinding.rbac.authorization.k8s.io/flannel created
serviceaccount/flannel created
configmap/kube-flannel-cfg created
daemonset.apps/kube-flannel-ds created
root@ip-172-31-82-74:/home/ubuntu#

```

```
root@ip-172-31-82-74:/home/ubuntu# kubectl apply -f https://k8s.io/examples/application/deployment.yaml
deployment.apps/nginx-deployment created
root@ip-172-31-82-74:/home/ubuntu# |
```

```
root@ip-172-31-82-74:/home/ubuntu# kubectl apply -f https://k8s.io/examples/application/deployment.yaml
deployment.apps/nginx-deployment created
root@ip-172-31-82-74:/home/ubuntu# kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-d556bf558-g4cln    0/1     Pending   0           17s
nginx-deployment-d556bf558-zl9p4    0/1     Pending   0           17s
root@ip-172-31-82-74:/home/ubuntu#
```

```
root@ip-172-31-82-74:/home/ubuntu# kubectl apply -f https://raw.githubusercontent.com/coreos/flannel/master/Documentation/kube-flannel.yml
namespace/kube-flannel created
clusterrole.rbac.authorization.k8s.io/flannel created
clusterrolebinding.rbac.authorization.k8s.io/flannel created
serviceaccount/flannel created
configmap/kube-flannel-cfg created
daemonset.apps/kube-flannel-ds created
root@ip-172-31-82-74:/home/ubuntu# kubectl apply -f https://k8s.io/examples/application/deployment.yaml
deployment.apps/nginx-deployment created
root@ip-172-31-82-74:/home/ubuntu# kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-d556bf558-g4cln    0/1     Pending   0           17s
nginx-deployment-d556bf558-zl9p4    0/1     Pending   0           17s
root@ip-172-31-82-74:/home/ubuntu# POD_NAME=$(kubectl get pods -l app=nginx -o jsonpath="{.items[0].metadata.name}")
root@ip-172-31-82-74:/home/ubuntu# kubectl port-forward $POD_NAME 8080:80
error: unable to forward port because pod is not running. Current status=Pending
root@ip-172-31-82-74:/home/ubuntu# |
```

```
root@ip-172-31-82-74:/home/ubuntu# ^C
root@ip-172-31-82-74:/home/ubuntu# kubectl taint nodes --all node-role.kubernetes.io/control-plane-
node/ip-172-31-82-74 untainted
root@ip-172-31-82-74:/home/ubuntu#
```

```
root@ip-172-31-82-74:/home/ubuntu# kubectl get nodes
NAME                                STATUS    ROLES    AGE     VERSION
ip-172-31-82-74                    Ready     control-plane  5m24s   v1.31.1
root@ip-172-31-82-74:/home/ubuntu# |
```

```
root@ip-172-31-82-74:/home/ubuntu# kubectl get nodes
NAME                                STATUS    ROLES    AGE     VERSION
ip-172-31-82-74                    Ready     control-plane  5m24s   v1.31.1
root@ip-172-31-82-74:/home/ubuntu# kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-d556bf558-g4cln    1/1     Running   0           3m27s
nginx-deployment-d556bf558-zl9p4    1/1     Running   0           3m27s
root@ip-172-31-82-74:/home/ubuntu# POD_NAME=$(kubectl get pods -l app=nginx -o jsonpath="{.items[0].metadata.name}")
root@ip-172-31-82-74:/home/ubuntu# kubectl port-forward $POD_NAME 8080:80
Forwarding from 127.0.0.1:8080 -> 80
Forwarding from [::1]:8080 -> 80
```

```

root@ip-172-31-82-74:/home/ubuntu# kubectl get nodes
NAME                STATUS    ROLES    AGE   VERSION
ip-172-31-82-74     Ready    control-plane   5m24s   v1.31.1
root@ip-172-31-82-74:/home/ubuntu# kubectl get pods
NAME                READY    STATUS    RESTARTS   AGE
nginx-deployment-d556bf558-g4cln  1/1      Running    0           3m27s
nginx-deployment-d556bf558-z19p4  1/1      Running    0           3m27s
root@ip-172-31-82-74:/home/ubuntu# kubectl get pods -l app=nginx -o jsonpath="{.items[0].metadata.name}"
nginx-deployment-d556bf558-g4cln
root@ip-172-31-82-74:/home/ubuntu# kubectl port-forward $POD_NAME 8080:80
Forwarding from 127.0.0.1:8080 -> 80
Forwarding from [::1]:8080 -> 80

```

```

ssh -i "exp4.pem" ubuntu@186.229.32
Welcome to Ubuntu 24.04 LTS (GNU/Linux 6.8.0-1012-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Thu Sep 26 08:56:56 UTC 2024

System load: 0.12      Processes: 156
Usage of /: 55.3% of 6.71GB   Users logged in: 1
Memory usage: 19%      IPv4 address for enx0: 172.31.82.74
Swap usage: 0%

Expanded Security Maintenance for Applications is not enabled.

145 updates can be applied immediately.
41 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

Last login: Thu Sep 26 08:32:50 2024 from 125.99.93.18
ubuntu@ip-172-31-82-74:~$ curl --head http://127.0.0.1:8080
HTTP/1.1 200 OK
Server: nginx/1.14.2
Date: Thu, 26 Sep 2024 08:57:26 GMT
Content-Type: text/html
Content-Length: 612
Last-Modified: Tue, 04 Dec 2018 14:44:49 GMT
Connection: keep-alive
ETag: "5c0692e1-264"
Accept-Ranges: bytes

ubuntu@ip-172-31-82-74:~$

```

```

--discovery-token-ca-cert-hash sha256:5f5bfacdfc2ad85/ae6a666334013d20d43223ab290f1622/574924b
2f836fa
root@ip-172-31-82-74:/home/ubuntu# mkdir -p $HOME/.kube
root@ip-172-31-82-74:/home/ubuntu# cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
root@ip-172-31-82-74:/home/ubuntu# kubectl apply -f https://raw.githubusercontent.com/coreos/flannel/master/Documentation/kube-flannel.yml
error: flag needs an argument: 'f' in -f
See 'kubectl apply --help' for usage.
bash: https://raw.githubusercontent.com/coreos/flannel/master/Documentation/kube-flannel.yml: No such file or directory
root@ip-172-31-82-74:/home/ubuntu# kubectl apply -f https://raw.githubusercontent.com/coreos/flannel/master/Documentation/kube-flannel.yml
namespace/kube-flannel created
clusterrole.rbac.authorization.k8s.io/flannel created
clusterrolebinding.rbac.authorization.k8s.io/flannel created
serviceaccount/flannel created
configmap/kube-flannel-cfg created
daemonset.apps/kube-flannel-ds created
root@ip-172-31-82-74:/home/ubuntu# kubectl apply -f https://k8s.io/examples/application/deployment.yaml
deployment.apps/nginx-deployment created
root@ip-172-31-82-74:/home/ubuntu# kubectl get pods
NAME                READY    STATUS    RESTARTS   AGE
nginx-deployment-d556bf558-g4cln  0/1      Pending   0           17s
nginx-deployment-d556bf558-z19p4  0/1      Pending   0           17s
root@ip-172-31-82-74:/home/ubuntu# kubectl get pods -l app=nginx -o jsonpath="{.items[0].metadata.name}"
nginx-deployment-d556bf558-g4cln
root@ip-172-31-82-74:/home/ubuntu# kubectl port-forward $POD_NAME 8080:80
error: unable to forward port because pod is not running. Current status=Pending
root@ip-172-31-82-74:/home/ubuntu# kubectl taint nodes --all node-role.kubernetes.io/control-plane=
error: at least one taint update is required
root@ip-172-31-82-74:/home/ubuntu# kubectl taint nodes --all node-role.kubernetes.io/control-plane=
error: at least one taint update is required
root@ip-172-31-82-74:/home/ubuntu# kubectl taint nodes --all node-role.kubernetes.io/control-plane=
node/ip-172-31-82-74 tainted
root@ip-172-31-82-74:/home/ubuntu# kubectl get nodes
NAME                STATUS    ROLES    AGE   VERSION
ip-172-31-82-74     Ready    control-plane   5m24s   v1.31.1
root@ip-172-31-82-74:/home/ubuntu# kubectl get pods
NAME                READY    STATUS    RESTARTS   AGE
nginx-deployment-d556bf558-g4cln  1/1      Running    0           3m27s
nginx-deployment-d556bf558-z19p4  1/1      Running    0           3m27s
root@ip-172-31-82-74:/home/ubuntu# kubectl get pods -l app=nginx -o jsonpath="{.items[0].metadata.name}"
nginx-deployment-d556bf558-g4cln
root@ip-172-31-82-74:/home/ubuntu# kubectl port-forward $POD_NAME 8080:80
Forwarding from 127.0.0.1:8080 -> 80
Forwarding from [::1]:8080 -> 80
Handling connection for 8080

```