Sparksoft

Red Hat

OKD on Bare Metal

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Test Automation

DevSecOps Delivery

Data Science

Contact Center Operations

Welcome!

Thank you for being here!

What we're going to cover today

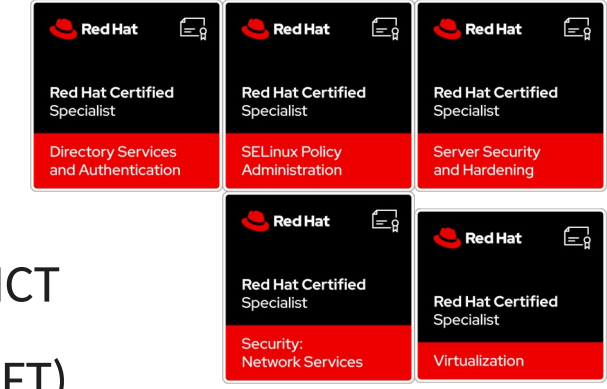
- Introduction
- Credit
- Network
- DHCP
- DNS Settings
- HAProxy
- NFS
- Installing the Cluster
- Post-installation Configuration

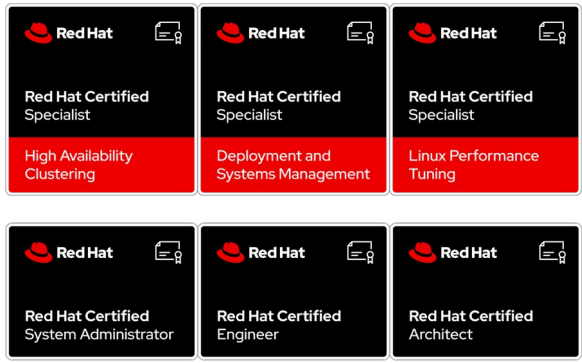
Introduction

Who am I, and why should you care?

Howdy! I'm Thomas

- I've been doing this since 1993
- Started as a Novell CNE
- Went to work for Microsoft, became an MCSE/MCT
- Started using Linux in 1995 (while working at MSFT)
- Worked for Red Hat for about 14 years – RHCA level 5
- Went to AWS for 4 years – Solution Arch Pro, Solution Arch Assoc, Security Specialty, SysOps Associate, AAI
- Been with SparkSoft since July 2023





Howdy! I’m Thomas

- I am NOT an OKD maven. I like OKD, and I am learning OKD, but I’m still muddling my way through this.
- You never, ever stop learning (thank goodness).

Credit

Big ups to Ryan Hay!

Howdy! I'm Thomas

- HUGE credit goes to Ryan Hay https://github.com/ryanhay
- I shamelessly used his video
  - https://www.youtube.com/watch?v=d03xg2PKOPg
- And his instructions
  - https://github.com/ryanhay/ocp4-metal-install
- to prepare this demo.
- I had to update a bunch of stuff for Fedora 39, but the "bones" are definitely from his work.

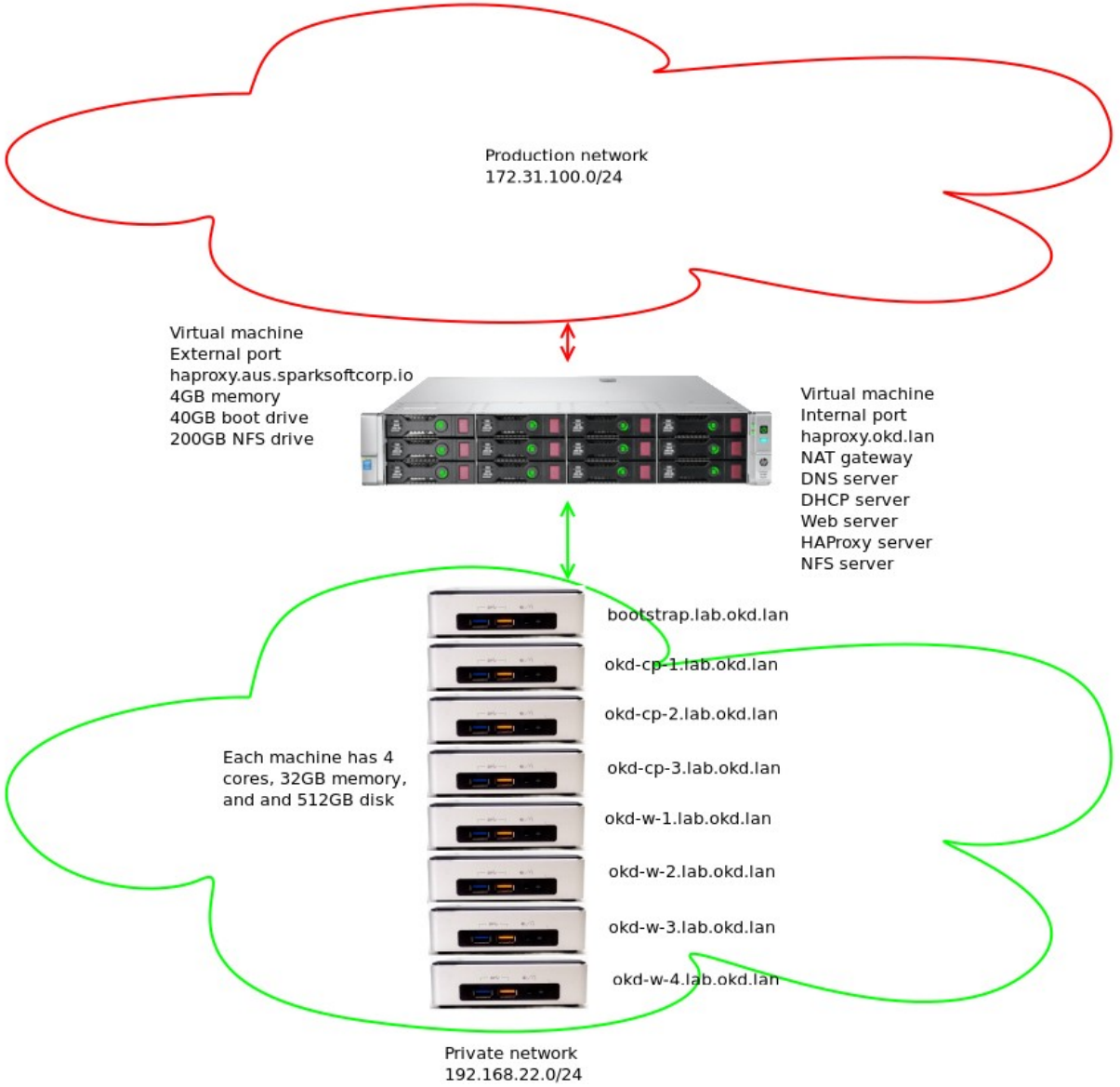
Network

What environment is this installed in?

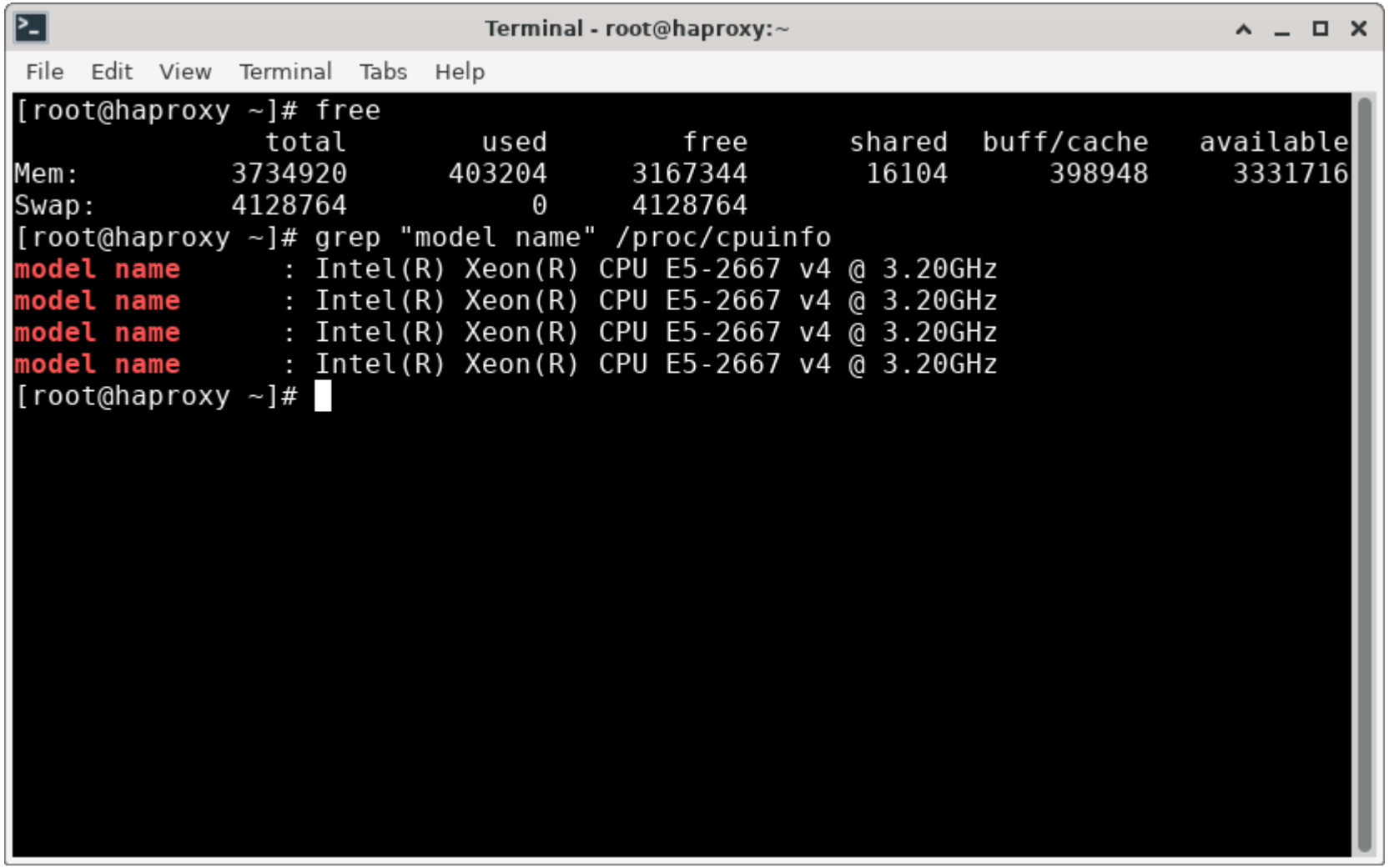
Two networks, 8 physical machines, one VM

- The production network is 172.31.100.0/24
  - DNS
  - DHCP/PXE
- The private network for the OKD cluster is 192.168.22.0/24
  - Need private DNS
  - Need private DHCP
- The connection between the two networks is the HAProxy machine, a VM
  - One interface bridged to the production network
  - One interface bridged to the private network

The Layout


Production network
172.31.100.0/24
Virtual machine
External port
haproxy.aus.sparksoftcorp.io
4GB memory
40GB boot drive
200GB NFS drive
Virtual machine
Internal port
haproxy.okd.lan
NAT gateway
DNS server
DHCP server
Web server
HAProxy server
NFS server
bootstrap.lab.okd.lan
okd-cp-1.lab.okd.lan
okd-cp-2.lab.okd.lan
okd-cp-3.lab.okd.lan
okd-w-1.lab.okd.lan
okd-w-2.lab.okd.lan
okd-w-3.lab.okd.lan
okd-w-4.lab.okd.lan
Each machine has 4 cores, 32GB memory, and and 512GB disk
Private network
192.168.22.0/24

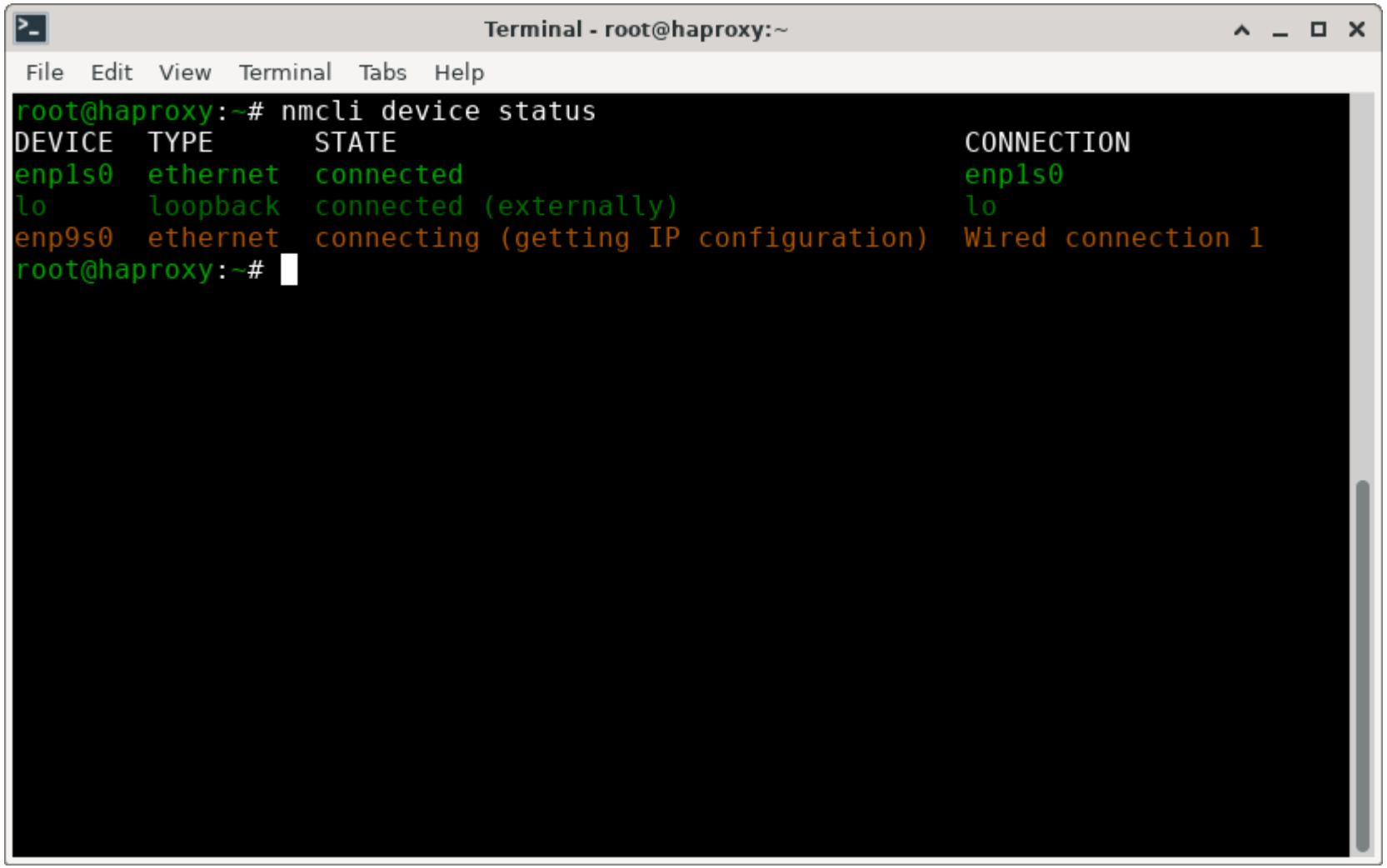
The Layout


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
[root@haproxy ~]# free
total used free shared buff/cache available
Mem: 3734920 403204 3167344 16104 398948 3331716
Swap: 4128764 0 4128764
[root@haproxy ~]# grep "model name" /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E5-2667 v4 @ 3.20GHz
model name : Intel(R) Xeon(R) CPU E5-2667 v4 @ 3.20GHz
model name : Intel(R) Xeon(R) CPU E5-2667 v4 @ 3.20GHz
model name : Intel(R) Xeon(R) CPU E5-2667 v4 @ 3.20GHz
[root@haproxy ~]#

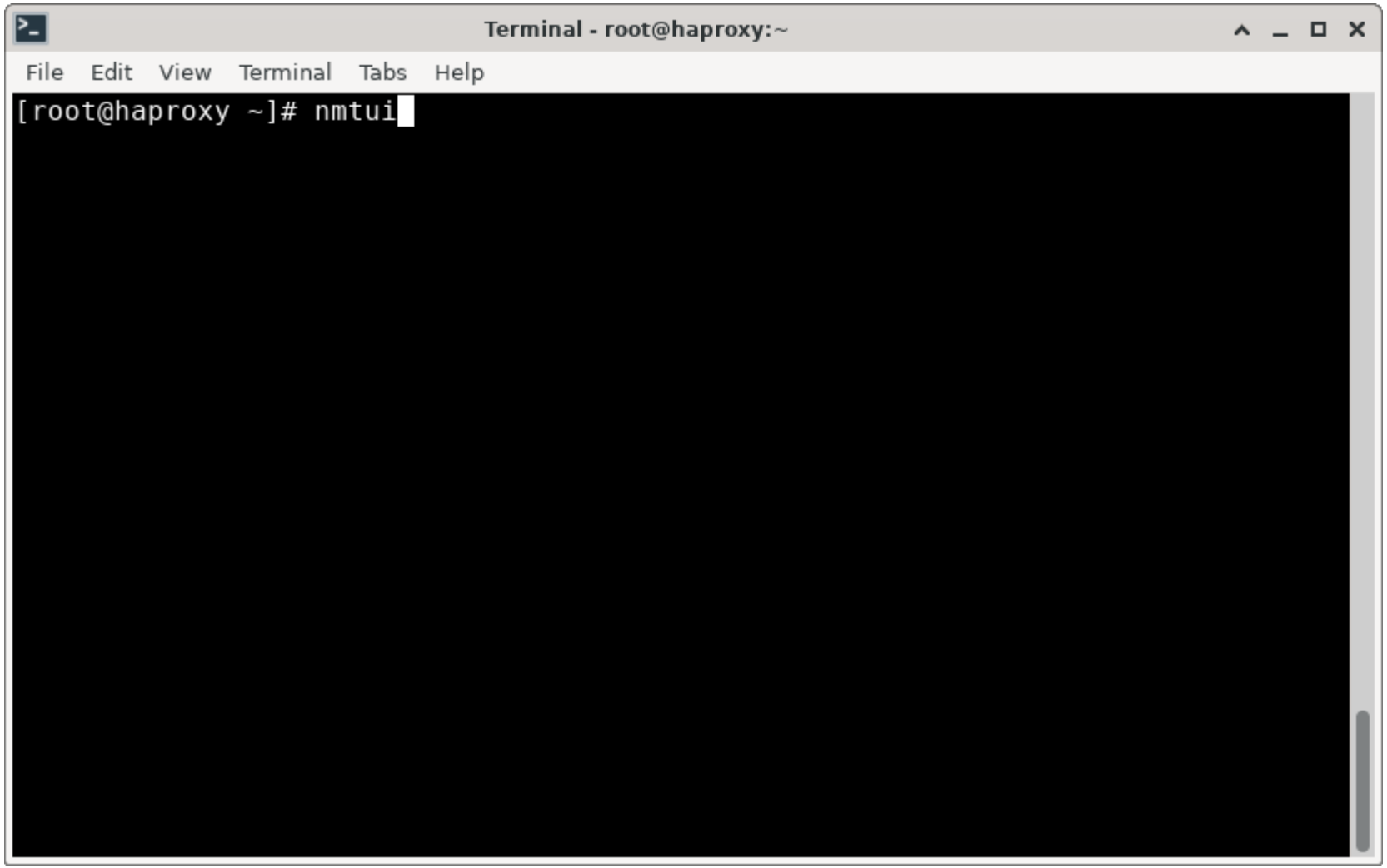
Set up the second interface

- I kickstarted the HAProxy machine from the production network, and it has a DHCP reservation so that the IP address is fixed
- The second interface was unconfigured

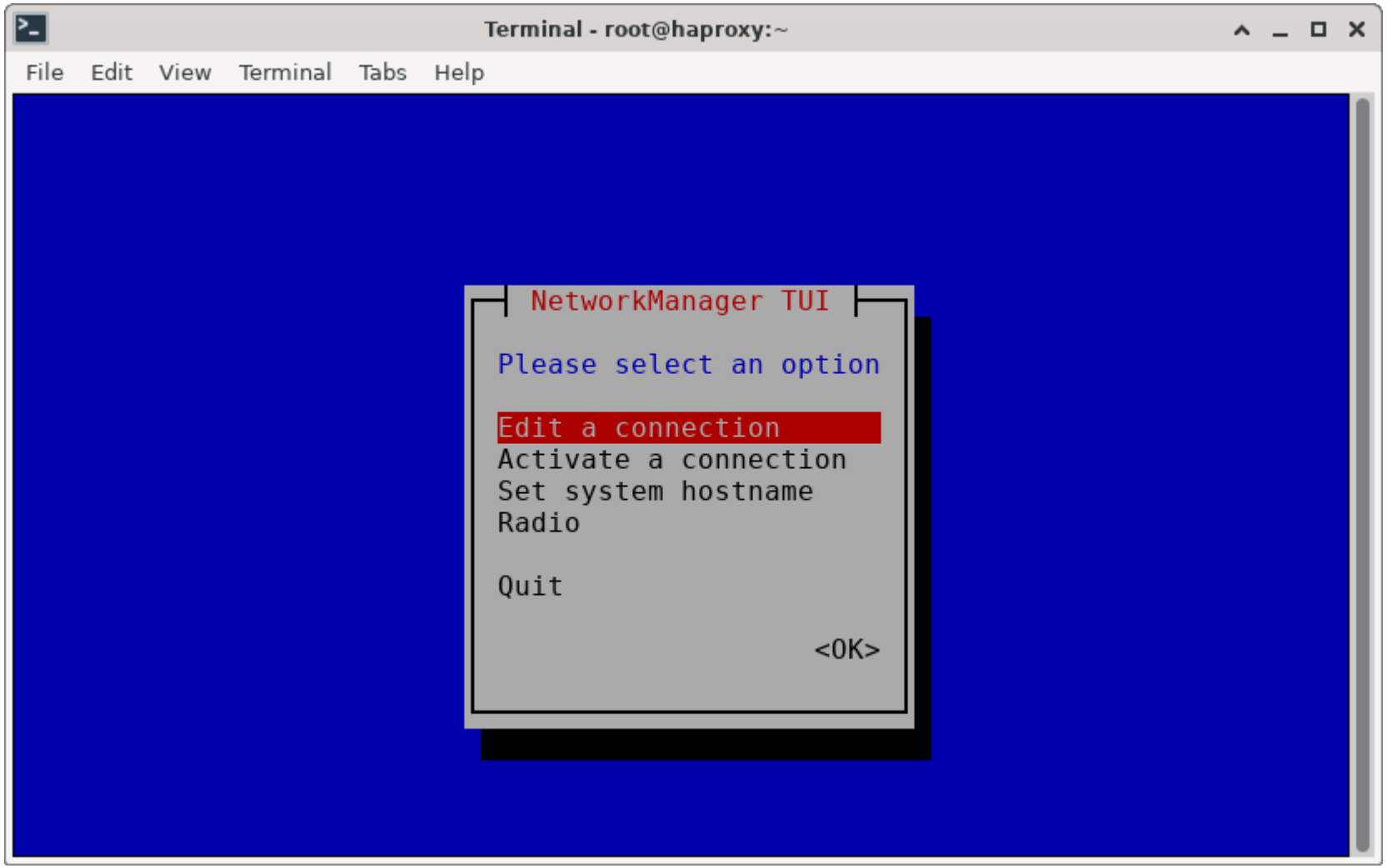
Network


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# nmcli device status
DEVICE TYPE STATE CONNECTION
enp1s0 ethernet connected enp1s0
lo loopback connected (externally) lo
enp9s0 ethernet connecting (getting IP configuration) Wired connection 1
root@haproxy:~#

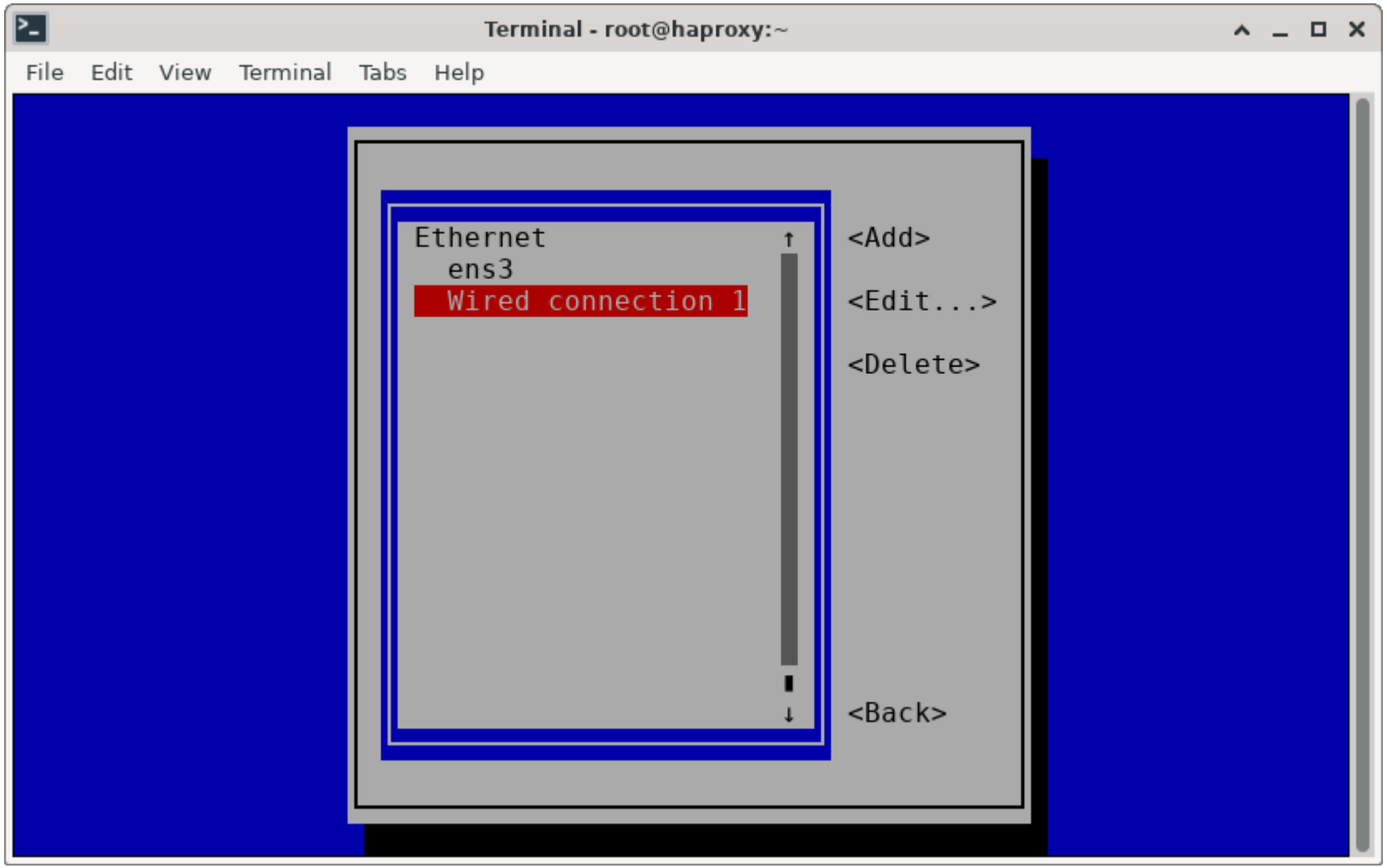
Network


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
[root@haproxy ~]# nmtui

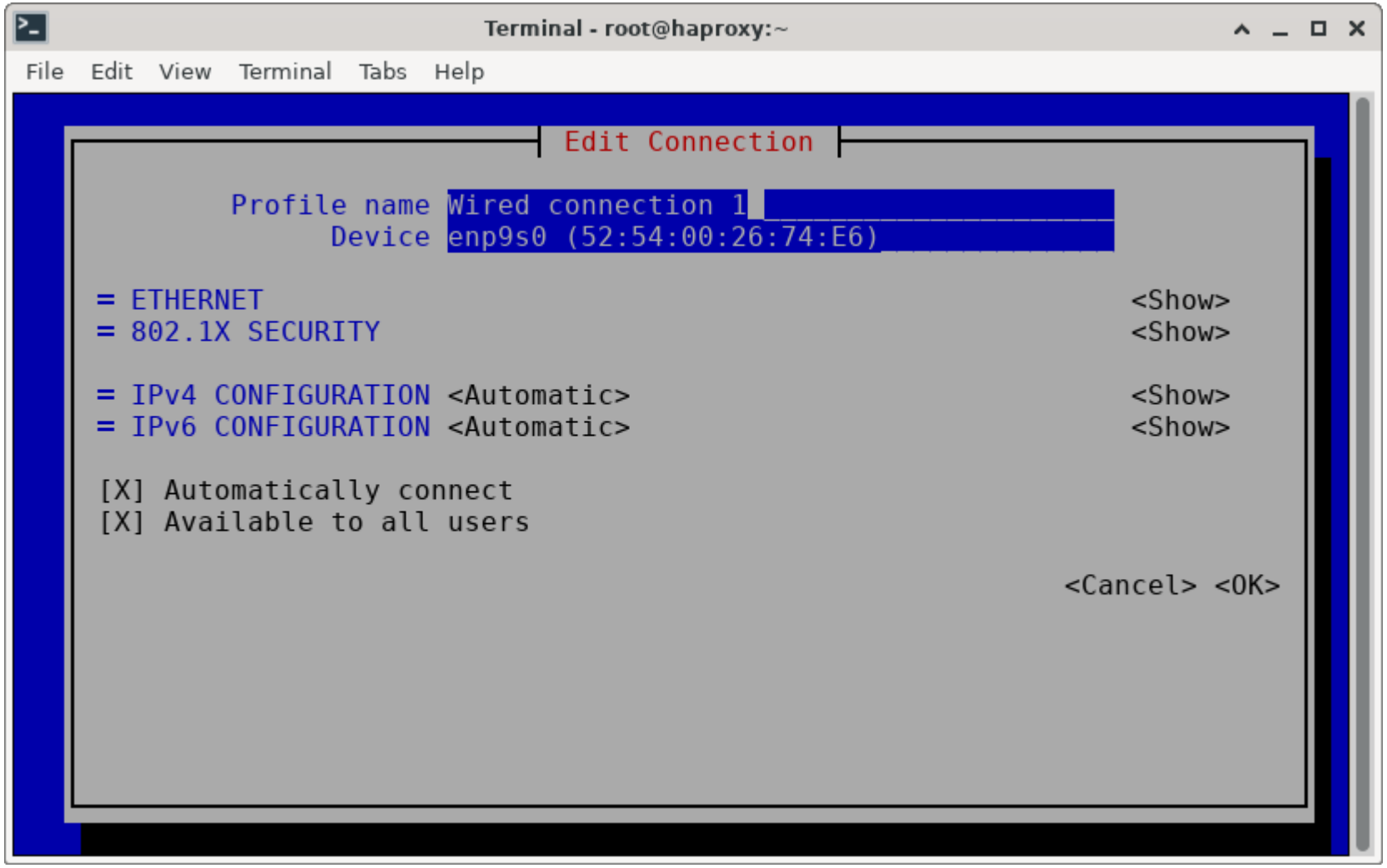
Network


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
NetworkManager TUI
Please select an option
Edit a connection
Activate a connection
Set system hostname
Radio
Quit
<OK>

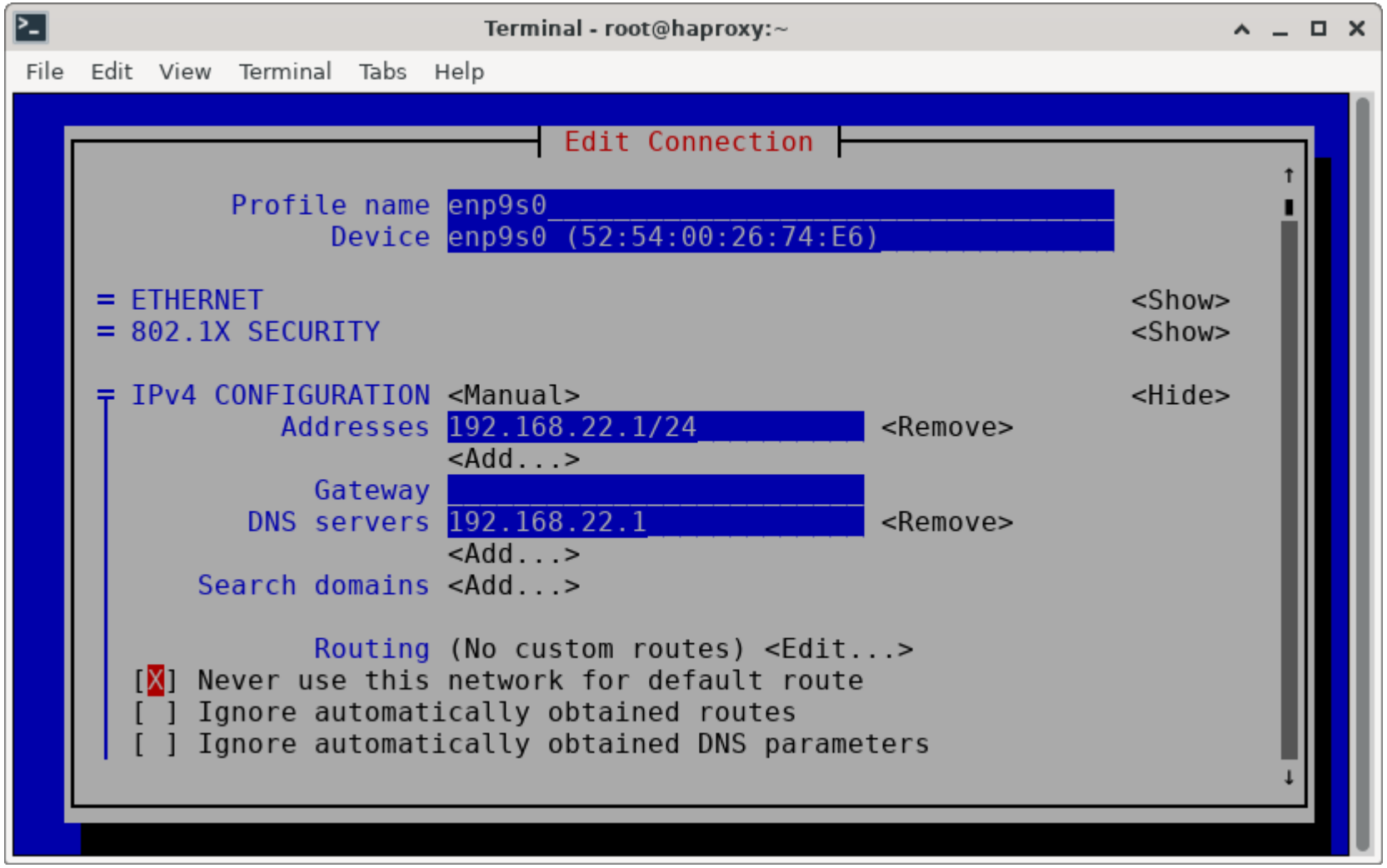
Network


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
Ethernet
ens3
Wired connection 1
<Add>
<Edit...>
<Delete>
<Back>

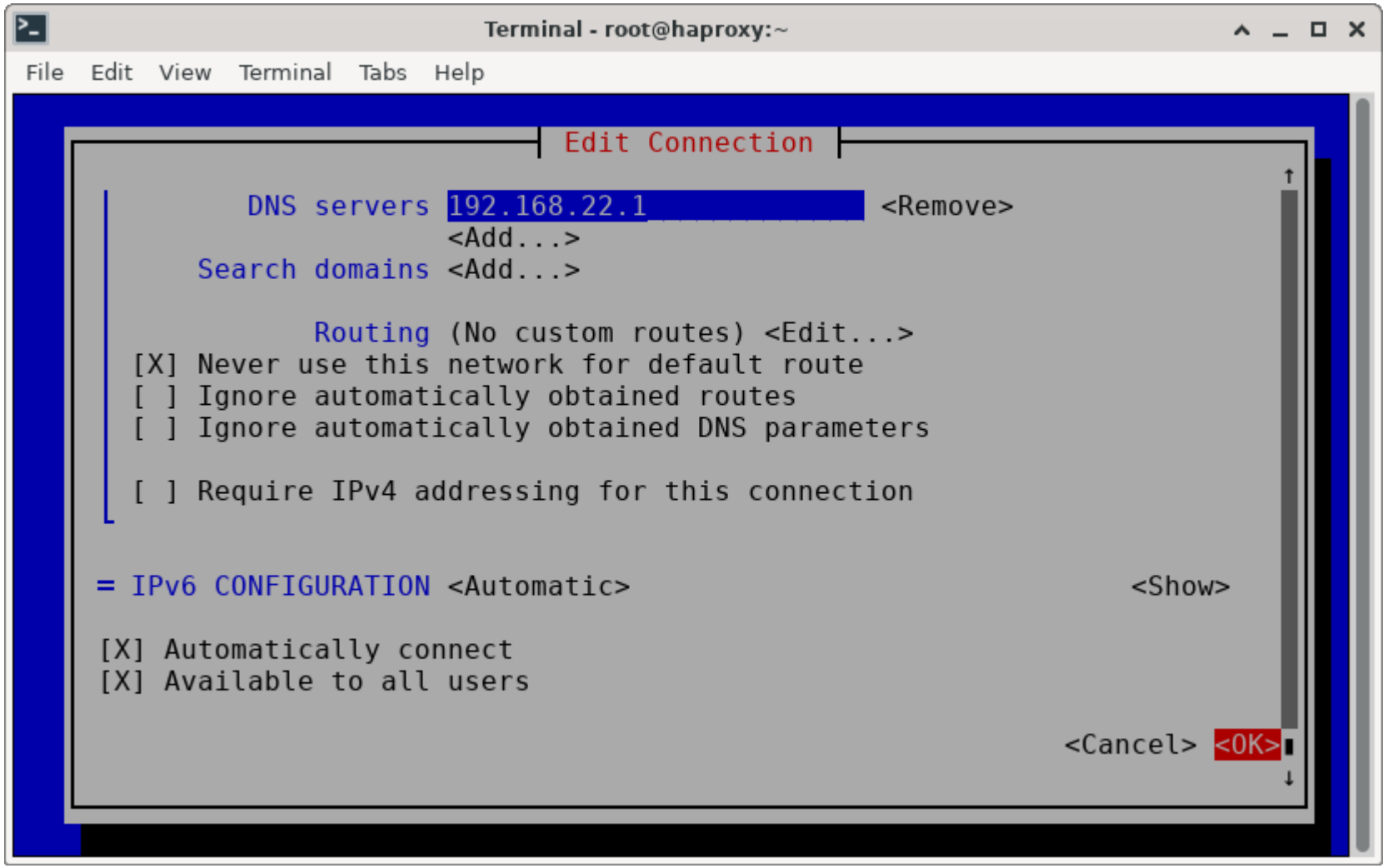
Network


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
Edit Connection
Profile name Wired connection 1
Device enp9s0 (52:54:00:26:74:E6)
= ETHERNET <Show>
= 802.1X SECURITY <Show>
= IPv4 CONFIGURATION <Automatic> <Show>
= IPv6 CONFIGURATION <Automatic> <Show>
[X] Automatically connect
[X] Available to all users
<Cancel> <OK>

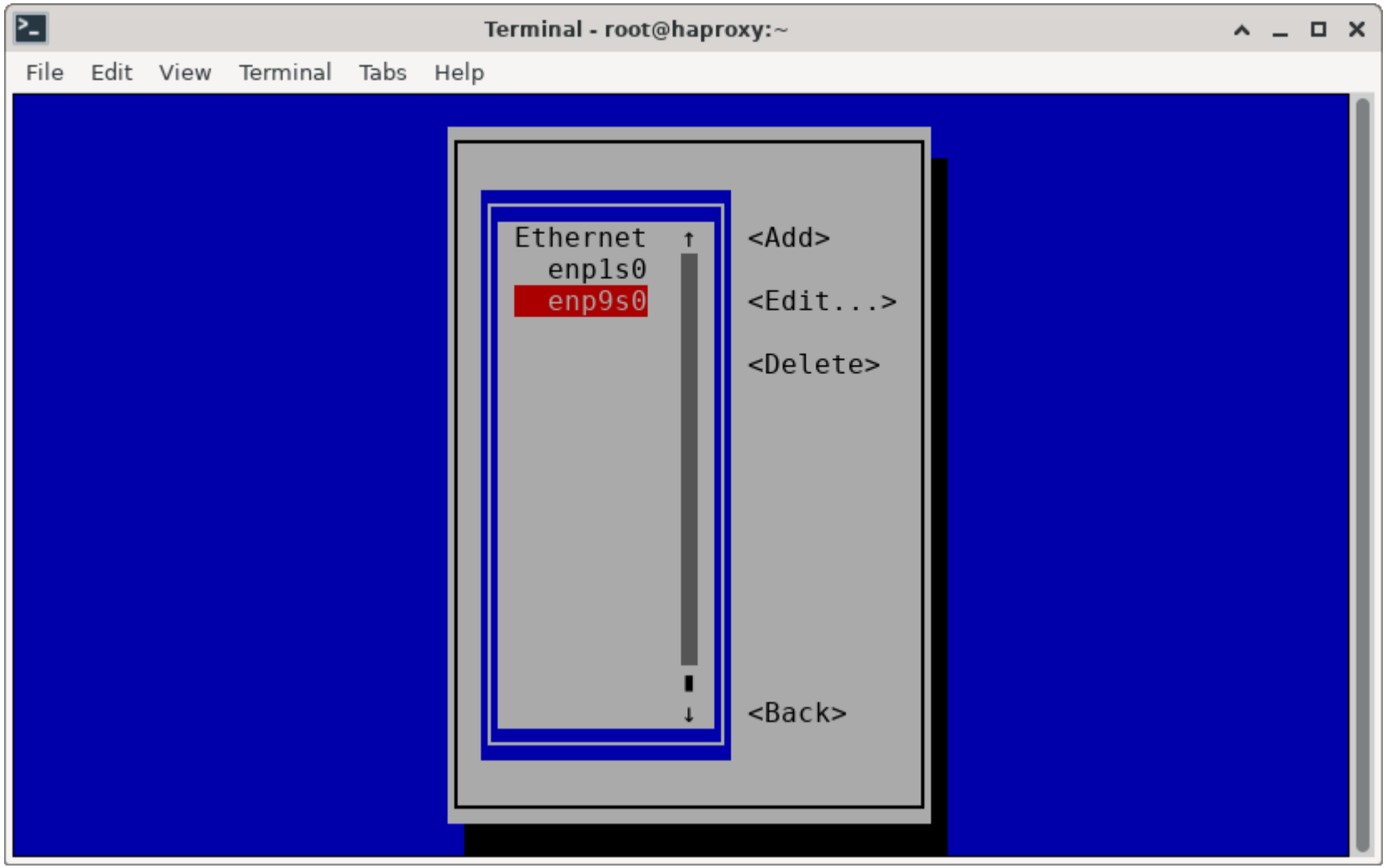
Network


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
Edit Connection
Profile name enp9s0
Device enp9s0 (52:54:00:26:74:E6)
= ETHERNET <Show>
= 802.1X SECURITY <Show>
= IPv4 CONFIGURATION <Manual> <Hide>
Addresses 192.168.22.1/24 <Remove>
<Add...>
Gateway
DNS servers 192.168.22.1 <Remove>
<Add...>
Search domains <Add...>
Routing (No custom routes) <Edit...>
[X] Never use this network for default route
[ ] Ignore automatically obtained routes
[ ] Ignore automatically obtained DNS parameters

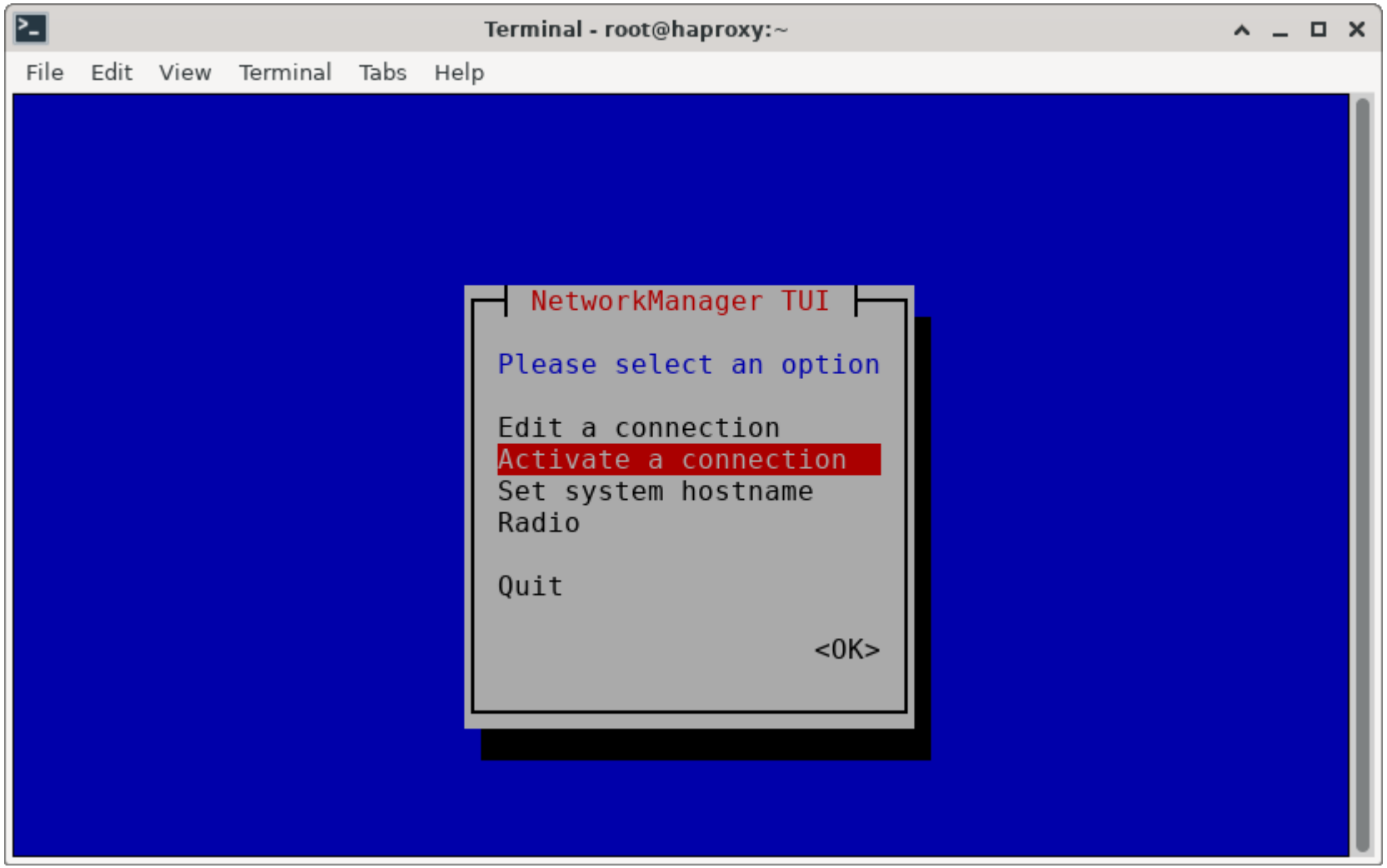
Network


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
Edit Connection
DNS servers 192.168.22.1 <Remove>
<Add...>
Search domains <Add...>
Routing (No custom routes) <Edit...>
[X] Never use this network for default route
[ ] Ignore automatically obtained routes
[ ] Ignore automatically obtained DNS parameters
[ ] Require IPv4 addressing for this connection
= IPv6 CONFIGURATION <Automatic> <Show>
[X] Automatically connect
[X] Available to all users
<Cancel> <OK>

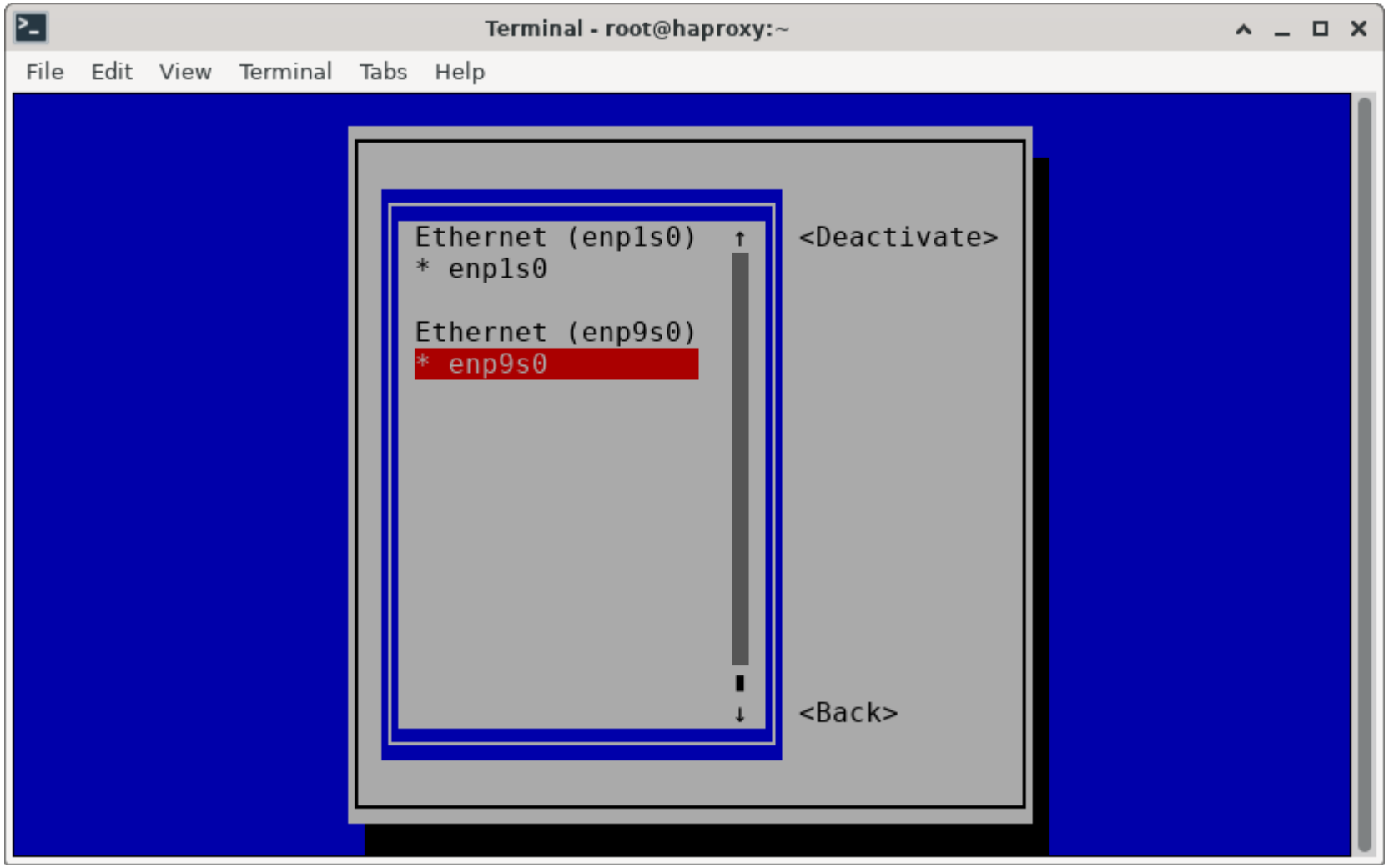
Network


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
Ethernet
enp1s0
enp9s0
<Add>
<Edit...>
<Delete>
<Back>

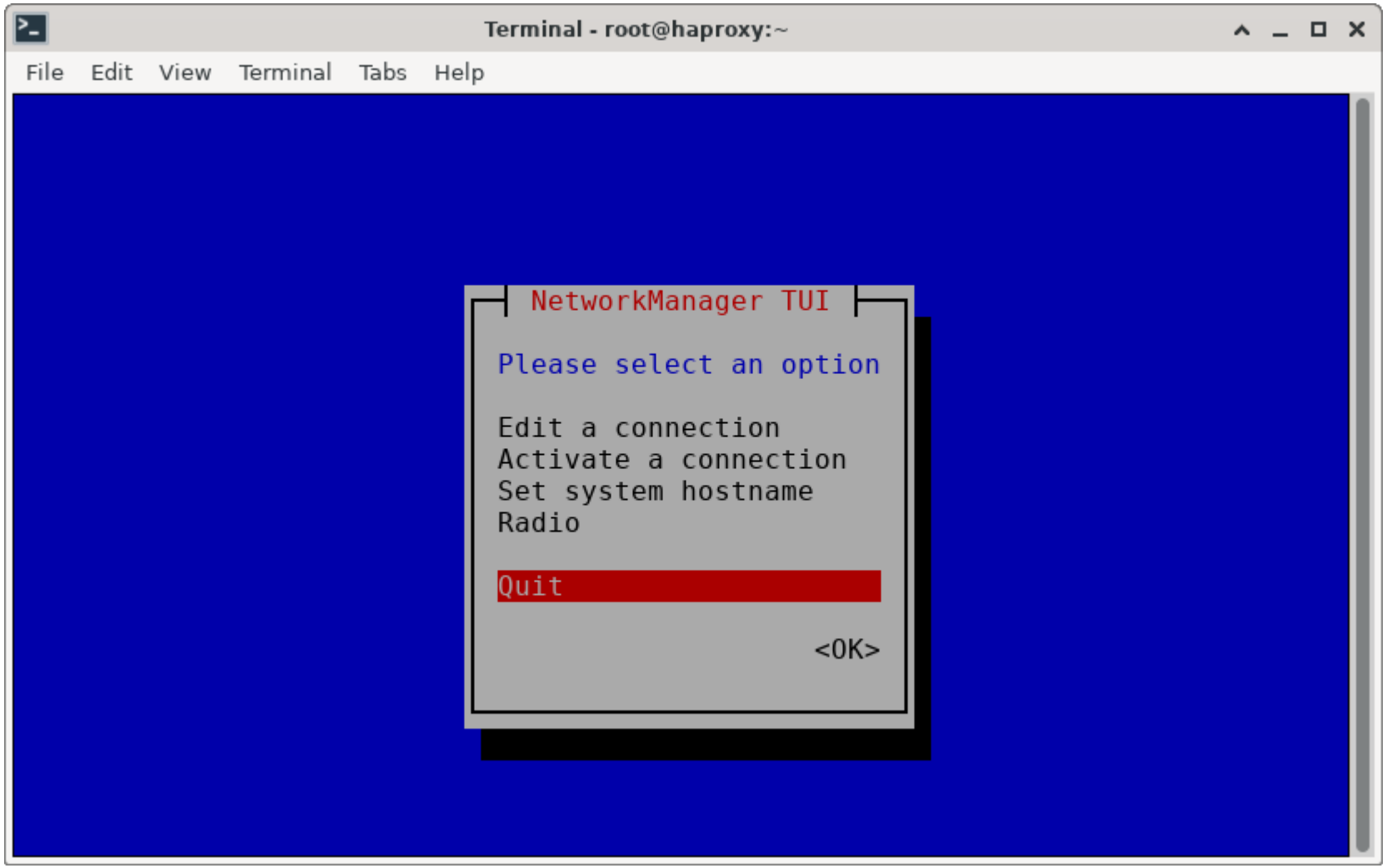
Network


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
NetworkManager TUI
Please select an option
Edit a connection
Activate a connection
Set system hostname
Radio
Quit
<OK>

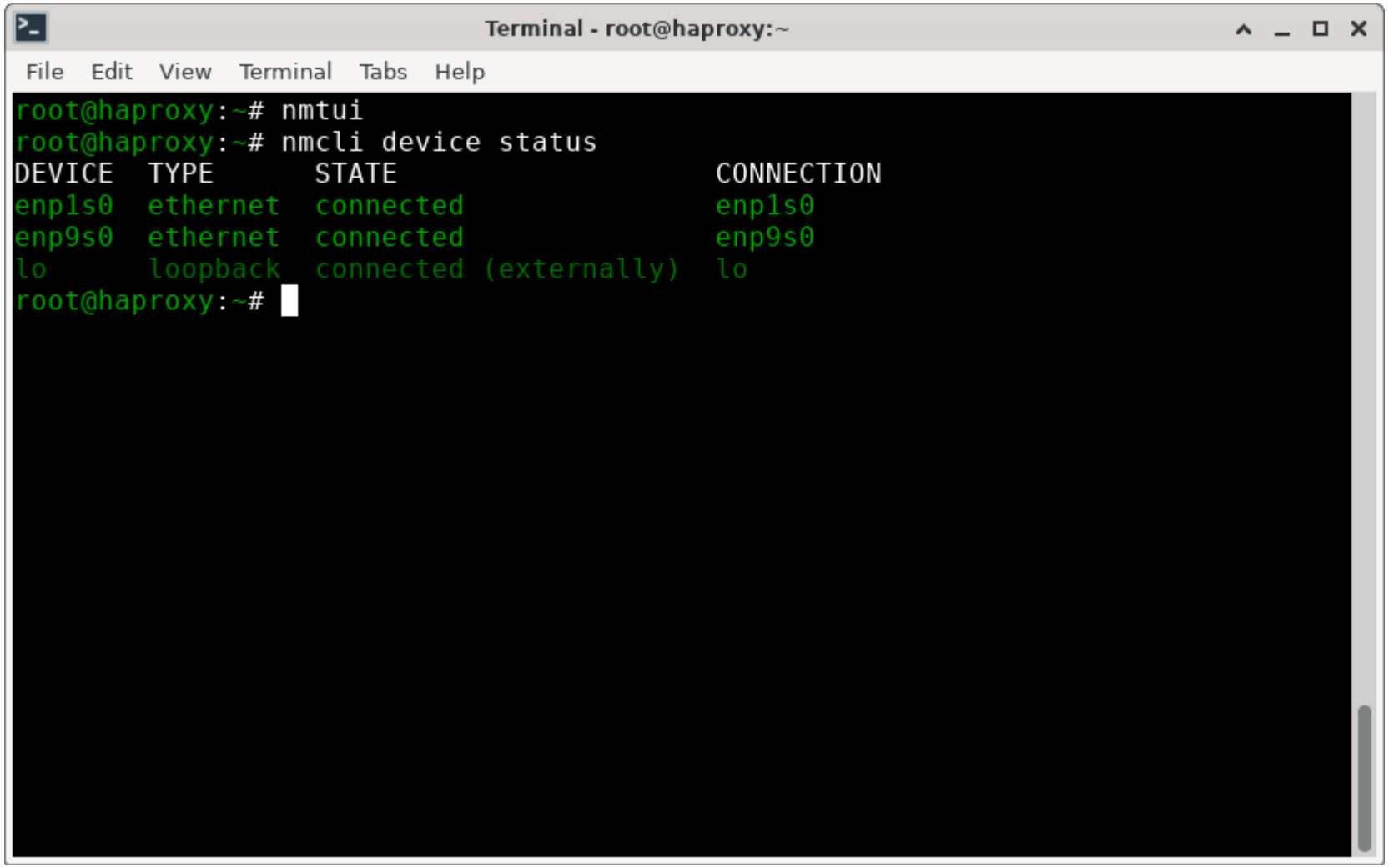
Network


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
Ethernet (enp1s0)
* enp1s0
Ethernet (enp9s0)
* enp9s0
<Deactivate>
<Back>

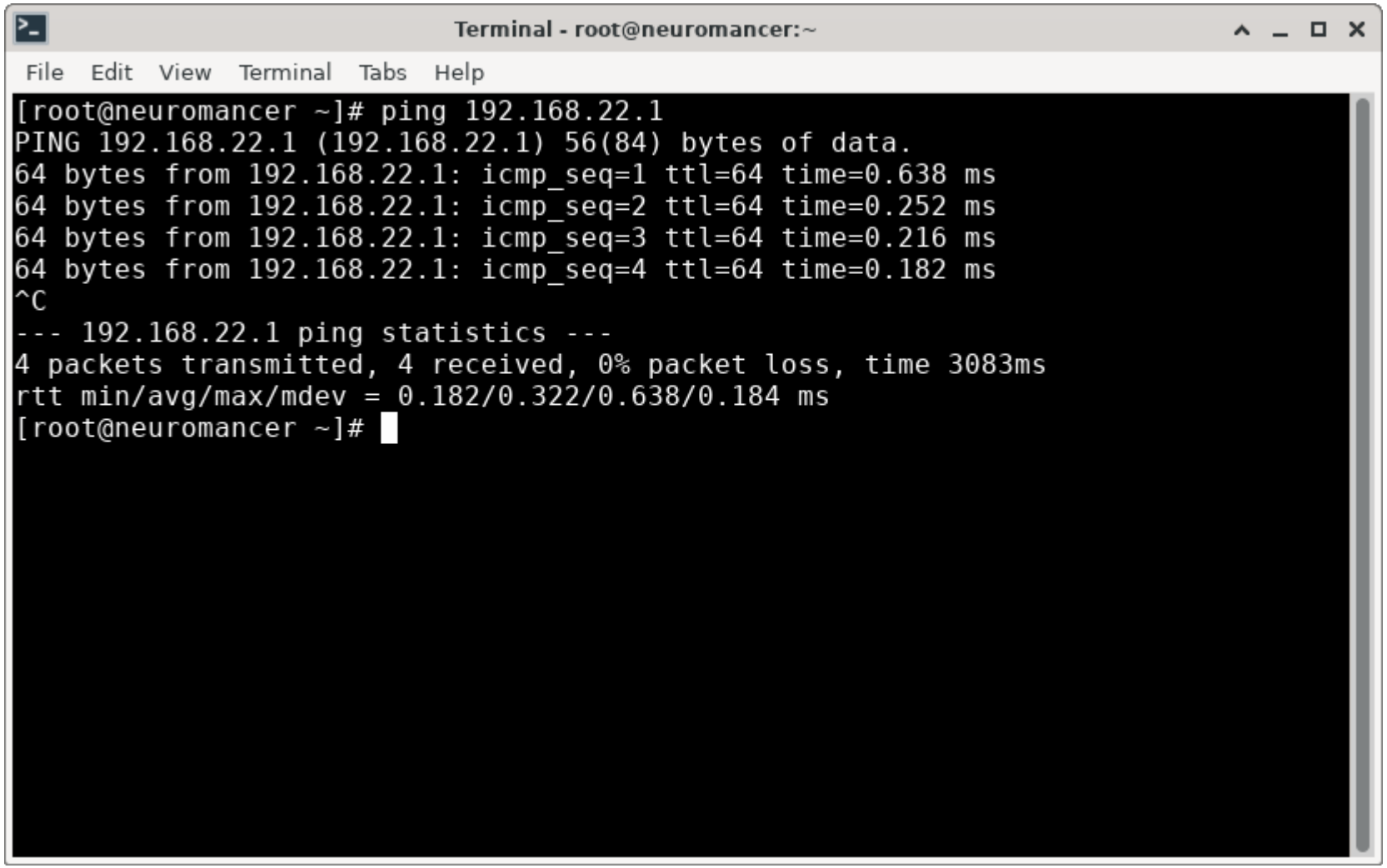
Network


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
NetworkManager TUI
Please select an option
Edit a connection
Activate a connection
Set system hostname
Radio
Quit
<OK>

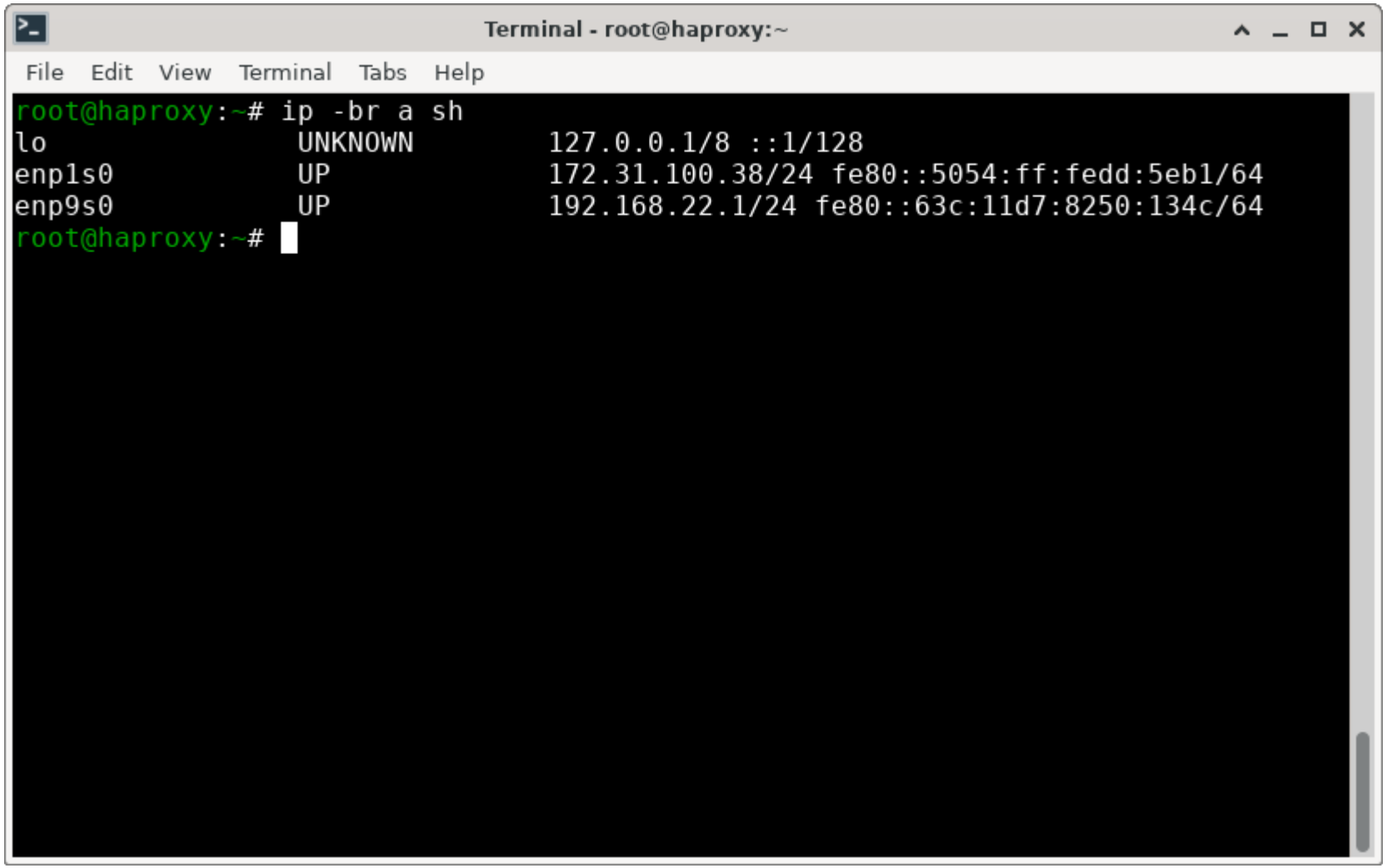
Network


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# nmtui
root@haproxy:~# nmcli device status
DEVICE TYPE STATE CONNECTION
enp1s0 ethernet connected enp1s0
enp9s0 ethernet connected enp9s0
lo loopback connected (externally) lo
root@haproxy:~#

Network


Terminal - root@neuromancer:~
File Edit View Terminal Tabs Help
[root@neuromancer ~]# ping 192.168.22.1
PING 192.168.22.1 (192.168.22.1) 56(84) bytes of data.
64 bytes from 192.168.22.1: icmp_seq=1 ttl=64 time=0.638 ms
64 bytes from 192.168.22.1: icmp_seq=2 ttl=64 time=0.252 ms
64 bytes from 192.168.22.1: icmp_seq=3 ttl=64 time=0.216 ms
64 bytes from 192.168.22.1: icmp_seq=4 ttl=64 time=0.182 ms
^C
--- 192.168.22.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3083ms
rtt min/avg/max/mdev = 0.182/0.322/0.638/0.184 ms
[root@neuromancer ~]#

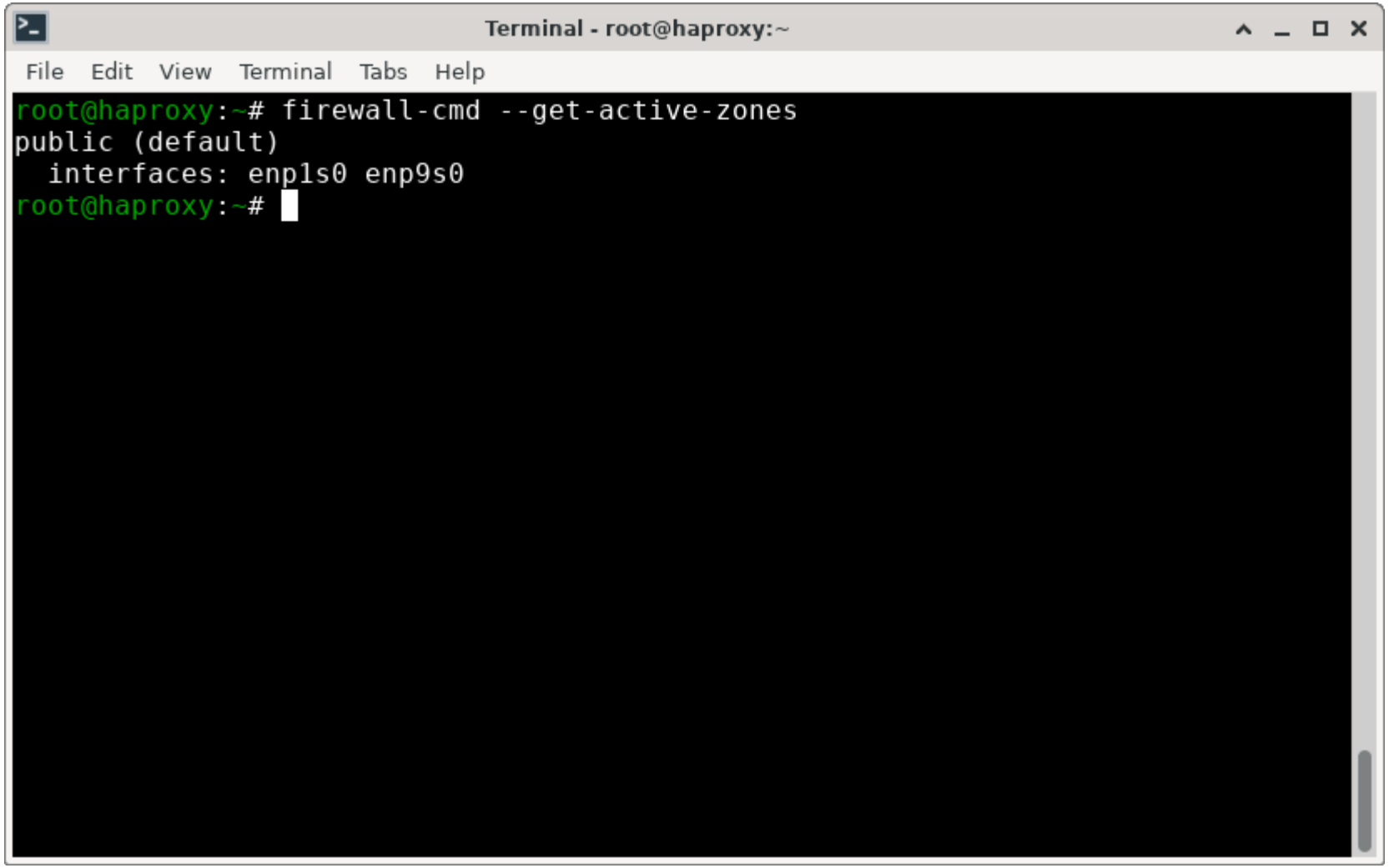
Network


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# ip -br a sh
lo UNKNOWN 127.0.0.1/8 ::1/128
enp1s0 UP 172.31.100.38/24 fe80::5054:ff:fedd:5eb1/64
enp9s0 UP 192.168.22.1/24 fe80::63c:11d7:8250:134c/64
root@haproxy:~#

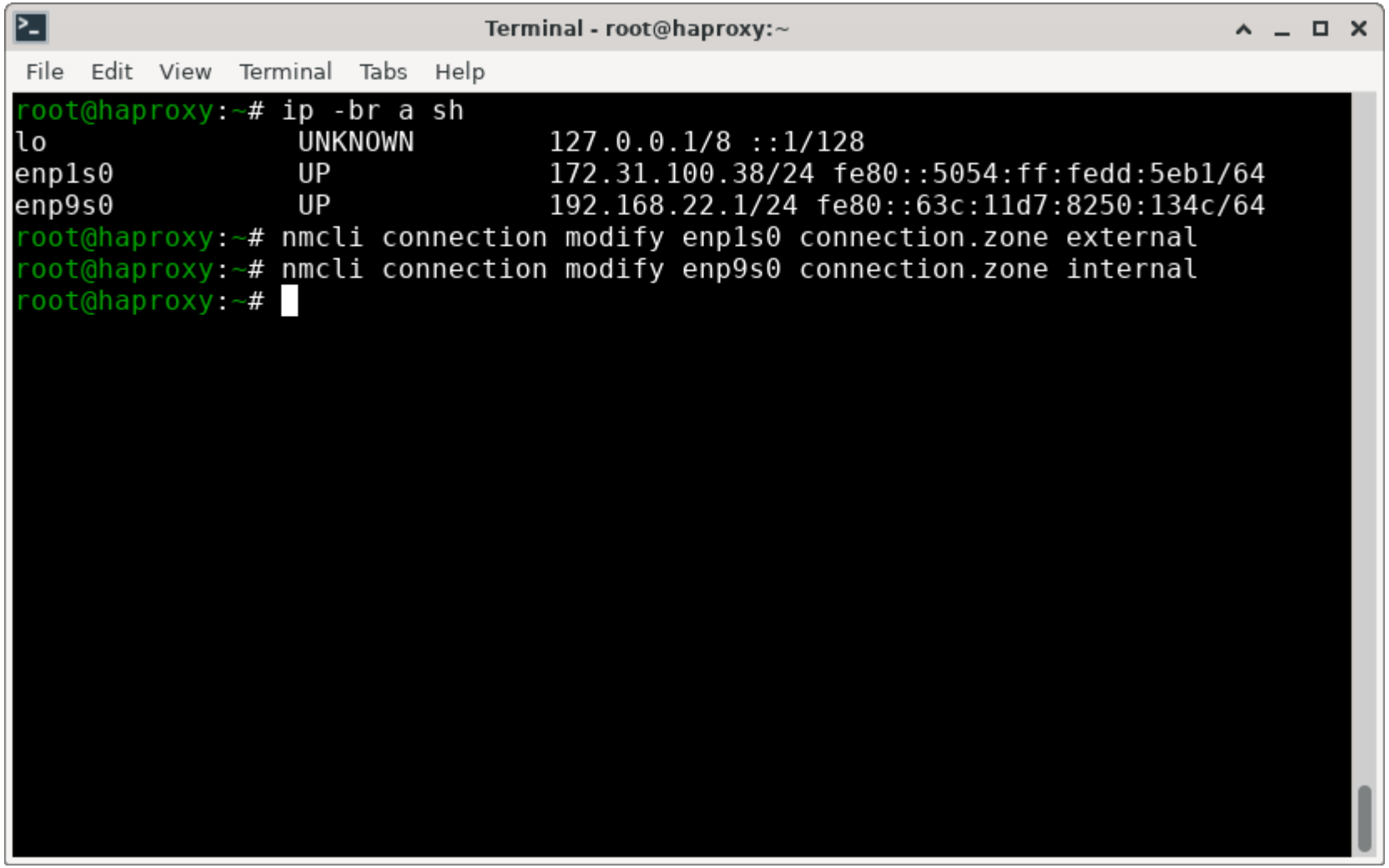
Firewall/NAT

- Now I need to tell firewalld that these two interfaces are on different networks (internal and external), so I can manage firewall rules and network address translation.

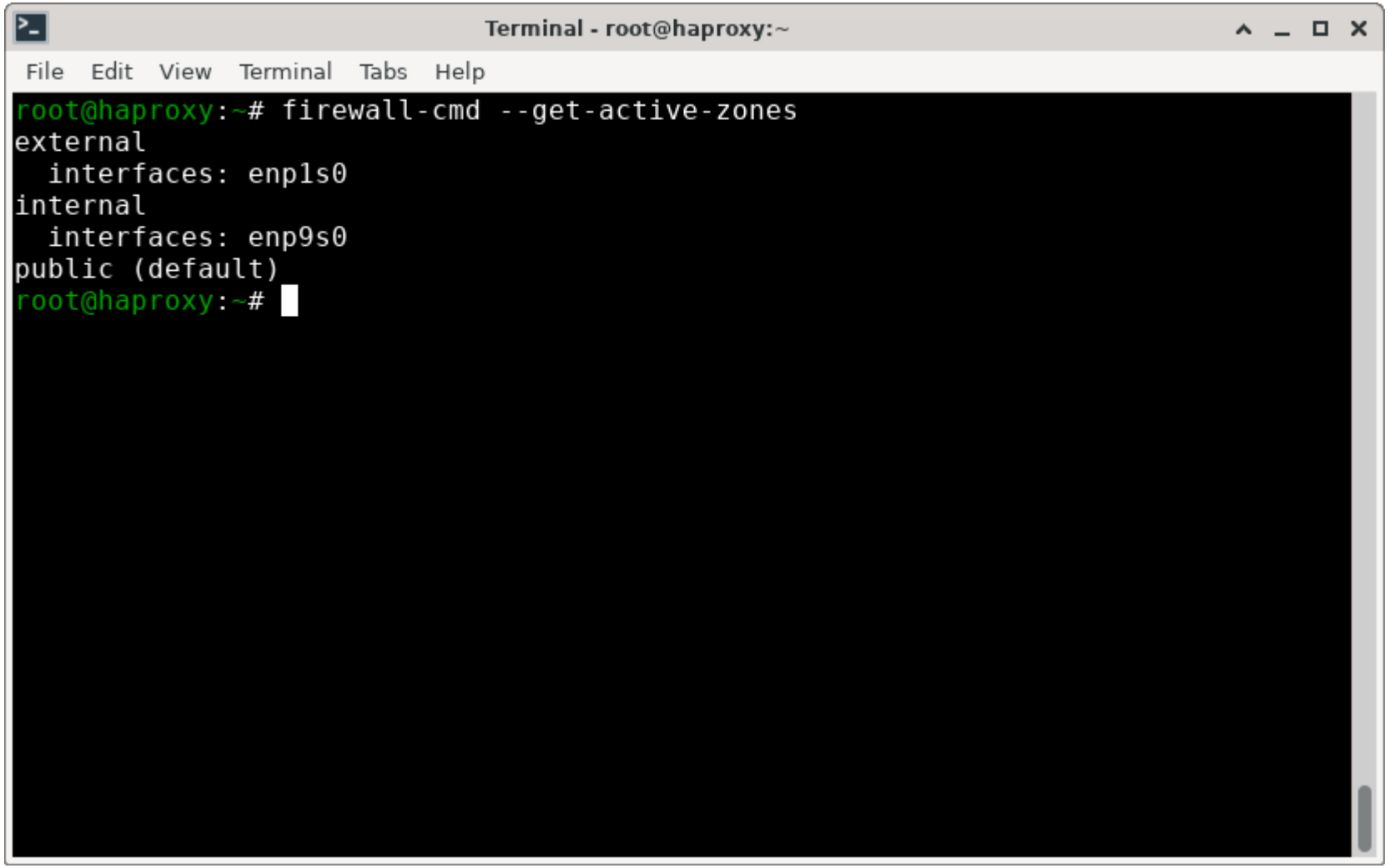
Firewall/NAT



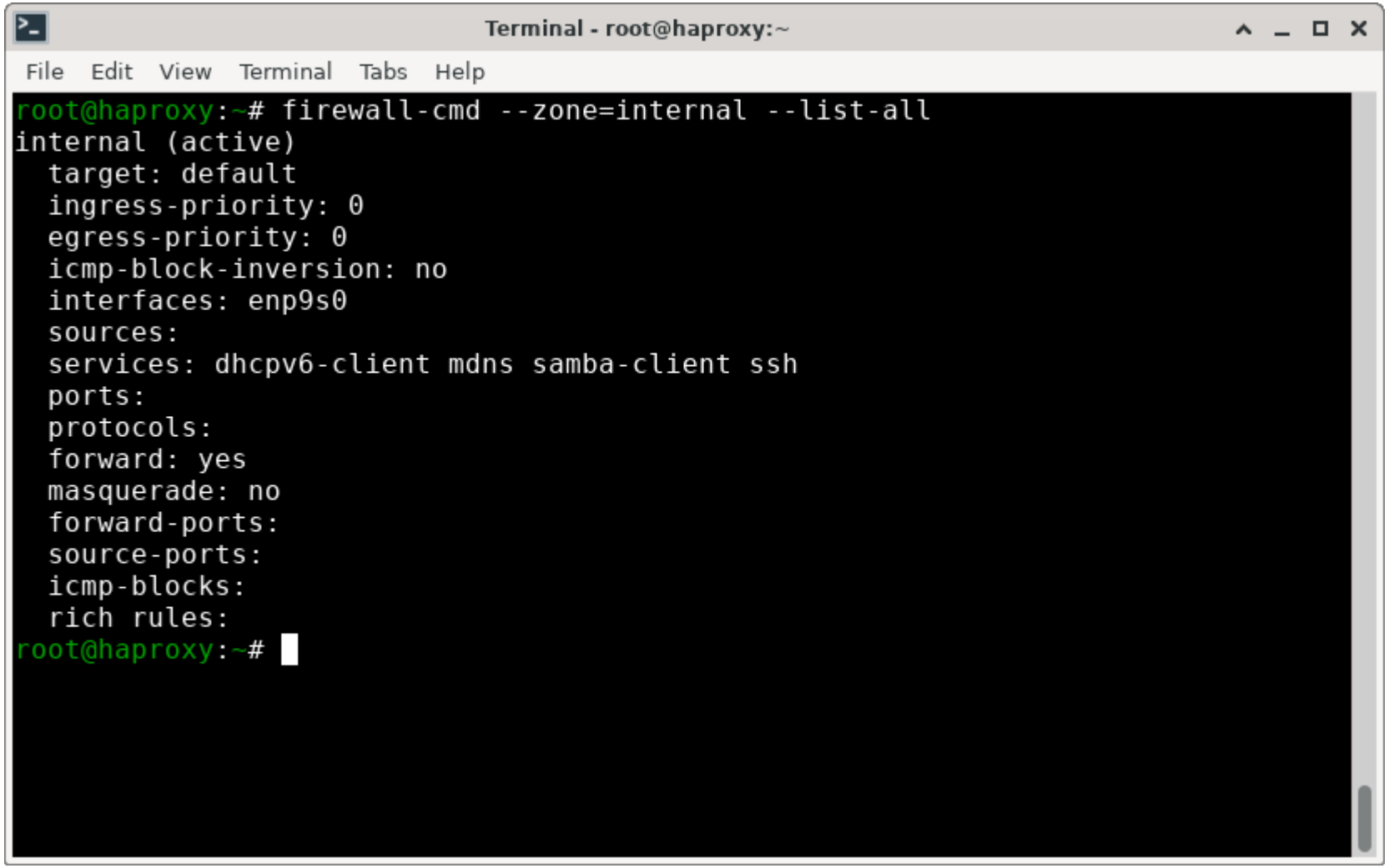
Firewall/NAT



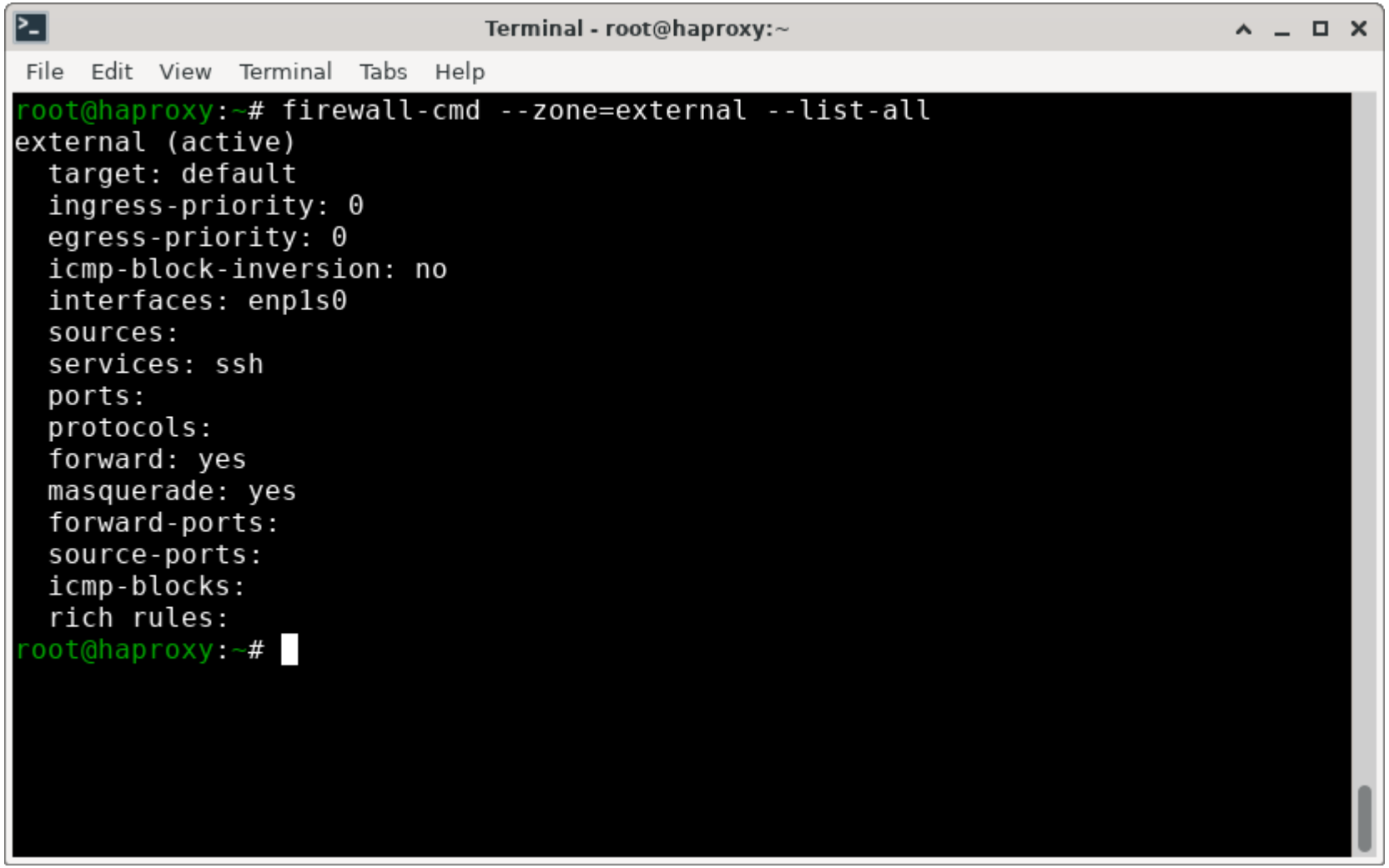
Firewall/NAT



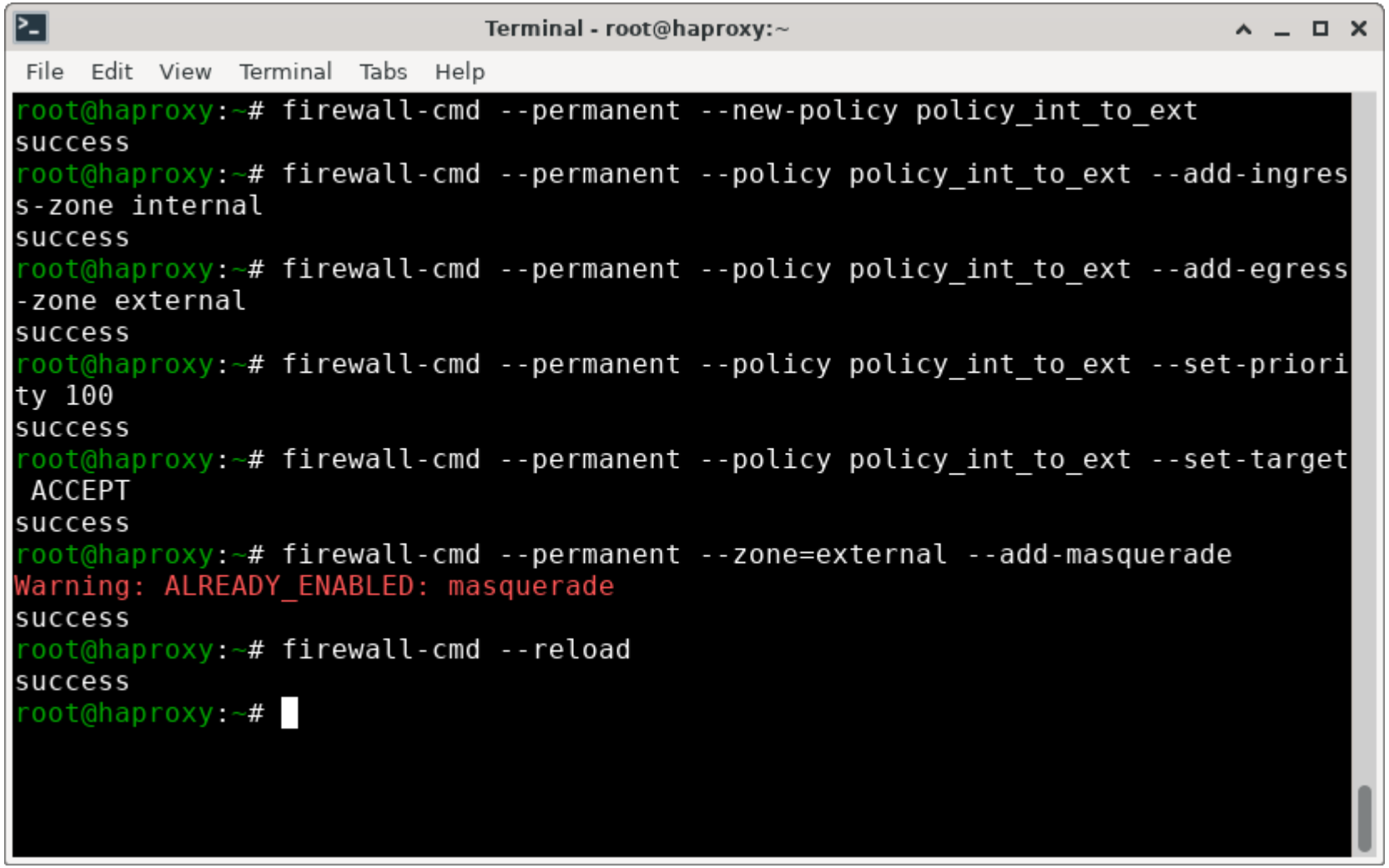
Firewall/NAT



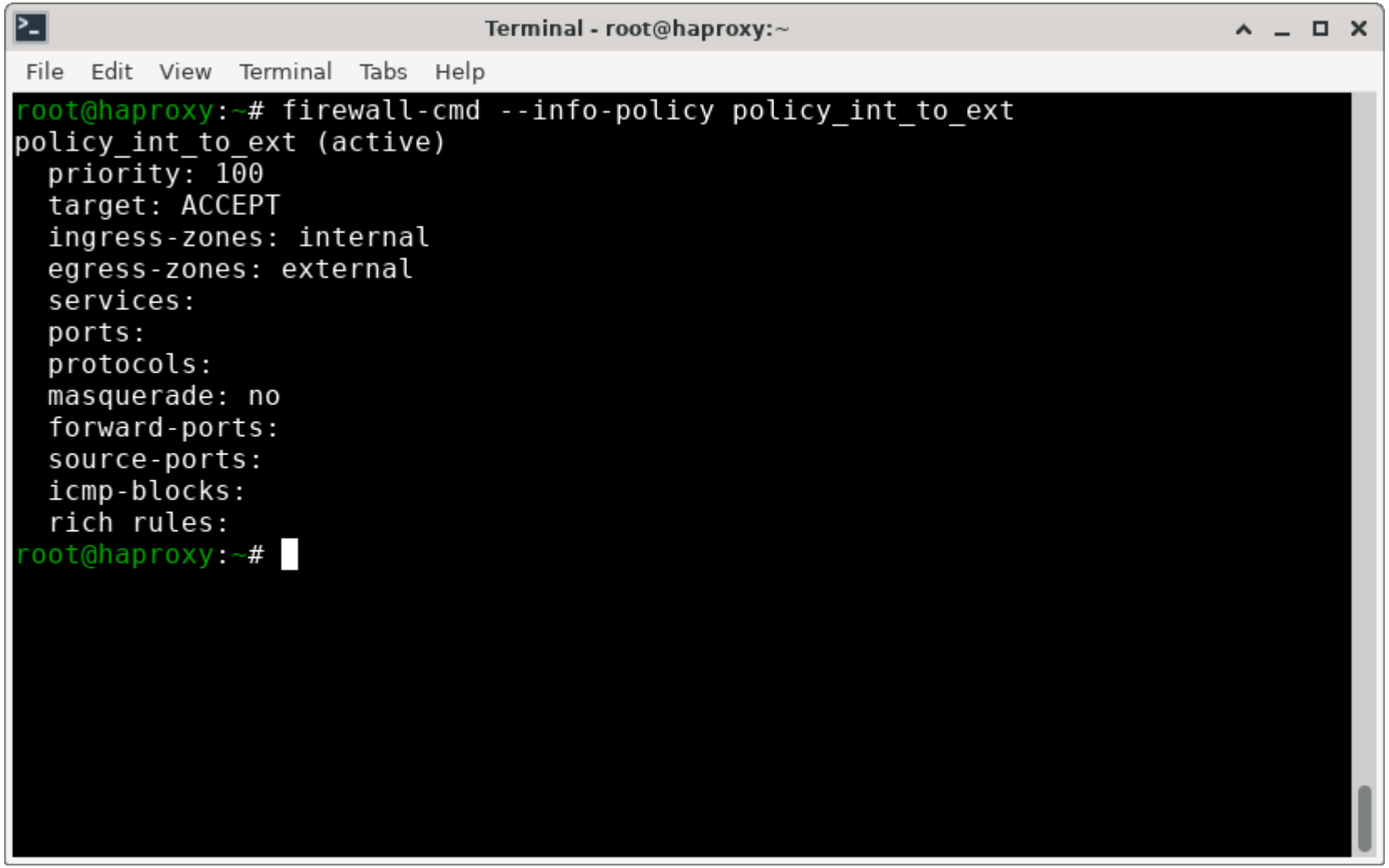
Firewall/NAT



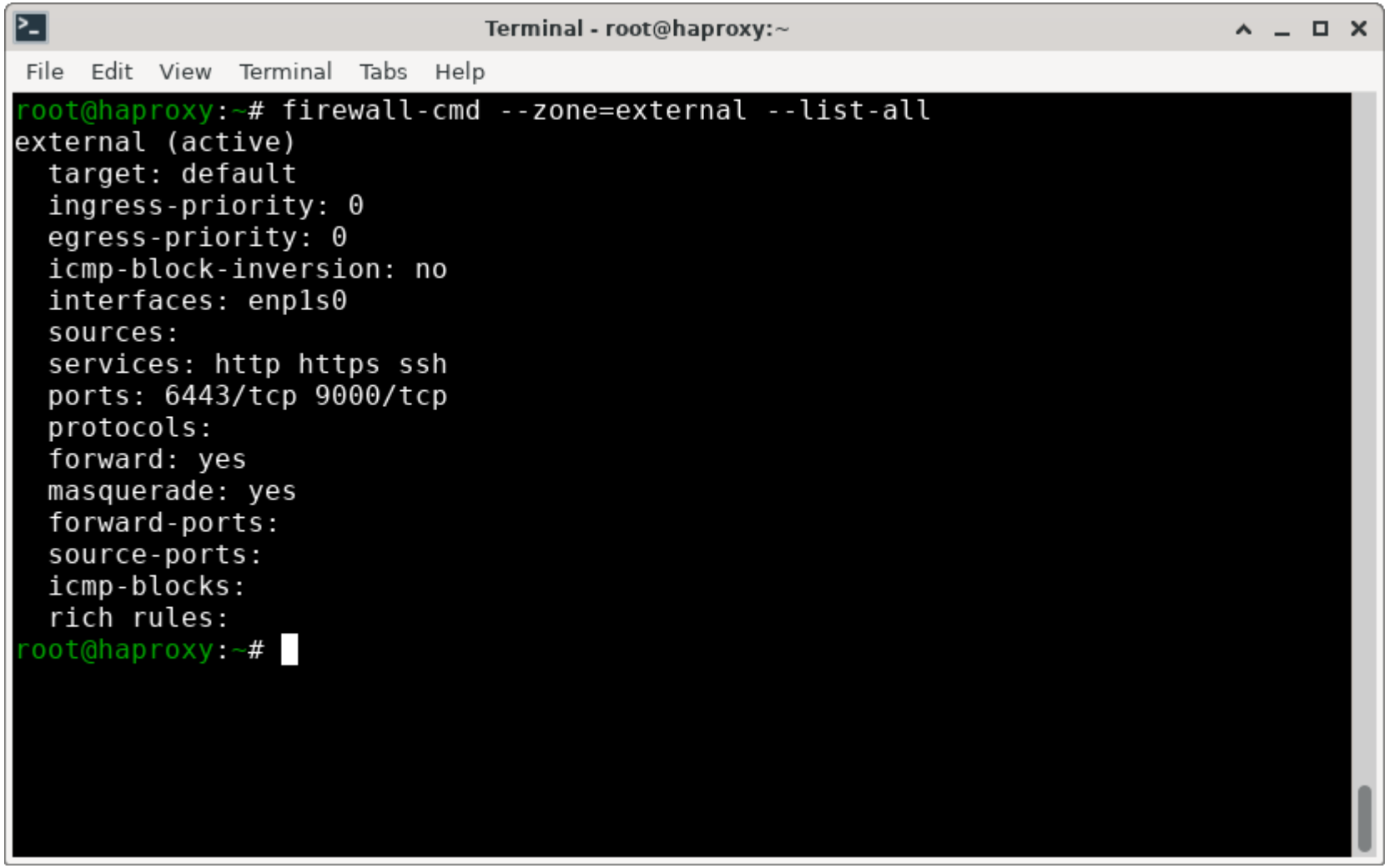
Firewall/NAT



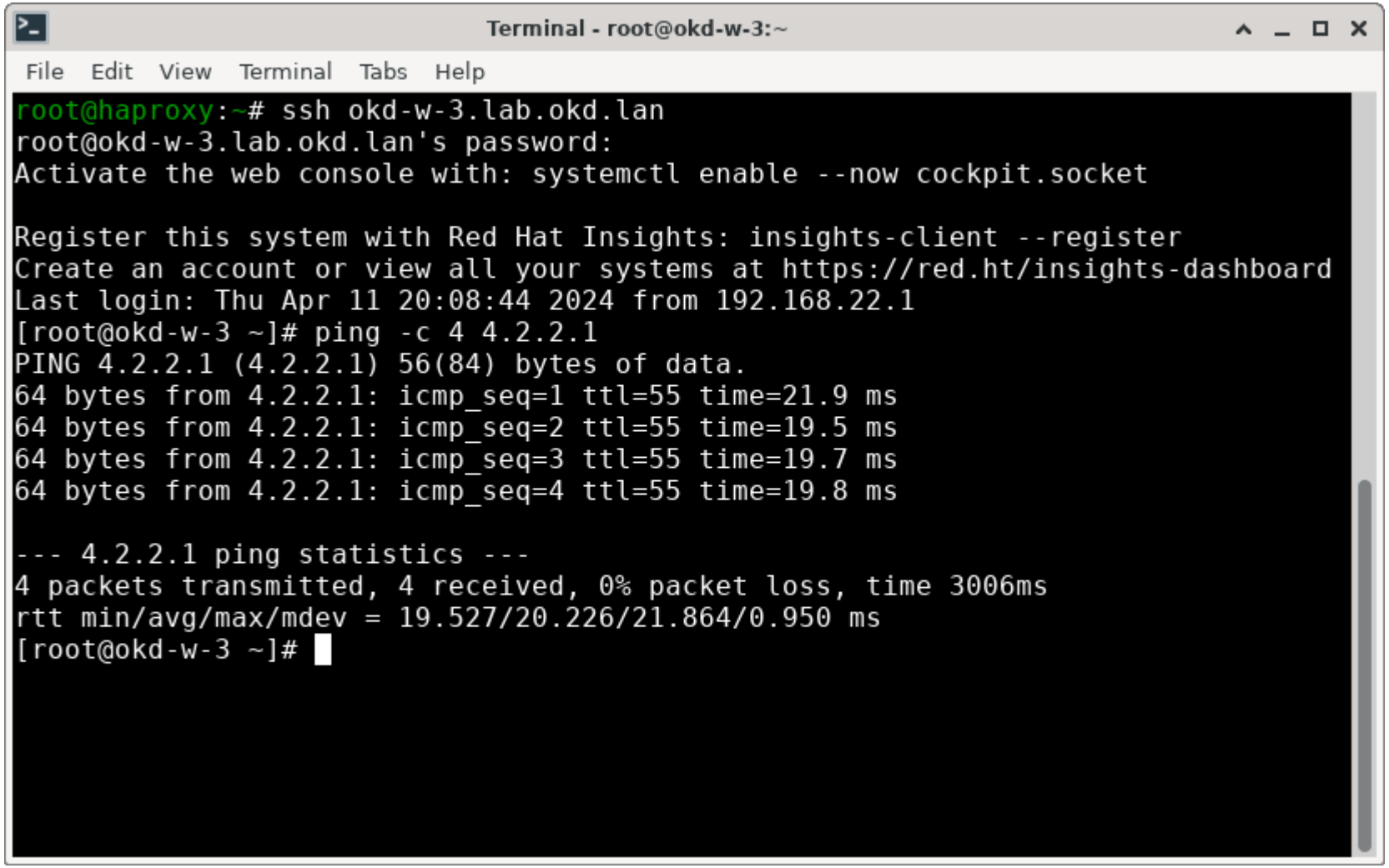
Firewall/NAT



Firewall/NAT



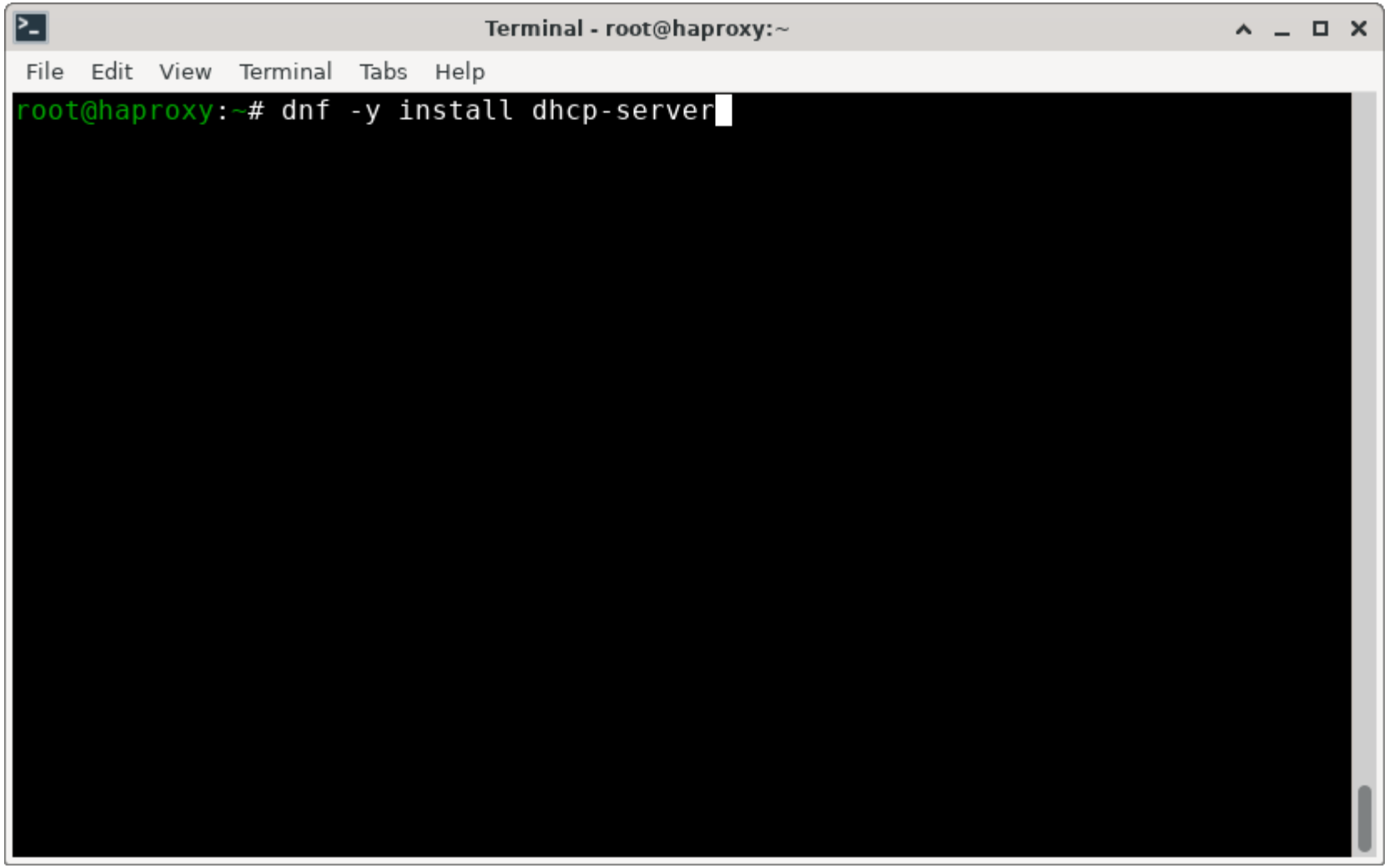
Firewall/NAT



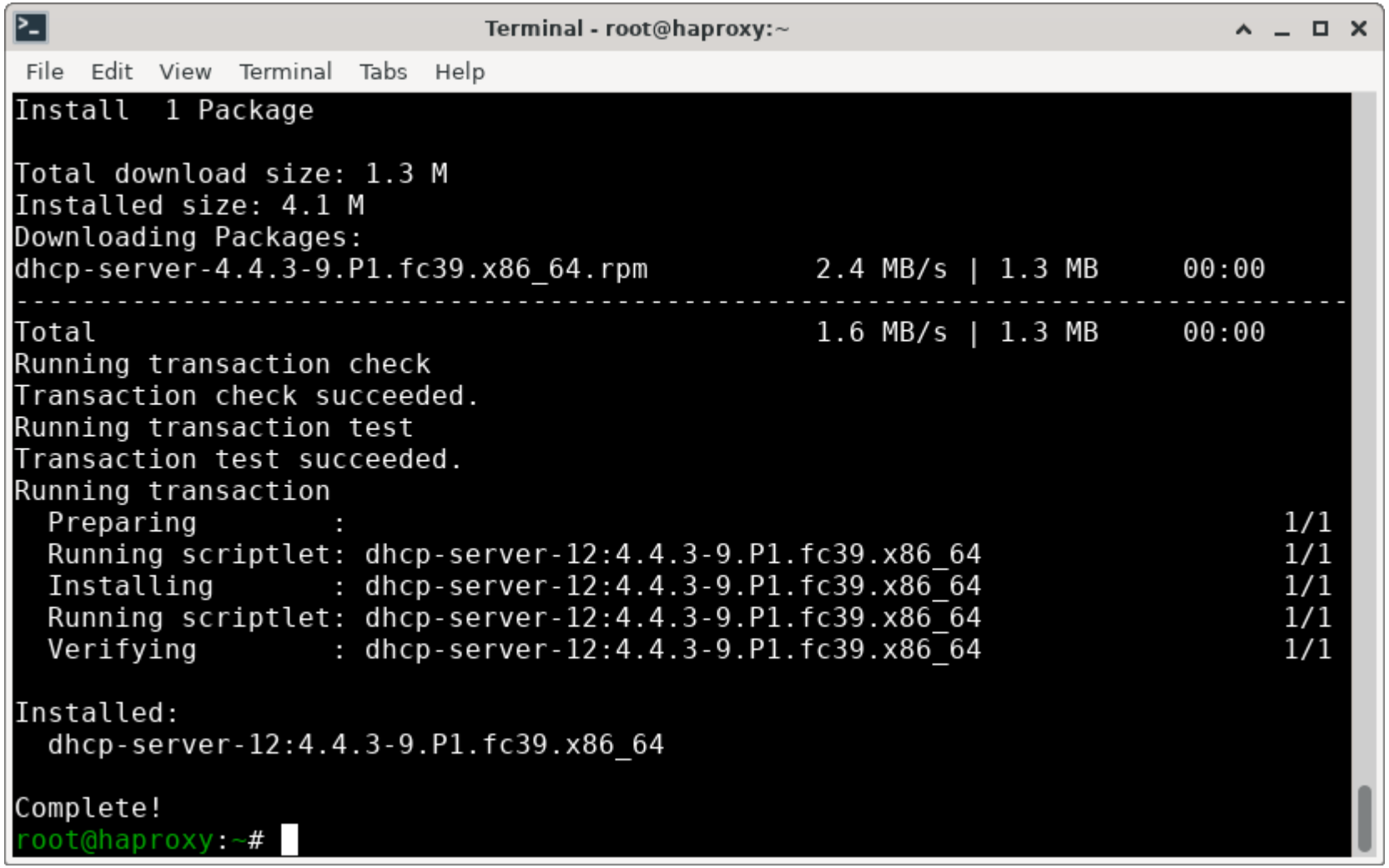
DHCP

- I’ve already got DHCP running on the production network, but the private network doesn’t have any access to it.
- Install and configure DHCP

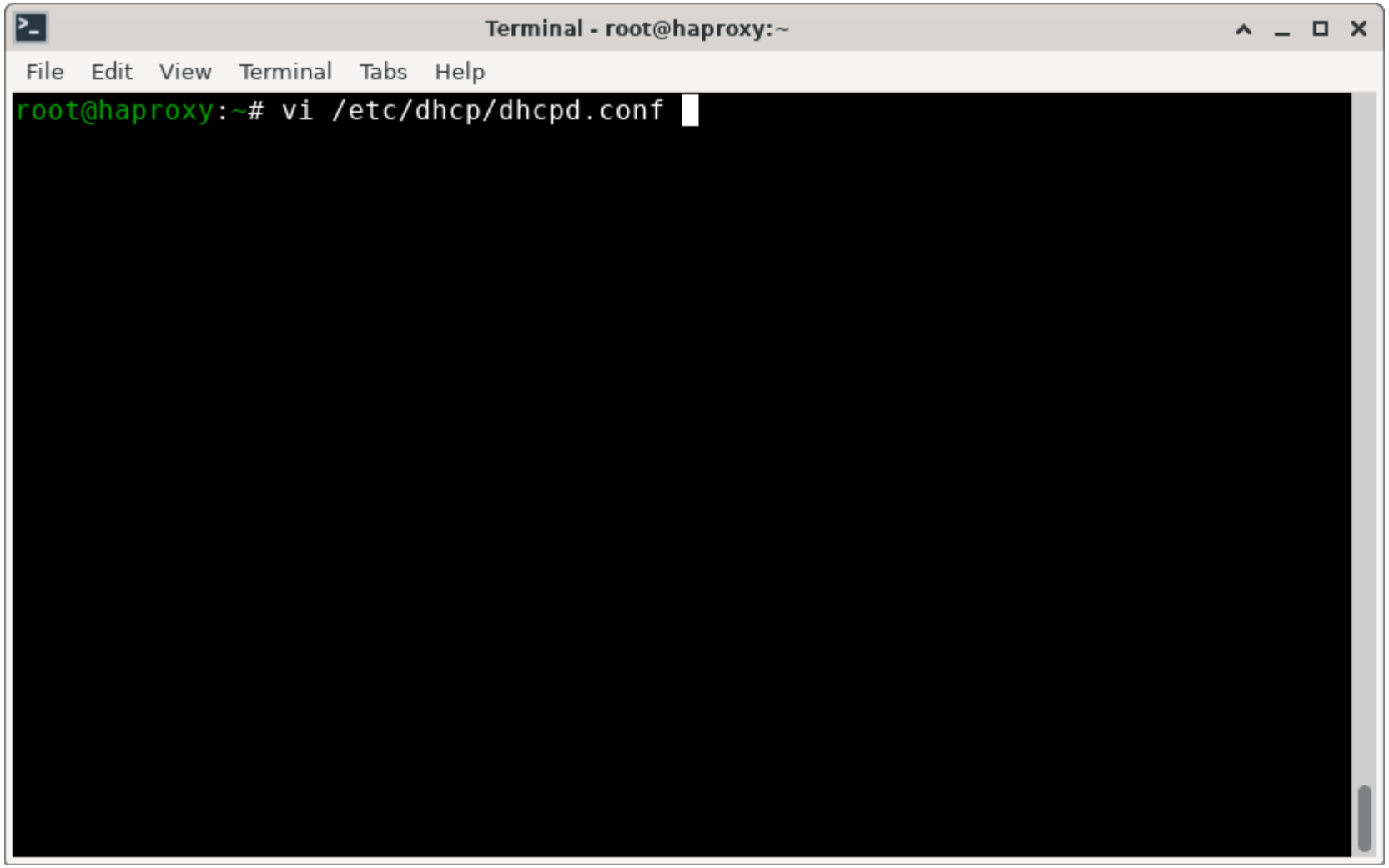
DHCP


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# dnf -y install dhcp-server

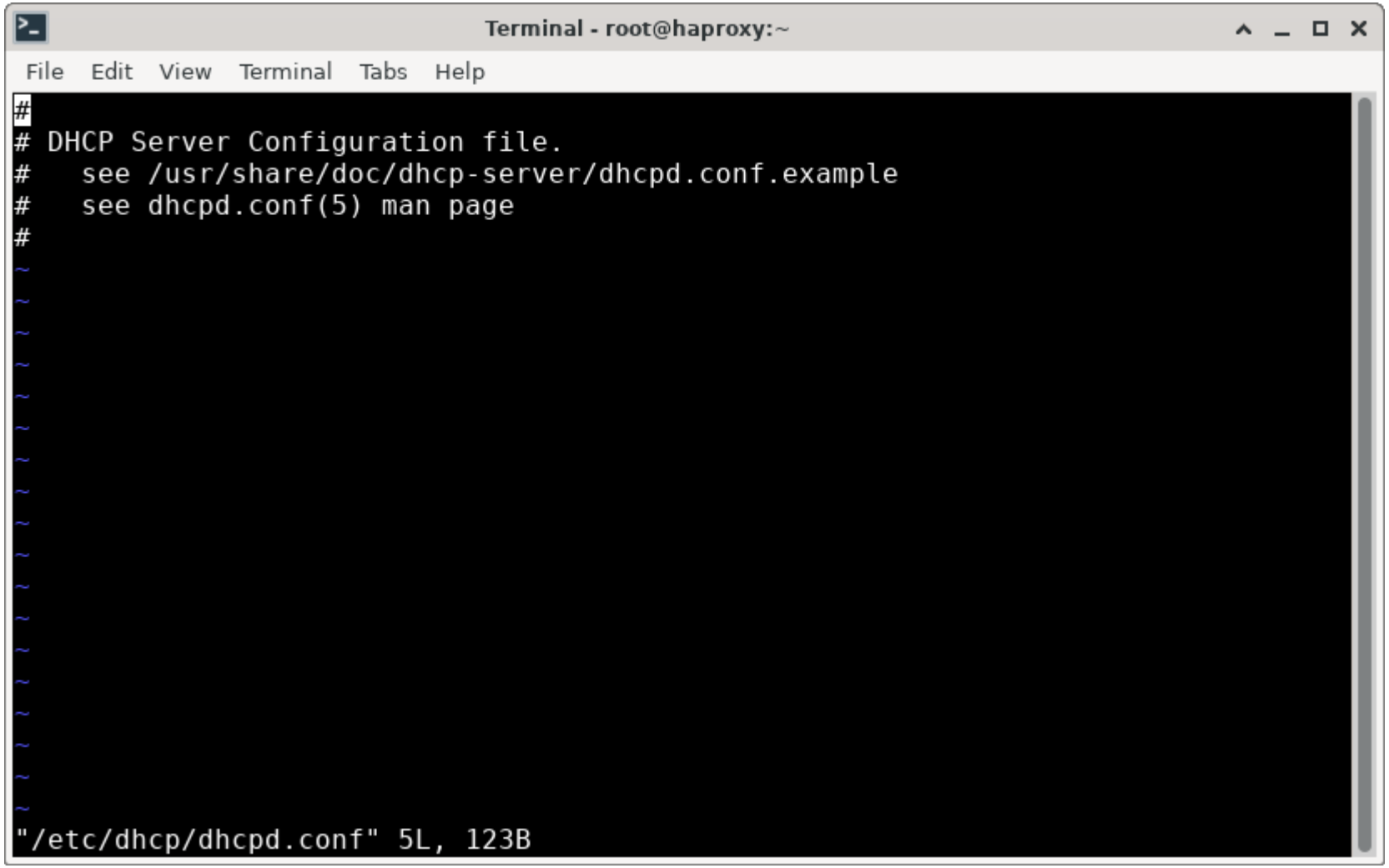
DHCP


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
Install 1 Package
Total download size: 1.3 M
Installed size: 4.1 M
Downloading Packages:
dhcp-server-4.4.3-9.P1.fc39.x86_64.rpm 2.4 MB/s | 1.3 MB 00:00
Total 1.6 MB/s | 1.3 MB 00:00
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
Preparing : 1/1
Running scriptlet: dhcp-server-12:4.4.3-9.P1.fc39.x86_64 1/1
Installing : dhcp-server-12:4.4.3-9.P1.fc39.x86_64 1/1
Running scriptlet: dhcp-server-12:4.4.3-9.P1.fc39.x86_64 1/1
Verifying : dhcp-server-12:4.4.3-9.P1.fc39.x86_64 1/1
Installed:
dhcp-server-12:4.4.3-9.P1.fc39.x86_64
Complete!
root@haproxy:~#

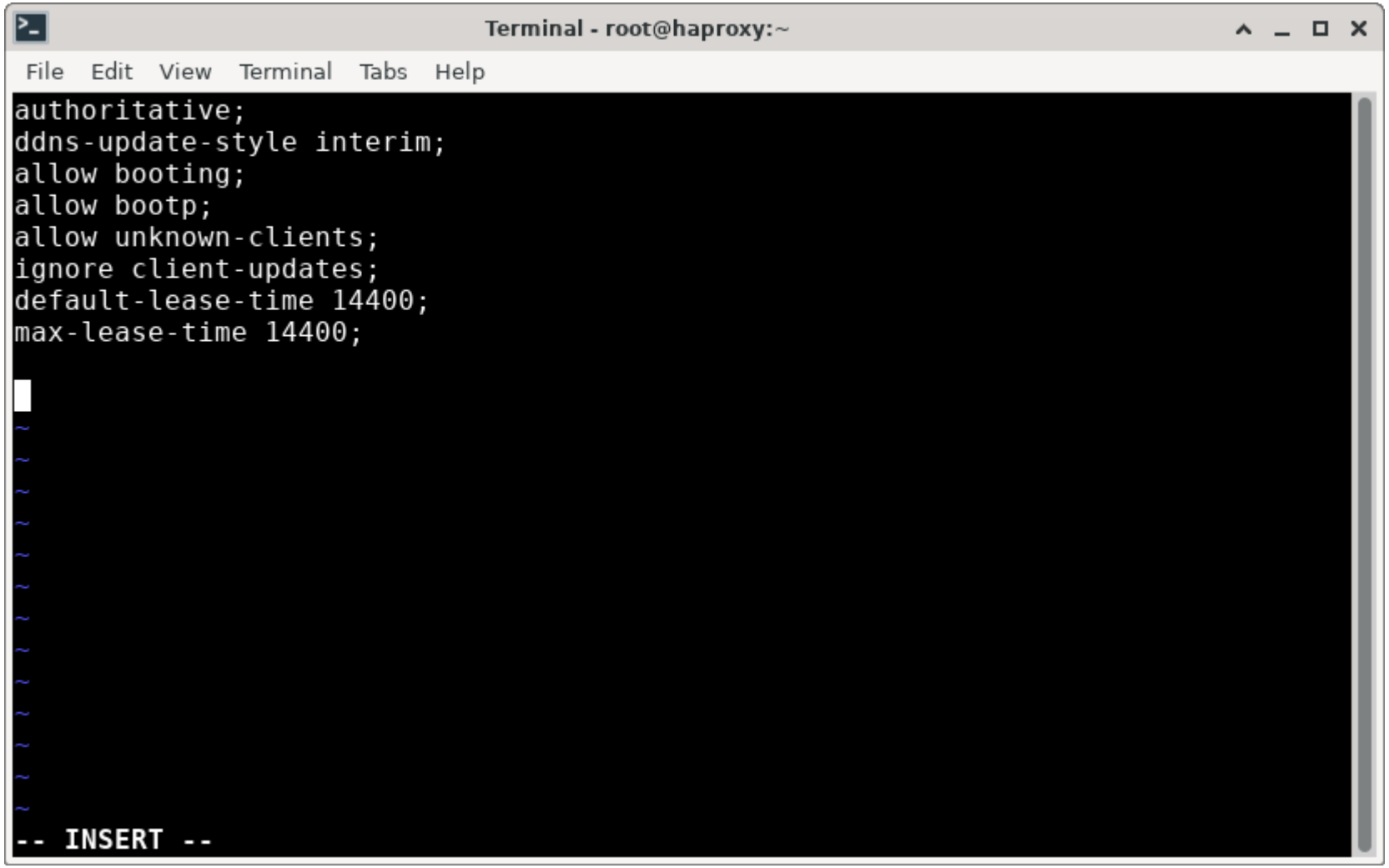
DHCP


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# vi /etc/dhcp/dhcpd.conf

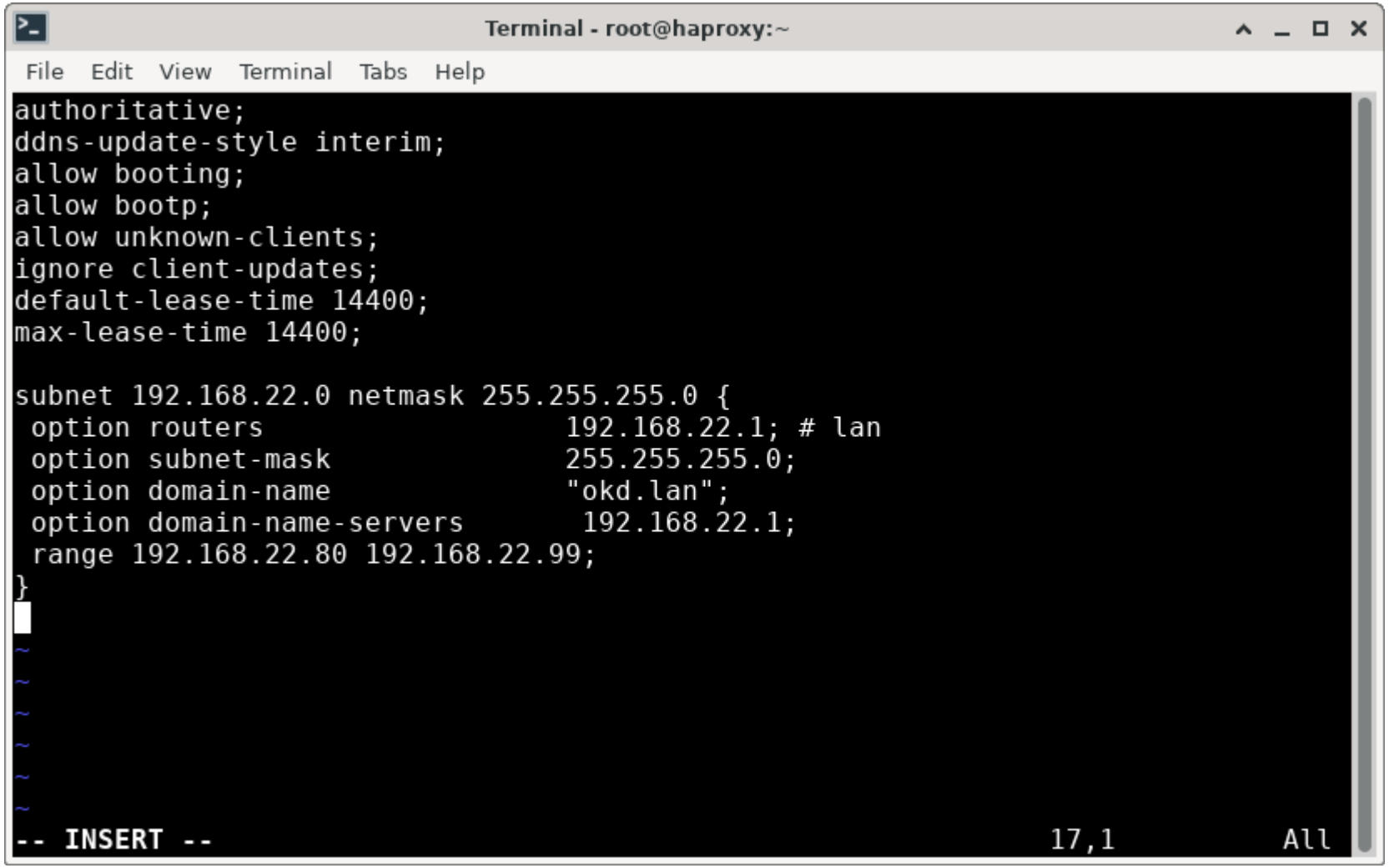
DHCP


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
#
DHCP Server Configuration file.
see /usr/share/doc/dhcp-server/dhcpd.conf.example
see dhcpd.conf(5) man page
#
"/etc/dhcp/dhcpd.conf" 5L, 123B

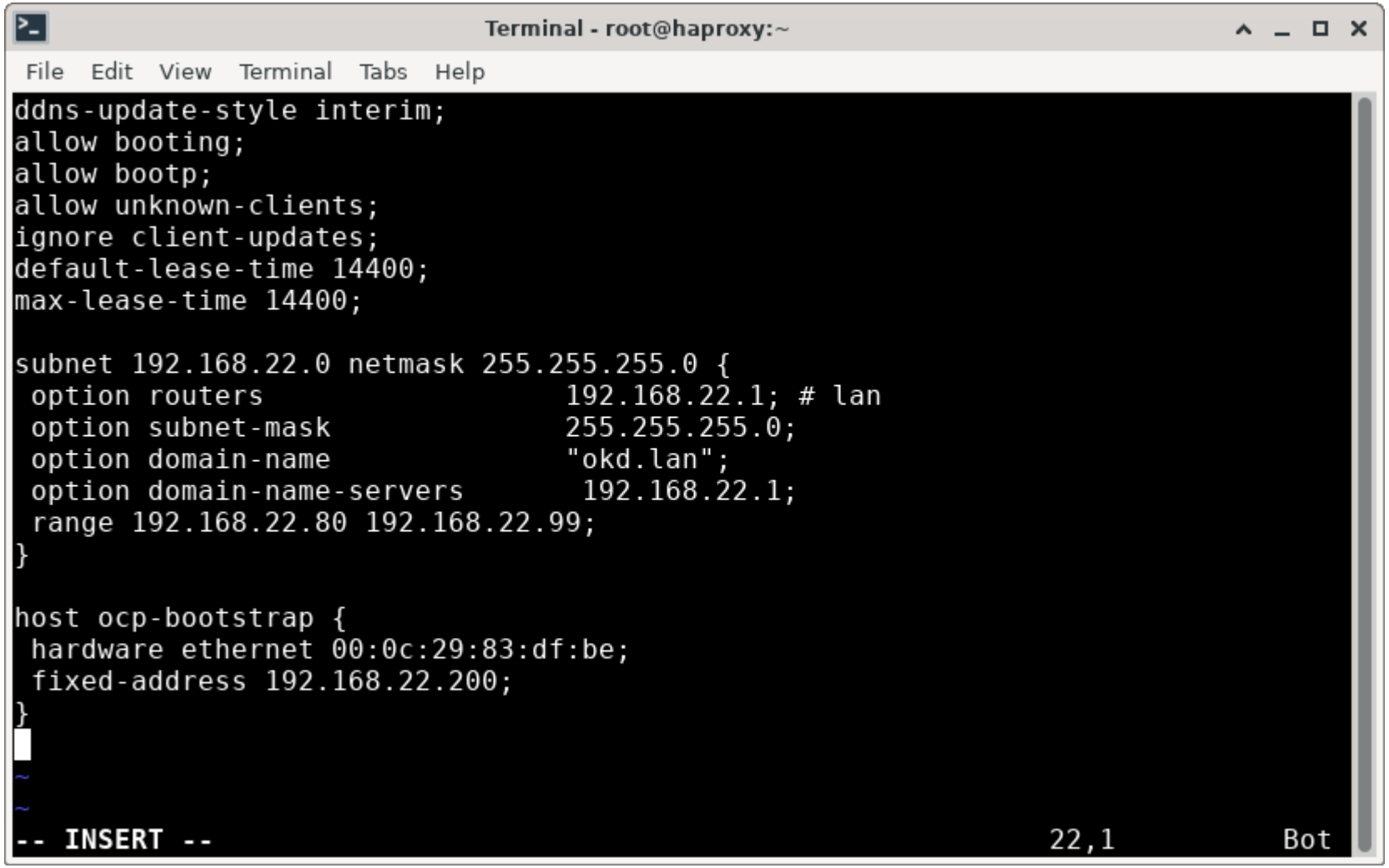
DHCP


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
authoritative;
ddns-update-style interim;
allow booting;
allow bootp;
allow unknown-clients;
ignore client-updates;
default-lease-time 14400;
max-lease-time 14400;
-- INSERT --

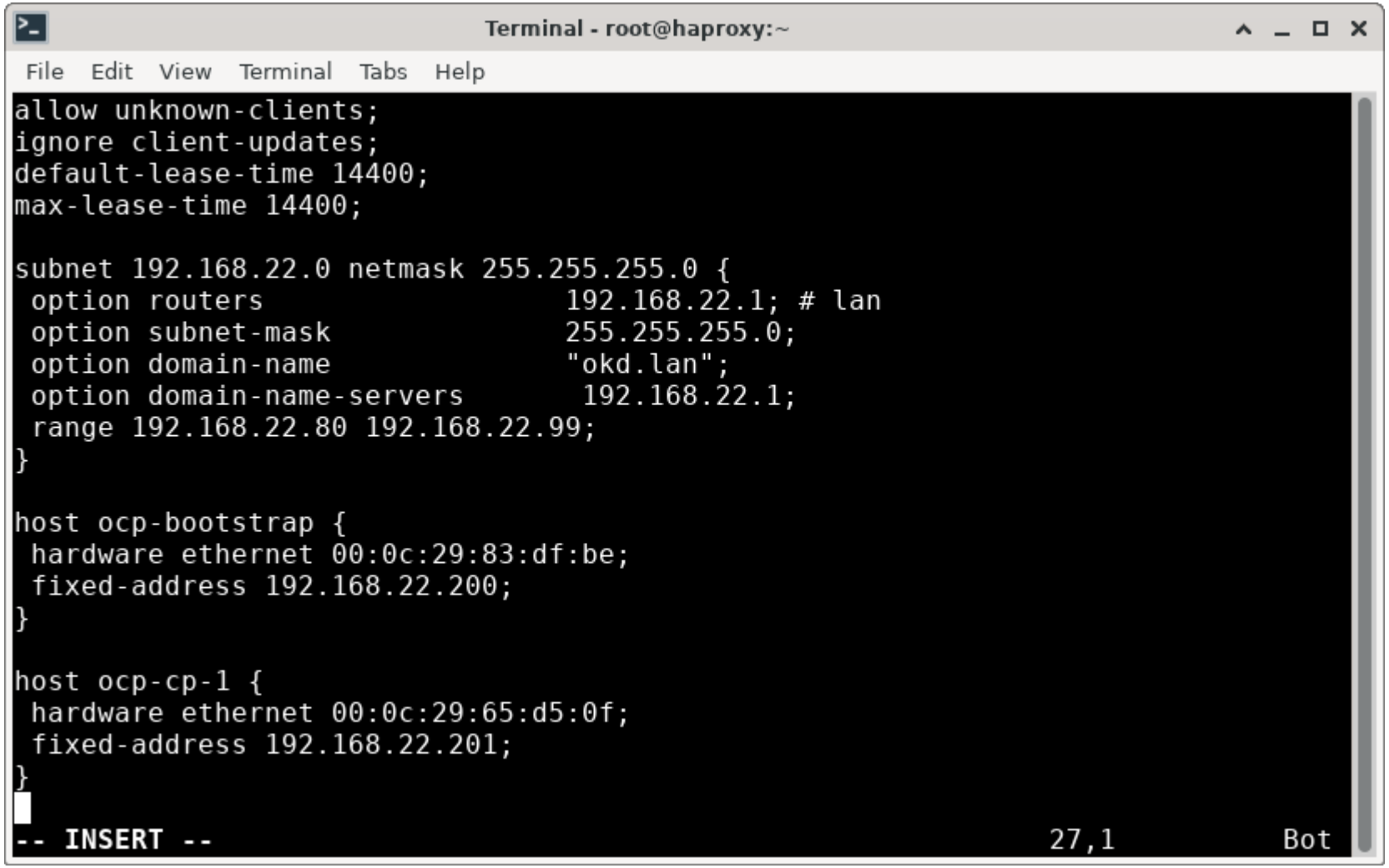
DHCP


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
authoritative;
ddns-update-style interim;
allow booting;
allow bootp;
allow unknown-clients;
ignore client-updates;
default-lease-time 14400;
max-lease-time 14400;
subnet 192.168.22.0 netmask 255.255.255.0 {
option routers 192.168.22.1; # lan
option subnet-mask 255.255.255.0;
option domain-name "okd.lan";
option domain-name-servers 192.168.22.1;
range 192.168.22.80 192.168.22.99;
}
-- INSERT -- 17,1 All

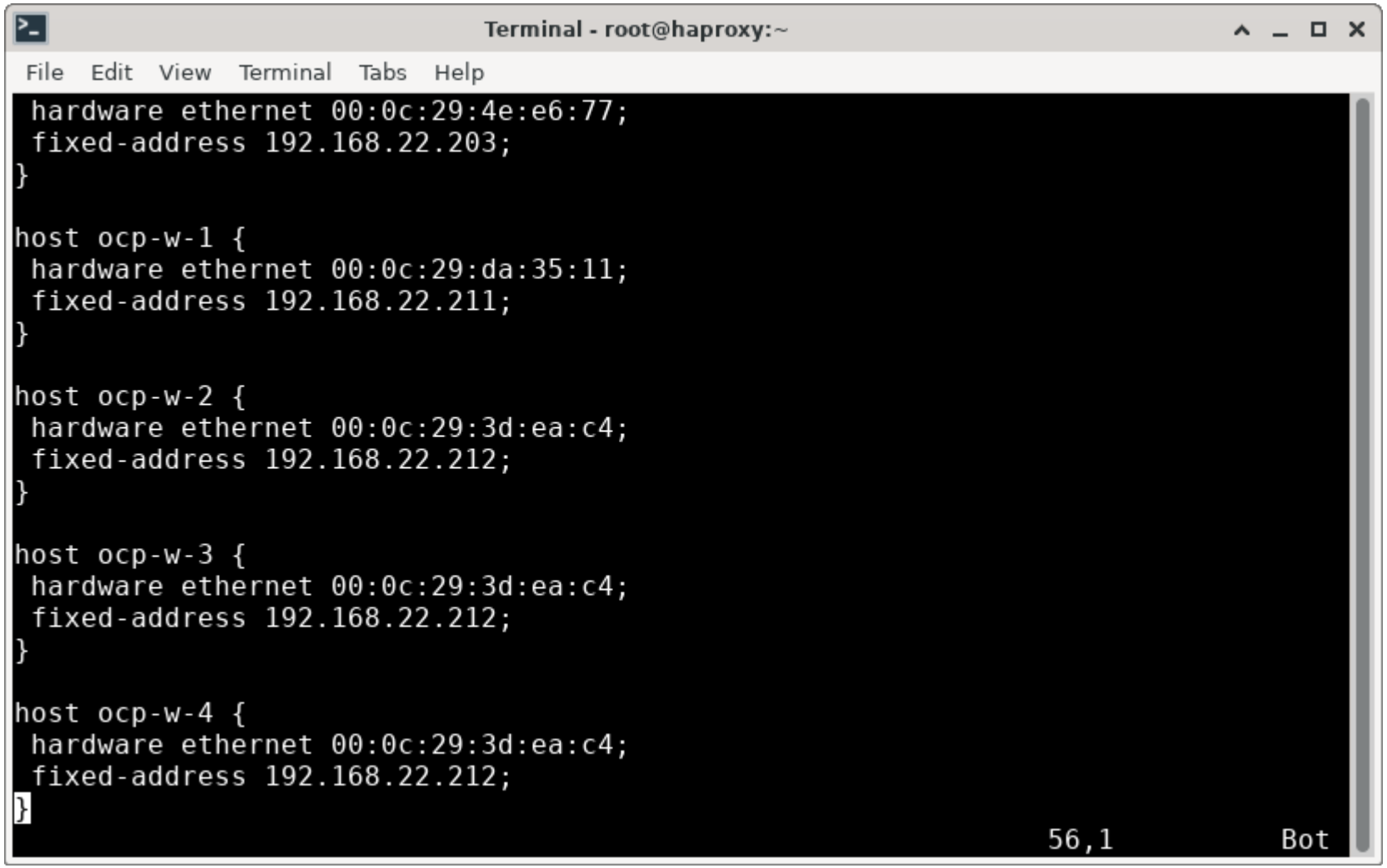
DHCP


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
ddns-update-style interim;
allow booting;
allow bootp;
allow unknown-clients;
ignore client-updates;
default-lease-time 14400;
max-lease-time 14400;
subnet 192.168.22.0 netmask 255.255.255.0 {
option routers 192.168.22.1; # lan
option subnet-mask 255.255.255.0;
option domain-name "okd.lan";
option domain-name-servers 192.168.22.1;
range 192.168.22.80 192.168.22.99;
}
host ocp-bootstrap {
hardware ethernet 00:0c:29:83:df:be;
fixed-address 192.168.22.200;
}
-- INSERT -- 22,1 Bot

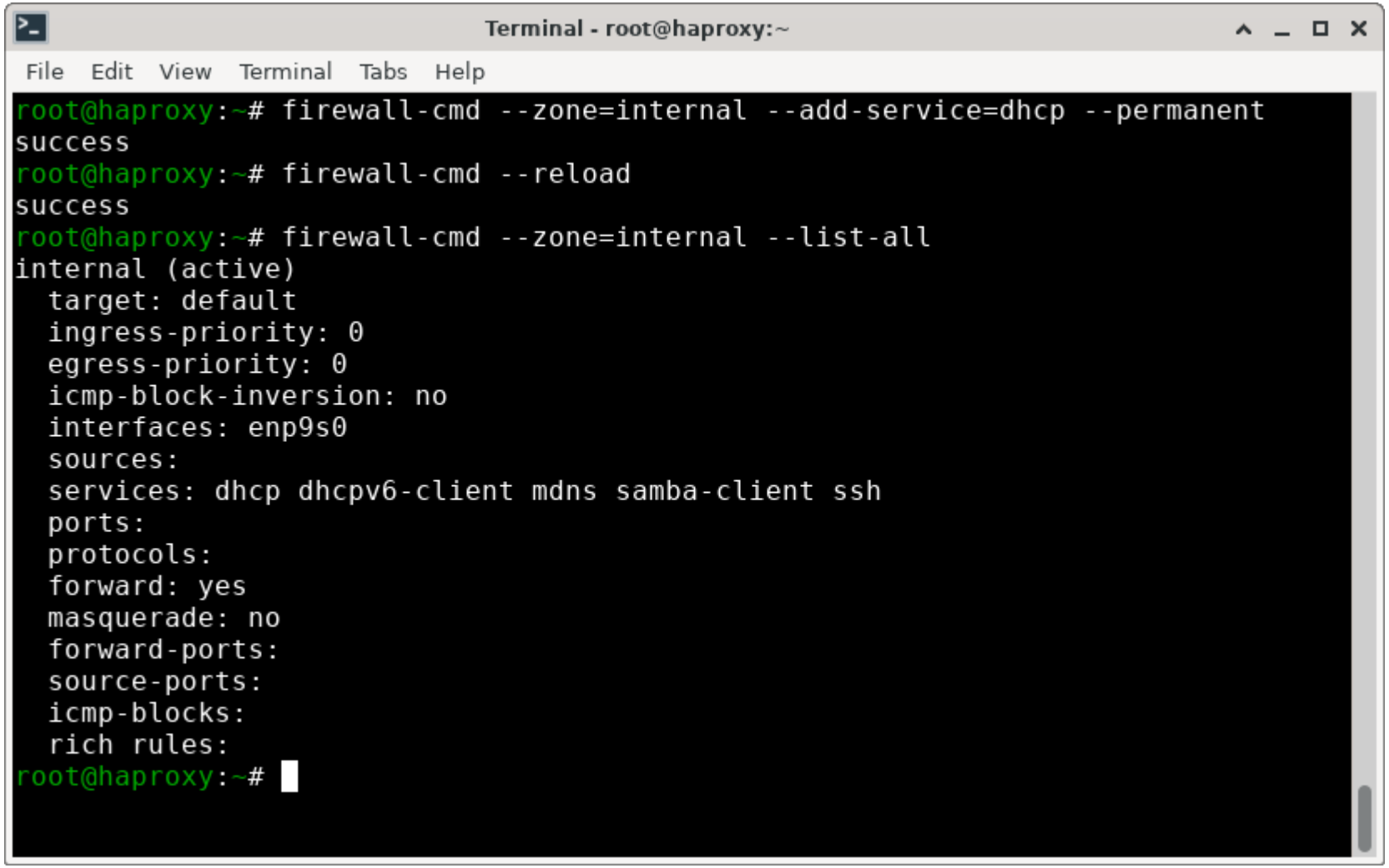
DHCP


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
allow unknown-clients;
ignore client-updates;
default-lease-time 14400;
max-lease-time 14400;
subnet 192.168.22.0 netmask 255.255.255.0 {
option routers 192.168.22.1; # lan
option subnet-mask 255.255.255.0;
option domain-name "okd.lan";
option domain-name-servers 192.168.22.1;
range 192.168.22.80 192.168.22.99;
}
host ocp-bootstrap {
hardware ethernet 00:0c:29:83:df:be;
fixed-address 192.168.22.200;
}
host ocp-cp-1 {
hardware ethernet 00:0c:29:65:d5:0f;
fixed-address 192.168.22.201;
}
-- INSERT -- 27,1 Bot

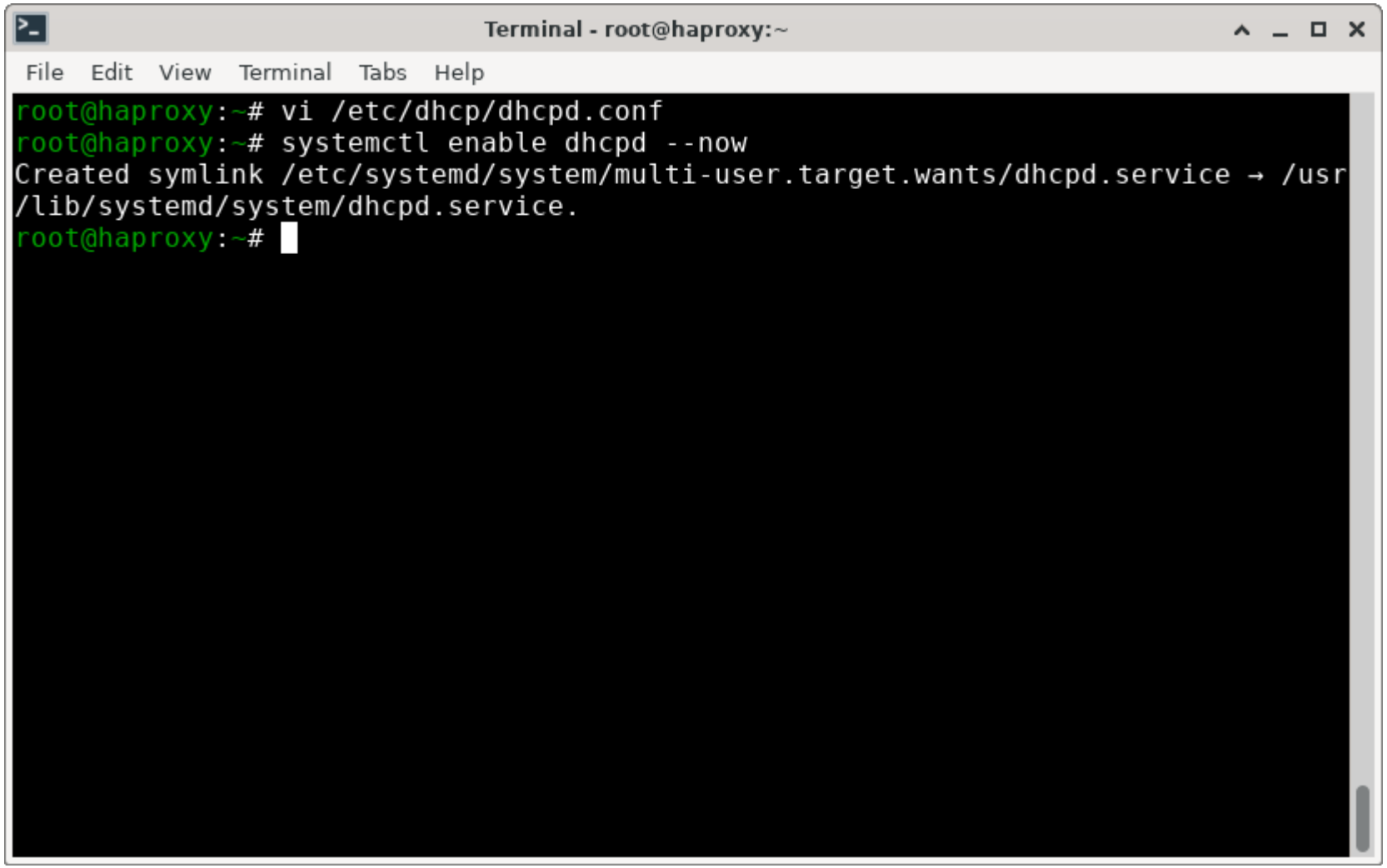
DHCP


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
hardware ethernet 00:0c:29:4e:e6:77;
fixed-address 192.168.22.203;
}
host ocp-w-1 {
hardware ethernet 00:0c:29:da:35:11;
fixed-address 192.168.22.211;
}
host ocp-w-2 {
hardware ethernet 00:0c:29:3d:ea:c4;
fixed-address 192.168.22.212;
}
host ocp-w-3 {
hardware ethernet 00:0c:29:3d:ea:c4;
fixed-address 192.168.22.212;
}
host ocp-w-4 {
hardware ethernet 00:0c:29:3d:ea:c4;
fixed-address 192.168.22.212;
}
56,1 Bot

DHCP


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# firewall-cmd --zone=internal --add-service=dhcp --permanent
success
root@haproxy:~# firewall-cmd --reload
success
root@haproxy:~# firewall-cmd --zone=internal --list-all
internal (active)
target: default
ingress-priority: 0
egress-priority: 0
icmp-block-inversion: no
interfaces: enp9s0
sources:
services: dhcp dhcpv6-client mdns samba-client ssh
ports:
protocols:
forward: yes
masquerade: no
forward-ports:
source-ports:
icmp-blocks:
rich rules:
root@haproxy:~#

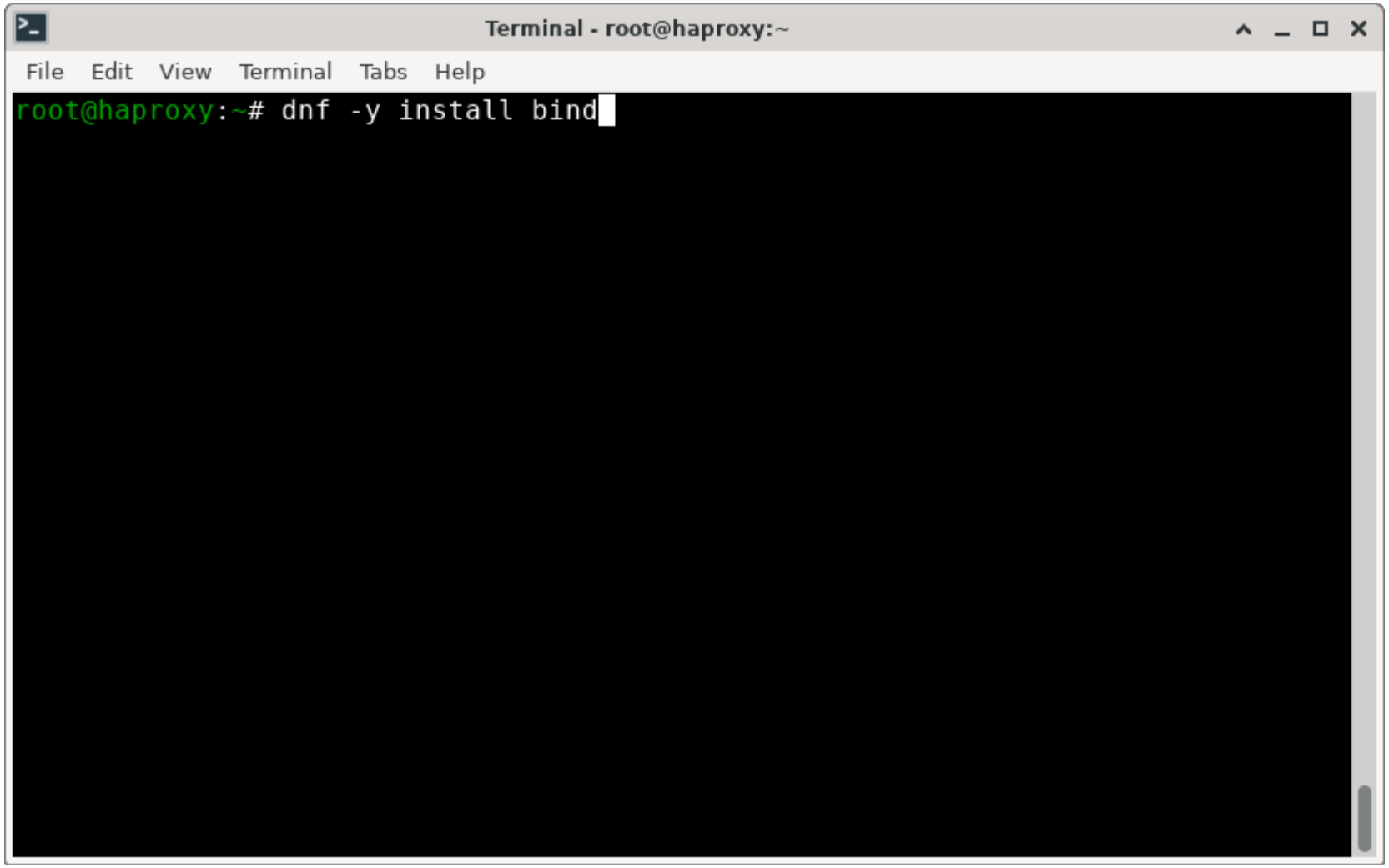
DHCP


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# vi /etc/dhcp/dhcpd.conf
root@haproxy:~# systemctl enable dhcpd --now
Created symlink /etc/systemd/system/multi-user.target.wants/dhcpd.service → /usr
/lib/systemd/system/dhcpd.service.
root@haproxy:~#

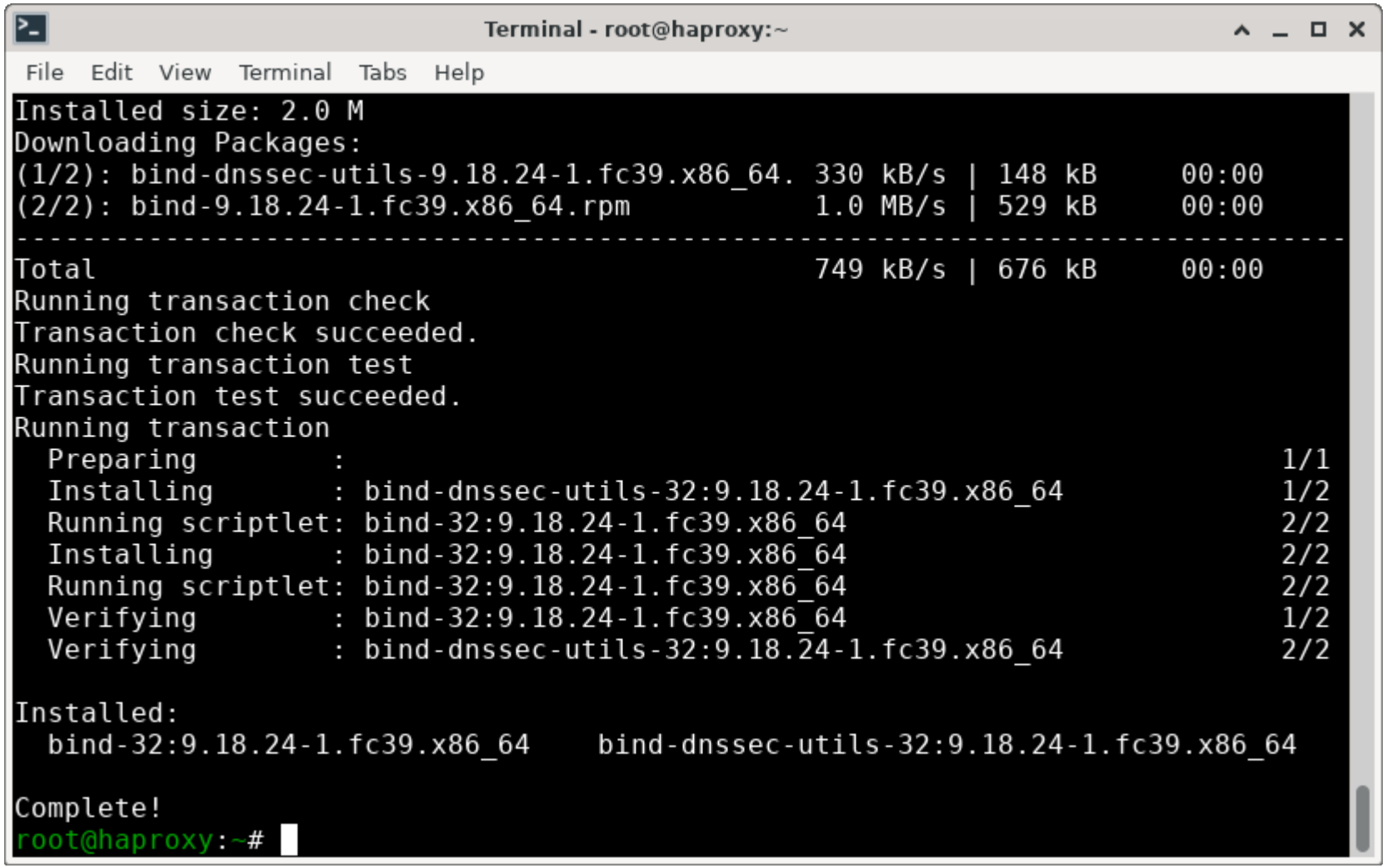
DNS

- The production network already has DNS, but the private network doesn’t
- It would be easy to argue that this cluster is so small that we could get away with /etc/hosts files, but OKD uses a BUNCH of hostnames. A DNS wildcard is quick and easy.

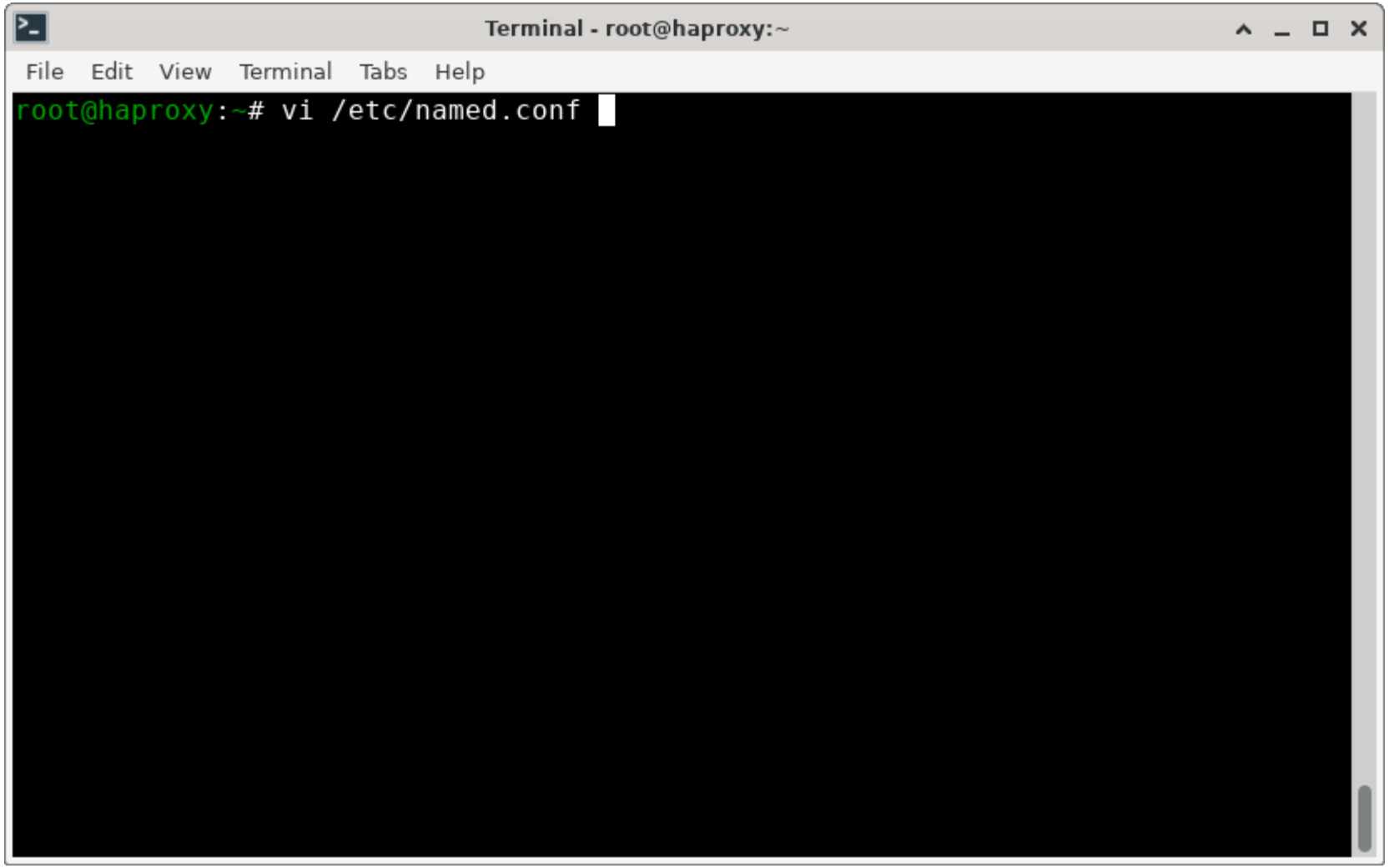
DNS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# dnf -y install bind

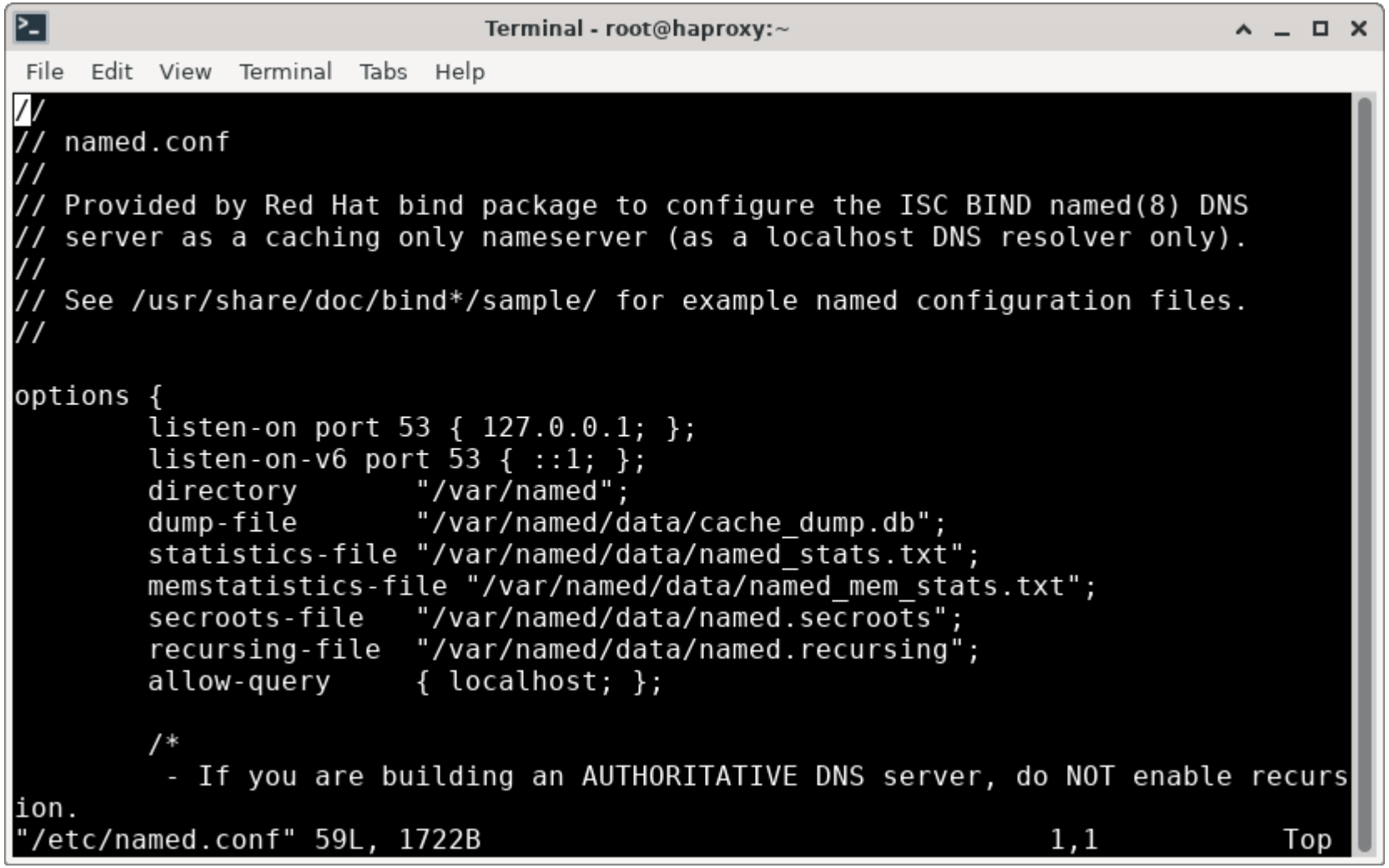
DNS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
Installed size: 2.0 M
Downloading Packages:
(1/2): bind-dnssec-utils-9.18.24-1.fc39.x86_64. 330 kB/s | 148 kB 00:00
(2/2): bind-9.18.24-1.fc39.x86_64.rpm 1.0 MB/s | 529 kB 00:00
Total 749 kB/s | 676 kB 00:00
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
Preparing : 1/1
Installing : bind-dnssec-utils-32:9.18.24-1.fc39.x86_64 1/2
Running scriptlet: bind-32:9.18.24-1.fc39.x86_64 2/2
Installing : bind-32:9.18.24-1.fc39.x86_64 2/2
Running scriptlet: bind-32:9.18.24-1.fc39.x86_64 2/2
Verifying : bind-32:9.18.24-1.fc39.x86_64 1/2
Verifying : bind-dnssec-utils-32:9.18.24-1.fc39.x86_64 2/2
Installed:
bind-32:9.18.24-1.fc39.x86_64 bind-dnssec-utils-32:9.18.24-1.fc39.x86_64
Complete!
root@haproxy:~#

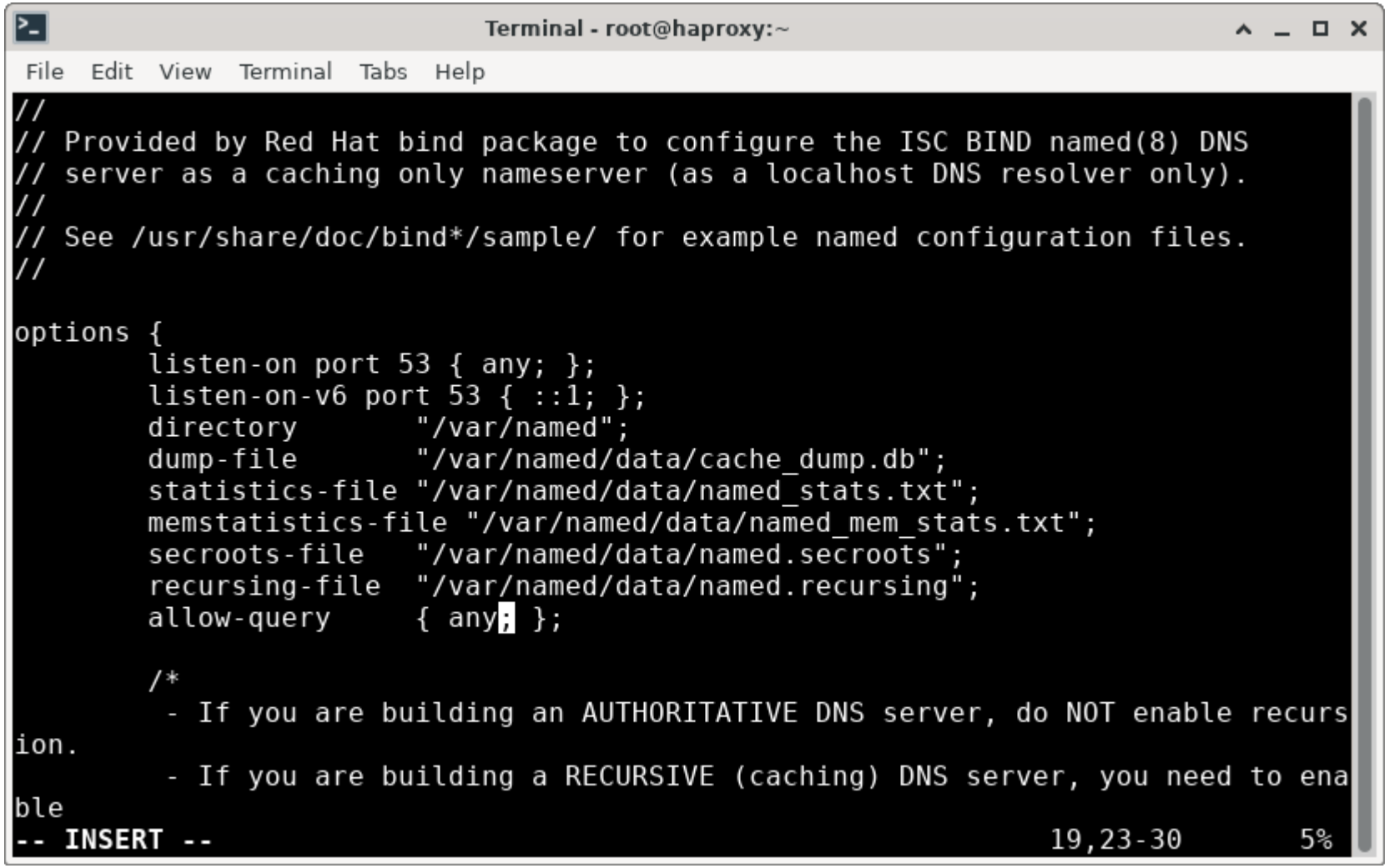
DNS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# vi /etc/named.conf

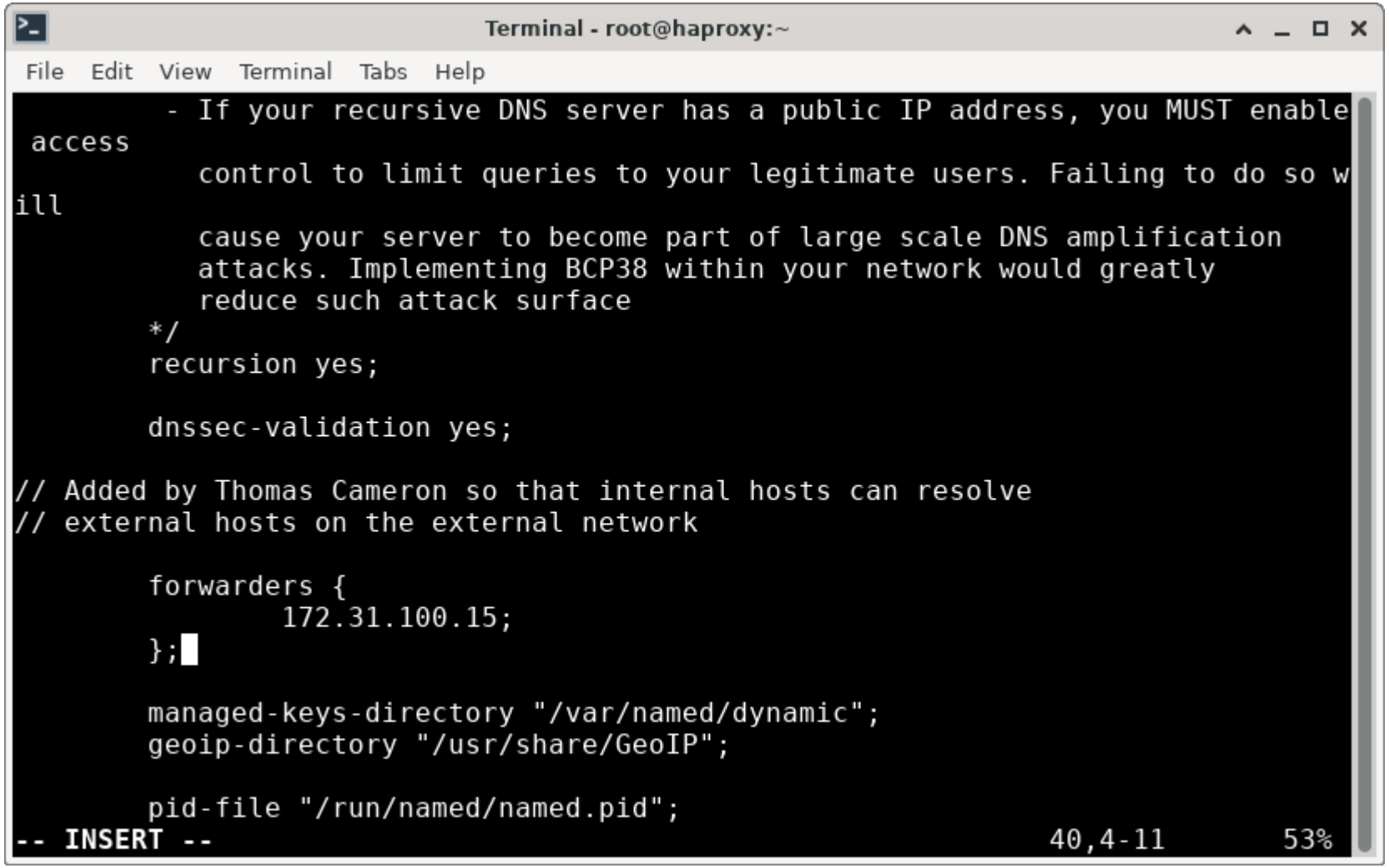
DNS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
//
// named.conf
//
// Provided by Red Hat bind package to configure the ISC BIND named(8) DNS
// server as a caching only nameserver (as a localhost DNS resolver only).
//
// See /usr/share/doc/bind*/sample/ for example named configuration files.
//
options {
listen-on port 53 { 127.0.0.1; };
listen-on-v6 port 53 { ::1; };
directory "/var/named";
dump-file "/var/named/data/cache_dump.db";
statistics-file "/var/named/data/named_stats.txt";
memstatistics-file "/var/named/data/named_mem_stats.txt";
secroots-file "/var/named/data/named.secroots";
recursing-file "/var/named/data/named.recursing";
allow-query { localhost; };
/*
- If you are building an AUTHORITATIVE DNS server, do NOT enable recurs
ion.
"/etc/named.conf" 59L, 1722B 1,1 Top

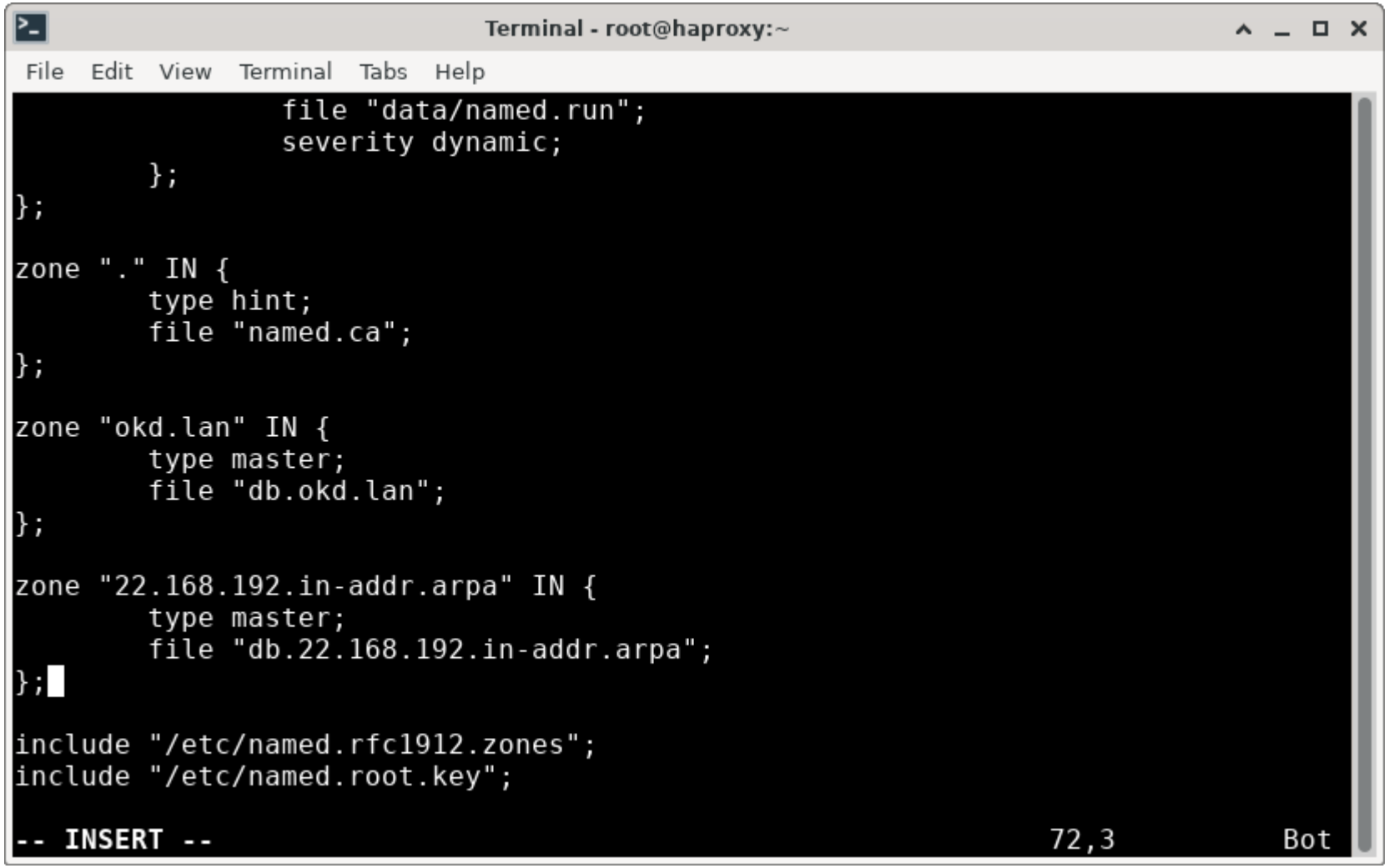
DNS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
//
// Provided by Red Hat bind package to configure the ISC BIND named(8) DNS
// server as a caching only nameserver (as a localhost DNS resolver only).
//
// See /usr/share/doc/bind*/sample/ for example named configuration files.
//
options {
listen-on port 53 { any; };
listen-on-v6 port 53 { ::1; };
directory "/var/named";
dump-file "/var/named/data/cache_dump.db";
statistics-file "/var/named/data/named_stats.txt";
memstatistics-file "/var/named/data/named_mem_stats.txt";
secroots-file "/var/named/data/named.secroots";
recursing-file "/var/named/data/named.recursing";
allow-query { any; };
/*
- If you are building an AUTHORITATIVE DNS server, do NOT enable recurs
ion.
- If you are building a RECURSIVE (caching) DNS server, you need to ena
ble
-- INSERT --
19,23-30
5%

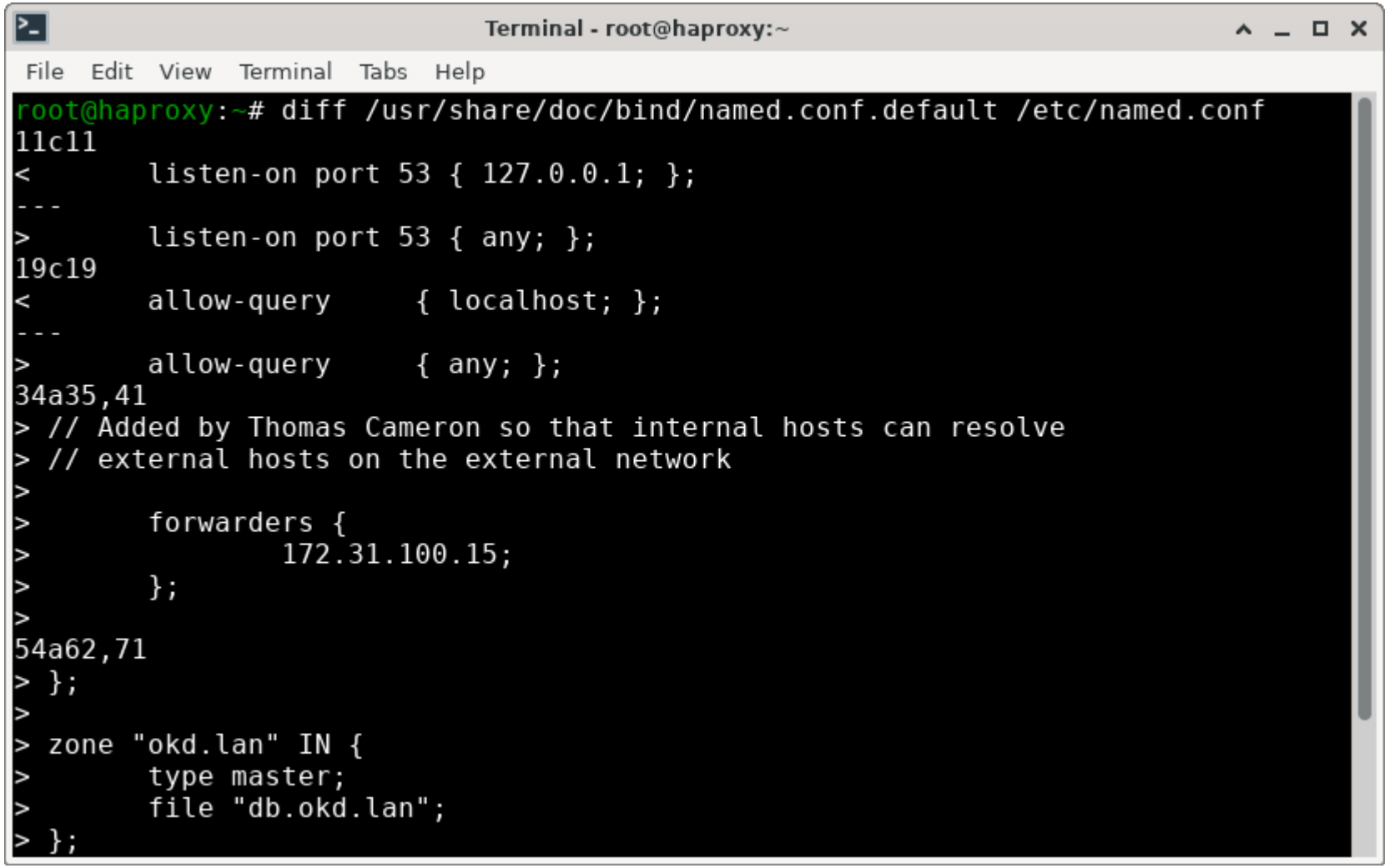
DNS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
- If your recursive DNS server has a public IP address, you MUST enable
access
control to limit queries to your legitimate users. Failing to do so w
ill
cause your server to become part of large scale DNS amplification
attacks. Implementing BCP38 within your network would greatly
reduce such attack surface
*/
recursion yes;
dnssec-validation yes;
// Added by Thomas Cameron so that internal hosts can resolve
// external hosts on the external network
forwarders {
172.31.100.15;
};
managed-keys-directory "/var/named/dynamic";
geoip-directory "/usr/share/GeoIP";
pid-file "/run/named/named.pid";
-- INSERT --
40,4-11
53%

DNS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
file "data/named.run";
severity dynamic;
};
};
zone "." IN {
type hint;
file "named.ca";
};
zone "okd.lan" IN {
type master;
file "db.okd.lan";
};
zone "22.168.192.in-addr.arpa" IN {
type master;
file "db.22.168.192.in-addr.arpa";
};
include "/etc/named.rfc1912.zones";
include "/etc/named.root.key";
-- INSERT -- 72,3 Bot

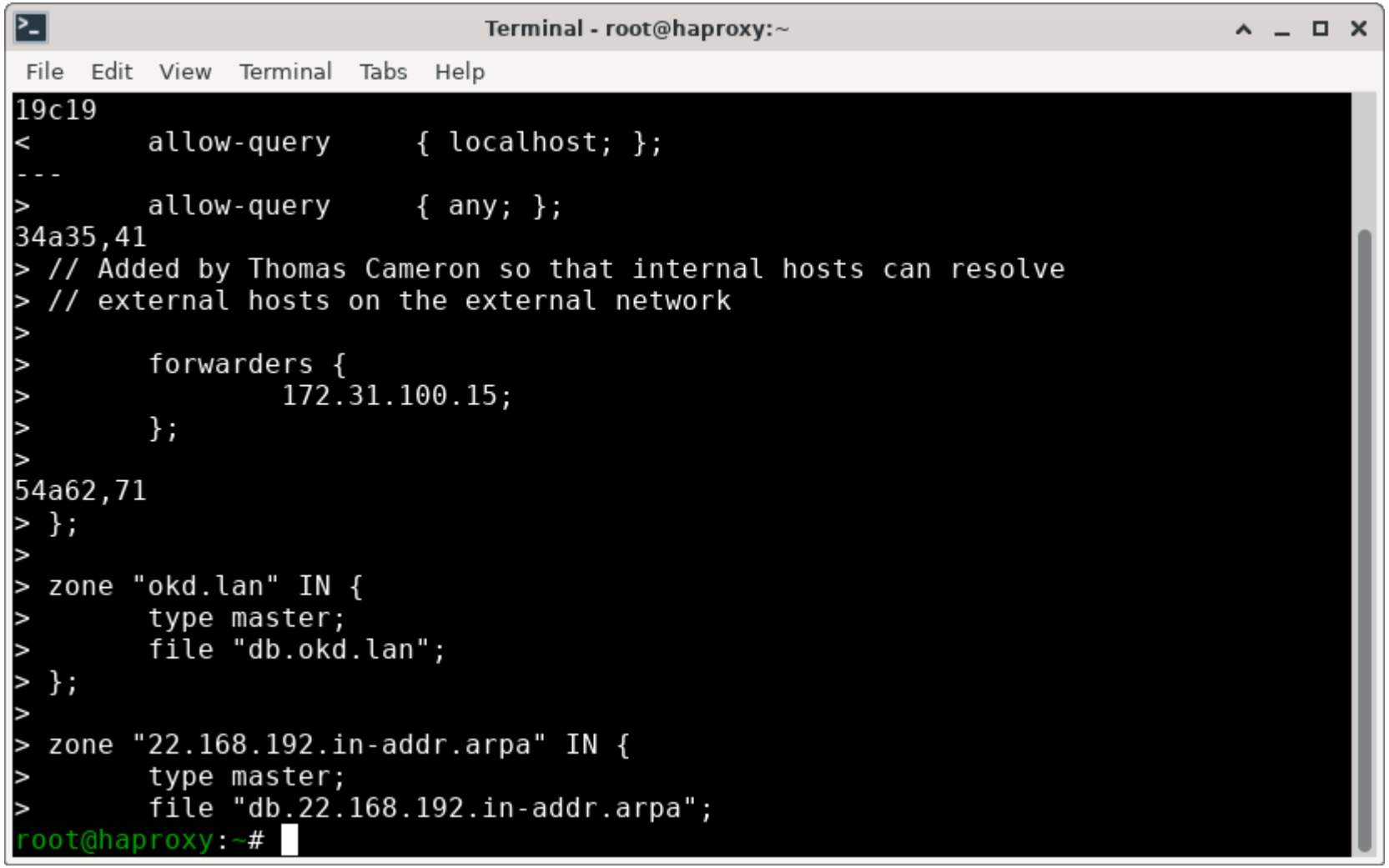
DNS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# diff /usr/share/doc/bind/named.conf.default /etc/named.conf
11c11
<   listen-on port 53 { 127.0.0.1; };

>   listen-on port 53 { any; };
19c19
<   allow-query   { localhost; };

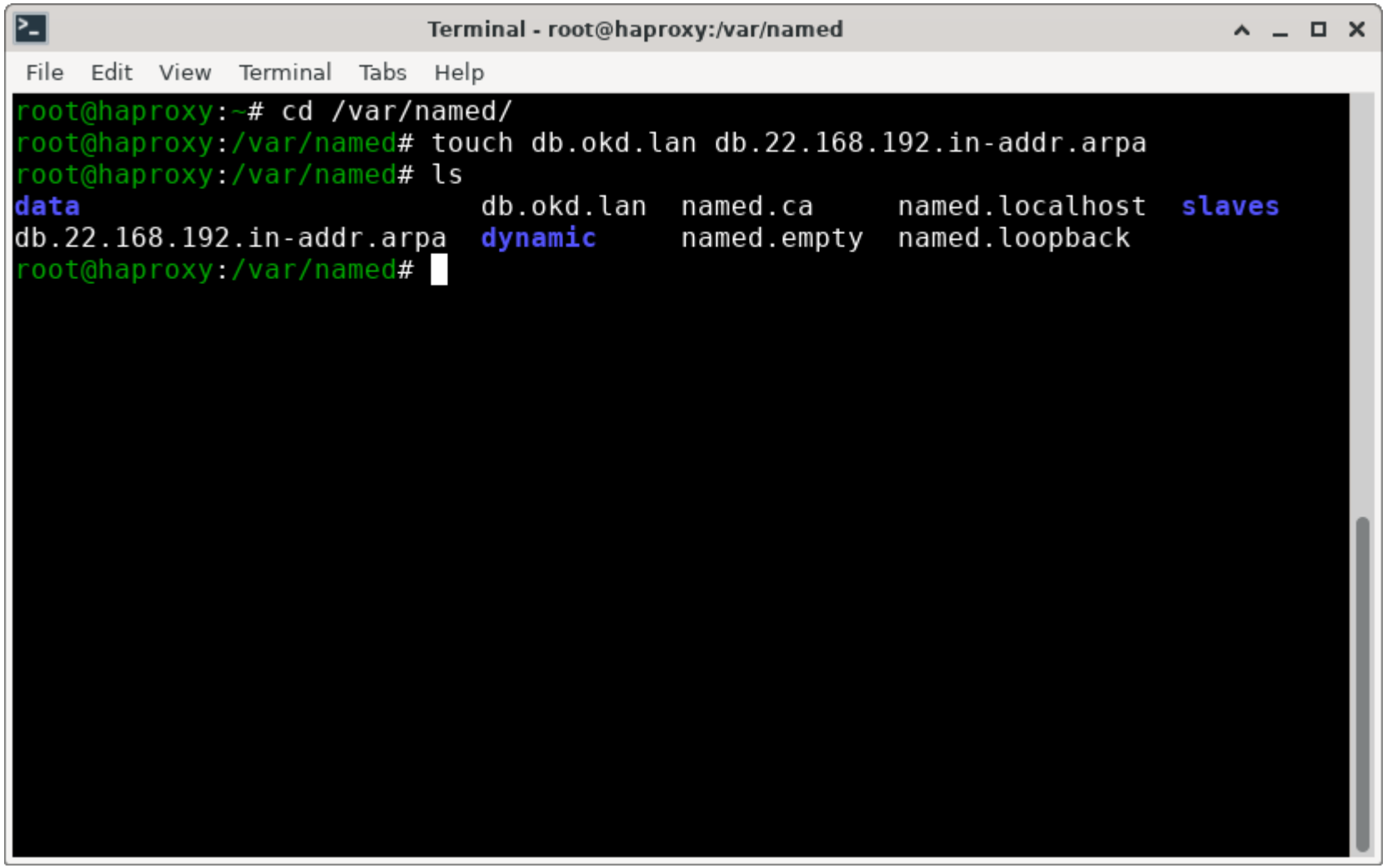
>   allow-query   { any; };
34a35,41
> // Added by Thomas Cameron so that internal hosts can resolve
> // external hosts on the external network
>
>   forwarders {
>   172.31.100.15;
>   };
>
54a62,71
> };
>
> zone "okd.lan" IN {
>   type master;
>   file "db.okd.lan";
> };

DNS

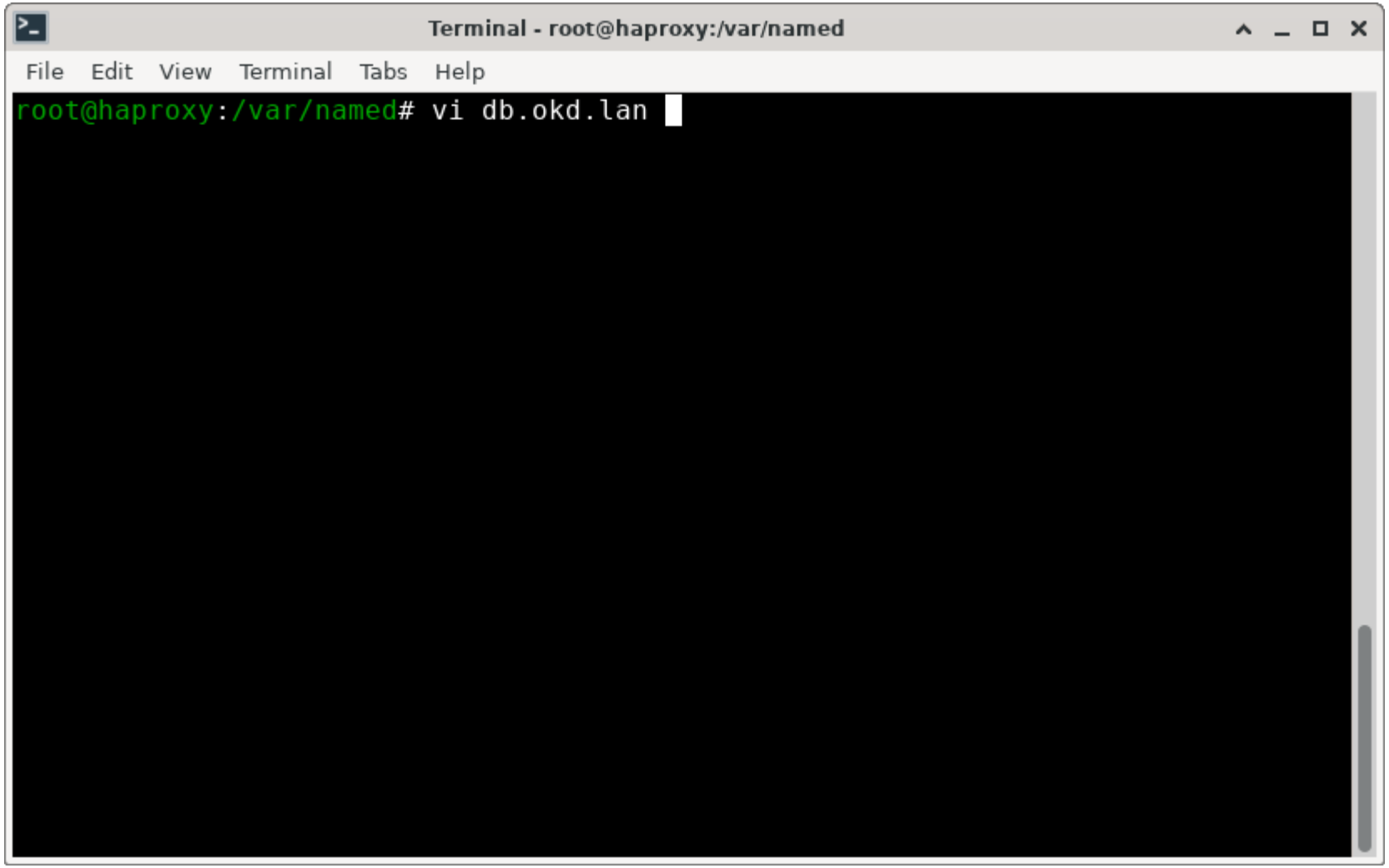

Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
19c19
< allow-query { localhost; };

> allow-query { any; };
34a35,41
> // Added by Thomas Cameron so that internal hosts can resolve
> // external hosts on the external network
>
> forwarders {
> 172.31.100.15;
> };
>
54a62,71
> };
>
> zone "okd.lan" IN {
> type master;
> file "db.okd.lan";
> };
>
> zone "22.168.192.in-addr.arpa" IN {
> type master;
> file "db.22.168.192.in-addr.arpa";
root@haproxy:~#

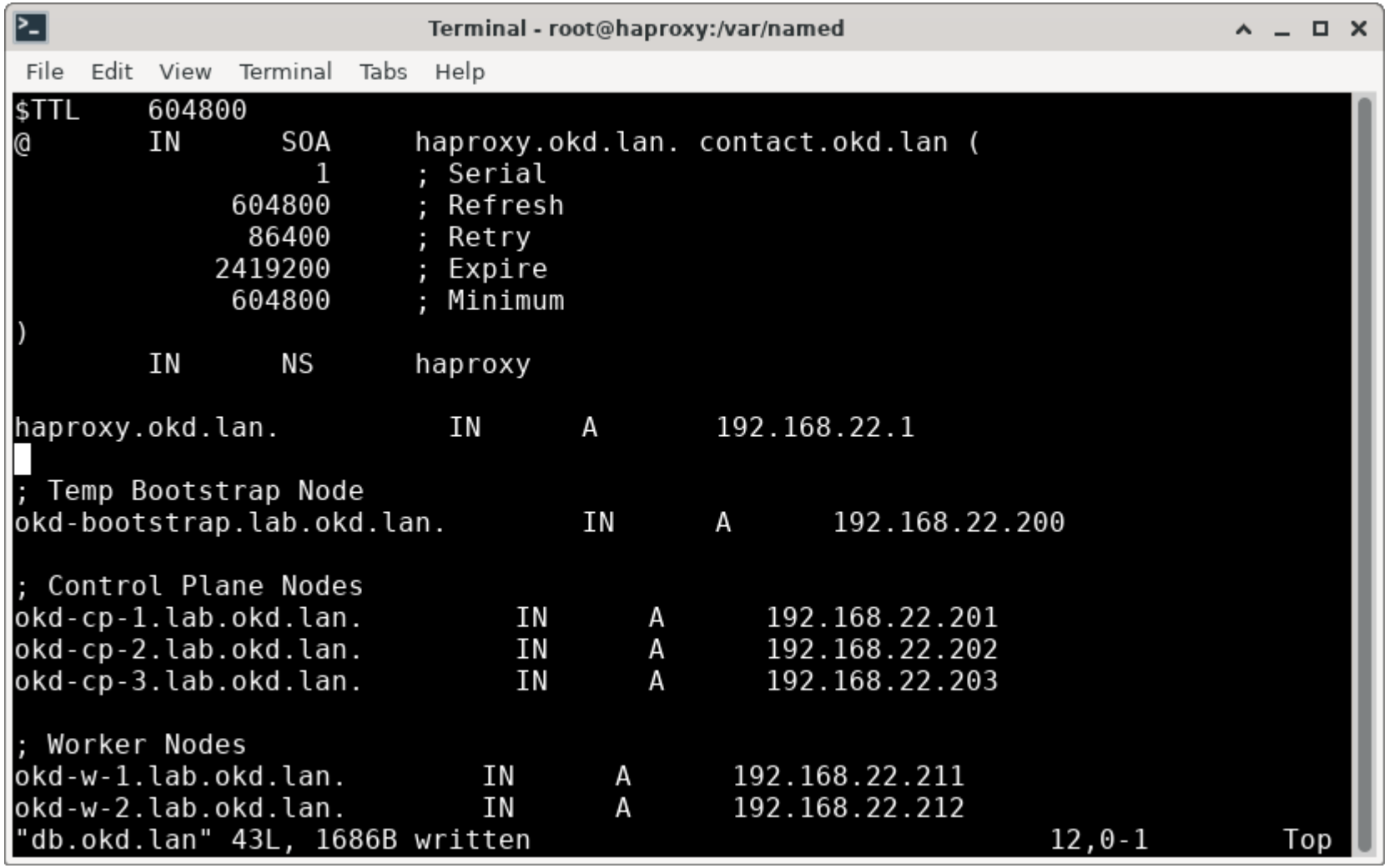
DNS


Terminal - root@haproxy:/var/named
File Edit View Terminal Tabs Help
root@haproxy:~# cd /var/named/
root@haproxy:/var/named# touch db.okd.lan db.22.168.192.in-addr.arpa
root@haproxy:/var/named# ls
data db.okd.lan named.ca named.localhost slaves
db.22.168.192.in-addr.arpa dynamic named.empty named.loopback
root@haproxy:/var/named#

DNS


Terminal - root@haproxy:/var/named
File Edit View Terminal Tabs Help
root@haproxy:/var/named# vi db.okd.lan

DNS


Terminal - root@haproxy:/var/named
File Edit View Terminal Tabs Help
$TTL 604800
@ IN SOA haproxy.okd.lan. contact.okd.lan (
1 ; Serial
604800 ; Refresh
86400 ; Retry
2419200 ; Expire
604800 ; Minimum
)
IN NS haproxy
haproxy.okd.lan. IN A 192.168.22.1
; Temp Bootstrap Node
okd-bootstrap.lab.okd.lan. IN A 192.168.22.200
; Control Plane Nodes
okd-cp-1.lab.okd.lan. IN A 192.168.22.201
okd-cp-2.lab.okd.lan. IN A 192.168.22.202
okd-cp-3.lab.okd.lan. IN A 192.168.22.203
; Worker Nodes
okd-w-1.lab.okd.lan. IN A 192.168.22.211
okd-w-2.lab.okd.lan. IN A 192.168.22.212
"db.okd.lan" 43L, 1686B written
12,0-1 Top

DNS

Terminal - root@haproxy:/var/named

File Edit View Terminal Tabs Help

```
; Worker Nodes
okd-w-1.lab.okd.lan.        IN      A       192.168.22.211
okd-w-2.lab.okd.lan.        IN      A       192.168.22.212
okd-w-3.lab.okd.lan.        IN      A       192.168.22.213
okd-w-4.lab.okd.lan.        IN      A       192.168.22.214

; OpenShift Internal - Load balancer
api.lab.okd.lan.         IN    A    192.168.22.1
api-int.lab.okd.lan.     IN    A    192.168.22.1
*.apps.lab.okd.lan.      IN    A    192.168.22.1

; ETCD Cluster
etcd-0.lab.okd.lan.     IN    A     192.168.22.201
etcd-1.lab.okd.lan.     IN    A     192.168.22.202
etcd-2.lab.okd.lan.     IN    A     192.168.22.203

; OpenShift Internal SRV records (cluster name = lab)
_etcd-server-ssl._tcp.lab.okd.lan.    86400     IN    SRV     0    10    2380
 etcd-0.lab
_etcd-server-ssl._tcp.lab.okd.lan.    86400     IN    SRV     0    10    2380
 etcd-1.lab
_etcd-server-ssl._tcp.lab.okd.lan.    86400     IN    SRV     0    10    2380
 etcd-2.lab
                                                             37,1          86%
```

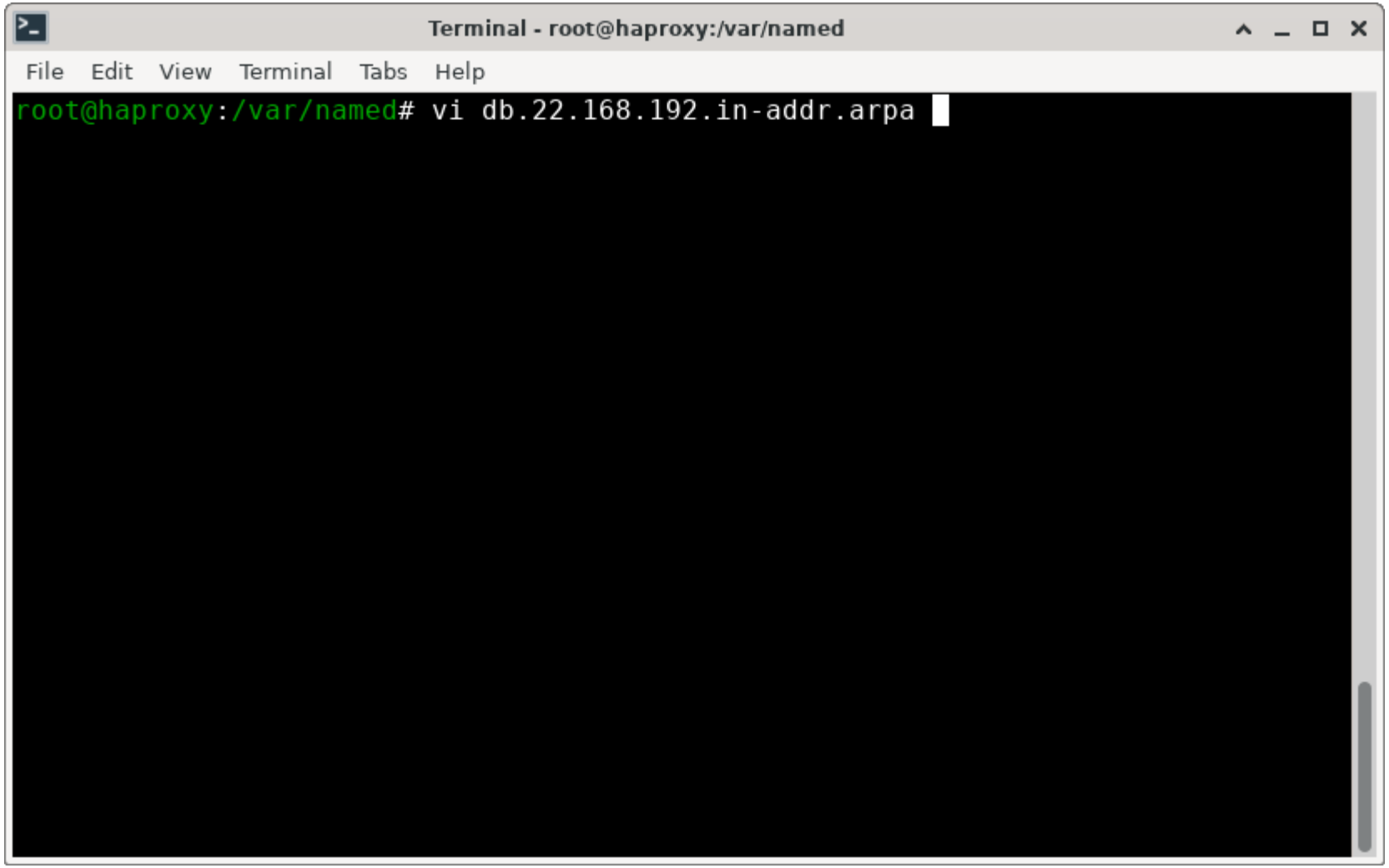
DNS

Terminal - root@haproxy:/var/named

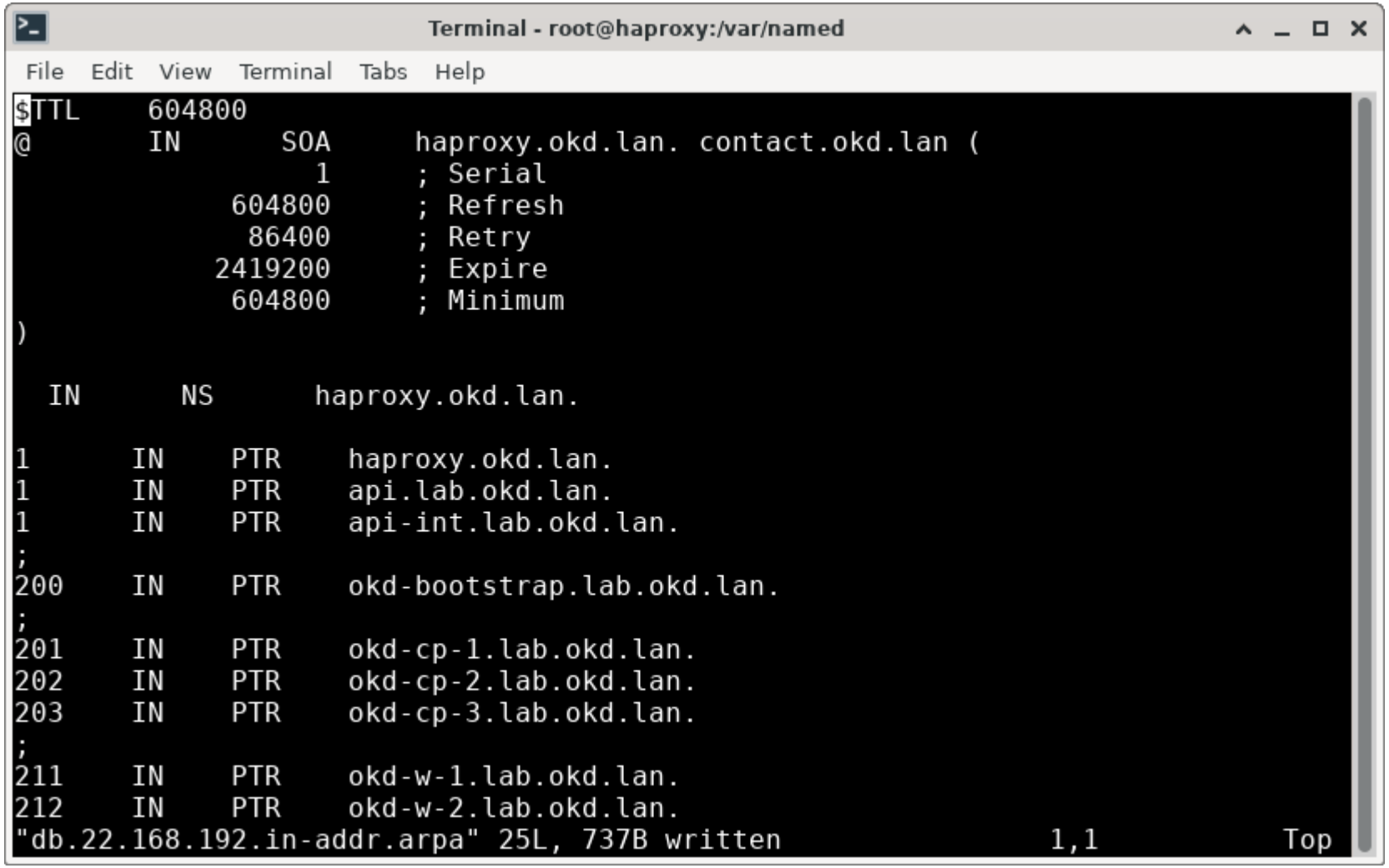
File Edit View Terminal Tabs Help

```
okd-w-3.lab.okd.lan.         IN      A      192.168.22.213
okd-w-4.lab.okd.lan.         IN      A      192.168.22.214

; OpenShift Internal - Load balancer
api.lab.okd.lan.          IN    A    192.168.22.1
api-int.lab.okd.lan.      IN    A    192.168.22.1
*.apps.lab.okd.lan.       IN    A    192.168.22.1

; ETCD Cluster
etcd-0.lab.okd.lan.     IN    A     192.168.22.201
etcd-1.lab.okd.lan.     IN    A     192.168.22.202
etcd-2.lab.okd.lan.     IN    A     192.168.22.203

; OpenShift Internal SRV records (cluster name = lab)
_etcd-server-ssl._tcp.lab.okd.lan.    86400     IN    SRV     0    10    2380
 etcd-0.lab
_etcd-server-ssl._tcp.lab.okd.lan.    86400     IN    SRV     0    10    2380
 etcd-1.lab
_etcd-server-ssl._tcp.lab.okd.lan.    86400     IN    SRV     0    10    2380
 etcd-2.lab

oauth-openshift.apps.lab.okd.lan.      IN     A      192.168.22.1
console-openshift-console.apps.lab.okd.lan.      IN      A     192.168.22.1
                                                              43,1          Bot
```

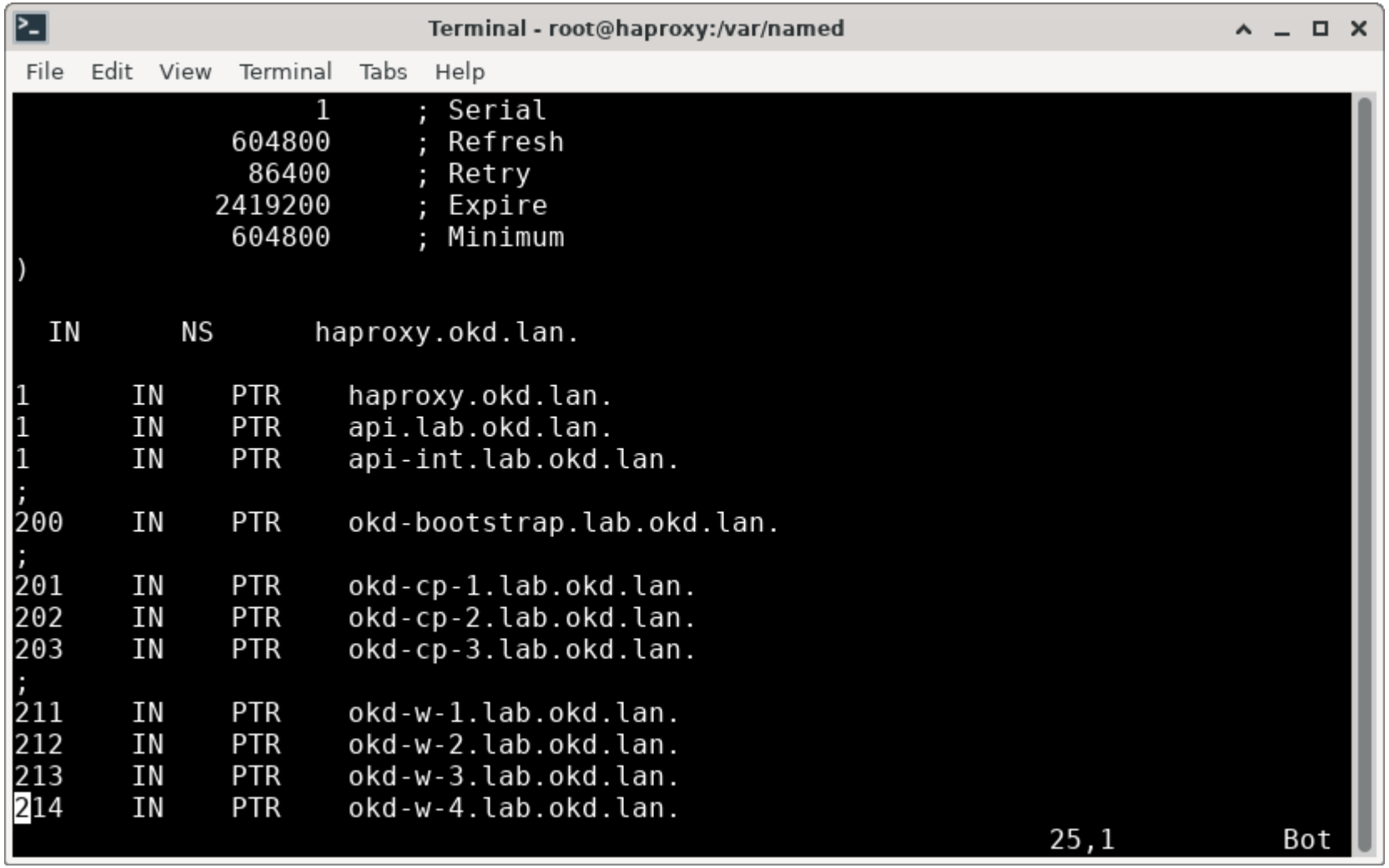
DNS


Terminal - root@haproxy:/var/named
File Edit View Terminal Tabs Help
root@haproxy:/var/named# vi db.22.168.192.in-addr.arpa

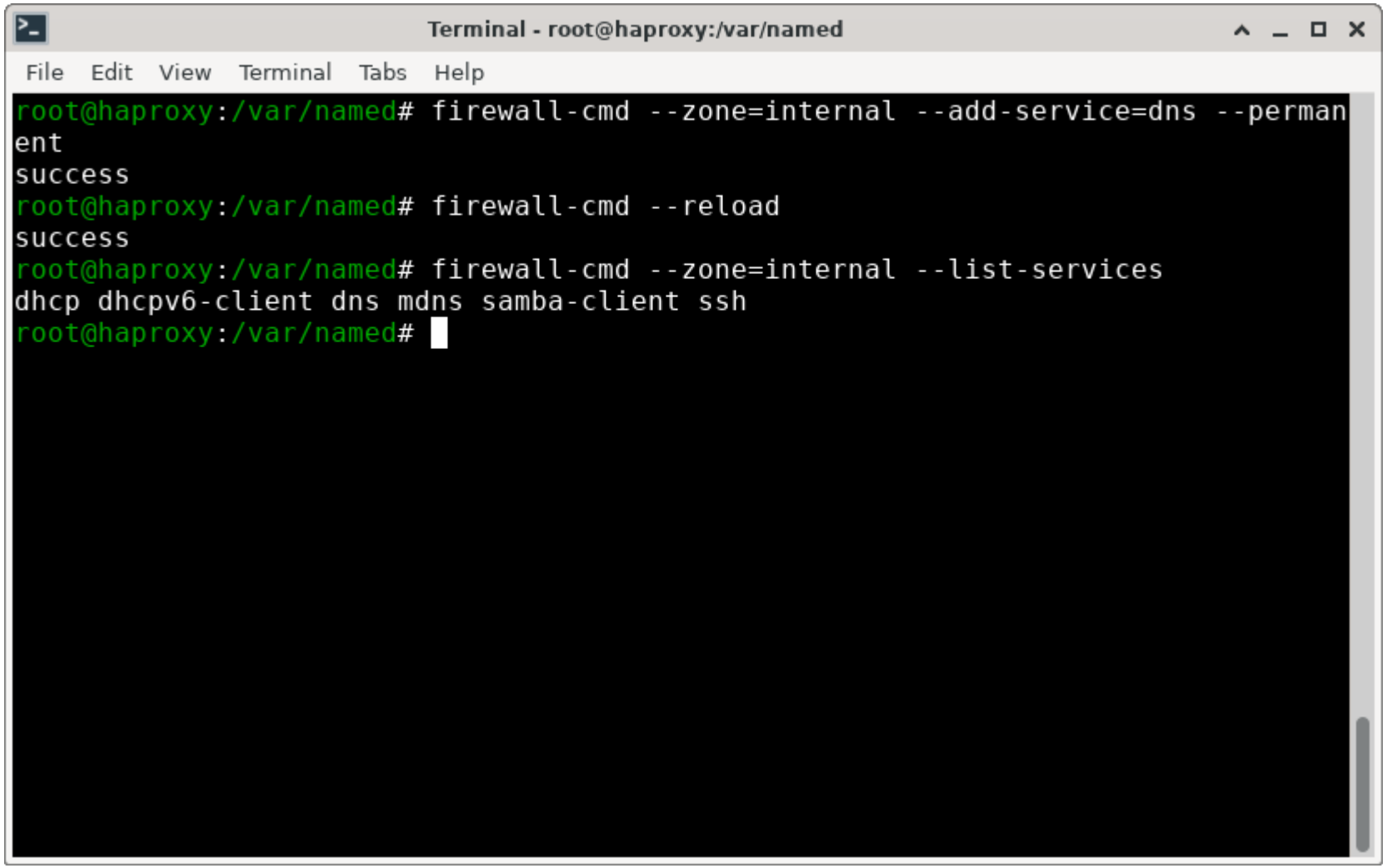
DNS


Terminal - root@haproxy:/var/named
File Edit View Terminal Tabs Help
$TTL 604800
@ IN SOA haproxy.okd.lan. contact.okd.lan (
1 ; Serial
604800 ; Refresh
86400 ; Retry
2419200 ; Expire
604800 ; Minimum
)
IN NS haproxy.okd.lan.
1 IN PTR haproxy.okd.lan.
1 IN PTR api.lab.okd.lan.
1 IN PTR api-int.lab.okd.lan.
;
200 IN PTR okd-bootstrap.lab.okd.lan.
;
201 IN PTR okd-cp-1.lab.okd.lan.
202 IN PTR okd-cp-2.lab.okd.lan.
203 IN PTR okd-cp-3.lab.okd.lan.
;
211 IN PTR okd-w-1.lab.okd.lan.
212 IN PTR okd-w-2.lab.okd.lan.
"db.22.168.192.in-addr.arpa" 25L, 737B written 1,1 Top

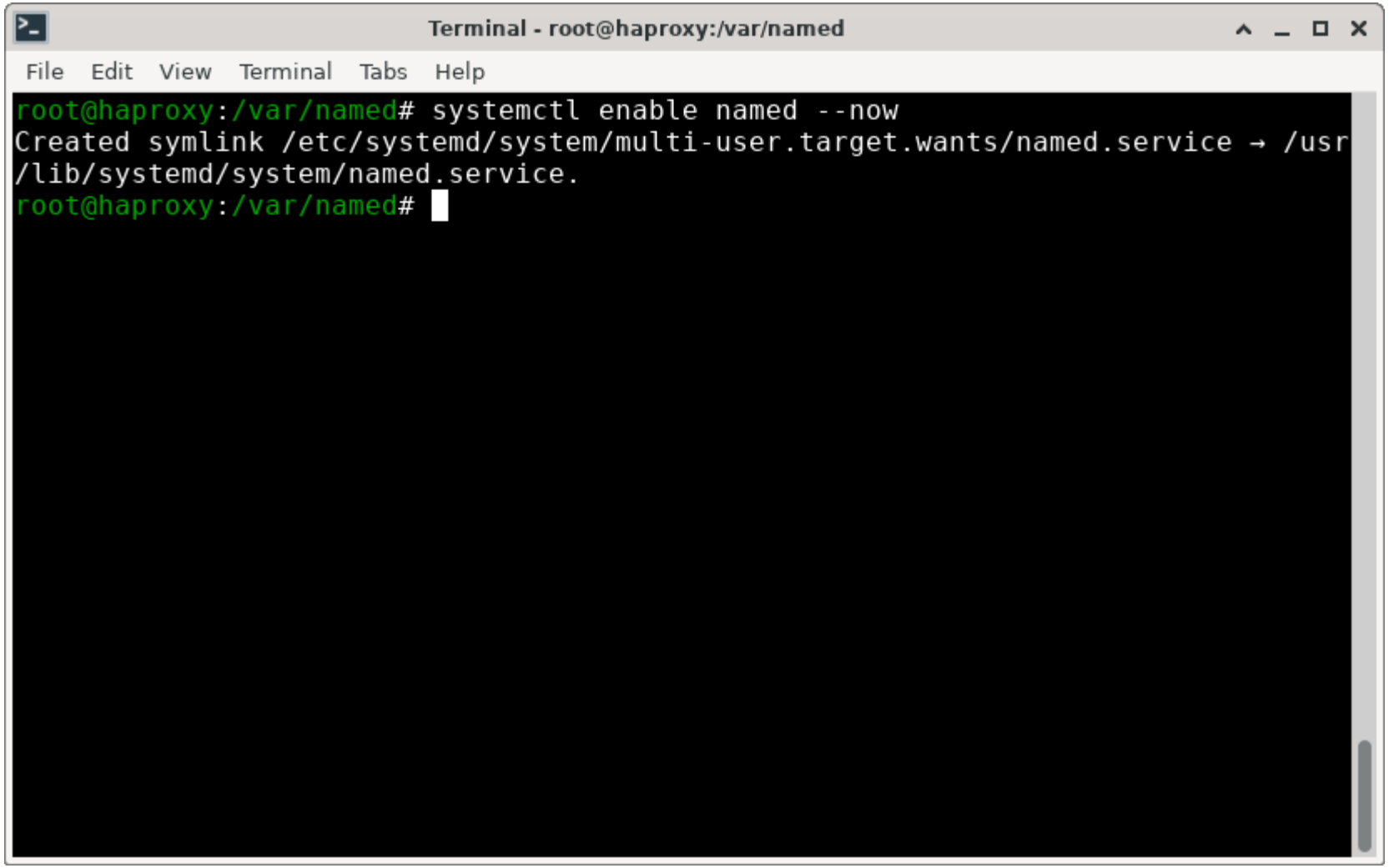
DNS


Terminal - root@haproxy:/var/named
File Edit View Terminal Tabs Help
1 ; Serial
604800 ; Refresh
86400 ; Retry
2419200 ; Expire
604800 ; Minimum
)
IN NS haproxy.okd.lan.
1 IN PTR haproxy.okd.lan.
1 IN PTR api.lab.okd.lan.
1 IN PTR api-int.lab.okd.lan.
;
200 IN PTR okd-bootstrap.lab.okd.lan.
;
201 IN PTR okd-cp-1.lab.okd.lan.
202 IN PTR okd-cp-2.lab.okd.lan.
203 IN PTR okd-cp-3.lab.okd.lan.
;
211 IN PTR okd-w-1.lab.okd.lan.
212 IN PTR okd-w-2.lab.okd.lan.
213 IN PTR okd-w-3.lab.okd.lan.
214 IN PTR okd-w-4.lab.okd.lan.
25,1 Bot

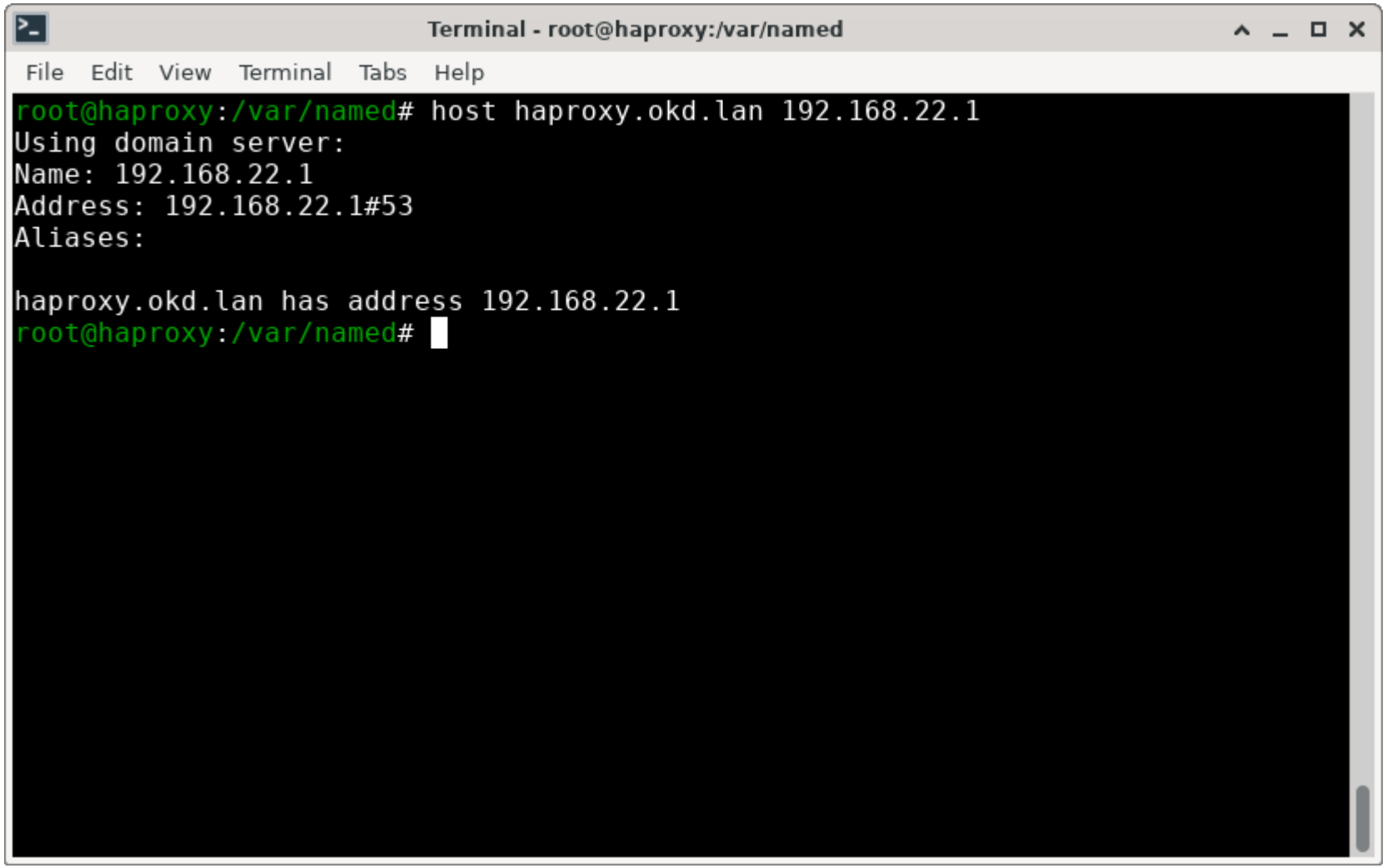
DNS


Terminal - root@haproxy:/var/named
File Edit View Terminal Tabs Help
root@haproxy:/var/named# firewall-cmd --zone=internal --add-service=dns --perman
ent
success
root@haproxy:/var/named# firewall-cmd --reload
success
root@haproxy:/var/named# firewall-cmd --zone=internal --list-services
dhcp dhcpv6-client dns mdns samba-client ssh
root@haproxy:/var/named#

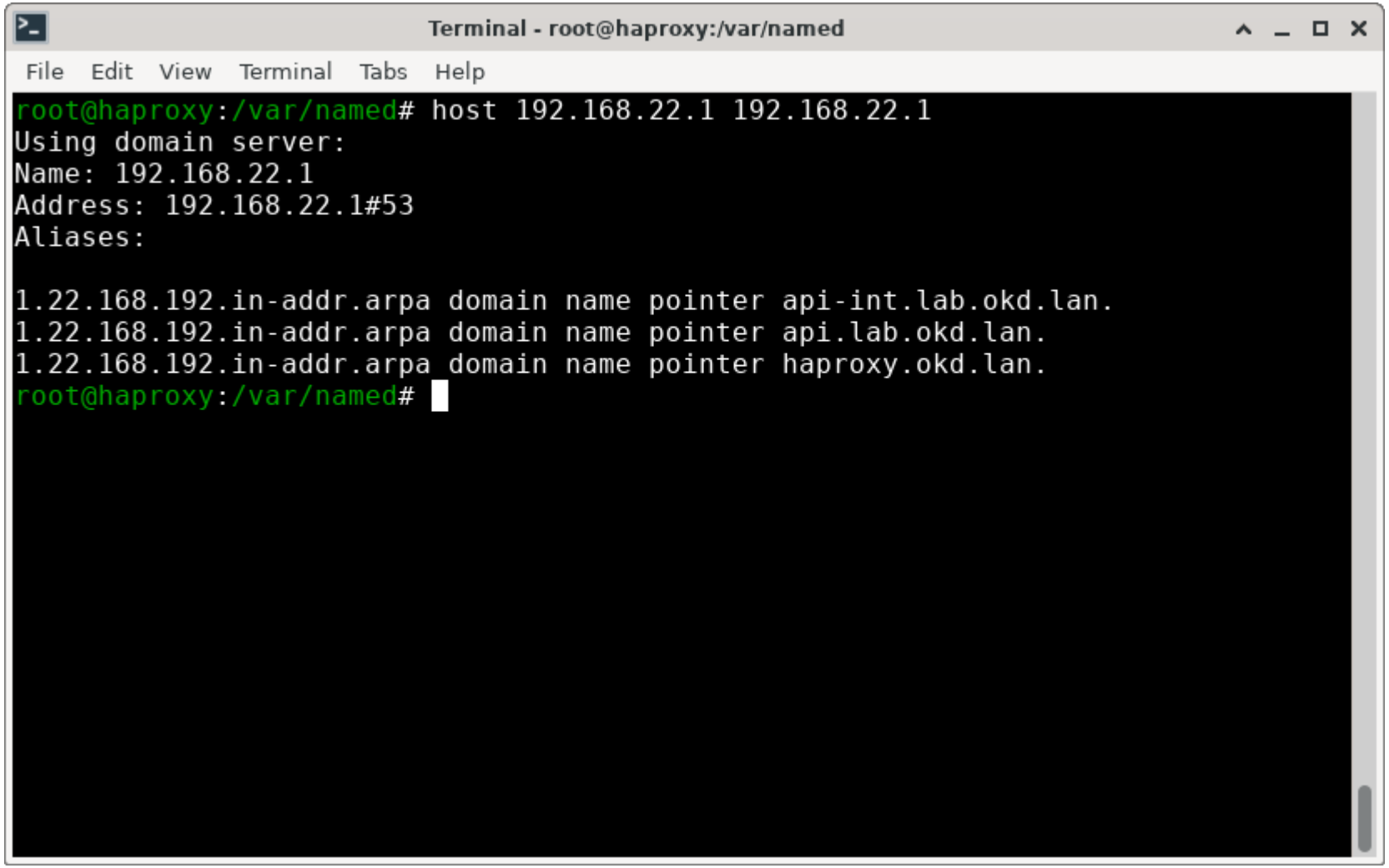
DNS


Terminal - root@haproxy:/var/named
File Edit View Terminal Tabs Help
root@haproxy:/var/named# systemctl enable named --now
Created symlink /etc/systemd/system/multi-user.target.wants/named.service → /usr
/lib/systemd/system/named.service.
root@haproxy:/var/named#

DNS


Terminal - root@haproxy:/var/named
File Edit View Terminal Tabs Help
root@haproxy:/var/named# host haproxy.okd.lan 192.168.22.1
Using domain server:
Name: 192.168.22.1
Address: 192.168.22.1#53
Aliases:
haproxy.okd.lan has address 192.168.22.1
root@haproxy:/var/named#

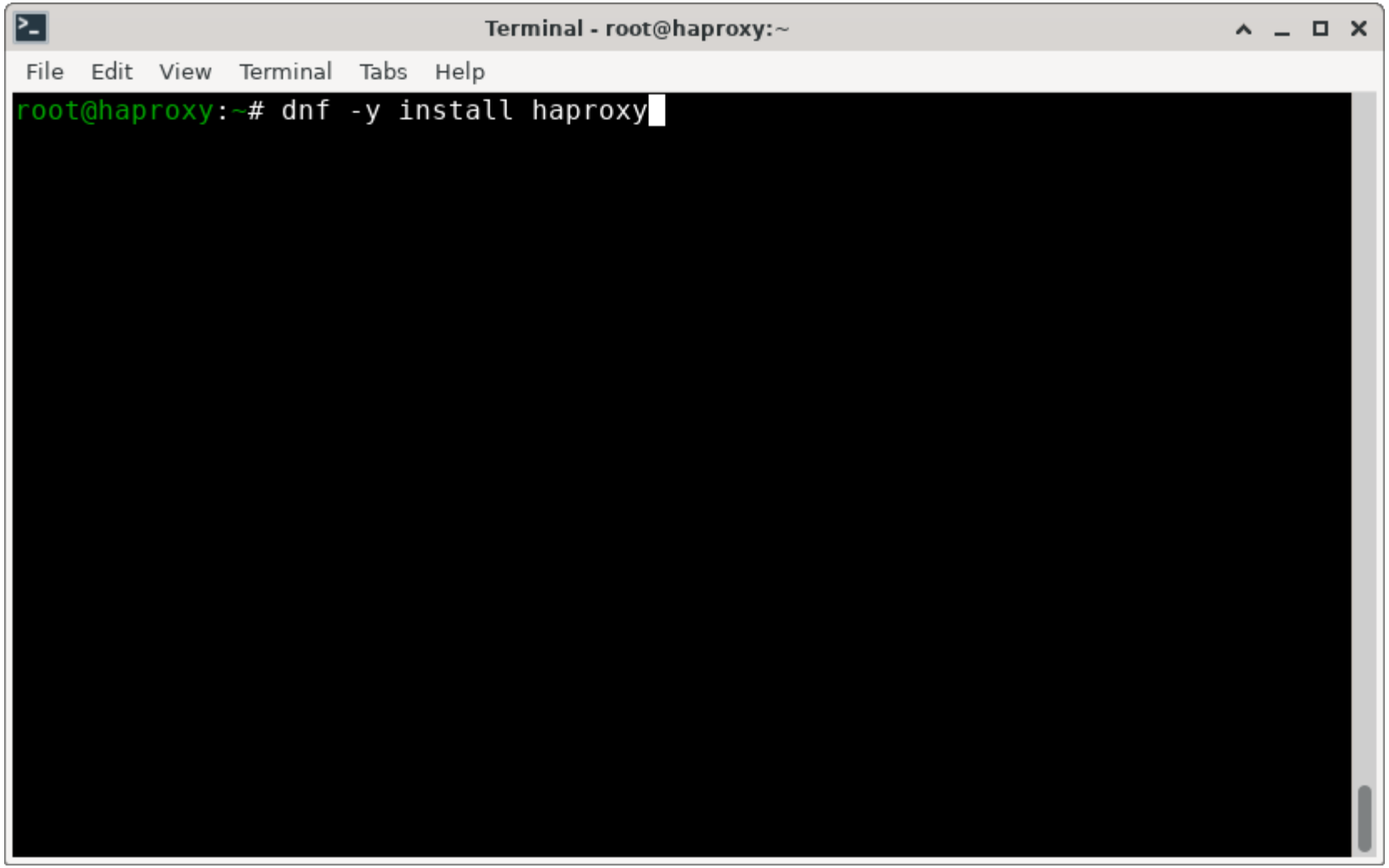
DNS


Terminal - root@haproxy:/var/named
File Edit View Terminal Tabs Help
root@haproxy:/var/named# host 192.168.22.1 192.168.22.1
Using domain server:
Name: 192.168.22.1
Address: 192.168.22.1#53
Aliases:
1.22.168.192.in-addr.arpa domain name pointer api-int.lab.okd.lan.
1.22.168.192.in-addr.arpa domain name pointer api.lab.okd.lan.
1.22.168.192.in-addr.arpa domain name pointer haproxy.okd.lan.
root@haproxy:/var/named#

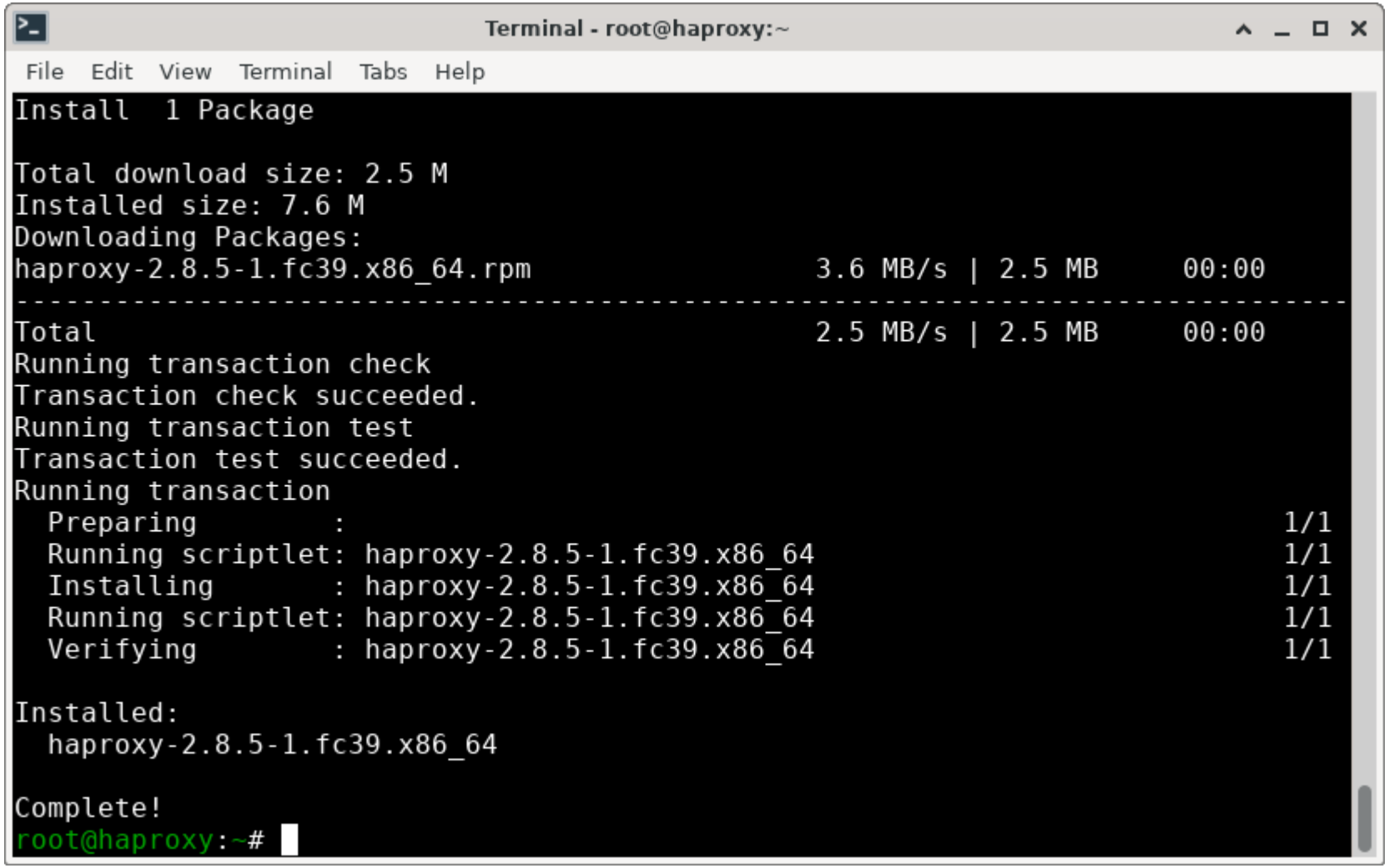
HAProxy

- We’re going to use HAProxy to distribute traffic coming into the HAProxy machine from internal OR external networks to the nodes in the cluster.
- Because we’re going to be accessing the cluster from the public network, we need to proxy traffic to the nodes on the private network.
- Because traffic can be distributed across various nodes from the private network, we’re going to send all the internal traffic to the HAProxy machine’s internal interface to distribute the load.

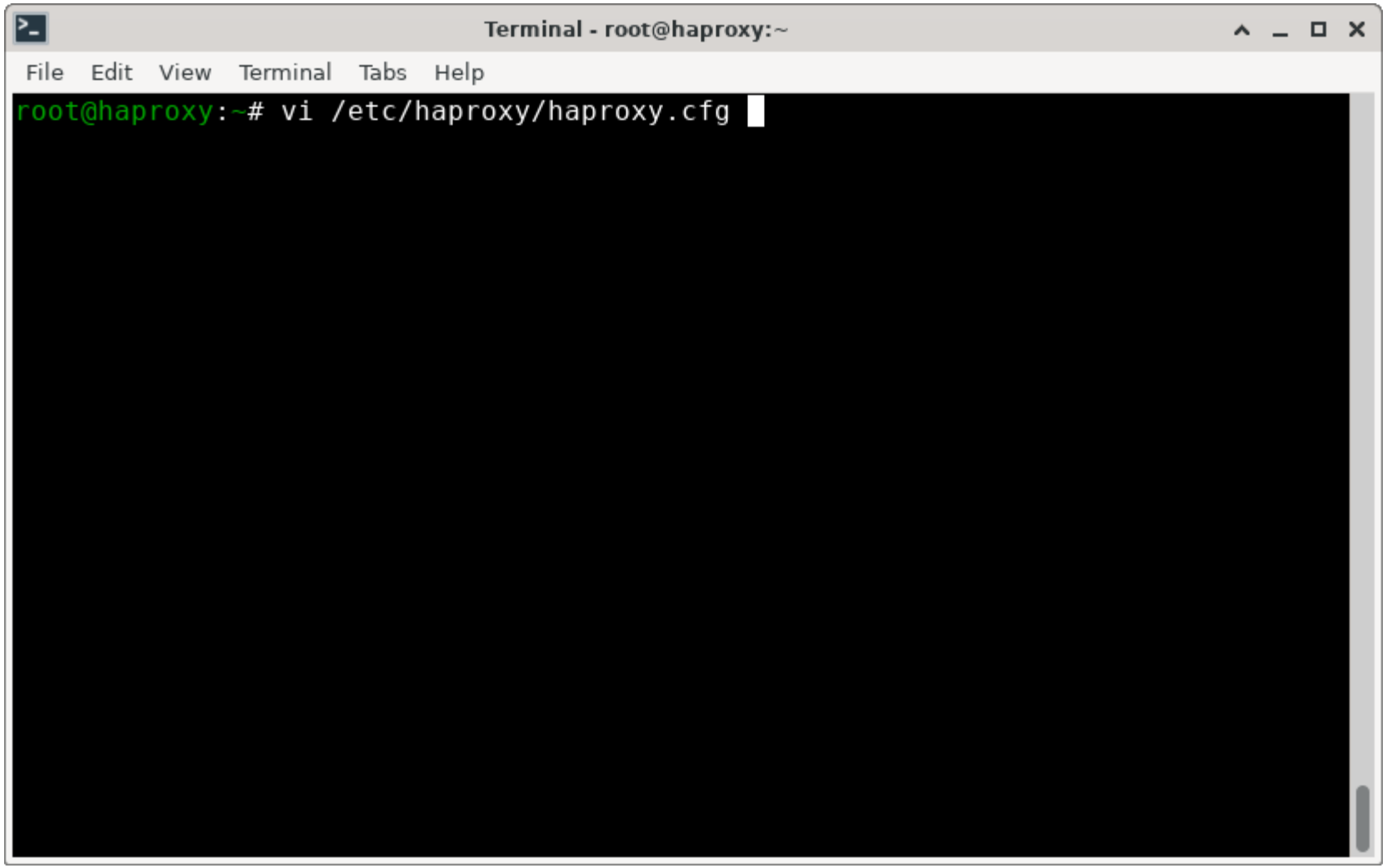
HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# dnf -y install haproxy

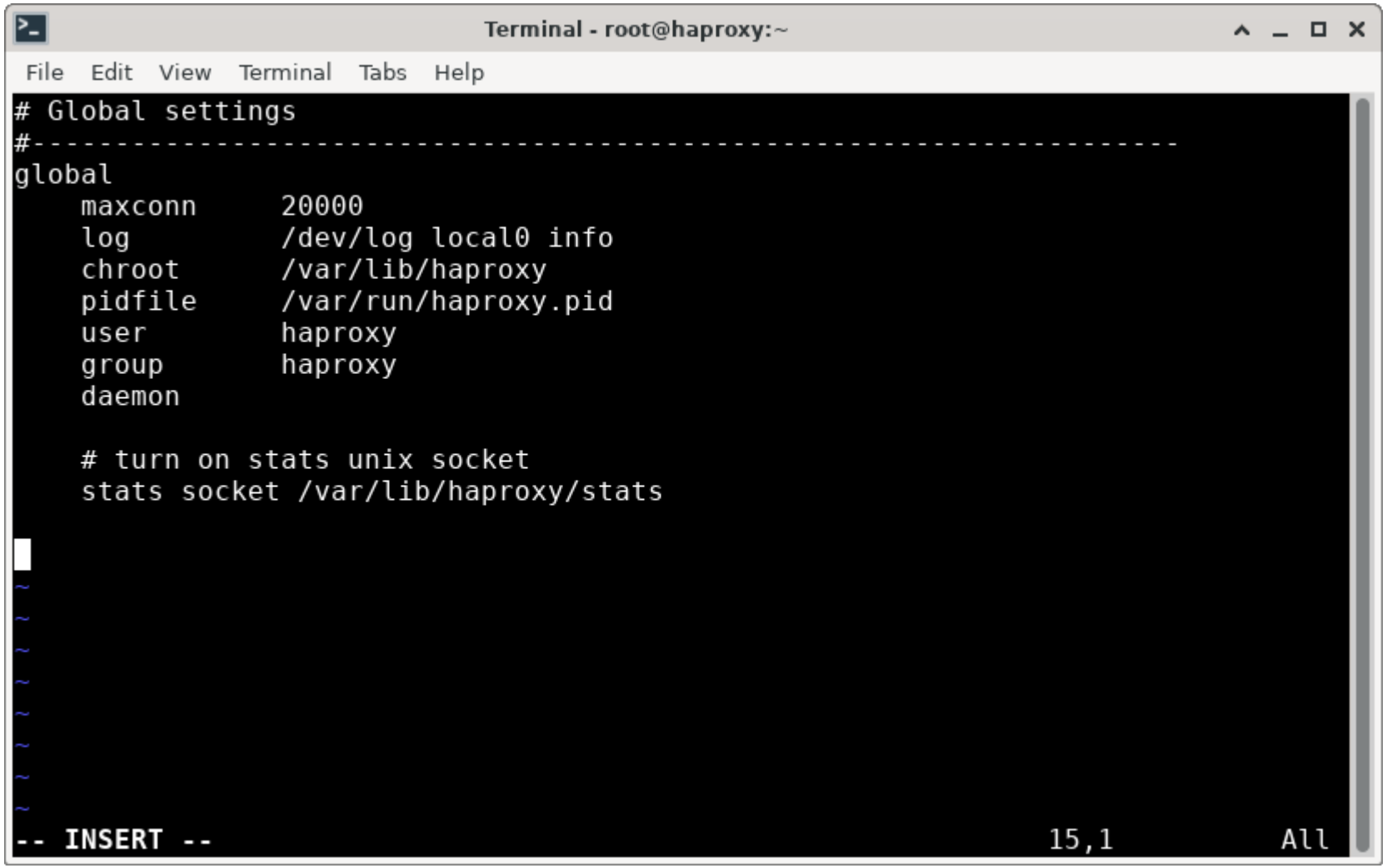
HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
Install 1 Package
Total download size: 2.5 M
Installed size: 7.6 M
Downloading Packages:
haproxy-2.8.5-1.fc39.x86_64.rpm 3.6 MB/s | 2.5 MB 00:00
Total 2.5 MB/s | 2.5 MB 00:00
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
Preparing : 1/1
Running scriptlet: haproxy-2.8.5-1.fc39.x86_64 1/1
Installing : haproxy-2.8.5-1.fc39.x86_64 1/1
Running scriptlet: haproxy-2.8.5-1.fc39.x86_64 1/1
Verifying : haproxy-2.8.5-1.fc39.x86_64 1/1
Installed:
haproxy-2.8.5-1.fc39.x86_64
Complete!
root@haproxy:~#

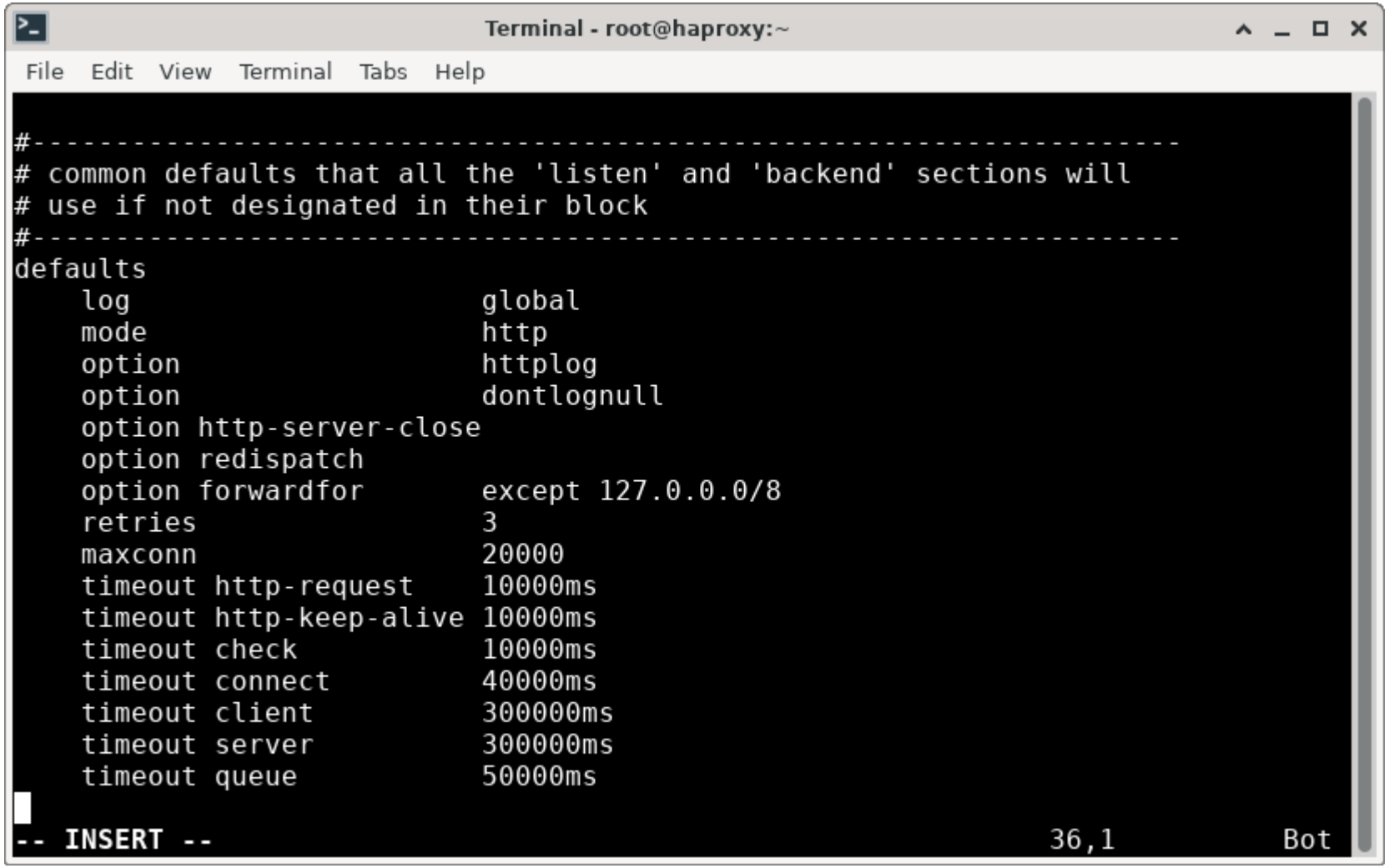
HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# vi /etc/haproxy/haproxy.cfg

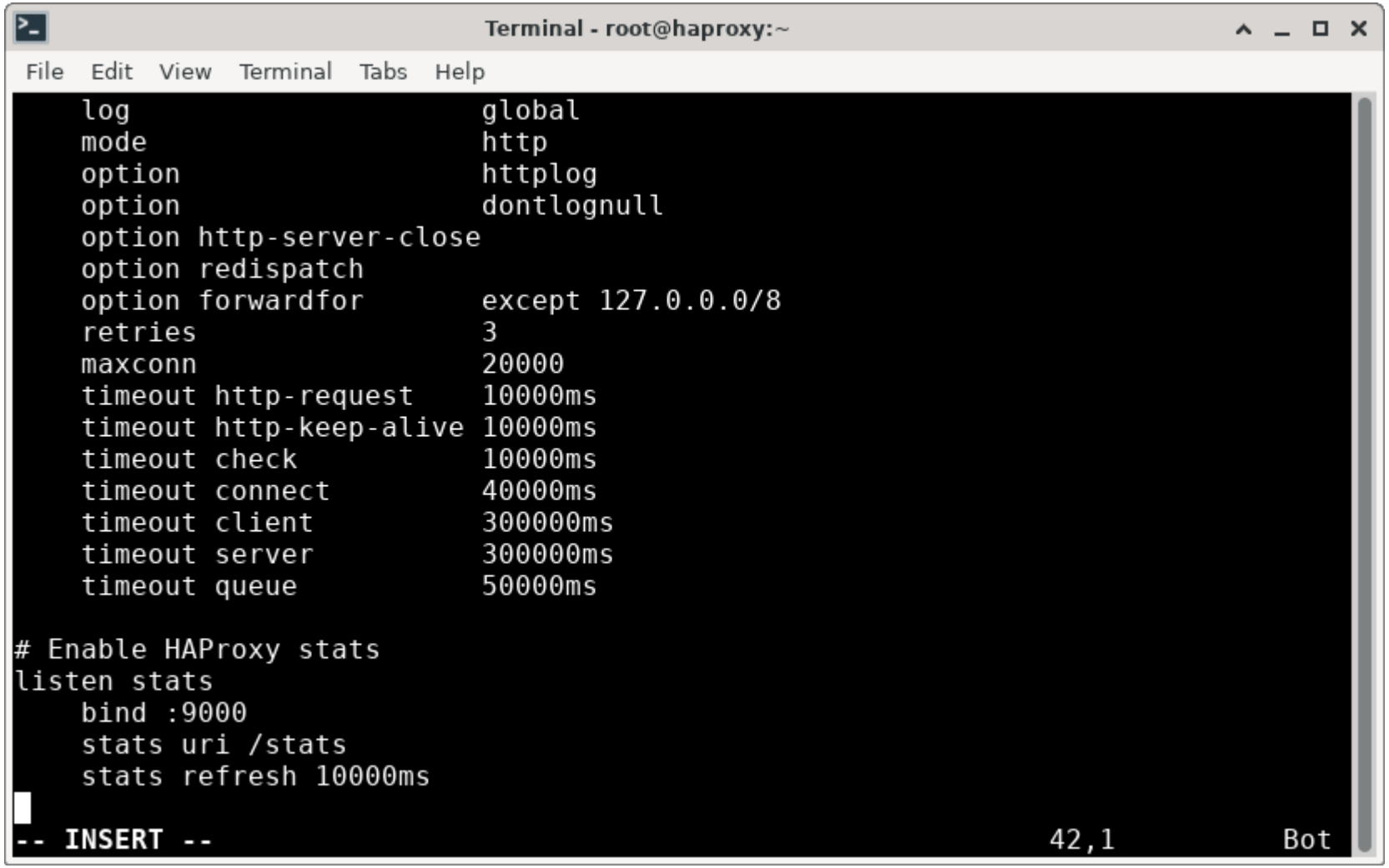
HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
Global settings
#---
global
maxconn 20000
log /dev/log local0 info
chroot /var/lib/haproxy
pidfile /var/run/haproxy.pid
user haproxy
group haproxy
daemon
turn on stats unix socket
stats socket /var/lib/haproxy/stats
-- INSERT -- 15,1 All

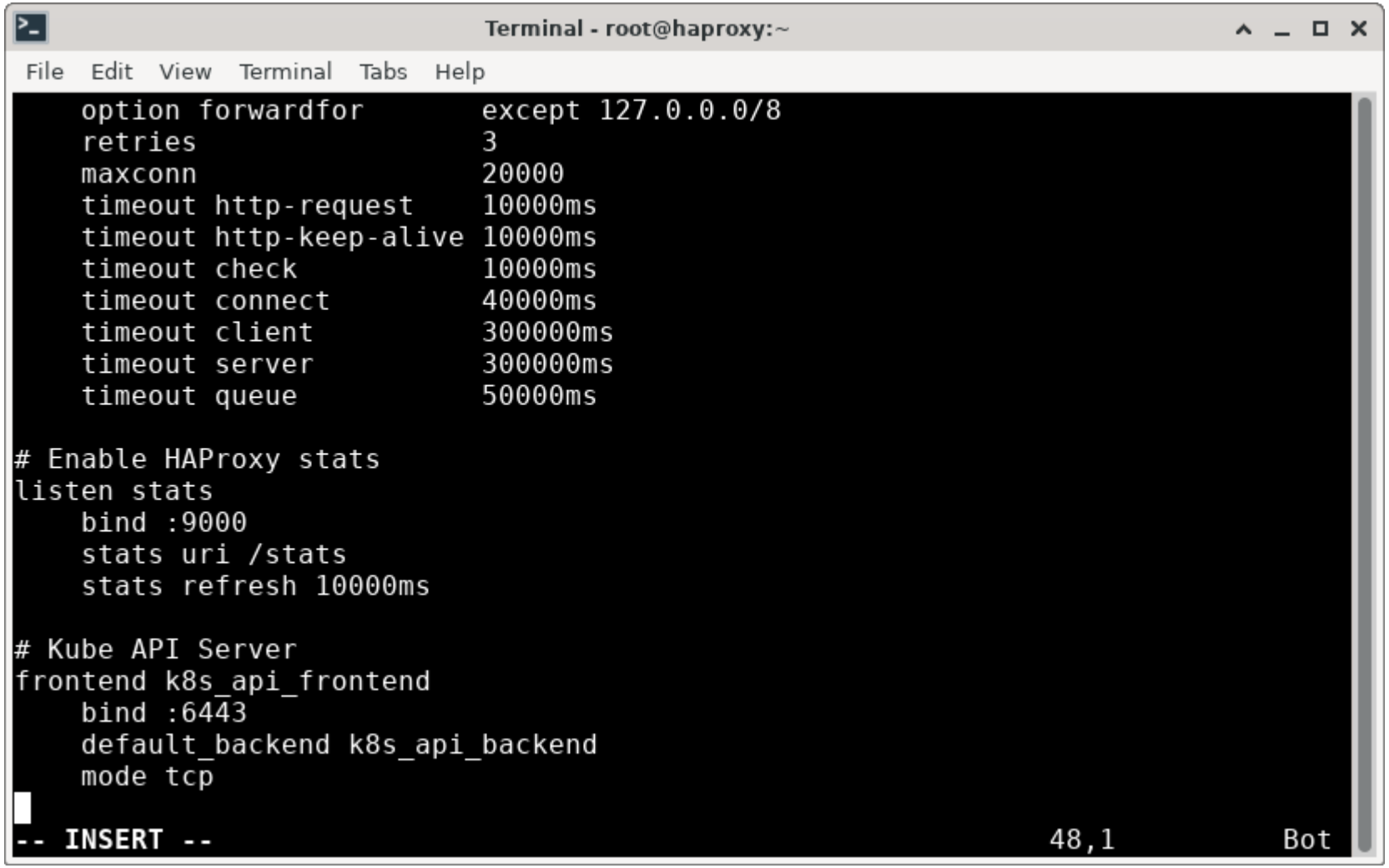
HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
#---
common defaults that all the 'listen' and 'backend' sections will
use if not designated in their block
#---
defaults
log global
mode http
option httplog
option dontlognull
option http-server-close
option redispatch
option forwardfor except 127.0.0.0/8
retries 3
maxconn 20000
timeout http-request 10000ms
timeout http-keep-alive 10000ms
timeout check 10000ms
timeout connect 40000ms
timeout client 300000ms
timeout server 300000ms
timeout queue 50000ms
-- INSERT -- 36,1 Bot

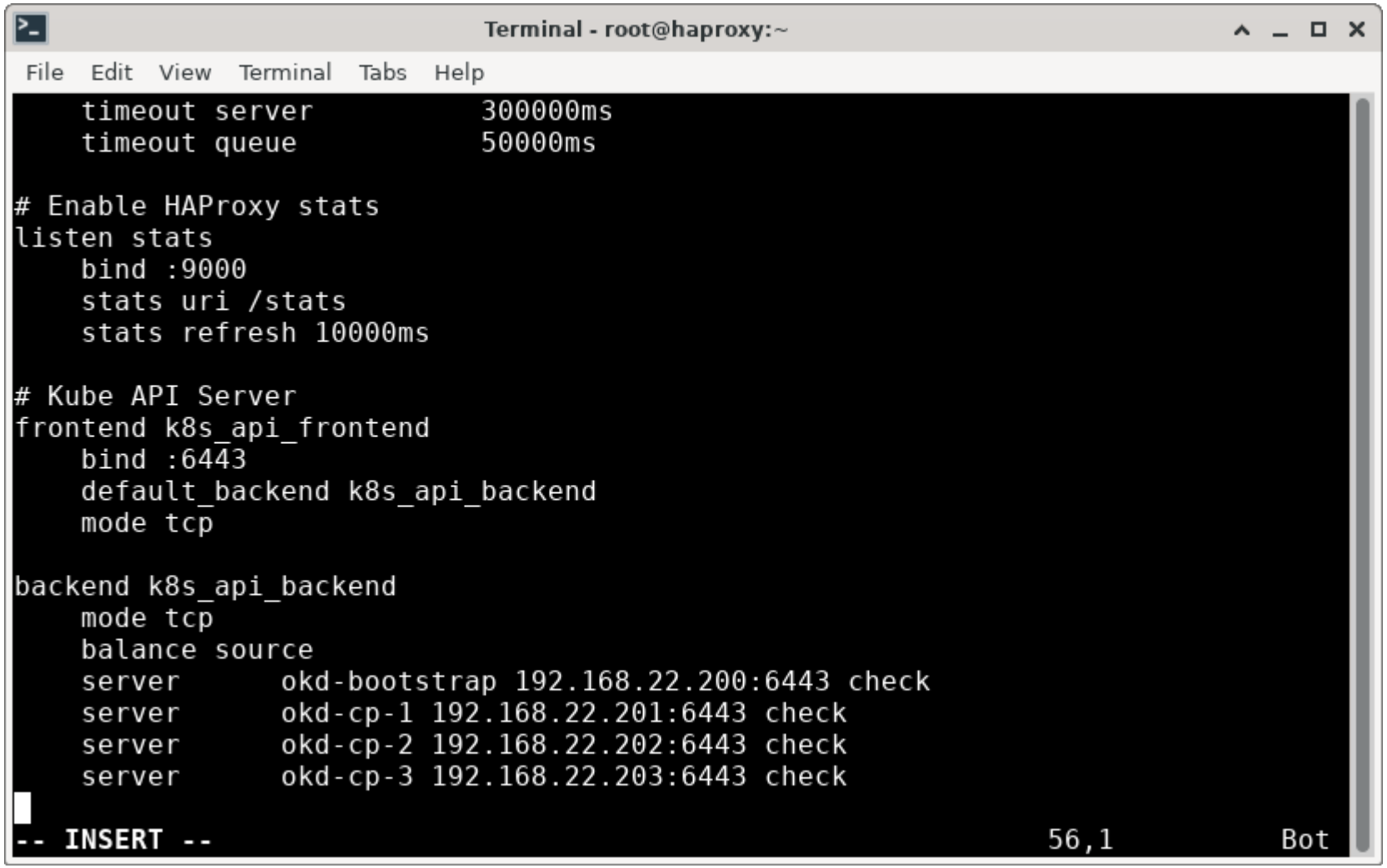
HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
log global
mode http
option httplog
option dontlognull
option http-server-close
option redispatch
option forwardfor except 127.0.0.0/8
retries 3
maxconn 20000
timeout http-request 10000ms
timeout http-keep-alive 10000ms
timeout check 10000ms
timeout connect 40000ms
timeout client 300000ms
timeout server 300000ms
timeout queue 50000ms
Enable HAProxy stats
listen stats
bind :9000
stats uri /stats
stats refresh 10000ms
-- INSERT -- 42,1 Bot

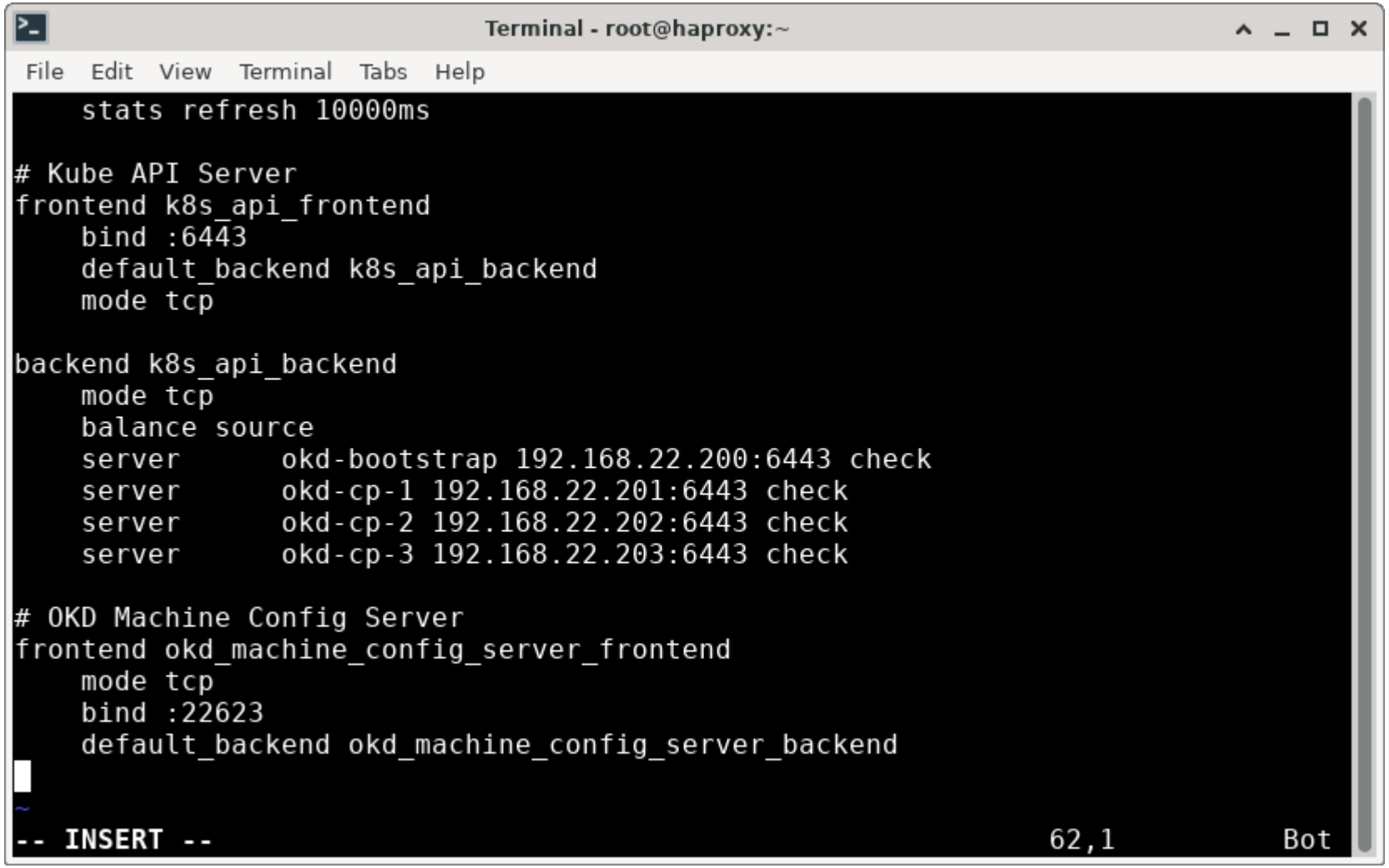
HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
option forwardfor except 127.0.0.0/8
retries 3
maxconn 20000
timeout http-request 10000ms
timeout http-keep-alive 10000ms
timeout check 10000ms
timeout connect 40000ms
timeout client 300000ms
timeout server 300000ms
timeout queue 50000ms
Enable HAProxy stats
listen stats
bind :9000
stats uri /stats
stats refresh 10000ms
Kube API Server
frontend k8s_api_frontend
bind :6443
default_backend k8s_api_backend
mode tcp
-- INSERT -- 48,1 Bot

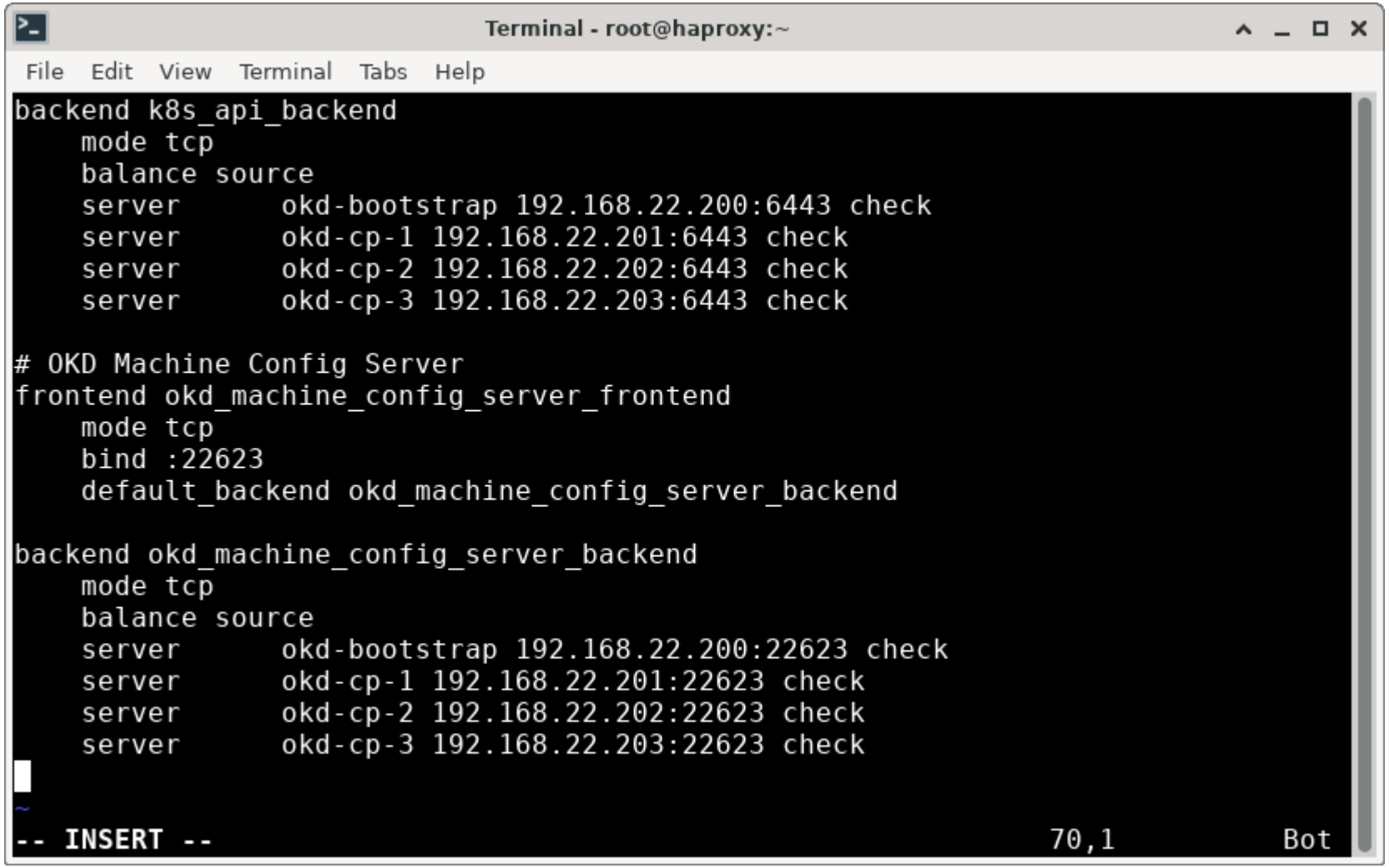
HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
timeout server 300000ms
timeout queue 50000ms
Enable HAProxy stats
listen stats
bind :9000
stats uri /stats
stats refresh 10000ms
Kube API Server
frontend k8s_api_frontend
bind :6443
default_backend k8s_api_backend
mode tcp
backend k8s_api_backend
mode tcp
balance source
server okd-bootstrap 192.168.22.200:6443 check
server okd-cp-1 192.168.22.201:6443 check
server okd-cp-2 192.168.22.202:6443 check
server okd-cp-3 192.168.22.203:6443 check
-- INSERT -- 56,1 Bot

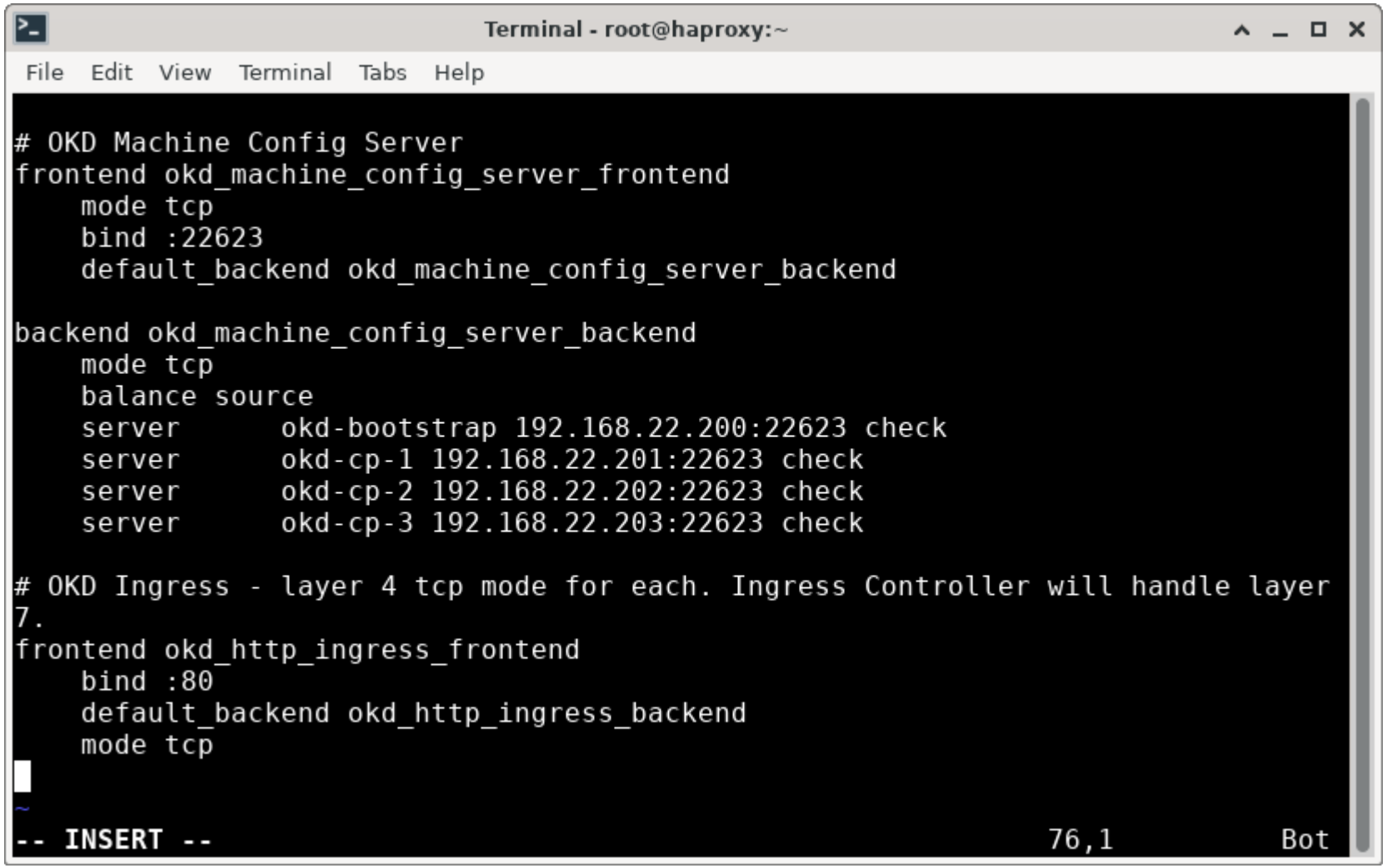
HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
stats refresh 10000ms
Kube API Server
frontend k8s_api_frontend
bind :6443
default_backend k8s_api_backend
mode tcp
backend k8s_api_backend
mode tcp
balance source
server okd-bootstrap 192.168.22.200:6443 check
server okd-cp-1 192.168.22.201:6443 check
server okd-cp-2 192.168.22.202:6443 check
server okd-cp-3 192.168.22.203:6443 check
OKD Machine Config Server
frontend okd_machine_config_server_frontend
mode tcp
bind :22623
default_backend okd_machine_config_server_backend
-- INSERT -- 62,1 Bot

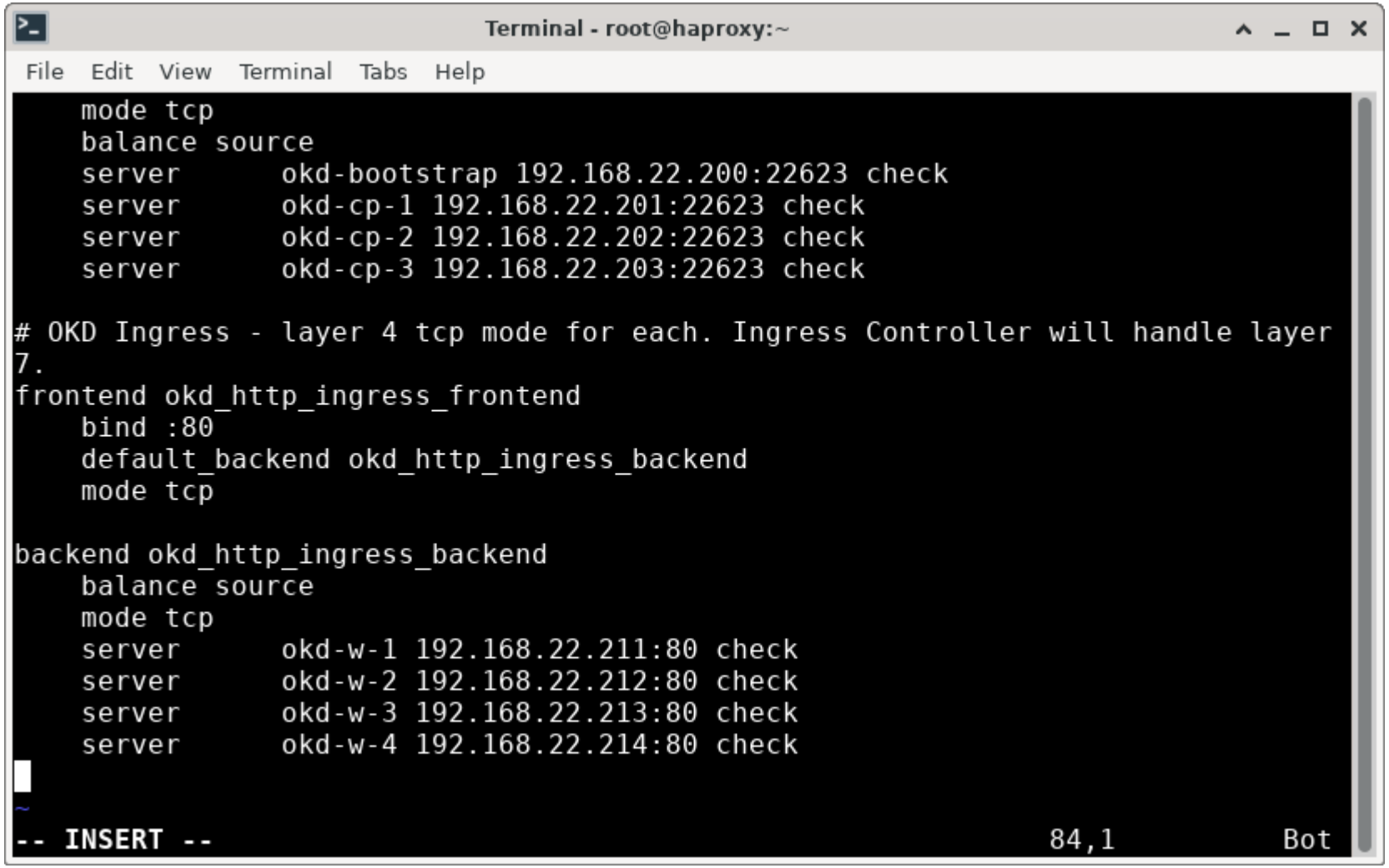
HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
backend k8s_api_backend
mode tcp
balance source
server okd-bootstrap 192.168.22.200:6443 check
server okd-cp-1 192.168.22.201:6443 check
server okd-cp-2 192.168.22.202:6443 check
server okd-cp-3 192.168.22.203:6443 check
OKD Machine Config Server
frontend okd_machine_config_server_frontend
mode tcp
bind :22623
default_backend okd_machine_config_server_backend
backend okd_machine_config_server_backend
mode tcp
balance source
server okd-bootstrap 192.168.22.200:22623 check
server okd-cp-1 192.168.22.201:22623 check
server okd-cp-2 192.168.22.202:22623 check
server okd-cp-3 192.168.22.203:22623 check
-- INSERT -- 70,1 Bot

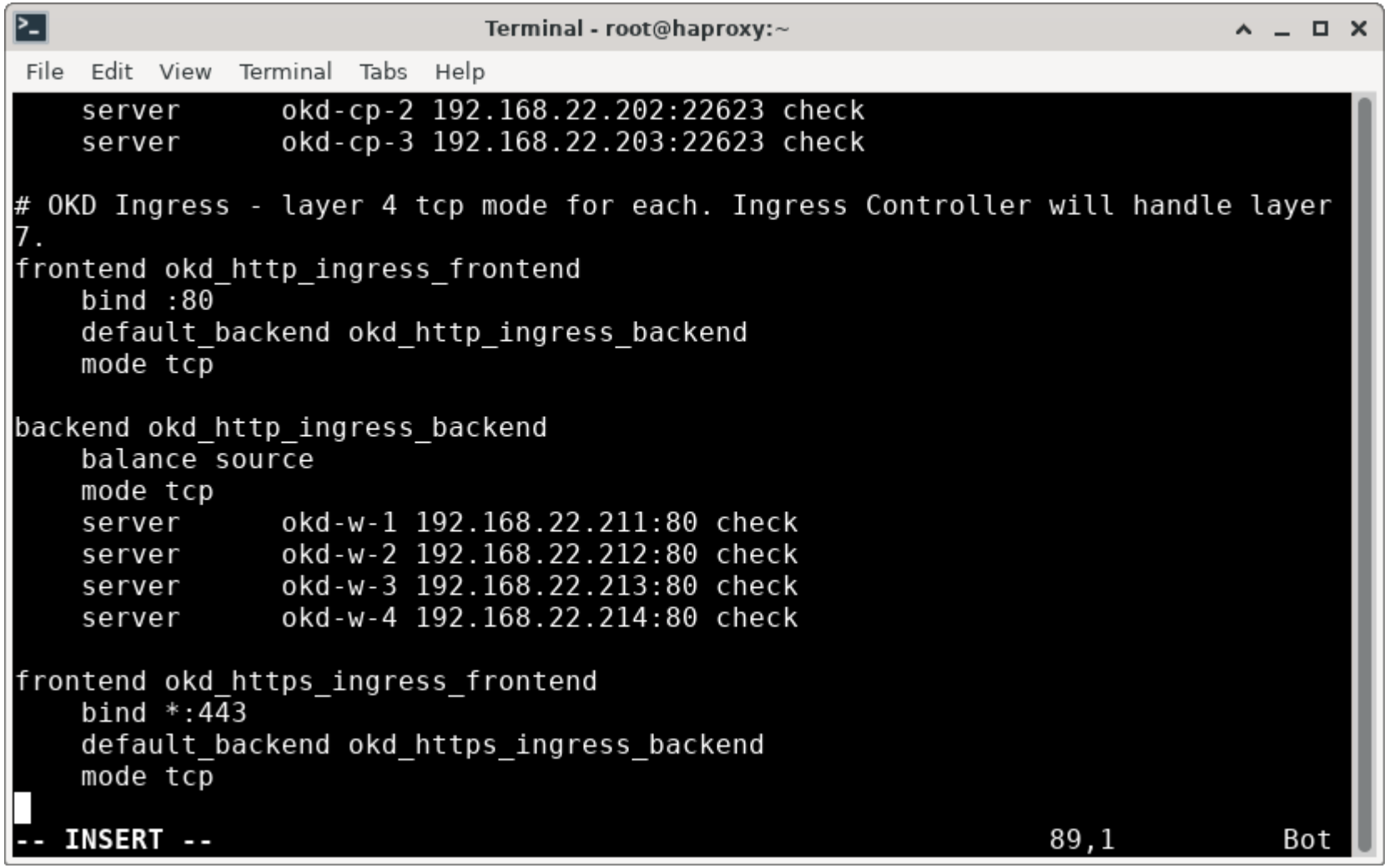
HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
OKD Machine Config Server
frontend okd_machine_config_server_frontend
mode tcp
bind :22623
default_backend okd_machine_config_server_backend
backend okd_machine_config_server_backend
mode tcp
balance source
server okd-bootstrap 192.168.22.200:22623 check
server okd-cp-1 192.168.22.201:22623 check
server okd-cp-2 192.168.22.202:22623 check
server okd-cp-3 192.168.22.203:22623 check
OKD Ingress - layer 4 tcp mode for each. Ingress Controller will handle layer
7.
frontend okd_http_ingress_frontend
bind :80
default_backend okd_http_ingress_backend
mode tcp
-- INSERT -- 76,1 Bot

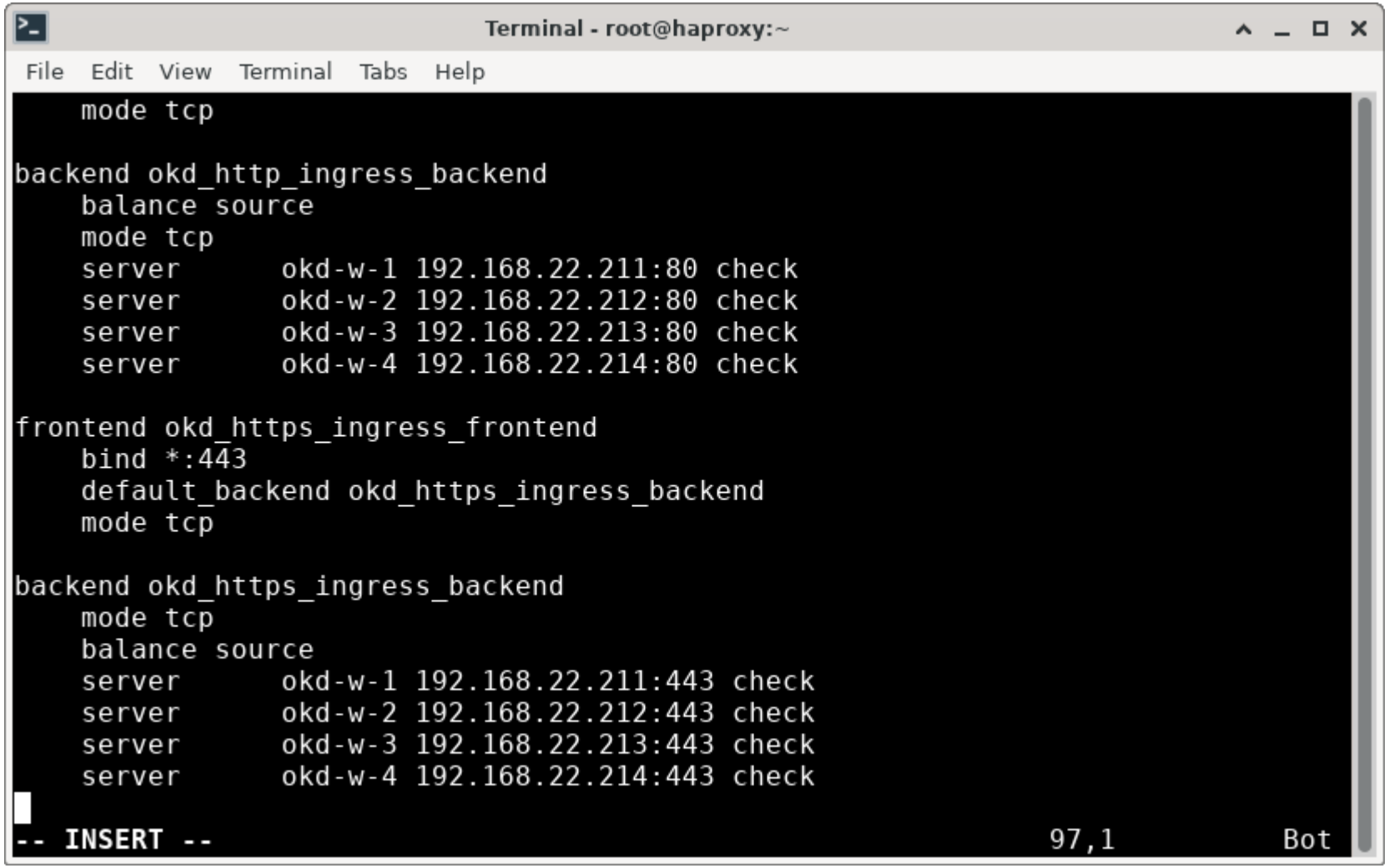
HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
mode tcp
balance source
server okd-bootstrap 192.168.22.200:22623 check
server okd-cp-1 192.168.22.201:22623 check
server okd-cp-2 192.168.22.202:22623 check
server okd-cp-3 192.168.22.203:22623 check
OKD Ingress - layer 4 tcp mode for each. Ingress Controller will handle layer 7.
frontend okd_http_ingress_frontend
bind :80
default_backend okd_http_ingress_backend
mode tcp
backend okd_http_ingress_backend
balance source
mode tcp
server okd-w-1 192.168.22.211:80 check
server okd-w-2 192.168.22.212:80 check
server okd-w-3 192.168.22.213:80 check
server okd-w-4 192.168.22.214:80 check
-- INSERT --
84,1
Bot

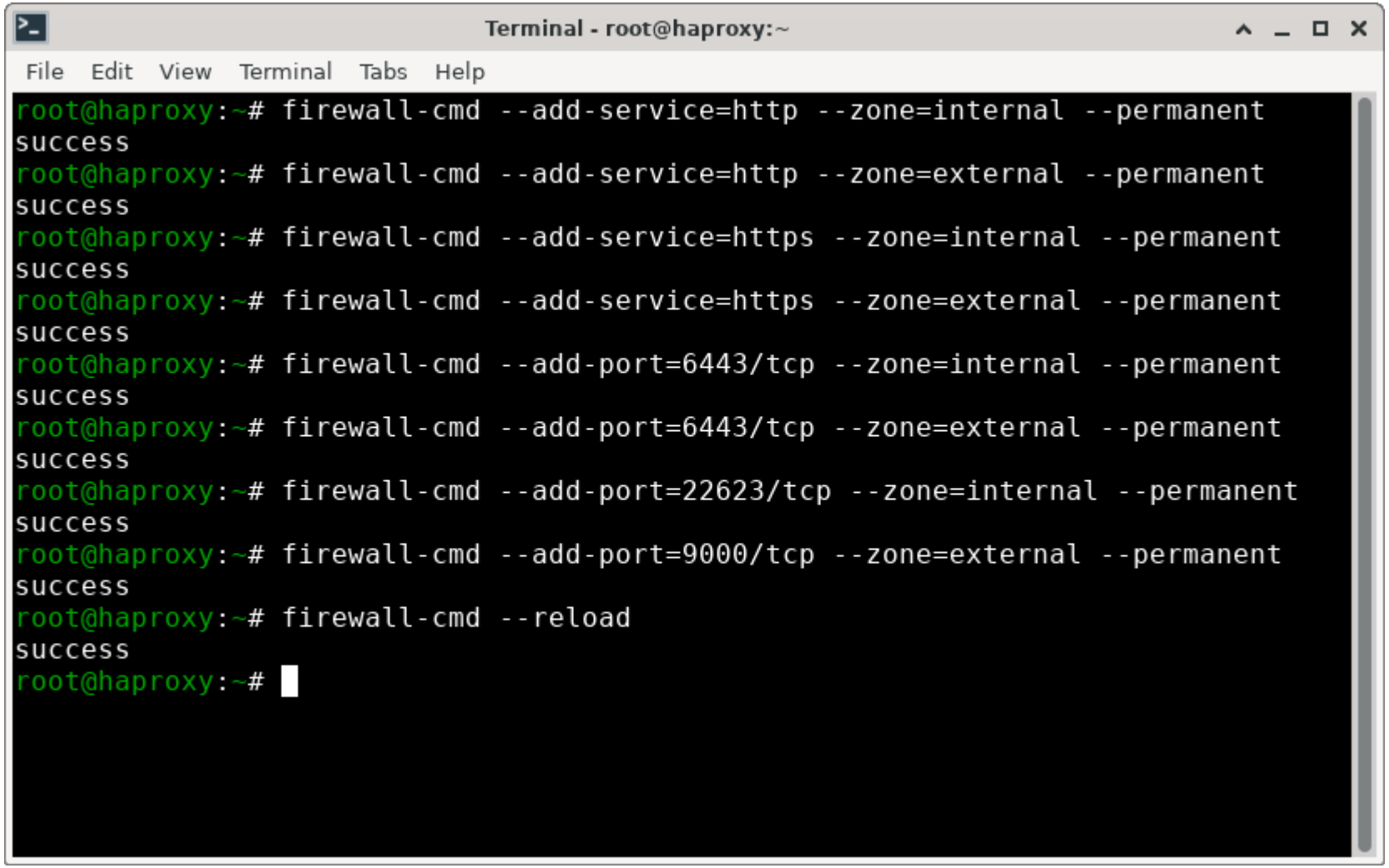
HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
server okd-cp-2 192.168.22.202:22623 check
server okd-cp-3 192.168.22.203:22623 check
OKD Ingress - layer 4 tcp mode for each. Ingress Controller will handle layer 7.
frontend okd_http_ingress_frontend
bind :80
default_backend okd_http_ingress_backend
mode tcp
backend okd_http_ingress_backend
balance source
mode tcp
server okd-w-1 192.168.22.211:80 check
server okd-w-2 192.168.22.212:80 check
server okd-w-3 192.168.22.213:80 check
server okd-w-4 192.168.22.214:80 check
frontend okd_https_ingress_frontend
bind *:443
default_backend okd_https_ingress_backend
mode tcp
-- INSERT -- 89,1 Bot

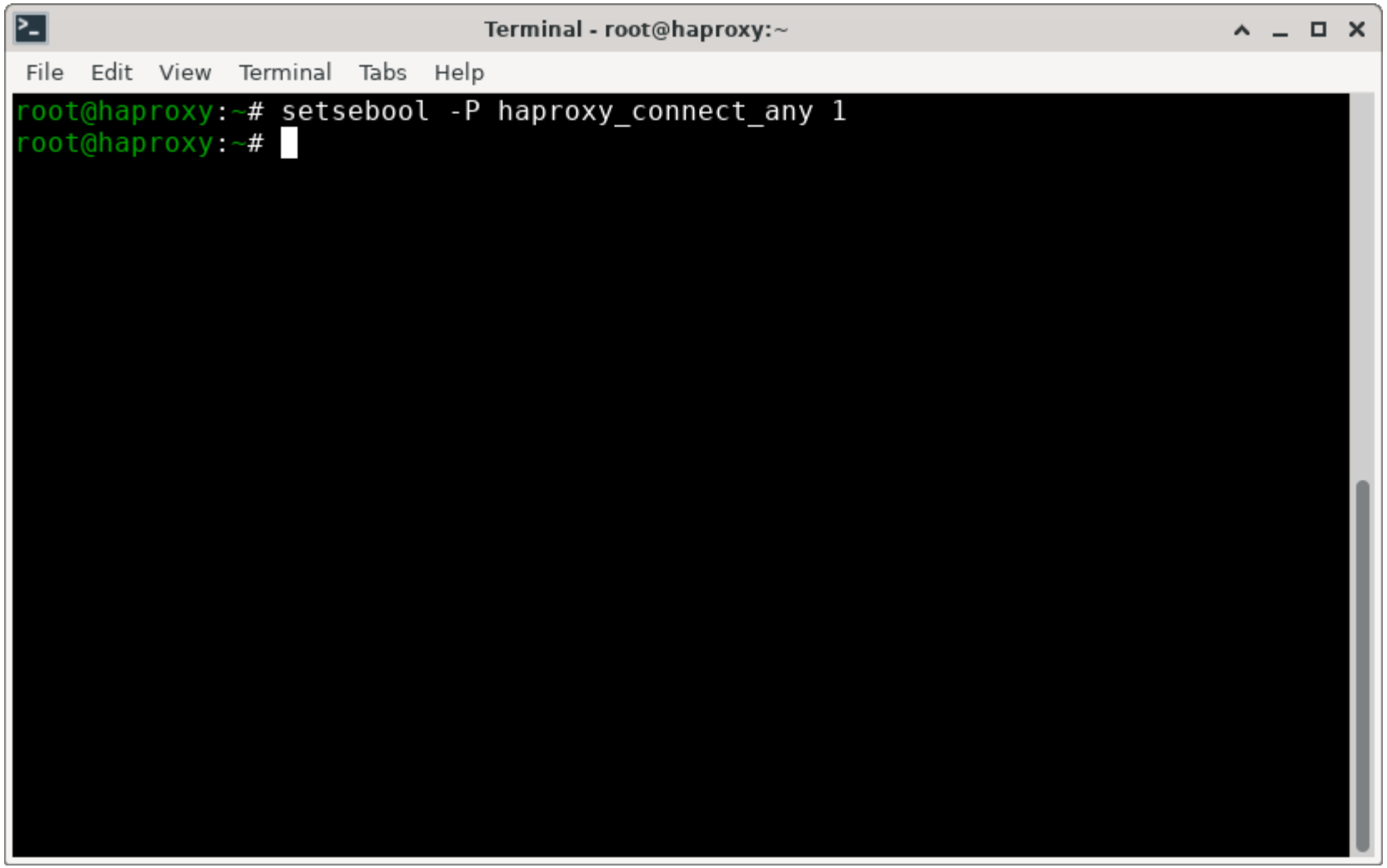
HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
mode tcp
backend okd_http_ingress_backend
balance source
mode tcp
server okd-w-1 192.168.22.211:80 check
server okd-w-2 192.168.22.212:80 check
server okd-w-3 192.168.22.213:80 check
server okd-w-4 192.168.22.214:80 check
frontend okd_https_ingress_frontend
bind *:443
default_backend okd_https_ingress_backend
mode tcp
backend okd_https_ingress_backend
mode tcp
balance source
server okd-w-1 192.168.22.211:443 check
server okd-w-2 192.168.22.212:443 check
server okd-w-3 192.168.22.213:443 check
server okd-w-4 192.168.22.214:443 check
-- INSERT -- 97,1 Bot

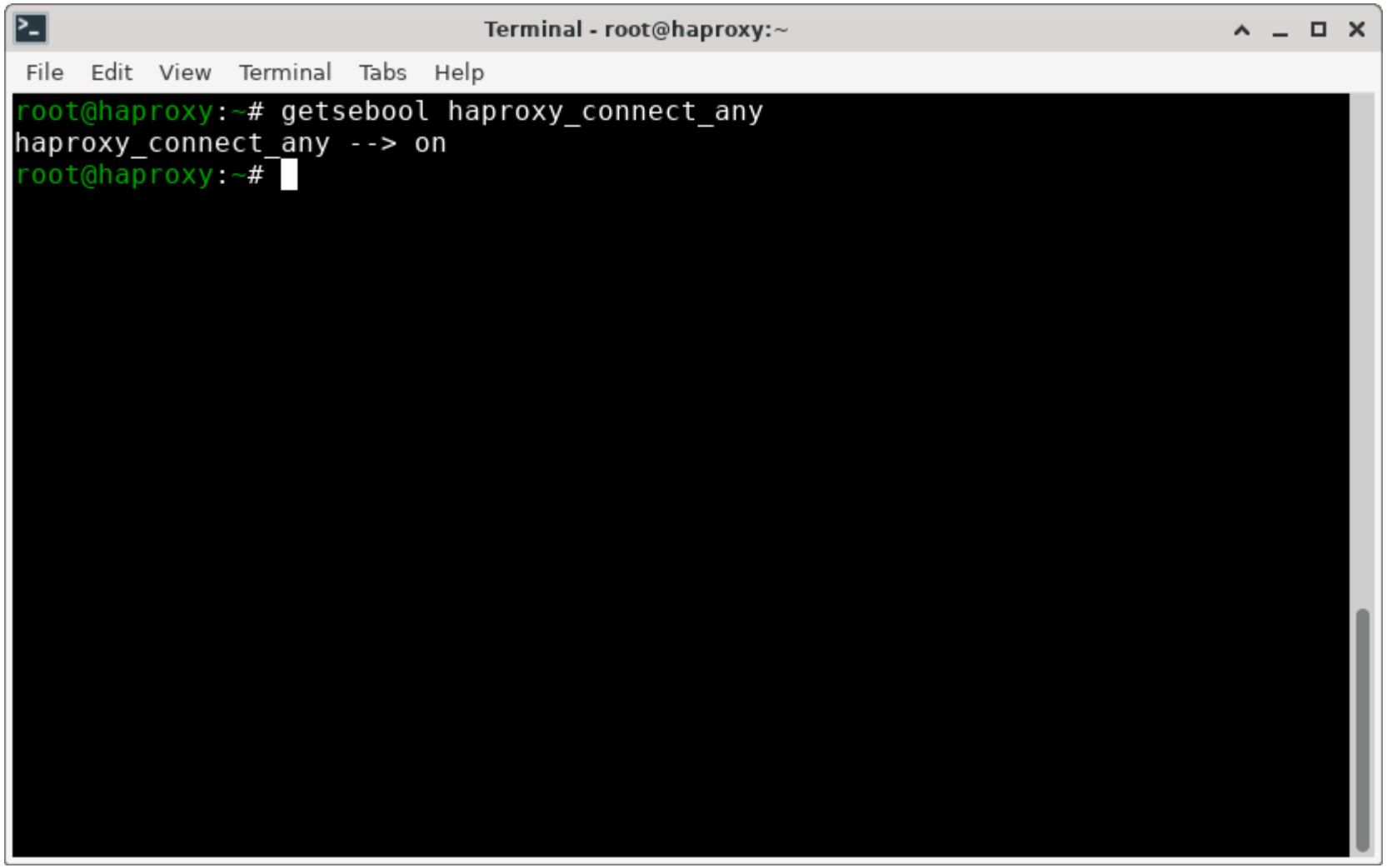
HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# firewall-cmd --add-service=http --zone=internal --permanent
success
root@haproxy:~# firewall-cmd --add-service=http --zone=external --permanent
success
root@haproxy:~# firewall-cmd --add-service=https --zone=internal --permanent
success
root@haproxy:~# firewall-cmd --add-service=https --zone=external --permanent
success
root@haproxy:~# firewall-cmd --add-port=6443/tcp --zone=internal --permanent
success
root@haproxy:~# firewall-cmd --add-port=6443/tcp --zone=external --permanent
success
root@haproxy:~# firewall-cmd --add-port=22623/tcp --zone=internal --permanent
success
root@haproxy:~# firewall-cmd --add-port=9000/tcp --zone=external --permanent
success
root@haproxy:~# firewall-cmd --reload
success
root@haproxy:~#

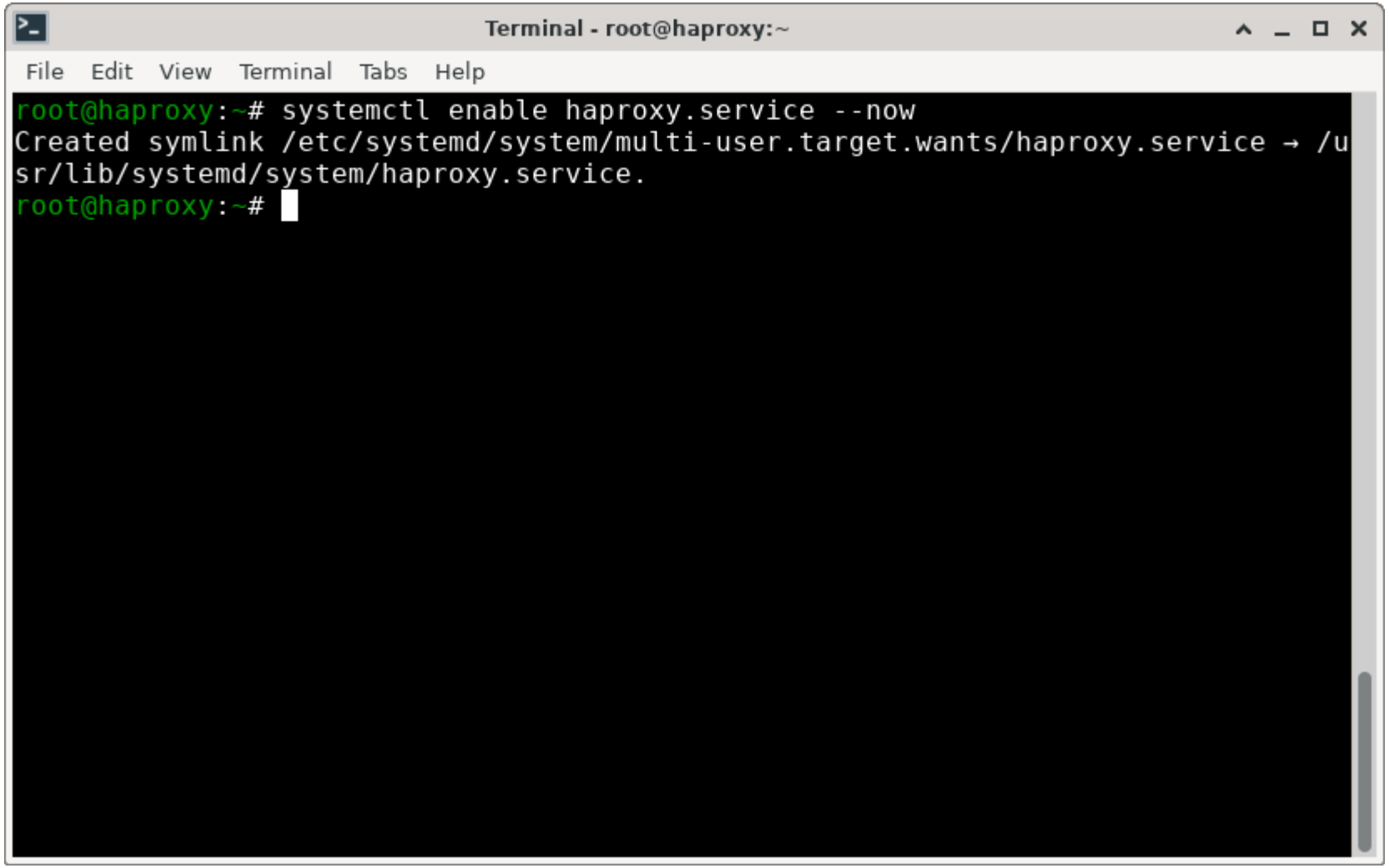
HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# setsebool -P haproxy_connect_any 1
root@haproxy:~#

HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# getsebool haproxy_connect_any
haproxy_connect_any --> on
root@haproxy:~#

HAProxy


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# systemctl enable haproxy.service --now
Created symlink /etc/systemd/system/multi-user.target.wants/haproxy.service → /u
sr/lib/systemd/system/haproxy.service.
root@haproxy:~#

HAProxy version 2.8.5-aaba8d0, released 2023/12/07

Statistics Report for pid 2981

> General process information

pid = 2981 (process #1, nbproc = 1, nbthread = 4)
uptime = 0d 0h01m52s; warnings = 28
system limits: memmax = unlimited; ulimit-n = 40055
maxsock = 40055; **maxconn =** 20000; **reached =** 0; **maxpipes =** 0
current conns = 1; current pipes = 0/0; conn rate = 1/sec; bit rate = 0.000 kbps
Running tasks: 0/42; idle = 100 %

active UP
active UP, going down
active DOWN, going up
active or backup DOWN
active or backup DOWN for maintenance (MAINT)
active or backup SOFT STOPPED for maintenance
backup UP
backup UP, going down
backup DOWN, going up
not checked
Note: "NOLB"/"DRAIN" = UP with load-balancing disabled.

Display option:
- Scope :
- Hide 'DOWN' servers
- Disable refresh
- Refresh now
- CSV export
- JSON export (schema)

External resources:
- Primary site
- Updates (v2.8)
- Online manual

stats

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				1	1	-	1	2	20 000	1			0	0	0	0	0					OPEN								
Backend	0	0		0	0		0	0	2 000	0	0	0s	0	0	0	0		0	0	0	0	1m52s UP		0/0	0	0		0		

k8s_api_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	0	-	0	0	20 000	0			0	0	0	0	0					OPEN								

k8s_api_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-bootstrap	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	1m52s DOWN	L4CON in 0ms	1/1	Y	-	1	1	1m52s	-
okd-cp-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	1m50s DOWN	* L4TOUT in 2001ms	1/1	Y	-	1	1	1m50s	-
okd-cp-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	1m50s DOWN	* L4TOUT in 2002ms	1/1	Y	-	1	1	1m50s	-
okd-cp-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	1m50s DOWN	L4TOUT in 2002ms	1/1	Y	-	1	1	1m50s	-
Backend	0	0		0	0		0	0	2 000	0	0	?	0	0	0	0		0	0	0	0	1m50s DOWN		0/0	0	0		1	1m50s	

okd_machine_config_server_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	0	-	0	0	20 000	0			0	0	0	0	0					OPEN								

okd_machine_config_server_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-bootstrap	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	1m52s DOWN	L4CON in 0ms	1/1	Y	-	1	1	1m52s	-
okd-cp-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	1m49s DOWN	L4TOUT in 2000ms	1/1	Y	-	1	1	1m49s	-
okd-cp-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	1m49s DOWN	L4TOUT in 2001ms	1/1	Y	-	1	1	1m49s	-
okd-cp-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	1m49s DOWN	L4TOUT in 2002ms	1/1	Y	-	1	1	1m49s	-
Backend	0	0		0	0		0	0	2 000	0	0	?	0	0	0	0		0	0	0	0	1m49s DOWN		0/0	0	0		1	1m49s	

okd_http_ingress_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	0	-	0	0	20 000	0			0	0	0	0	0					OPEN								

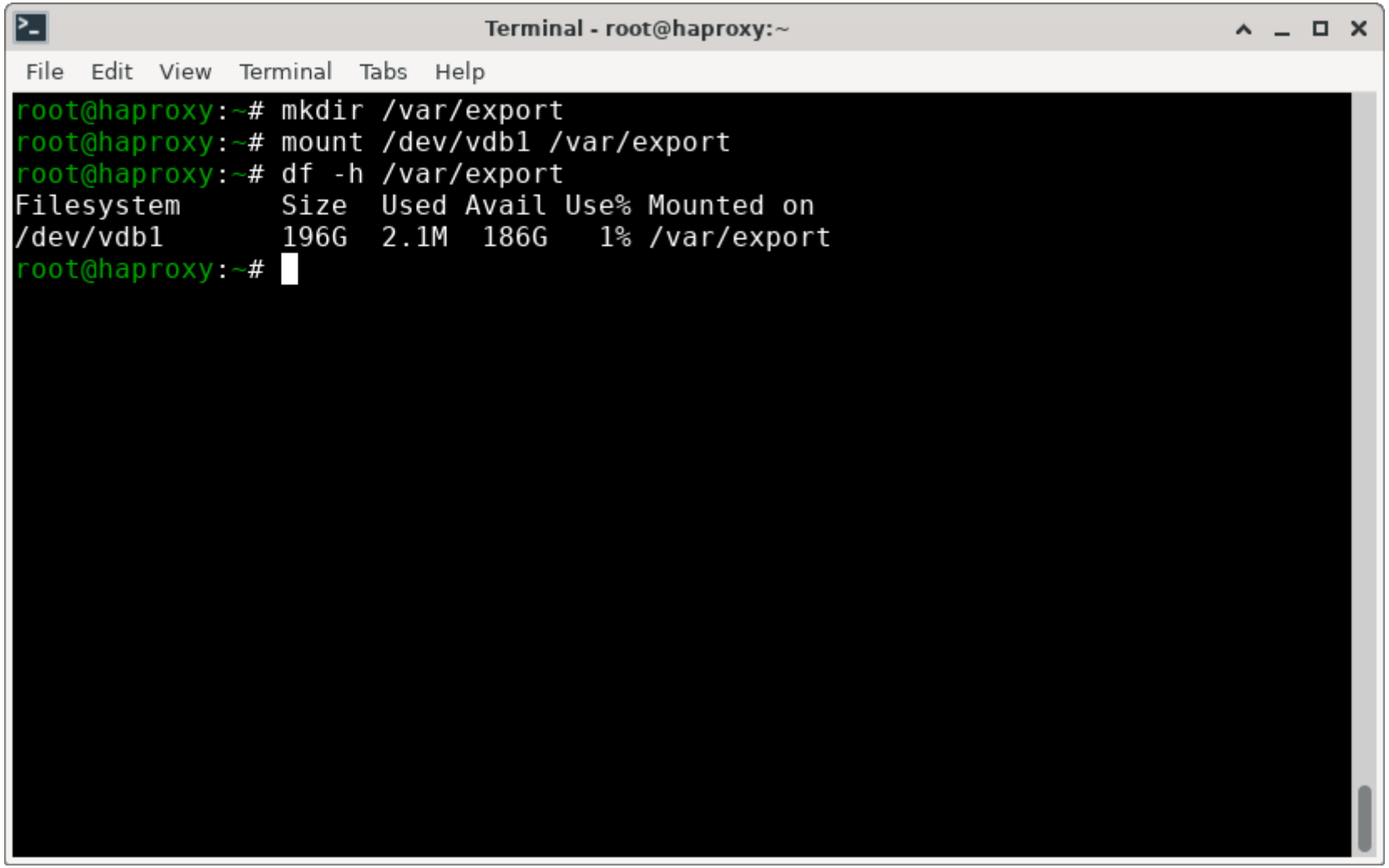
okd_http_ingress_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-w-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	1m49s DOWN	L4TOUT in 2001ms	1/1	Y	-	1	1	1m49s	-
okd-w-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	1m49s DOWN	L4TOUT in 2001ms	1/1	Y	-	1	1	1m49s	-
okd-w-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	1m49s DOWN	L4TOUT in 2001ms	1/1	Y	-	1	1	1m49s	-
okd-w-4	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	1m49s DOWN	L4TOUT in 2003ms	1/1	Y	-	1	1	1m49s	-
Backend	0	0		0	0		0	0	2 000	0	0	?	0	0	0	0		0	0	0	0	1m49s DOWN		0/0	0	0		1	1m49s	

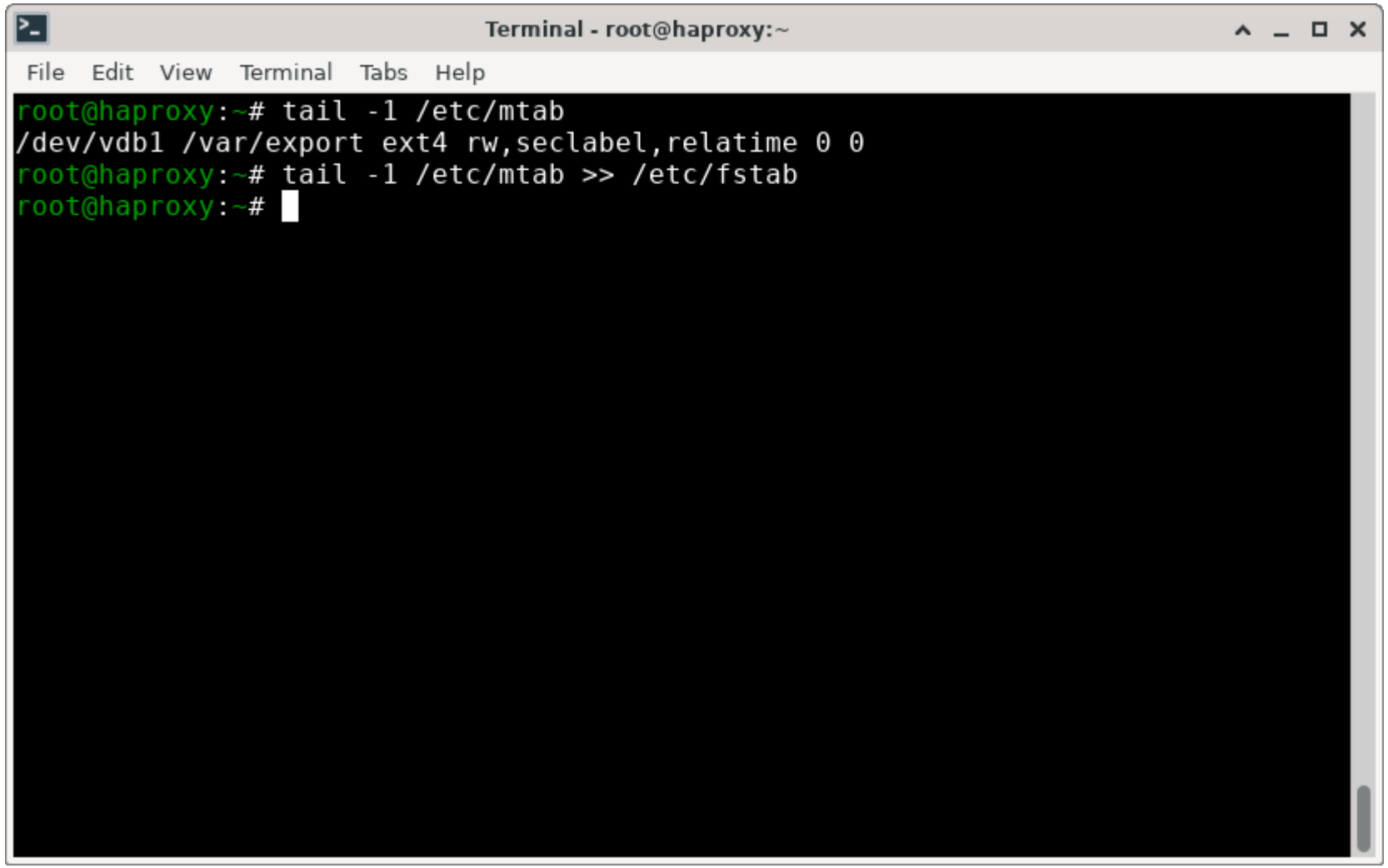
NFS

- We’re going to set up an NFS server for registry storage.
- I added a second 200GB disk to the HAProxy machine, partitioned it, and formatted it with ext4.
- We’ll export it using NFS.

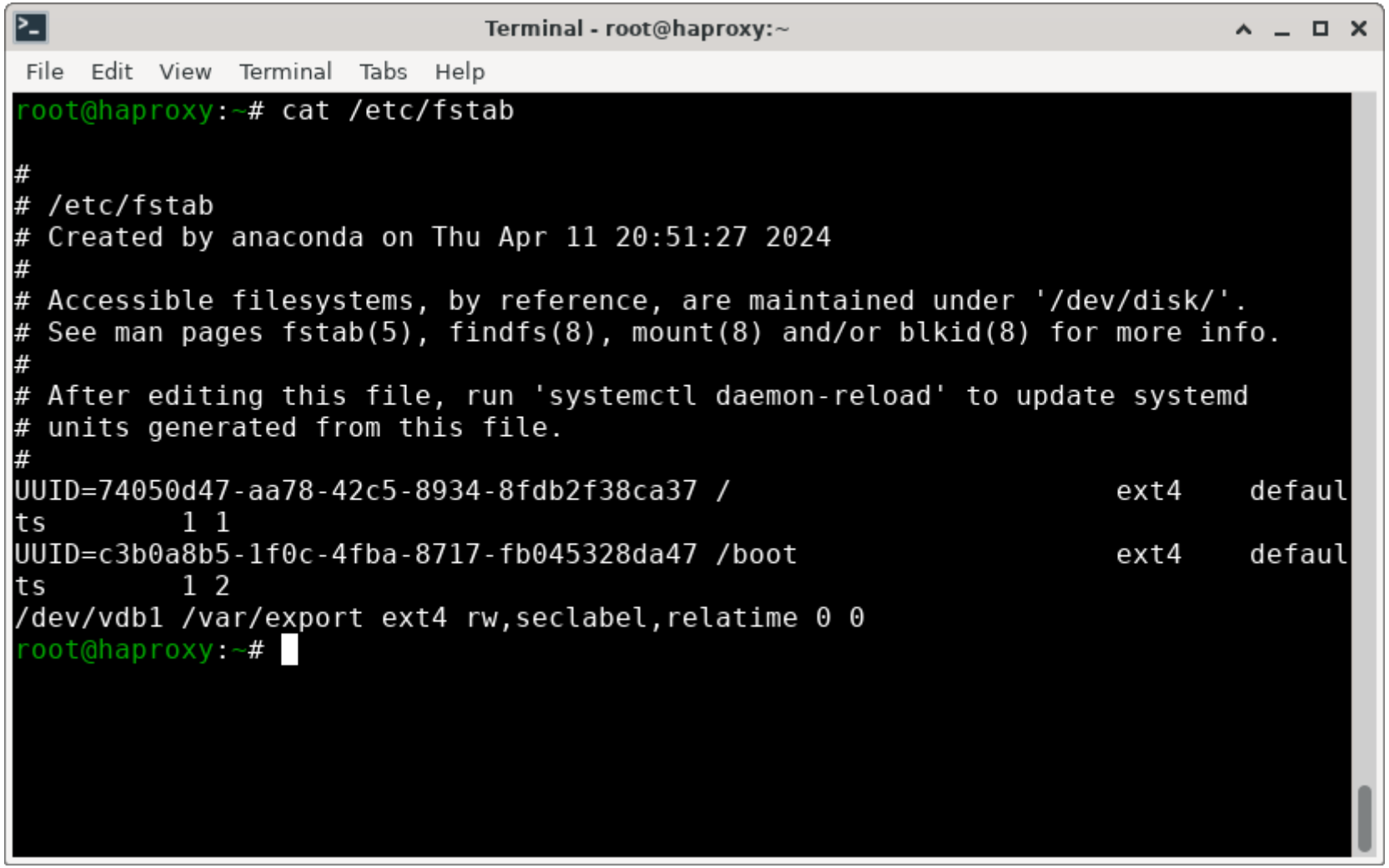
NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# mkdir /var/export
root@haproxy:~# mount /dev/vdb1 /var/export
root@haproxy:~# df -h /var/export
Filesystem Size Used Avail Use% Mounted on
/dev/vdb1 196G 2.1M 186G 1% /var/export
root@haproxy:~#

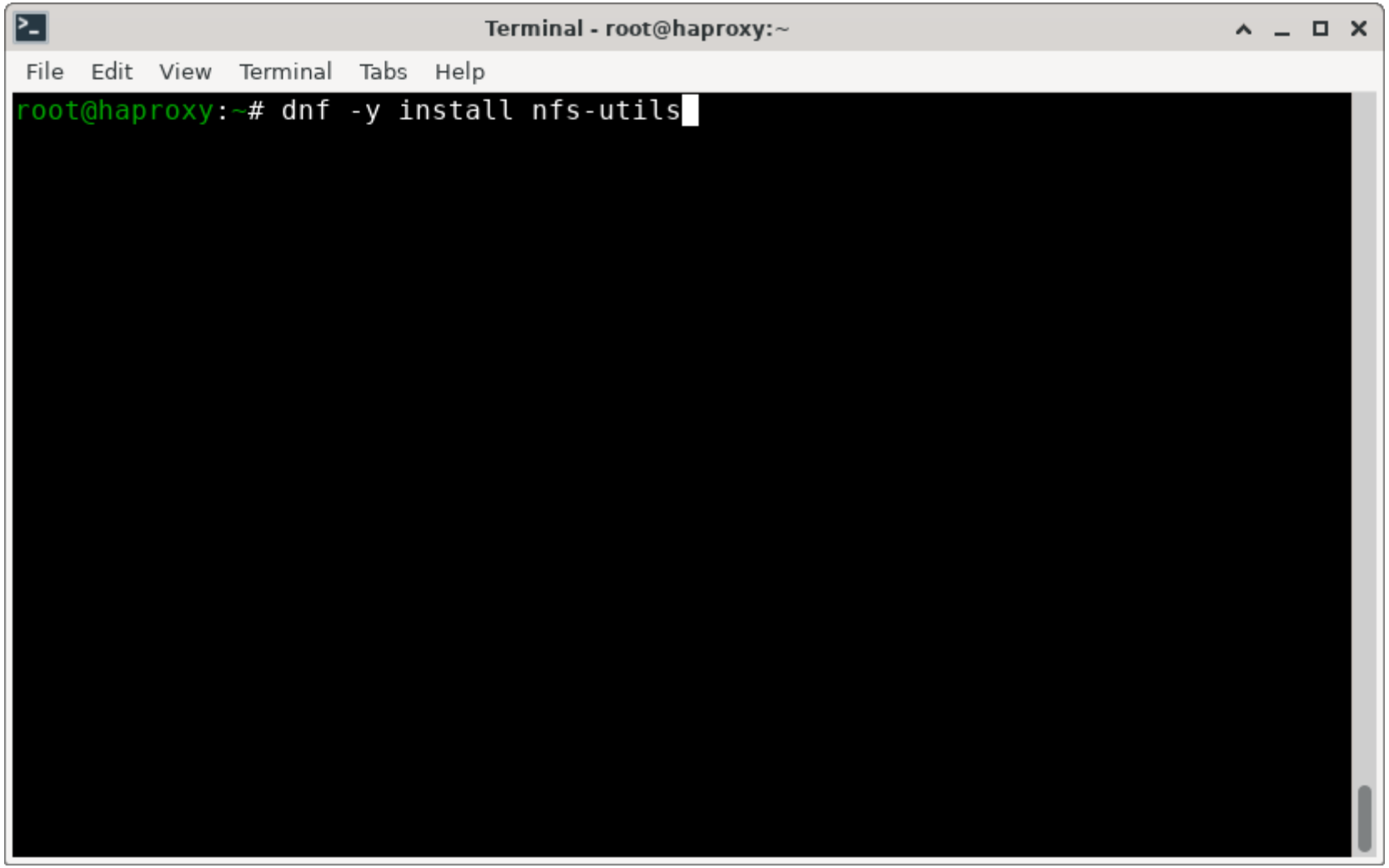
NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# tail -1 /etc/mtab
/dev/vdb1 /var/export ext4 rw,seclabel,relatime 0 0
root@haproxy:~# tail -1 /etc/mtab >> /etc/fstab
root@haproxy:~#

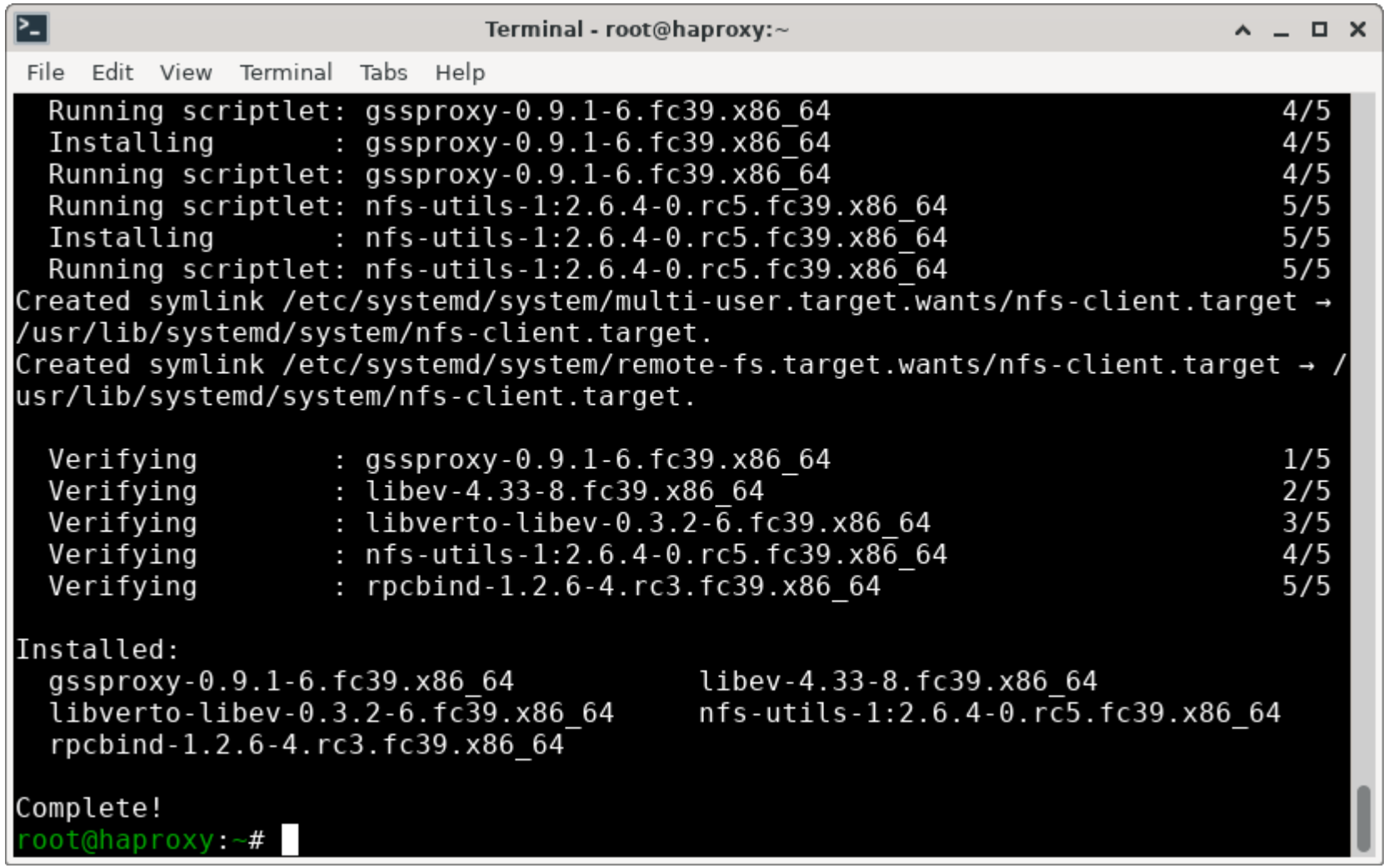
NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# cat /etc/fstab
#
/etc/fstab
Created by anaconda on Thu Apr 11 20:51:27 2024
#
Accessible filesystems, by reference, are maintained under '/dev/disk/'.
See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info.
#
After editing this file, run 'systemctl daemon-reload' to update systemd
units generated from this file.
#
UUID=74050d47-aa78-42c5-8934-8fdb2f38ca37 / ext4 defaul
ts 1 1
UUID=c3b0a8b5-1f0c-4fba-8717-fb045328da47 /boot ext4 defaul
ts 1 2
/dev/vdb1 /var/export ext4 rw,seclabel,relatime 0 0
root@haproxy:~#

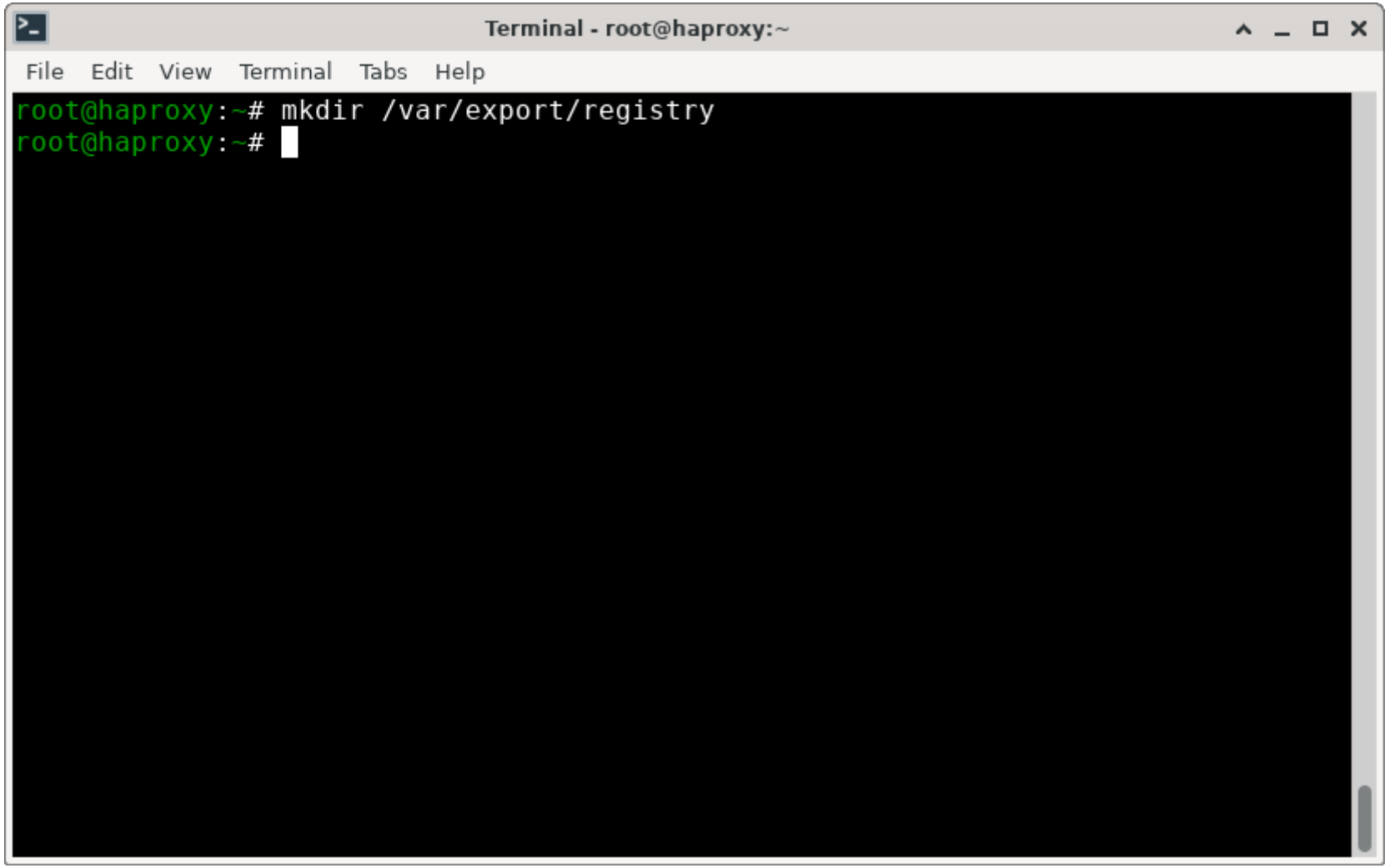
NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# dnf -y install nfs-utils

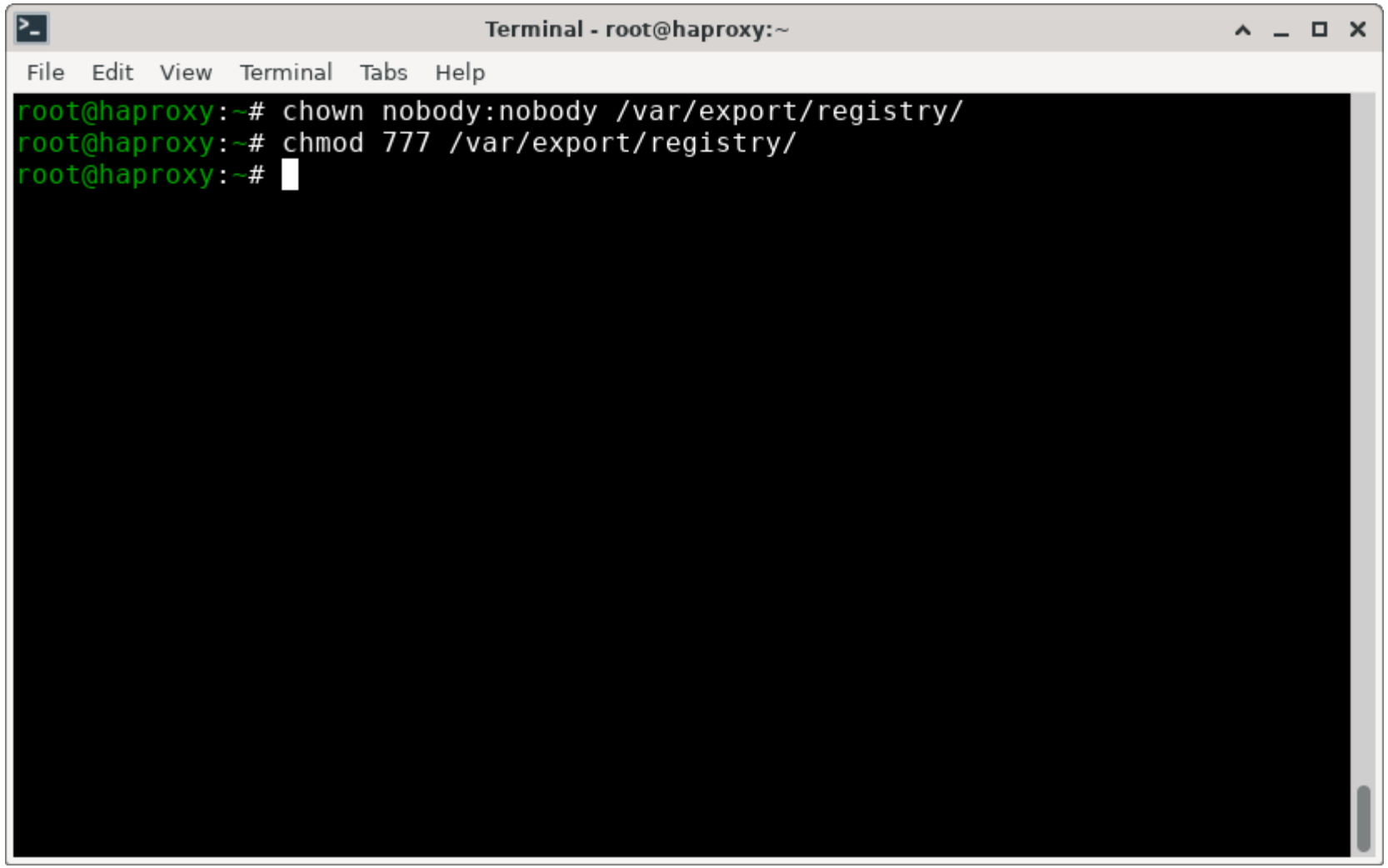
NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
Running scriptlet: gssproxy-0.9.1-6.fc39.x86_64 4/5
Installing : gssproxy-0.9.1-6.fc39.x86_64 4/5
Running scriptlet: gssproxy-0.9.1-6.fc39.x86_64 4/5
Running scriptlet: nfs-utils-1:2.6.4-0.rc5.fc39.x86_64 5/5
Installing : nfs-utils-1:2.6.4-0.rc5.fc39.x86_64 5/5
Running scriptlet: nfs-utils-1:2.6.4-0.rc5.fc39.x86_64 5/5
Created symlink /etc/systemd/system/multi-user.target.wants/nfs-client.target → /usr/lib/systemd/system/nfs-client.target.
Created symlink /etc/systemd/system/remote-fs.target.wants/nfs-client.target → /usr/lib/systemd/system/nfs-client.target.
Verifying : gssproxy-0.9.1-6.fc39.x86_64 1/5
Verifying : libev-4.33-8.fc39.x86_64 2/5
Verifying : libverto-libev-0.3.2-6.fc39.x86_64 3/5
Verifying : nfs-utils-1:2.6.4-0.rc5.fc39.x86_64 4/5
Verifying : rpcbind-1.2.6-4.rc3.fc39.x86_64 5/5
Installed:
gssproxy-0.9.1-6.fc39.x86_64 libev-4.33-8.fc39.x86_64
libverto-libev-0.3.2-6.fc39.x86_64 nfs-utils-1:2.6.4-0.rc5.fc39.x86_64
rpcbind-1.2.6-4.rc3.fc39.x86_64
Complete!
root@haproxy:~#

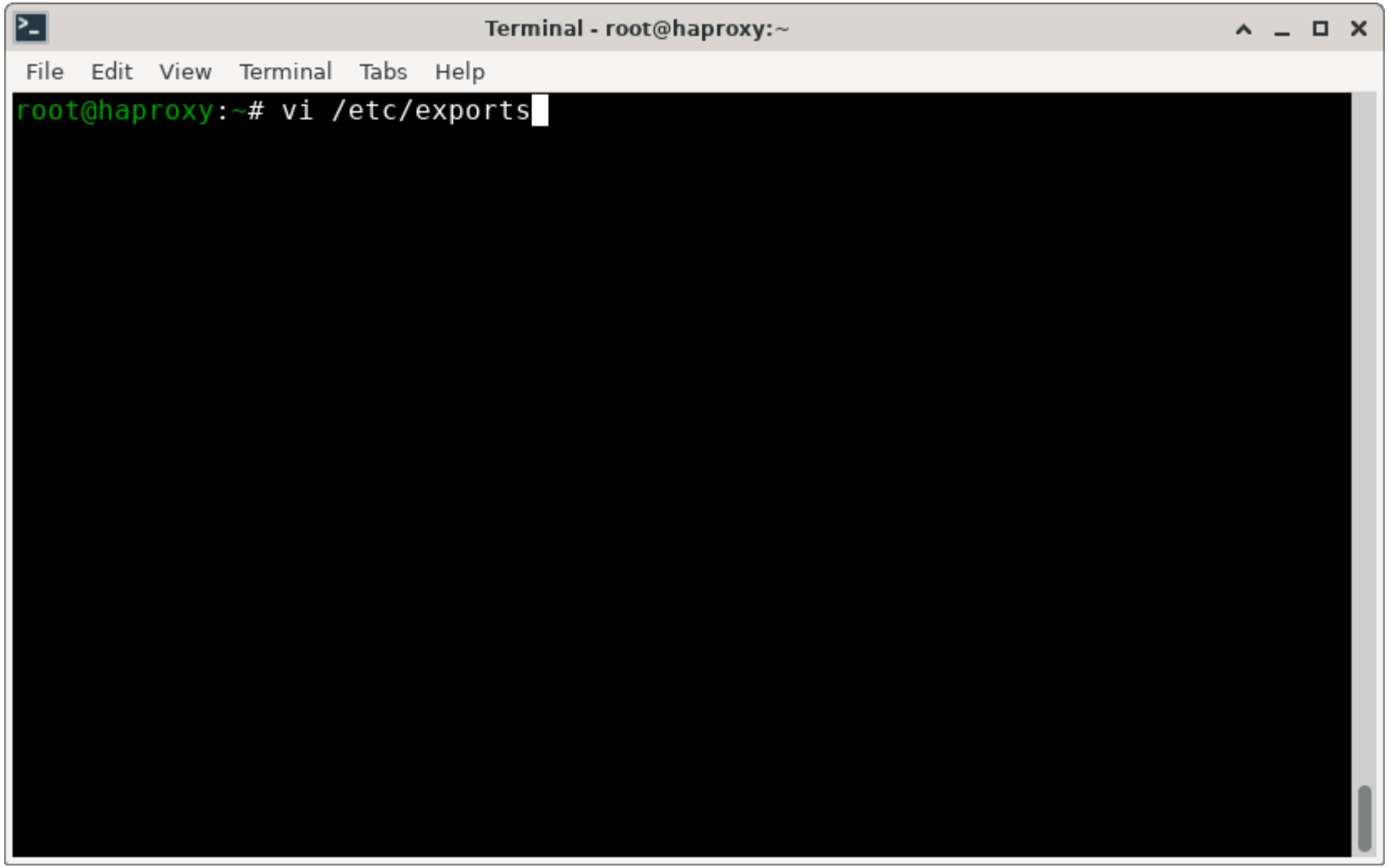
NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# mkdir /var/export/registry
root@haproxy:~#

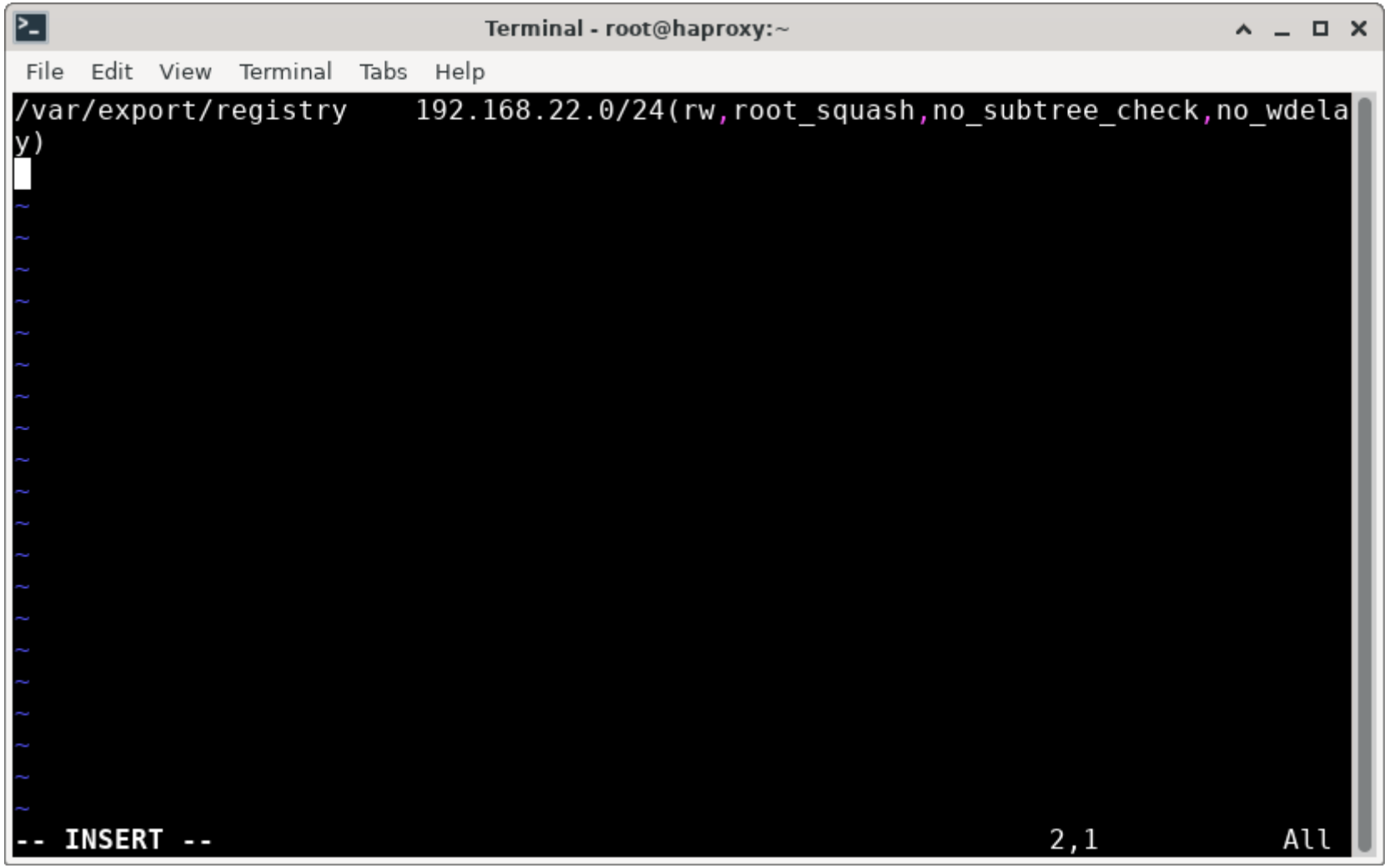
NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# chown nobody:nobody /var/export/registry/
root@haproxy:~# chmod 777 /var/export/registry/
root@haproxy:~#

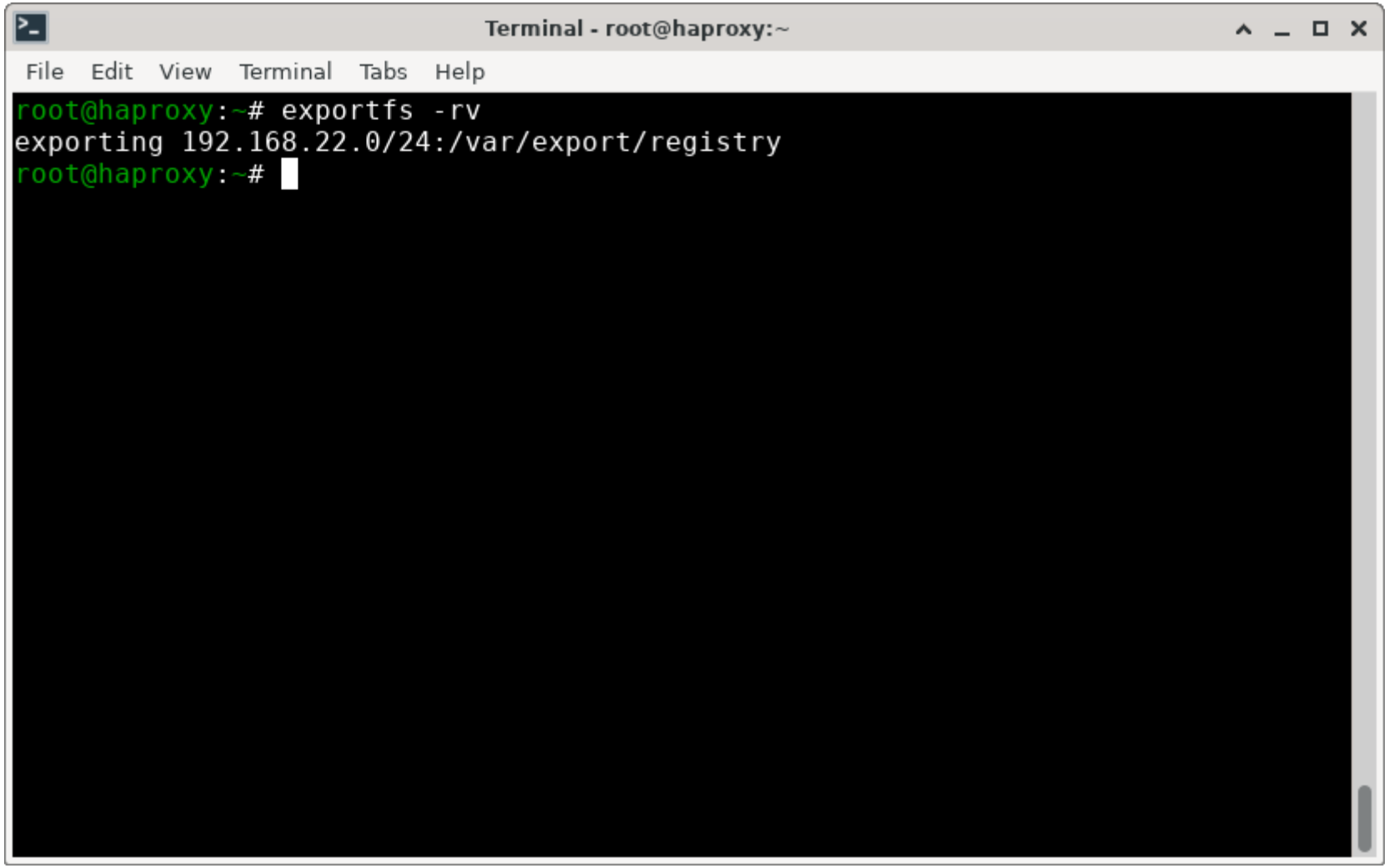
NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# vi /etc/exports

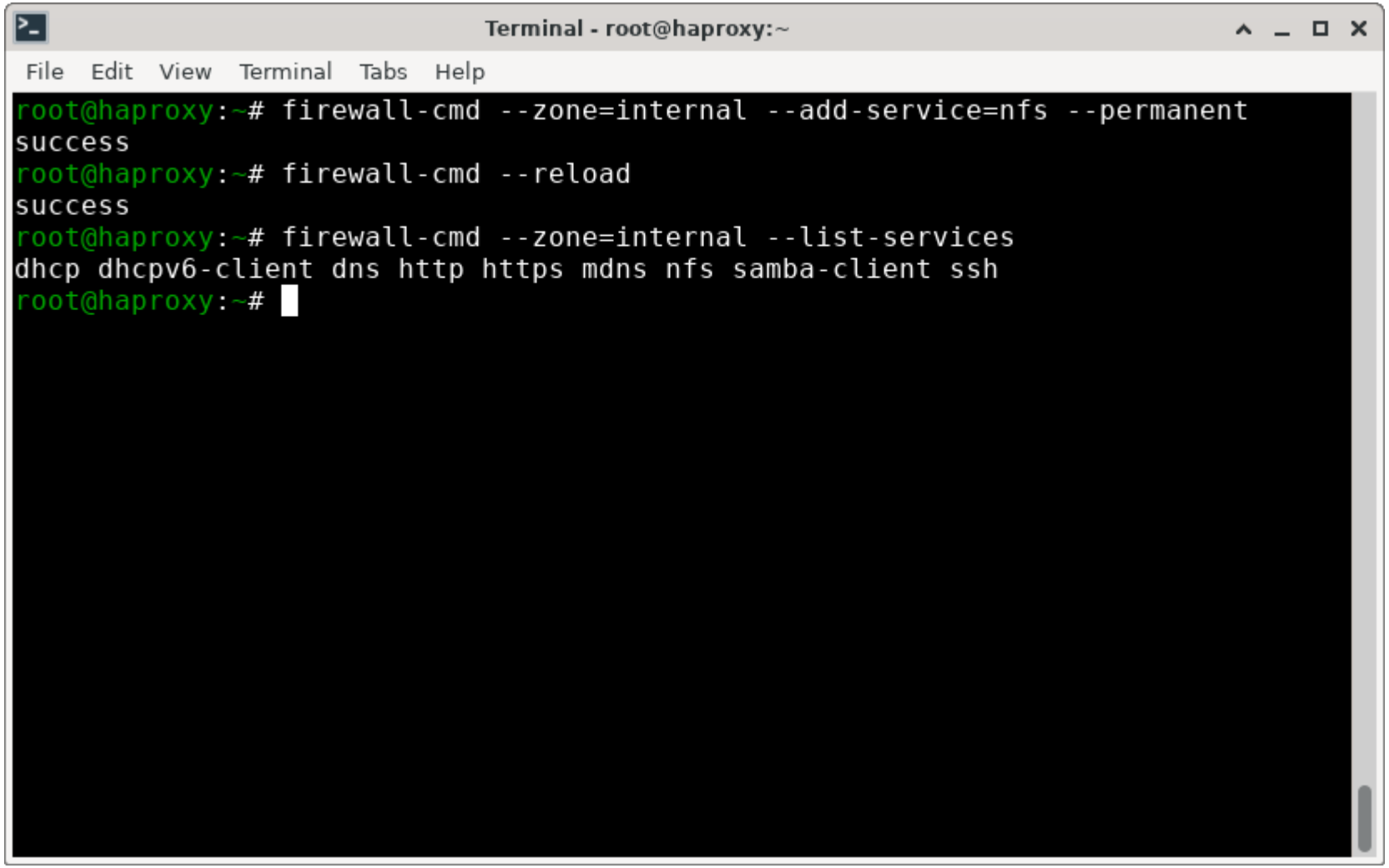
NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
/var/export/registry 192.168.22.0/24(rw,root_squash,no_subtree_check,no_wdela
y)
-- INSERT -- 2,1 All

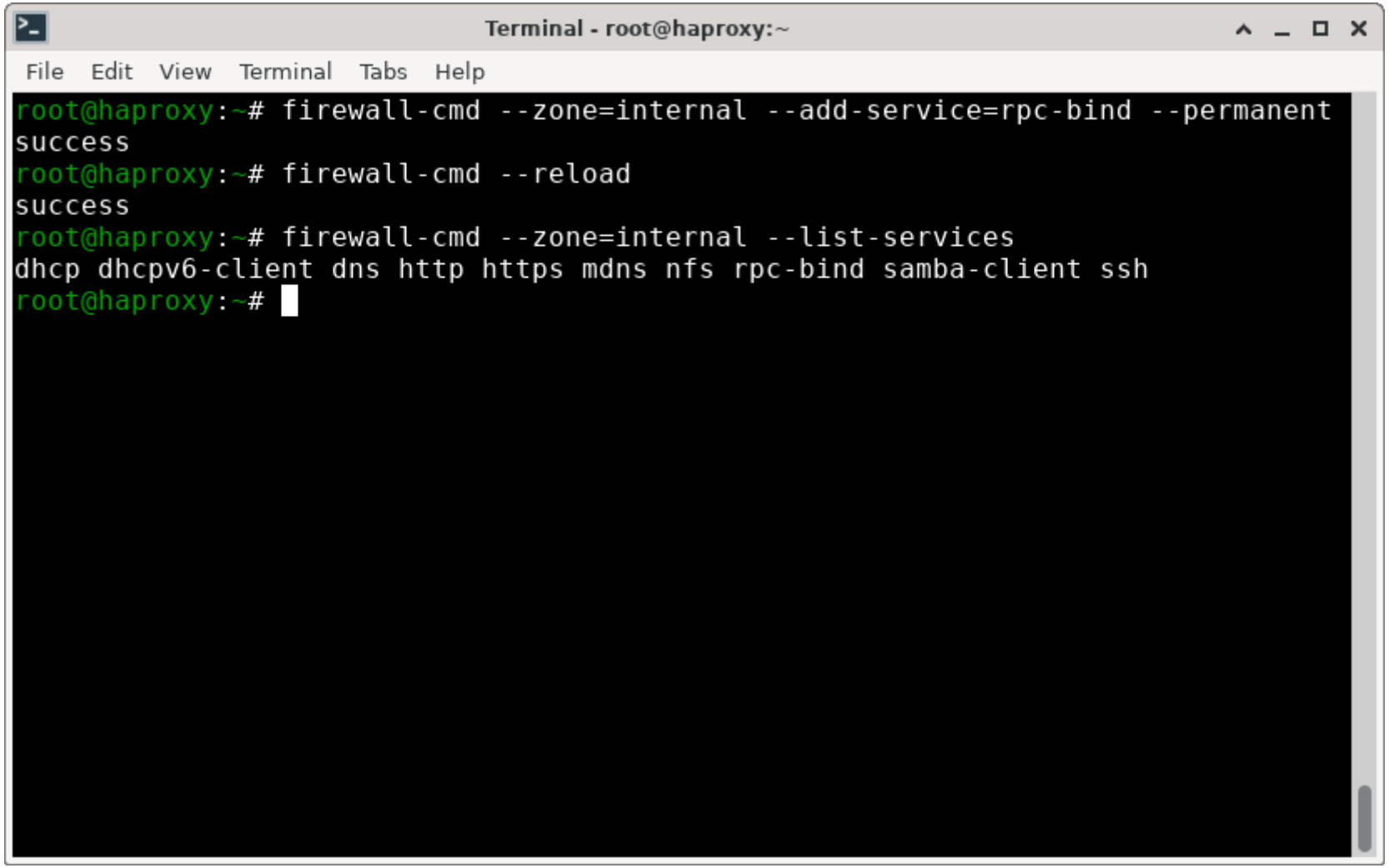
NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# exportfs -rv
exporting 192.168.22.0/24:/var/export/registry
root@haproxy:~#

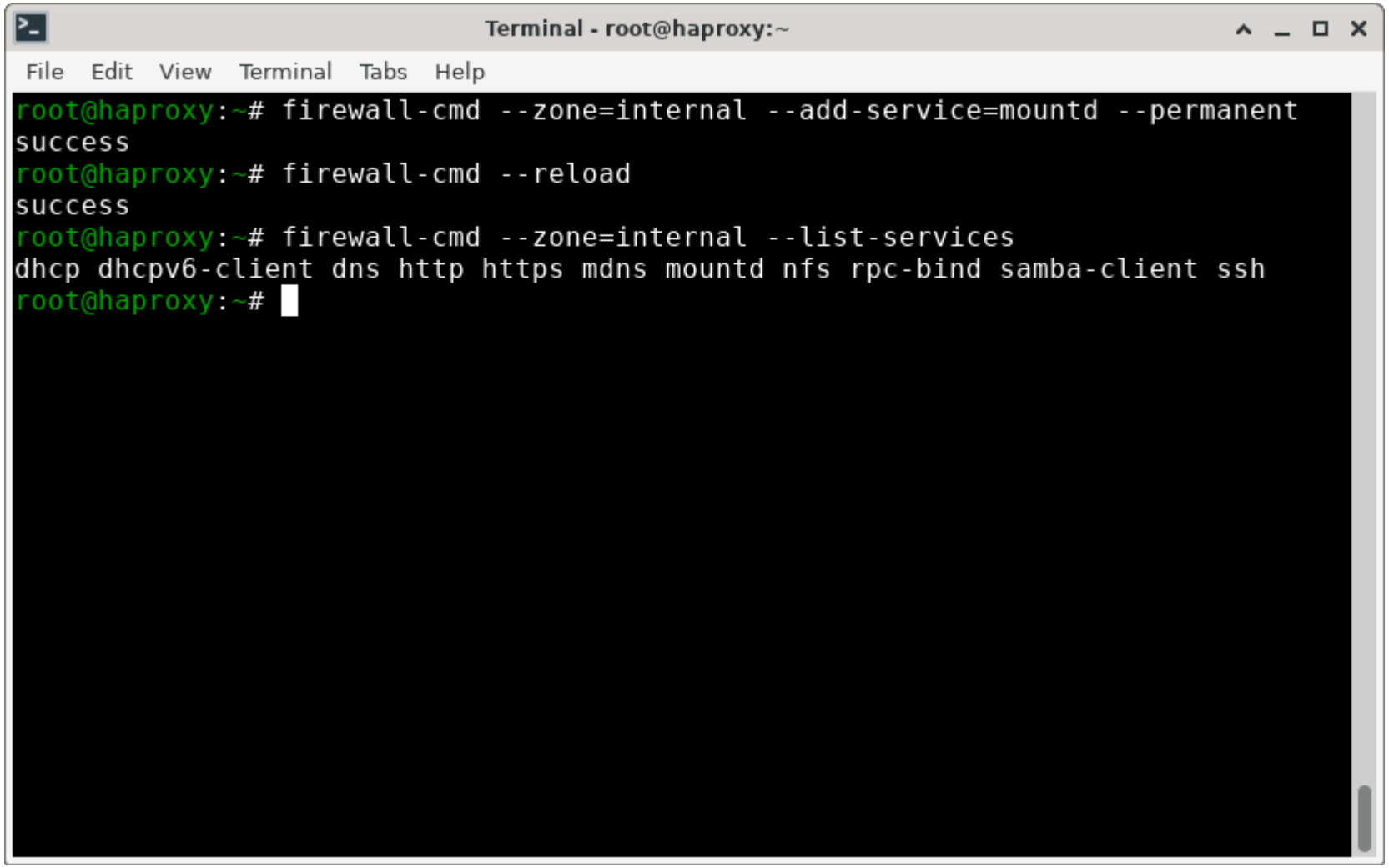
NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# firewall-cmd --zone=internal --add-service=nfs --permanent
success
root@haproxy:~# firewall-cmd --reload
success
root@haproxy:~# firewall-cmd --zone=internal --list-services
dhcp dhcpv6-client dns http https mdns nfs samba-client ssh
root@haproxy:~#

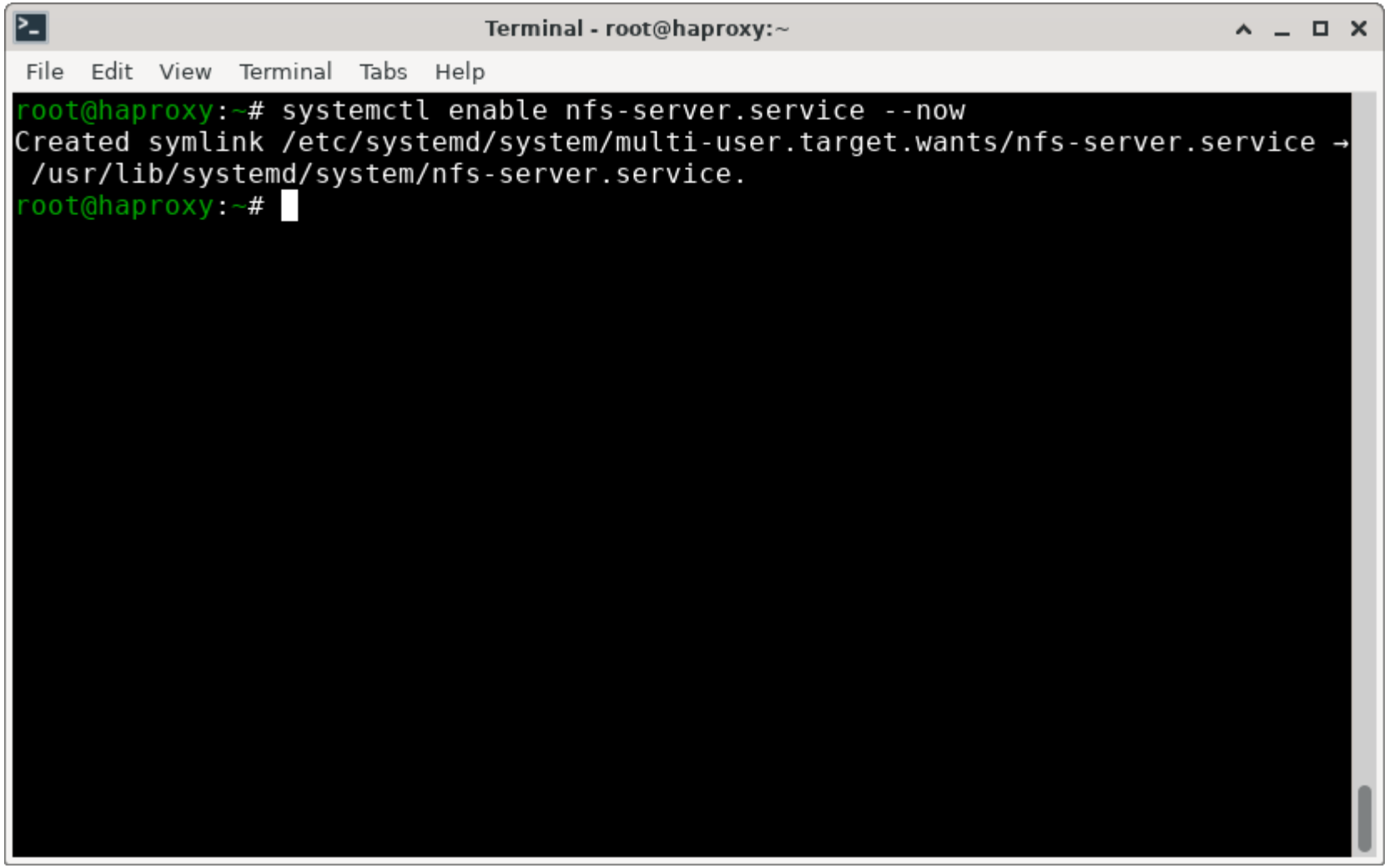
NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# firewall-cmd --zone=internal --add-service=rpc-bind --permanent
success
root@haproxy:~# firewall-cmd --reload
success
root@haproxy:~# firewall-cmd --zone=internal --list-services
dhcp dhcpv6-client dns http https mdns nfs rpc-bind samba-client ssh
root@haproxy:~#

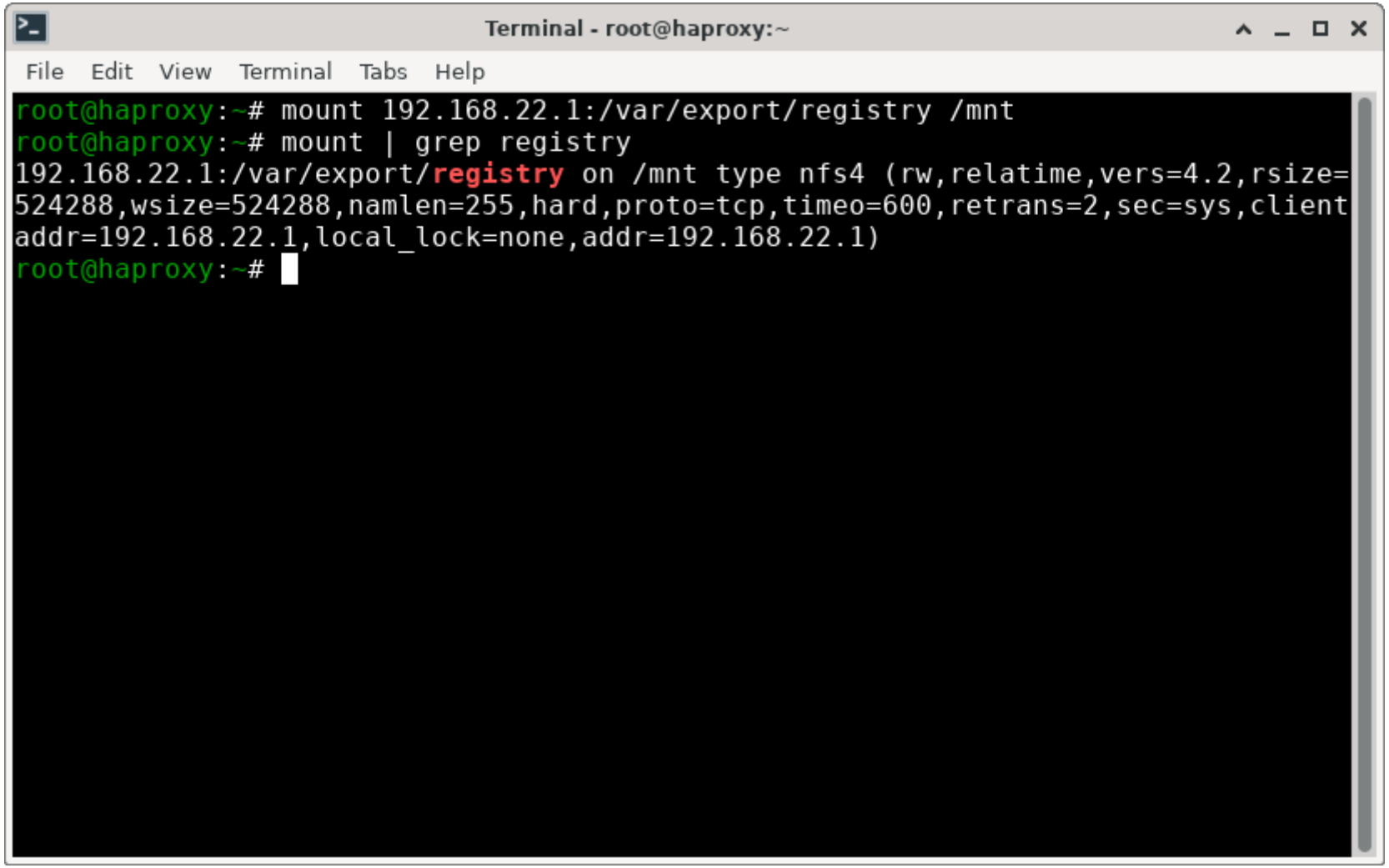
NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# firewall-cmd --zone=internal --add-service=mountd --permanent
success
root@haproxy:~# firewall-cmd --reload
success
root@haproxy:~# firewall-cmd --zone=internal --list-services
dhcp dhcpv6-client dns http https mdns mountd nfs rpc-bind samba-client ssh
root@haproxy:~#

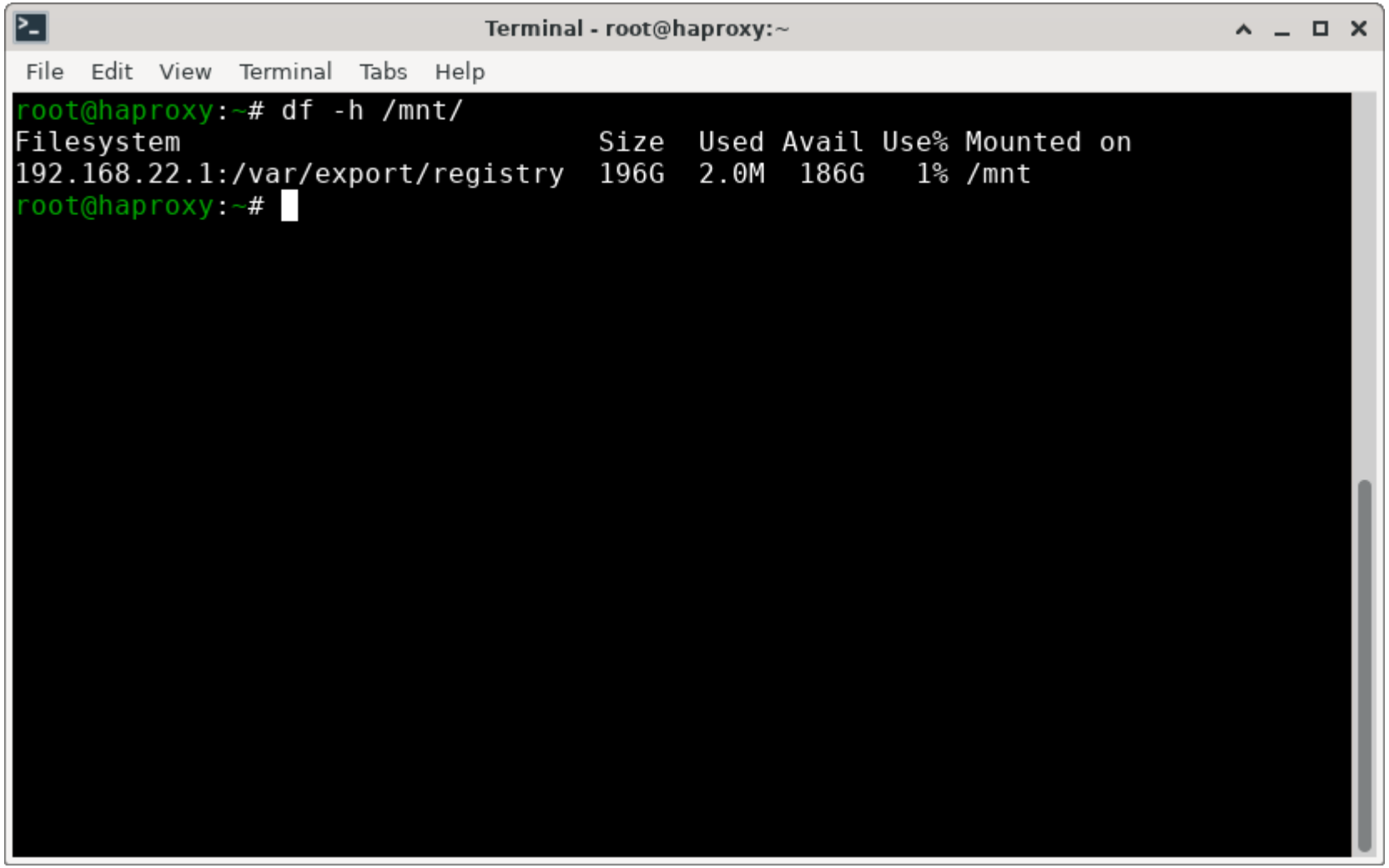
NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# systemctl enable nfs-server.service --now
Created symlink /etc/systemd/system/multi-user.target.wants/nfs-server.service →
/usr/lib/systemd/system/nfs-server.service.
root@haproxy:~#

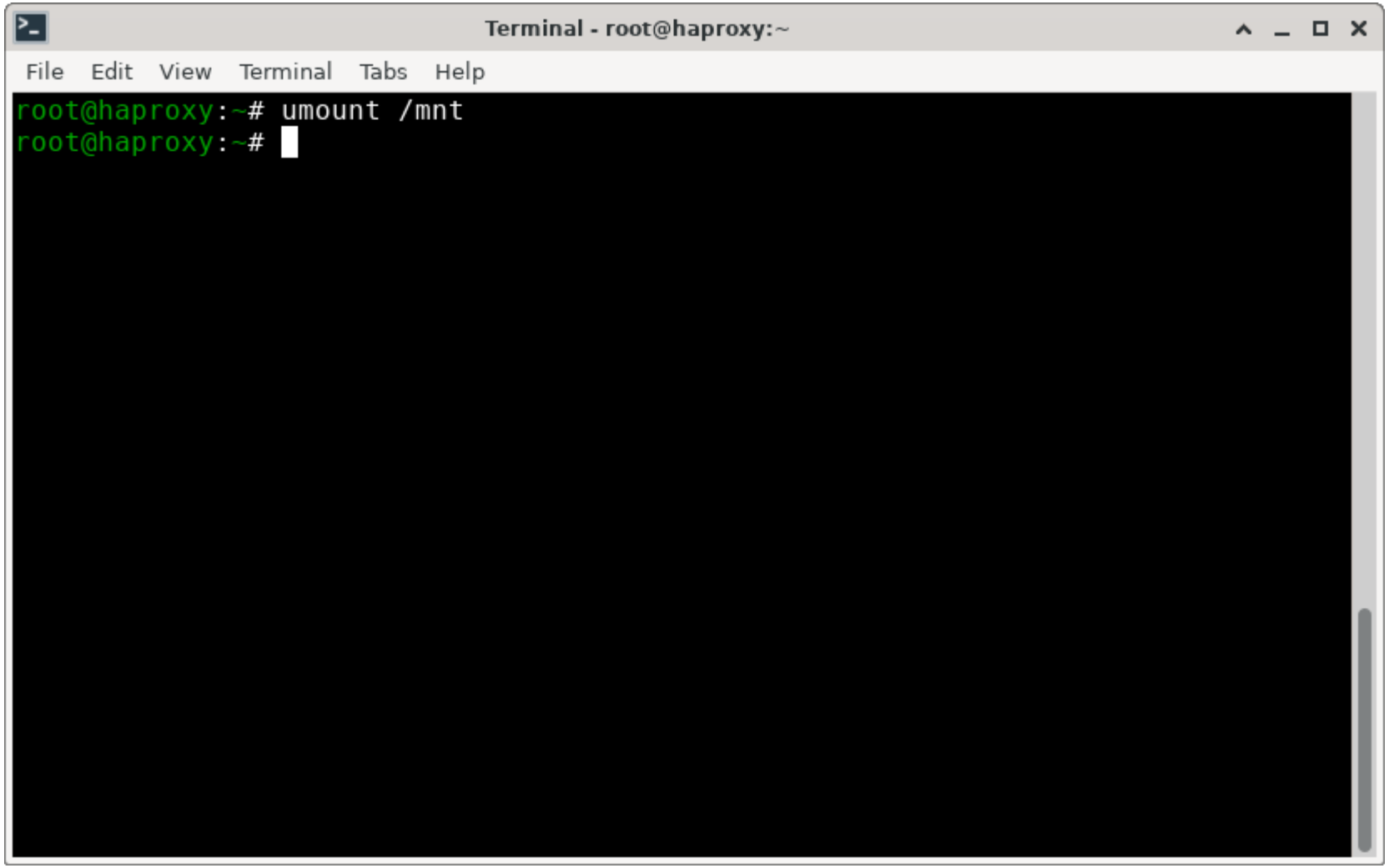
NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# mount 192.168.22.1:/var/export/registry /mnt
root@haproxy:~# mount | grep registry
192.168.22.1:/var/export/registry on /mnt type nfs4 (rw,relatime,vers=4.2,rsize=524288,wsize=524288,namlen=255,hard,proto=tcp,timeo=600,retrans=2,sec=sys,clientaddr=192.168.22.1,local_lock=none,addr=192.168.22.1)
root@haproxy:~#

NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# df -h /mnt/
Filesystem Size Used Avail Use% Mounted on
192.168.22.1:/var/export/registry 196G 2.0M 186G 1% /mnt
root@haproxy:~#

NFS


Terminal - root@haproxy:~
File Edit View Terminal Tabs Help
root@haproxy:~# umount /mnt
root@haproxy:~#

Download the client and installer

- Download the installation and client software
  - openshift-client-linux
  - openshift-install-linux
- I used my desktop machine to download the client and installer

Mar 10

vrutkovs

4.15.0-0.okd-...

e03dd17

Compare

4.15.0-0.okd-2024-03-10-010116 Latest

Client tools for OpenShift

These archives contain the client tooling for OpenShift.

To verify the contents of this directory, use the 'gpg' and 'shasum' tools to ensure the archives you have downloaded match those published from this location.

The openshift-install binary has been preconfigured to install the following release:

```
Name:          4.15.0-0.okd-2024-03-10-010116
Digest:        sha256:46b462be1e4c15ce5ab5fba97e713e8824bbb9f614ac5abe1be41fda916920cc
Created:       2024-03-10T06:53:44Z
OS/Arch:       linux/amd64
Manifests:     707
Metadata files: 1

Pull From: quay.io/openshift/okd@sha256:46b462be1e4c15ce5ab5fba97e713e8824bbb9f614ac5abe1be41fda916920cc

Release Metadata:
  Version:  4.15.0-0.okd-2024-03-10-010116
  Upgrades: <none>
  Metadata:
```

```
cluster-machine-approver                quay.io/openshift/okd-content@sha256:a4999452f126c8591aa6
cluster-monitoring-operator             quay.io/openshift/okd-content@sha256:cbbd5af3d21d4df519ac
cluster-network-operator                quay.io/openshift/okd-content@sha256:e97313025e336f52e6a5
c...
```

Read more

Assets 15

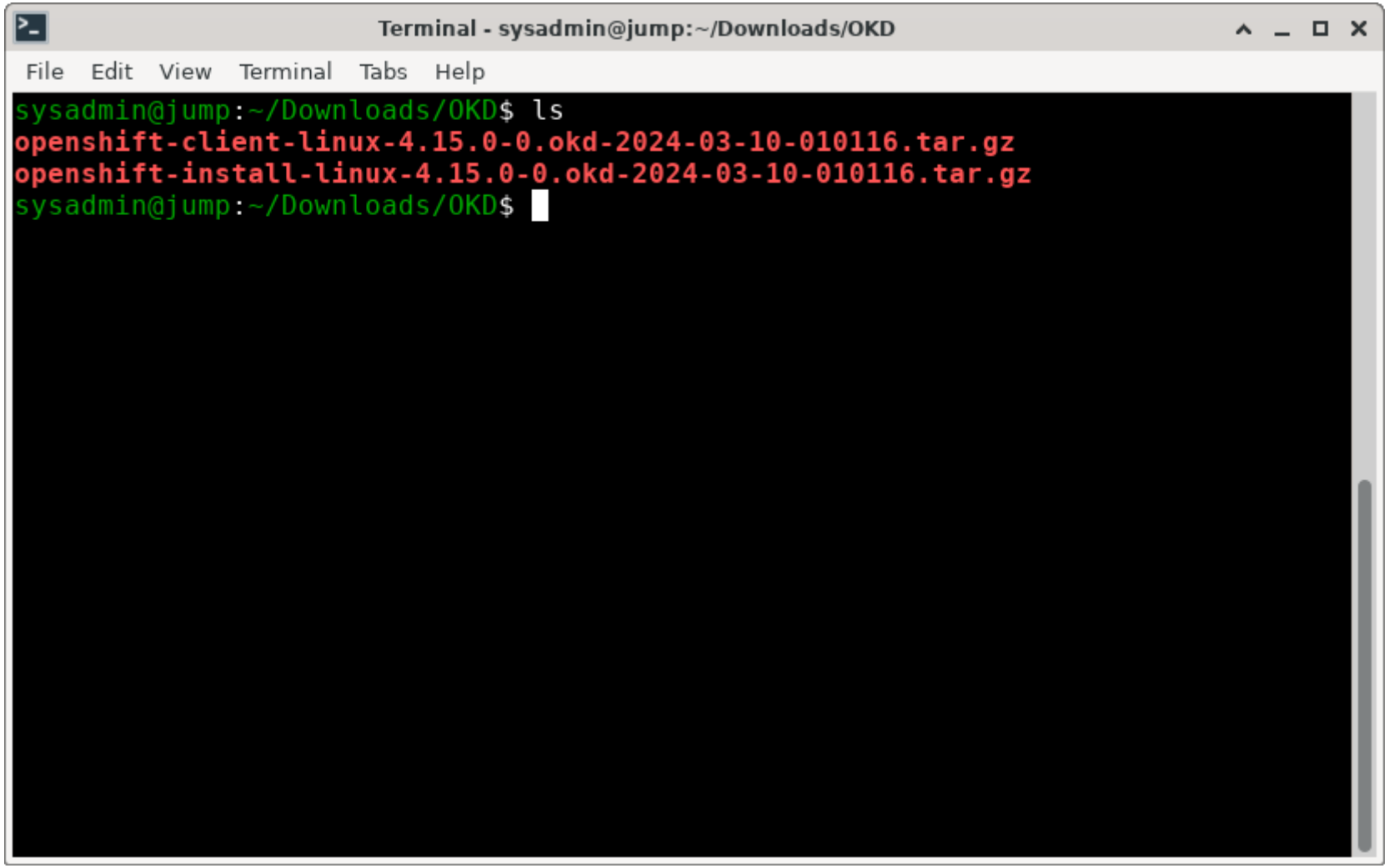
ccoctl-linux-4.15.0-0.okd-2024-03-10-010116.tar.gz	34.7 MB	Mar 10
openshift-client-linux-4.15.0-0.okd-2024-03-10-010116.tar.gz	62.4 MB	Mar 10
openshift-client-linux-arm64-4.15.0-0.okd-2024-03-10-010116.tar.gz	48.8 MB	Mar 10
openshift-client-mac-4.15.0-0.okd-2024-03-10-010116.tar.gz	52.1 MB	Mar 10
openshift-client-mac-arm64-4.15.0-0.okd-2024-03-10-010116.tar.gz	50.4 MB	Mar 10
openshift-client-windows-4.15.0-0.okd-2024-03-10-010116.zip	51.2 MB	Mar 10
openshift-install-linux-4.15.0-0.okd-2024-03-10-010116.tar.gz	419 MB	Mar 10
openshift-install-linux-arm64-4.15.0-0.okd-2024-03-10-010116.tar.gz	372 MB	Mar 10
openshift-install-mac-4.15.0-0.okd-2024-03-10-010116.tar.gz	442 MB	Mar 10
openshift-install-mac-arm64-4.15.0-0.okd-2024-03-10-010116.tar.gz	426 MB	Mar 10
release.txt	30.3 KB	Mar 10
sha256sum.txt	1.33 KB	Mar 10
sha256sum.txt.asc	488 Bytes	Mar 10
Source code (zip)		Mar 7
Source code (tar.gz)		Mar 7

4 4 people reacted 1 Join discussion

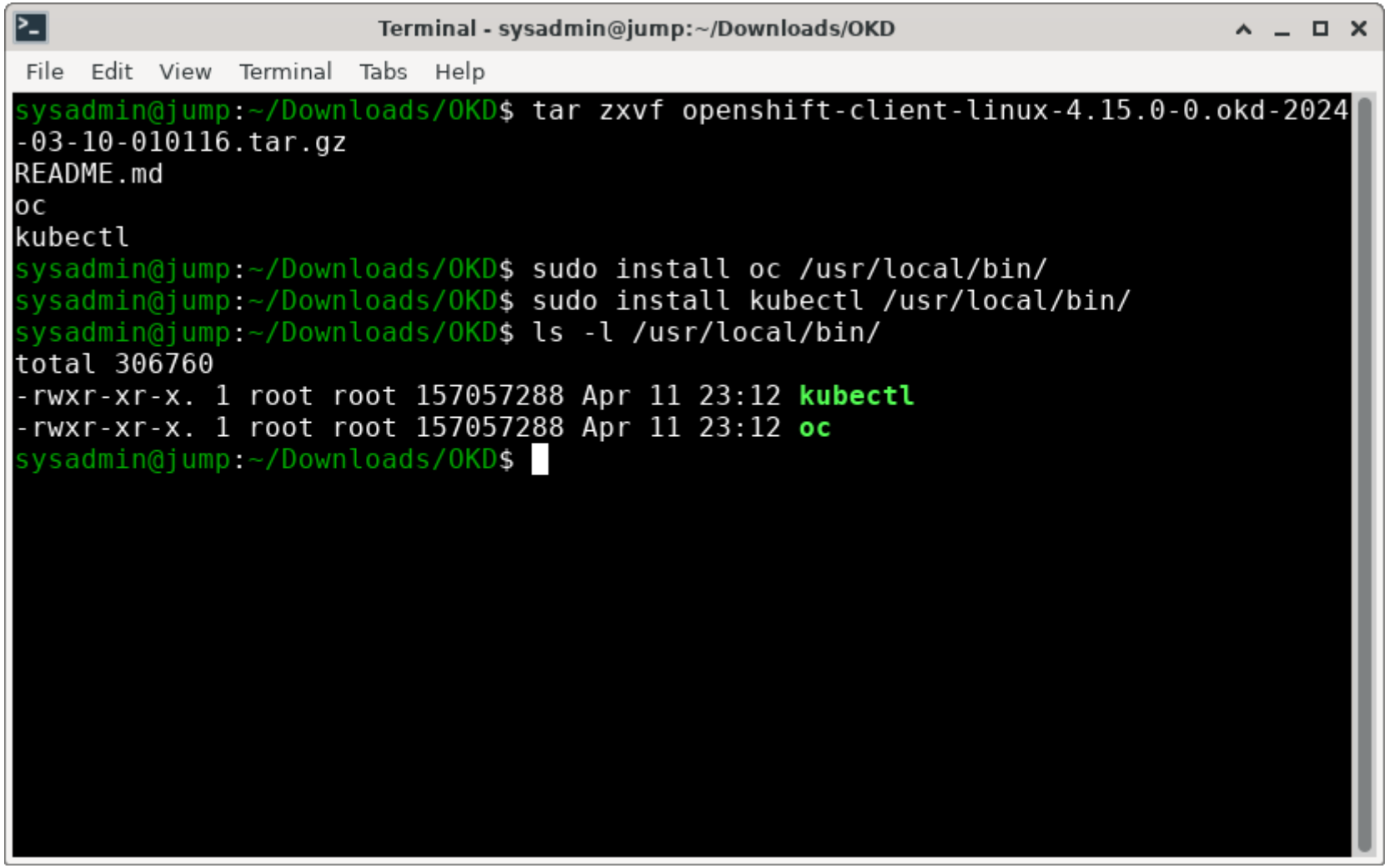
Feb 25

4.15.0-0.okd-2024-02-23-163410

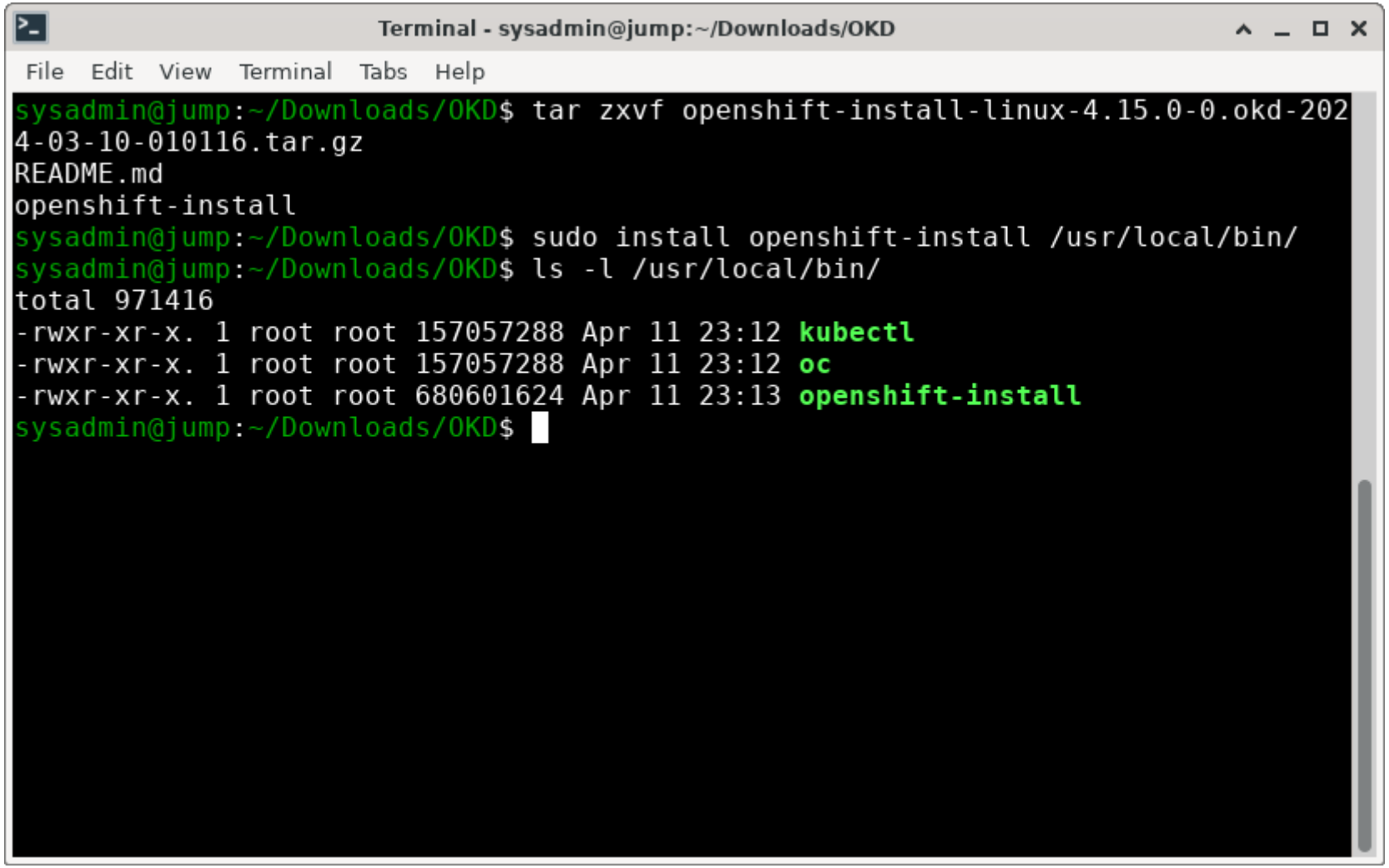
Client and Install



Client and Install



Client and Install

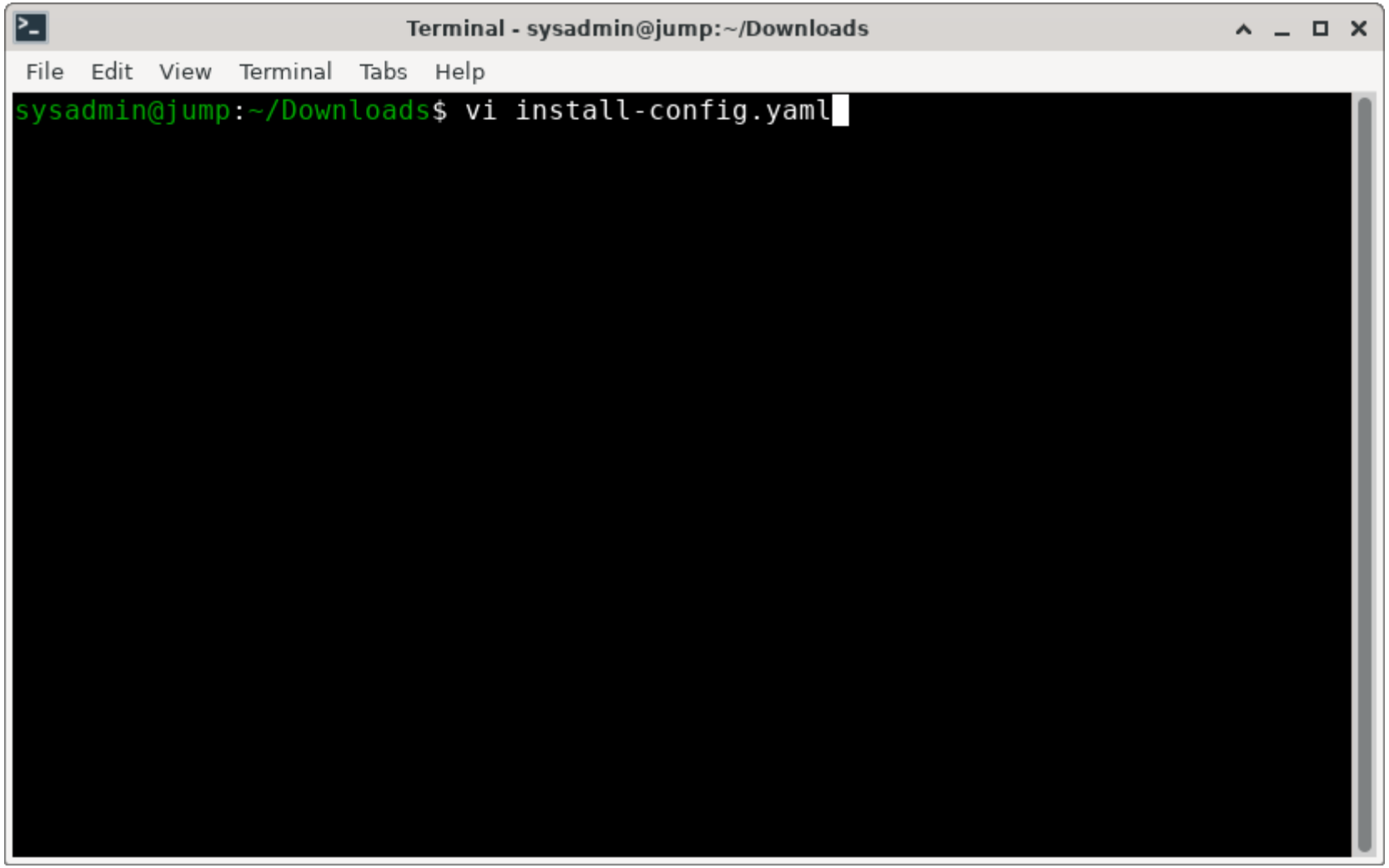


Create the install-config.yaml file

- You can download the template from the documentation site: https://github.com/openshift/installer/blob/master/docs/user/customization.md

- I used the one from Ryan's repository, and modified it a little bit for OKD vs. OpenShift

install-config.yaml



install-config.yaml

Terminal - sysadmin@jump:~/Downloads

File Edit View Terminal Tabs Help

```
apiVersion: v1
baseDomain: okd.lan
compute:
  - hyperthreading: Enabled
    name: worker
    replicas: 0 # Must be set to 0 for User Provisioned Installation as worker n
odes will be manually deployed.
controlPlane:
  hyperthreading: Enabled
  name: master
  replicas: 3
metadata:
  name: lab # Cluster name
networking:
  clusterNetwork:
    - cidr: 10.128.0.0/14
      hostPrefix: 23
  networkType: OVNKubernetes
  serviceNetwork:
    - 172.30.0.0/16
platform:
  none: {}
fips: false
                                                              1,1           Top
```

Grab your pull secret

- You **can** create a pull secret at https://console.redhat.com/openshift/install/pull-secret but it will register your cluster to Red Hat!
- Instead, you can use the string {"auths":{"fake": {"auth":"aWQ6cGFzcwo="}}} into your install-configure.yaml to bypass registration.

Extract the downloaded tarballs and copy the binaries into your PATH. Then run the following from an empty directory:

```
$ openshift-install create cluster
```

You'll be prompted to choose a platform to install to - AWS is currently the best place to start with OKD4 while we get Fedora CoreOS machine images set up in the other clouds.

You will need to have cloud credentials set in your shell properly before installation. You must have permission to configure the appropriate cloud resources from that account (such as VPCs, instances, and DNS records). You must have already configured a public DNS zone on your chosen cloud before the install starts.

You will also be prompted for a pull-secret that will be made available to all of of your machines - for OKD4 you should either paste the pull-secret you use for your registry, or paste `{"auths":{"fake":{"auth":"aWQ6cGFzcwo="}}}` to bypass the required value check (see bug #182).

Once the install completes successfully (usually 30m on AWS) the console URL and an admin username and password will be printed. If your DNS records were correct, you should be able to log in to your new OKD4 cluster!

To undo the installation and delete any cloud resources created by the installer, run

```
$ openshift-install destroy cluster
```

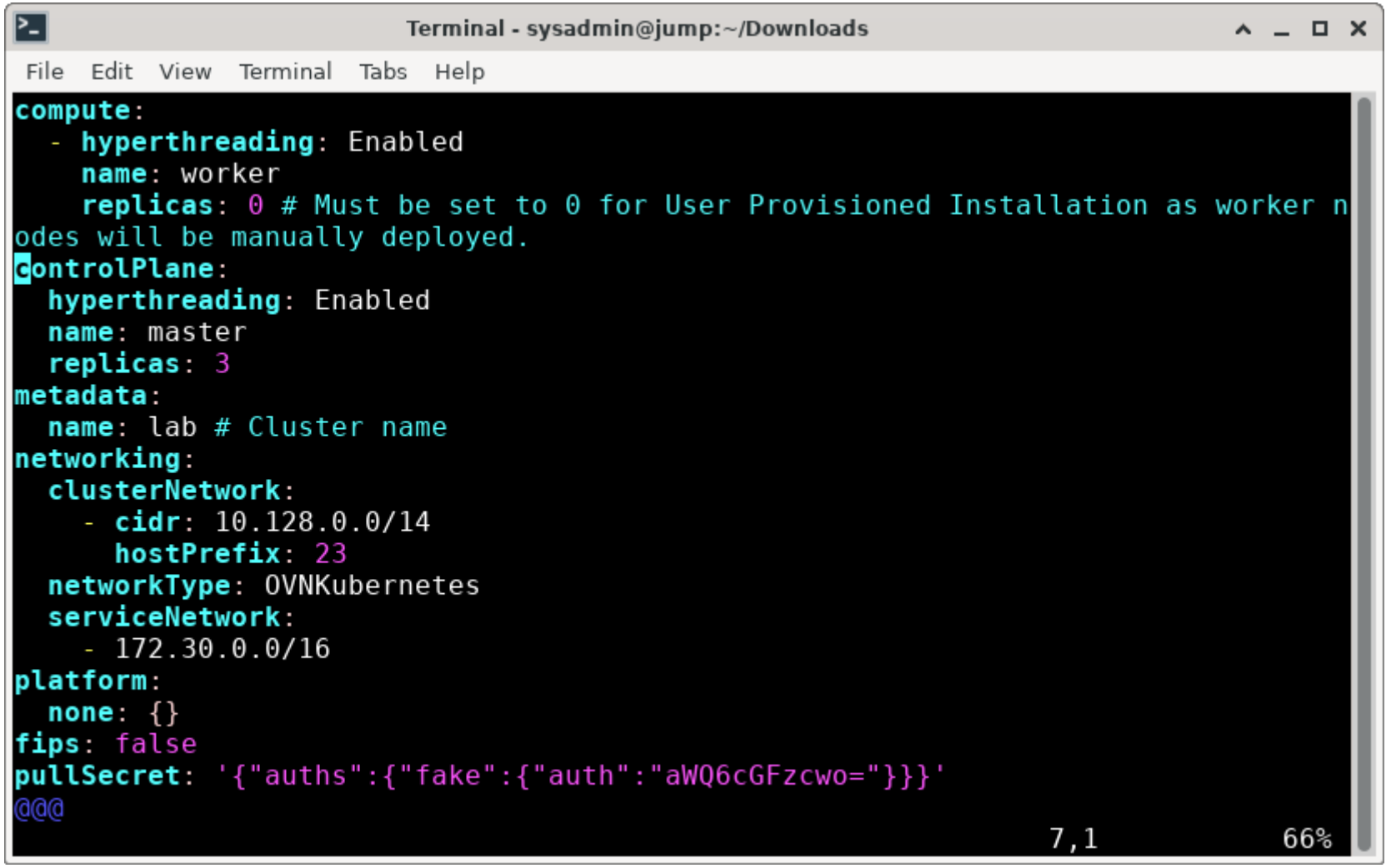
Learn more about the installer

The OpenShift client tools for your cluster can be downloaded from the web console.

Features

- A fully automated distribution of Kubernetes on all major clouds and bare metal, OpenStack, and other virtualization providers
  - Easily build applications with integrated service discovery and persistent storage.
  - Quickly and easily scale applications to handle periods of increased demand.
    - Support for automatic high availability, load balancing, health checking, and failover.
  - Access to the Operator Hub for extending Kubernetes with new, automated lifecycle capabilities
- Developer centric tooling and console for building containerized applications on Kubernetes
  - Push source code to your Git repository and automatically deploy containerized applications

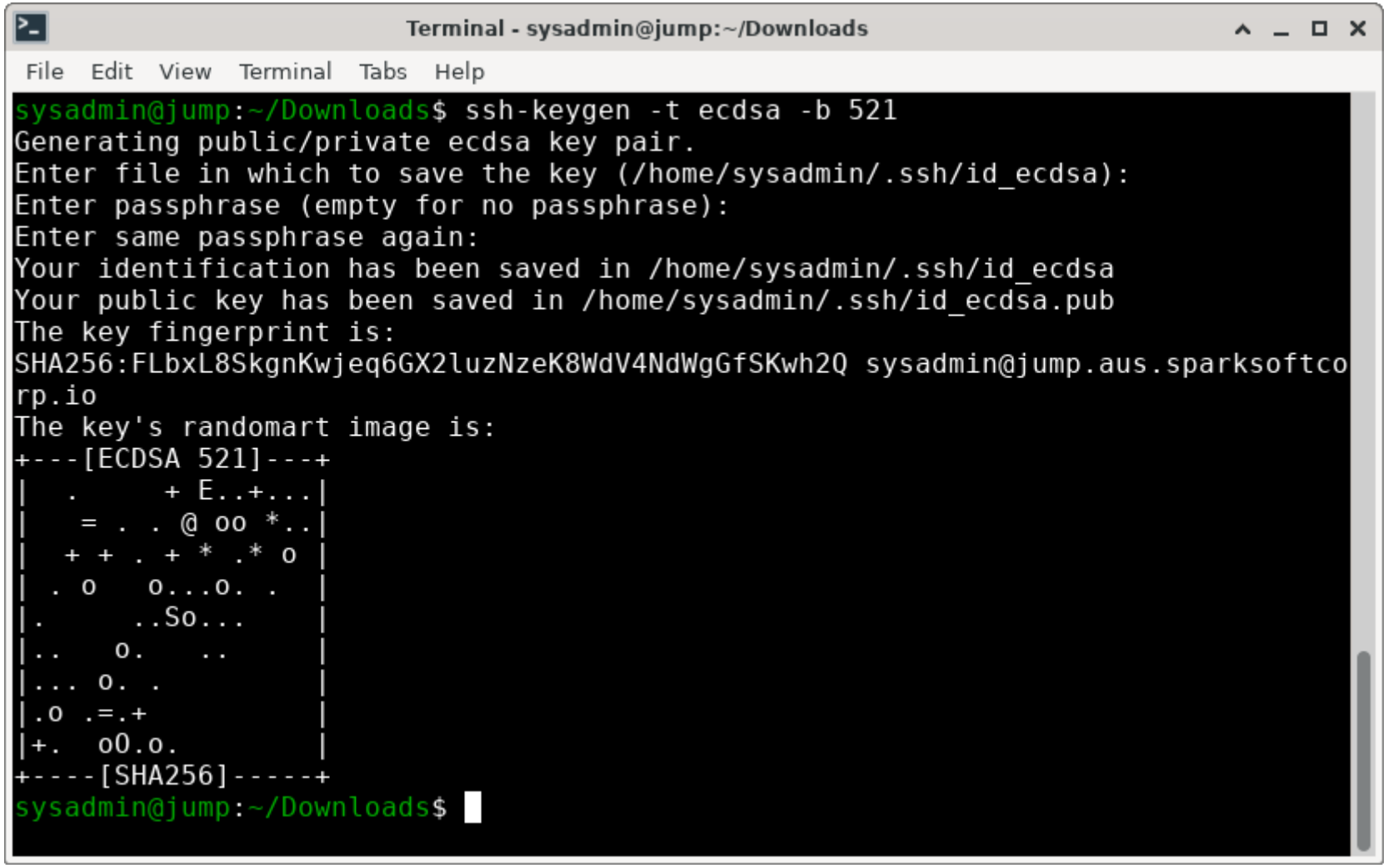
Pull secret


Terminal - sysadmin@jump:~/Downloads
File Edit View Terminal Tabs Help
compute:
- hyperthreading: Enabled
name: worker
replicas: 0 # Must be set to 0 for User Provisioned Installation as worker n
odes will be manually deployed.
controlPlane:
hyperthreading: Enabled
name: master
replicas: 3
metadata:
name: lab # Cluster name
networking:
clusterNetwork:
- cidr: 10.128.0.0/14
hostPrefix: 23
networkType: OVNKubernetes
serviceNetwork:
- 172.30.0.0/16
platform:
none: {}
fips: false
pullSecret: '{"auths":{"fake":{"auth":"aWQ6cGFzcwo="}}}'
@@@
7,1 66%

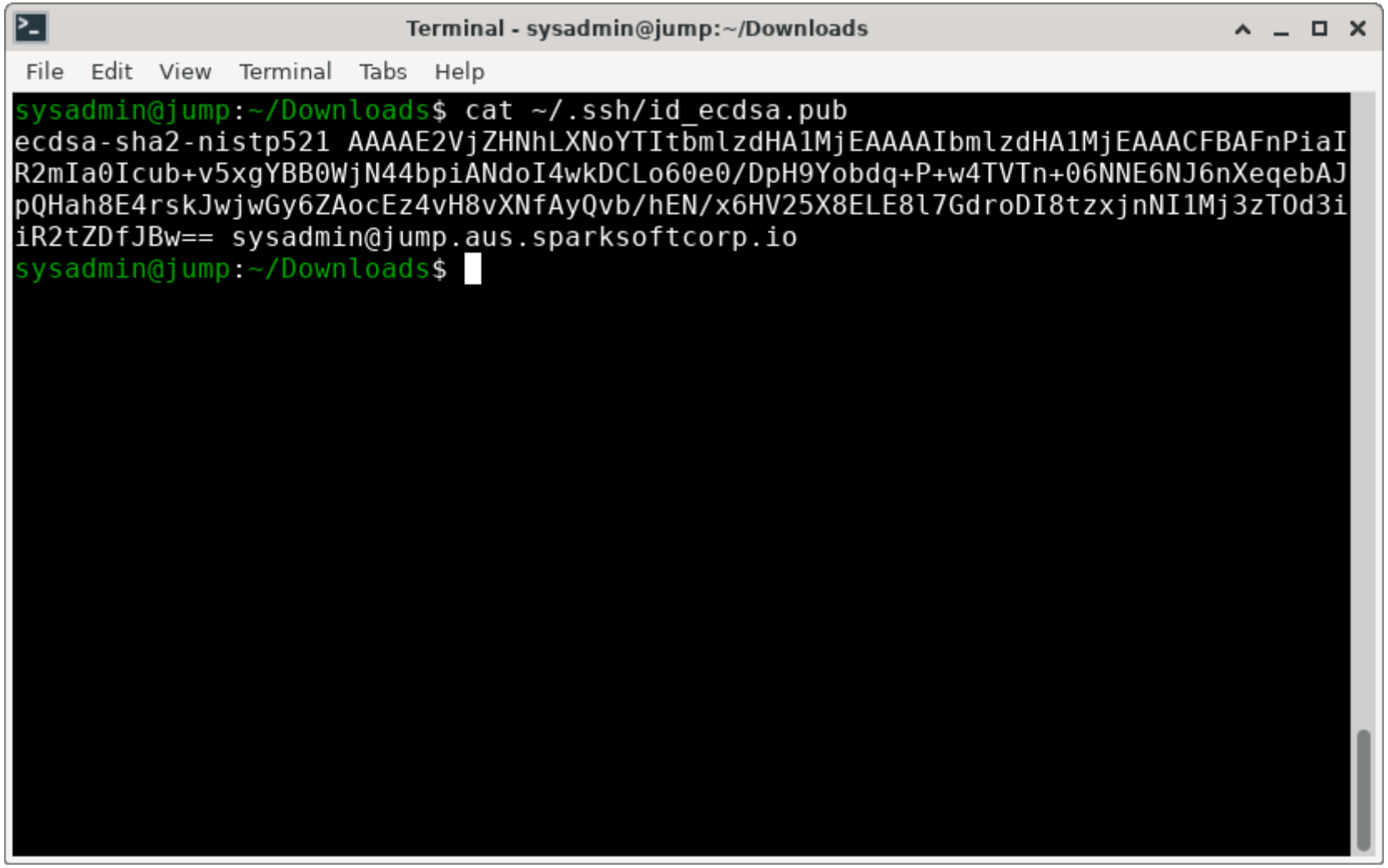
Create an ssh key

- Use ssh-keygen -t ecdsa -b 521

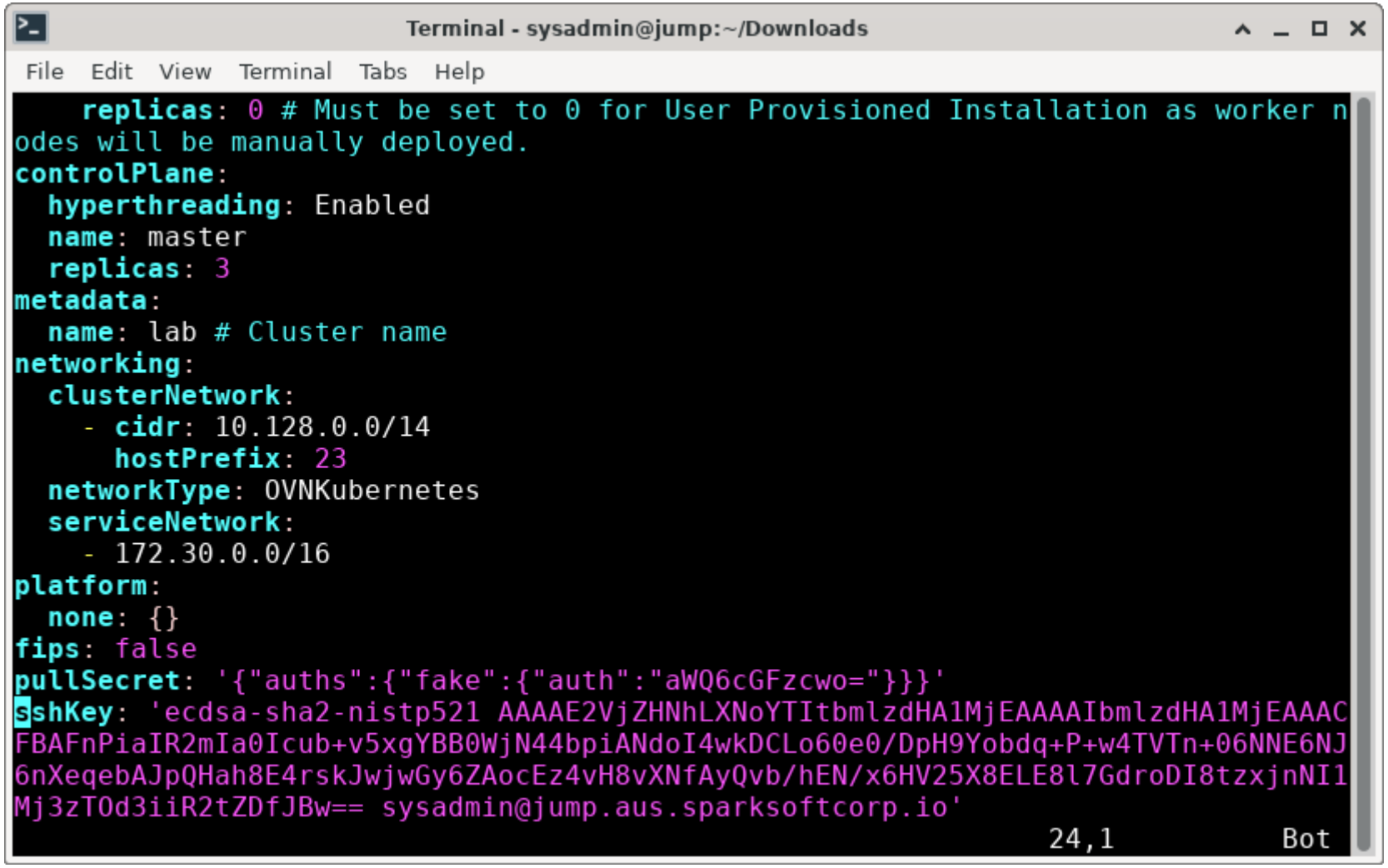
ssh-keygen


Terminal - sysadmin@jump:~/Downloads
File Edit View Terminal Tabs Help
sysadmin@jump:~/Downloads$ ssh-keygen -t ecdsa -b 521
Generating public/private ecdsa key pair.
Enter file in which to save the key (/home/sysadmin/.ssh/id_ecdsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/sysadmin/.ssh/id_ecdsa
Your public key has been saved in /home/sysadmin/.ssh/id_ecdsa.pub
The key fingerprint is:
SHA256:FLbxL8SkgnKwjeq6GX2luzNzeK8WdV4NdWgGfSKwh2Q sysadmin@jump.aus.sparksoftcorp.io
The key's randomart image is:
+---[ECDSA 521]---+
| .   + E..+...|
| = . . @ oo *..|
| + + . + * .* o |
| . o   o...o. . |
|.   ..So... |
|..   o.   .. |
|... o. . |
|.o .=.+ |
|+. o0.o. |
+----[SHA256]-----+
sysadmin@jump:~/Downloads$

ssh-keygen


Terminal - sysadmin@jump:~/Downloads
File Edit View Terminal Tabs Help
sysadmin@jump:~/Downloads$ cat ~/.ssh/id_ecdsa.pub
ecdsa-sha2-nistp521 AAAAE2VjZHNhLXNoYTItbmlzdHA1MjEAAAAIbmlzdHA1MjEAAACFBAFnPiaI
R2mIa0Icub+v5xgYBB0WjN44bpiANdoI4wkDCLo60e0/DpH9Yobdq+P+w4TVTn+06NNE6NJ6nXeqebAJ
pQHah8E4rskJwjwGy6ZAocEz4vH8vXNfAyQvb/hEN/x6HV25X8ELE8l7GdroDI8tzxjnNI1Mj3zTOd3i
iR2tZDfJBw== sysadmin@jump.aus.sparksoftcorp.io
sysadmin@jump:~/Downloads$

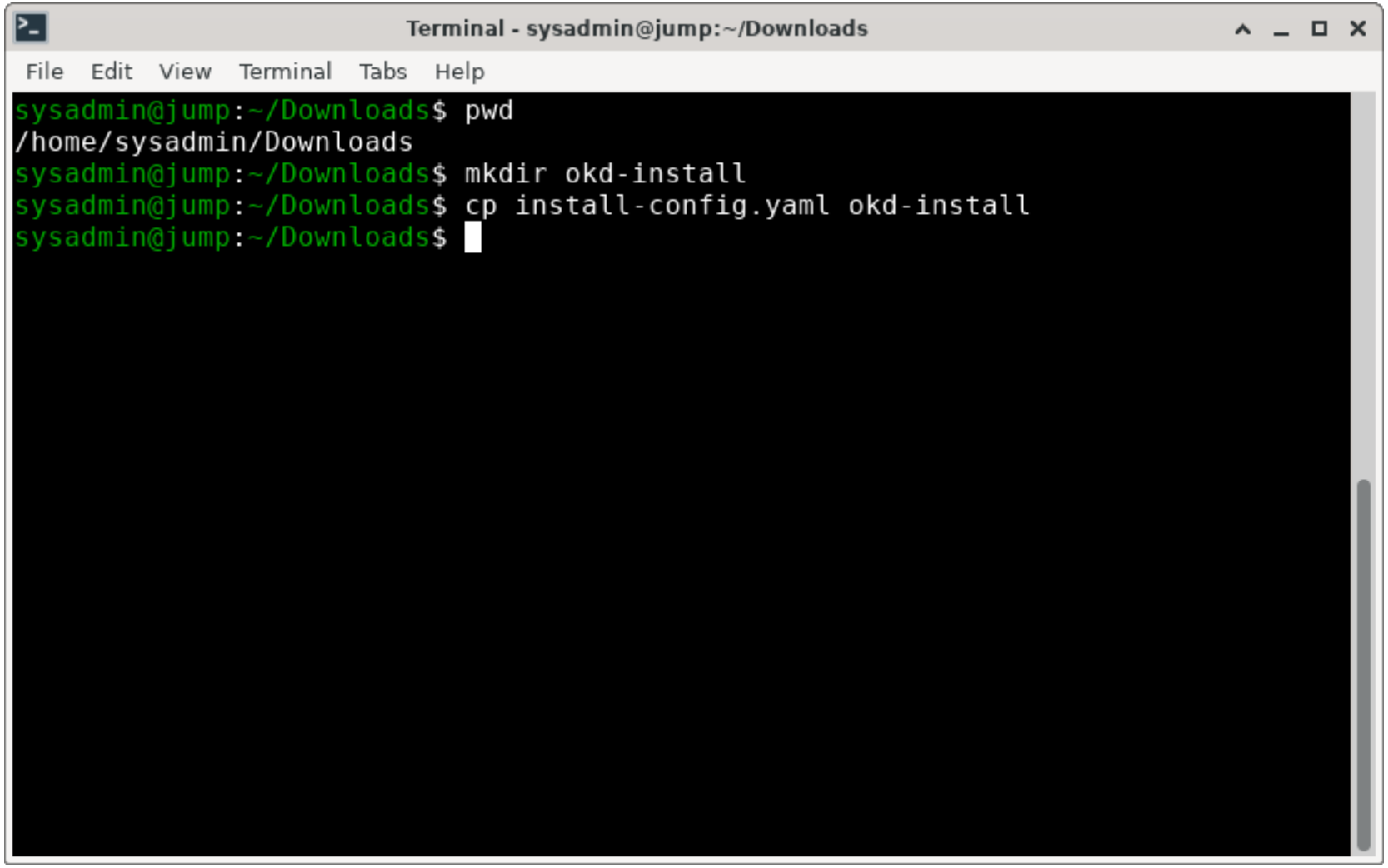
ssh-keygen


Terminal - sysadmin@jump:~/Downloads
File Edit View Terminal Tabs Help
replicas: 0 # Must be set to 0 for User Provisioned Installation as worker nodes will be manually deployed.
controlPlane:
hyperthreading: Enabled
name: master
replicas: 3
metadata:
name: lab # Cluster name
networking:
clusterNetwork:
- cidr: 10.128.0.0/14
hostPrefix: 23
networkType: OVNKubernetes
serviceNetwork:
- 172.30.0.0/16
platform:
none: {}
fips: false
pullSecret: '{"auths":{"fake":{"auth":"aWQ6cGFzcwo="}}}'
sshKey: 'ecdsa-sha2-nistp521 AAAAE2VjZHNhLXNoYTItbmlzdHA1MjEAAAAIbmlzdHA1MjEAAACFBAFnPiaIR2mIa0Icub+v5xgYBB0WjN44bpiANdoI4wkDCLo60e0/DpH9Yobdq+P+w4TVTn+06NNE6NJ6nXeqebAJpQHah8E4rskJwjwGy6ZAocEz4vH8vXNfAyQvb/hEN/x6HV25X8ELE8l7GdroDI8tzxjnNI1Mj3zTOd3iiR2tZDfJBw== sysadmin@jump.aus.sparksoftcorp.io'
24,1 Bot

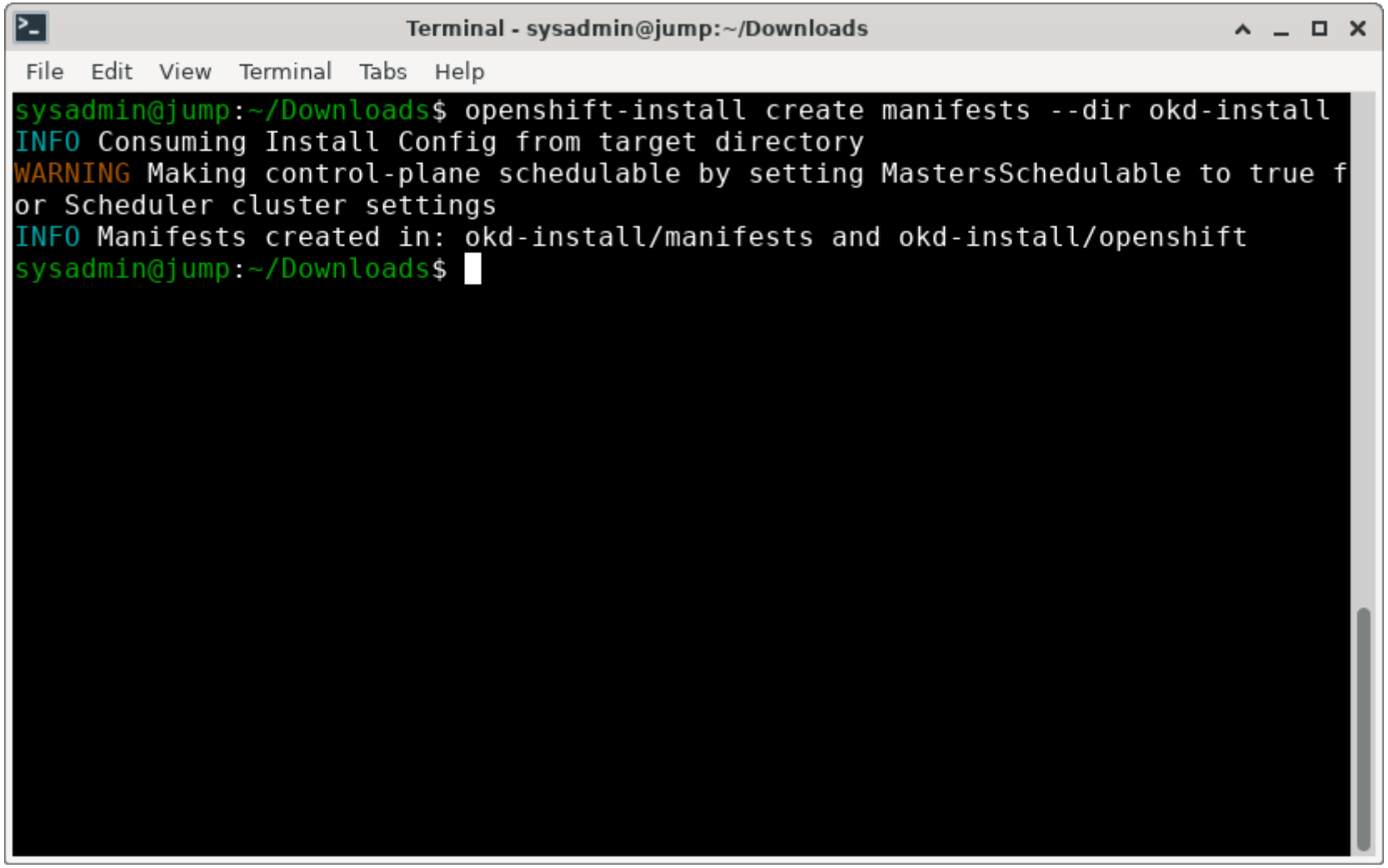
Create installation files

- Note that when you create the installation files, it will nuke your install-config.yaml file! So keep a copy of it if you want to re-deploy your cluster later.

Create installation files



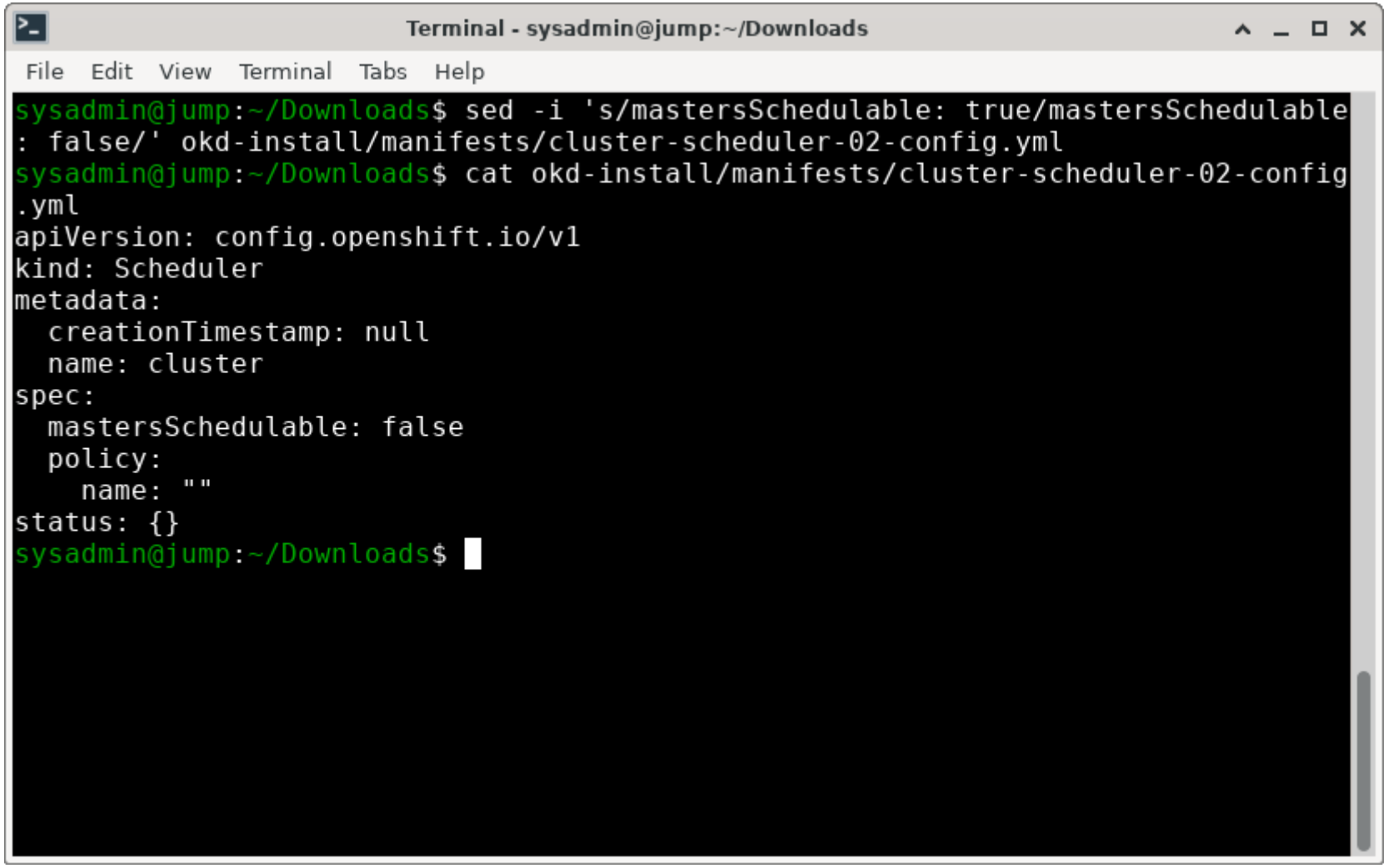
Create installation files



If you don’t want your control plane nodes to be scheduleable

- Change the cluster-scheduler-02-config.yml so that mastersSchedulable is set to false

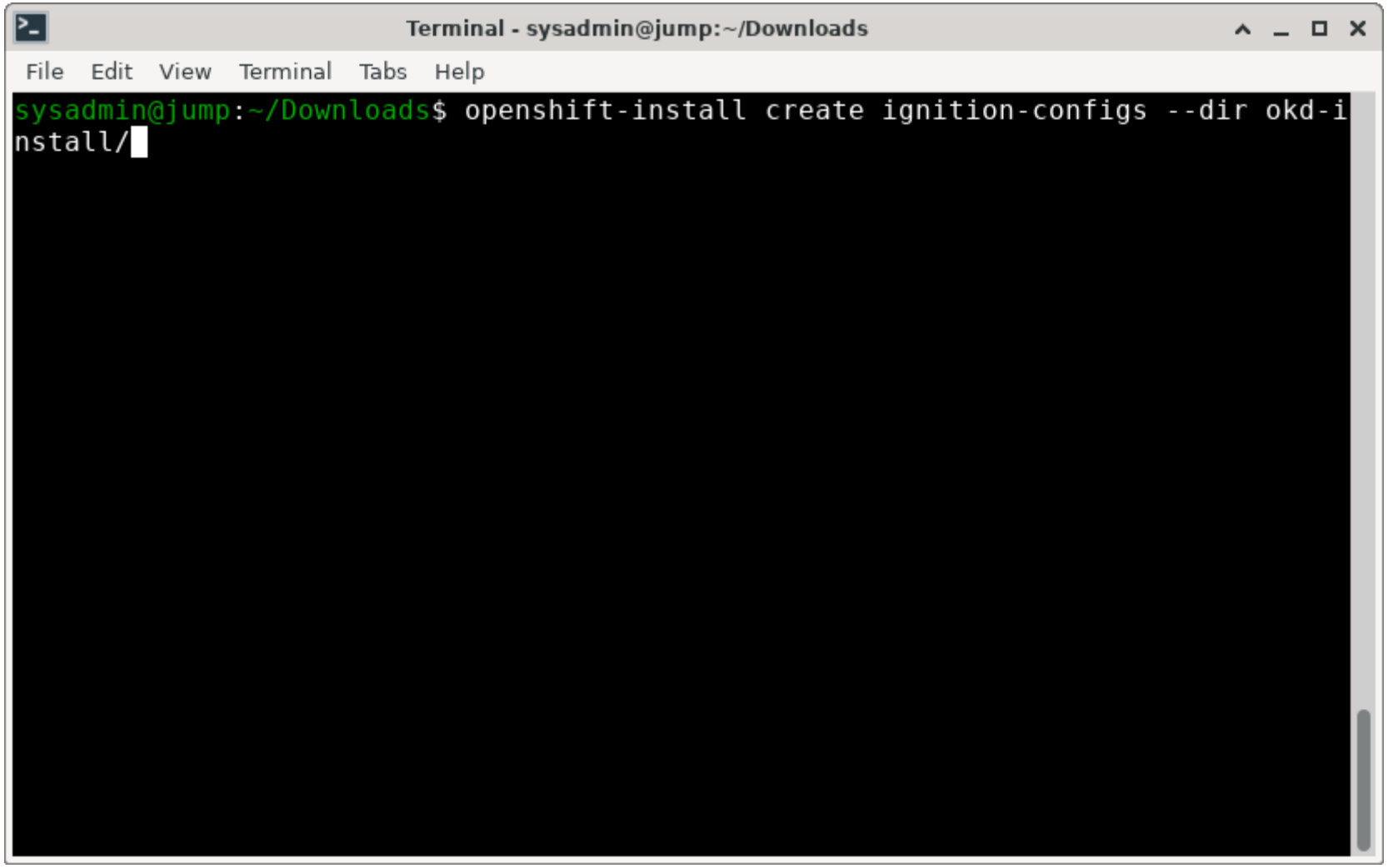
Create installation files



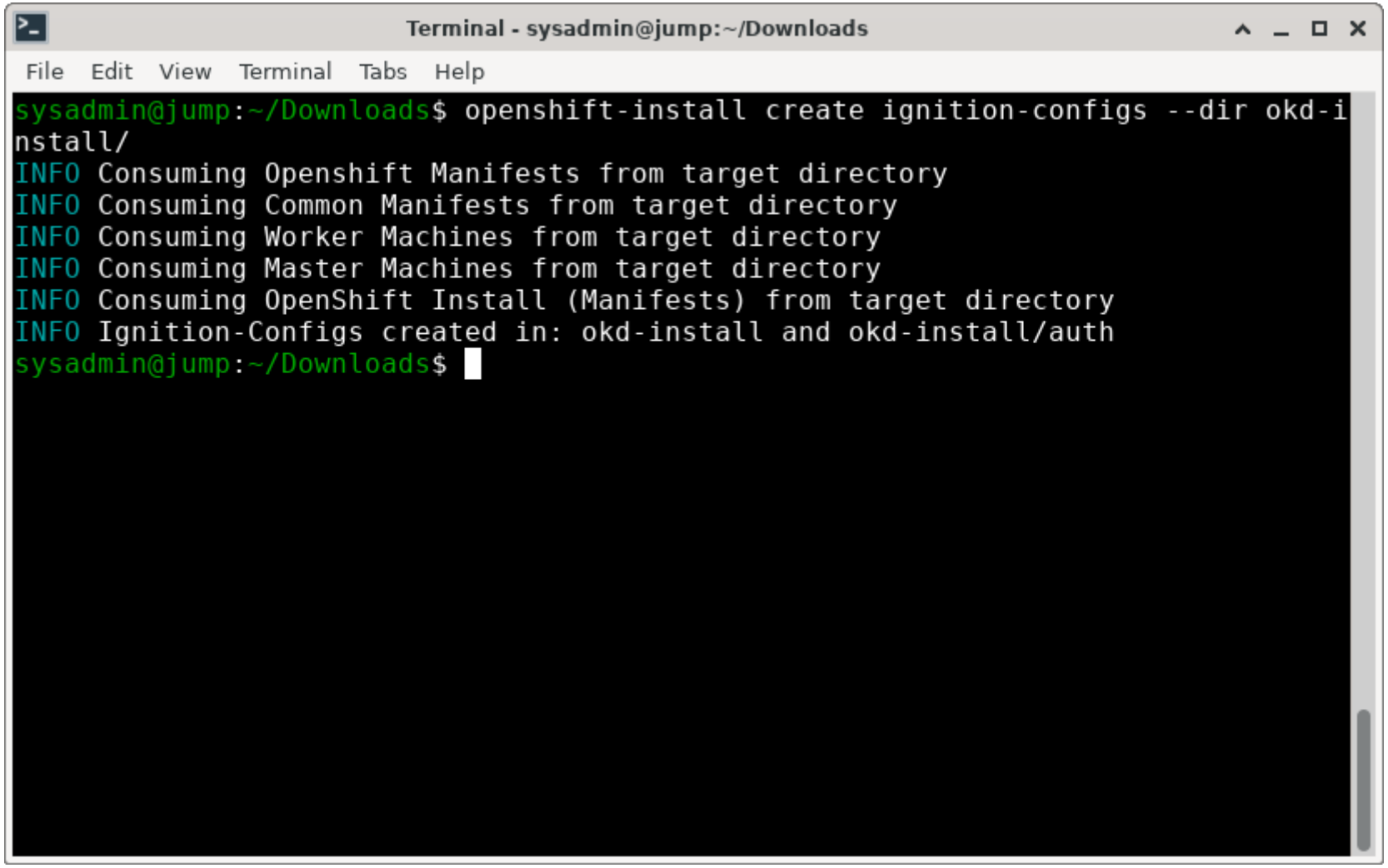
Create the ignition files

- openshift-install create ignition-configs --dir okd-install

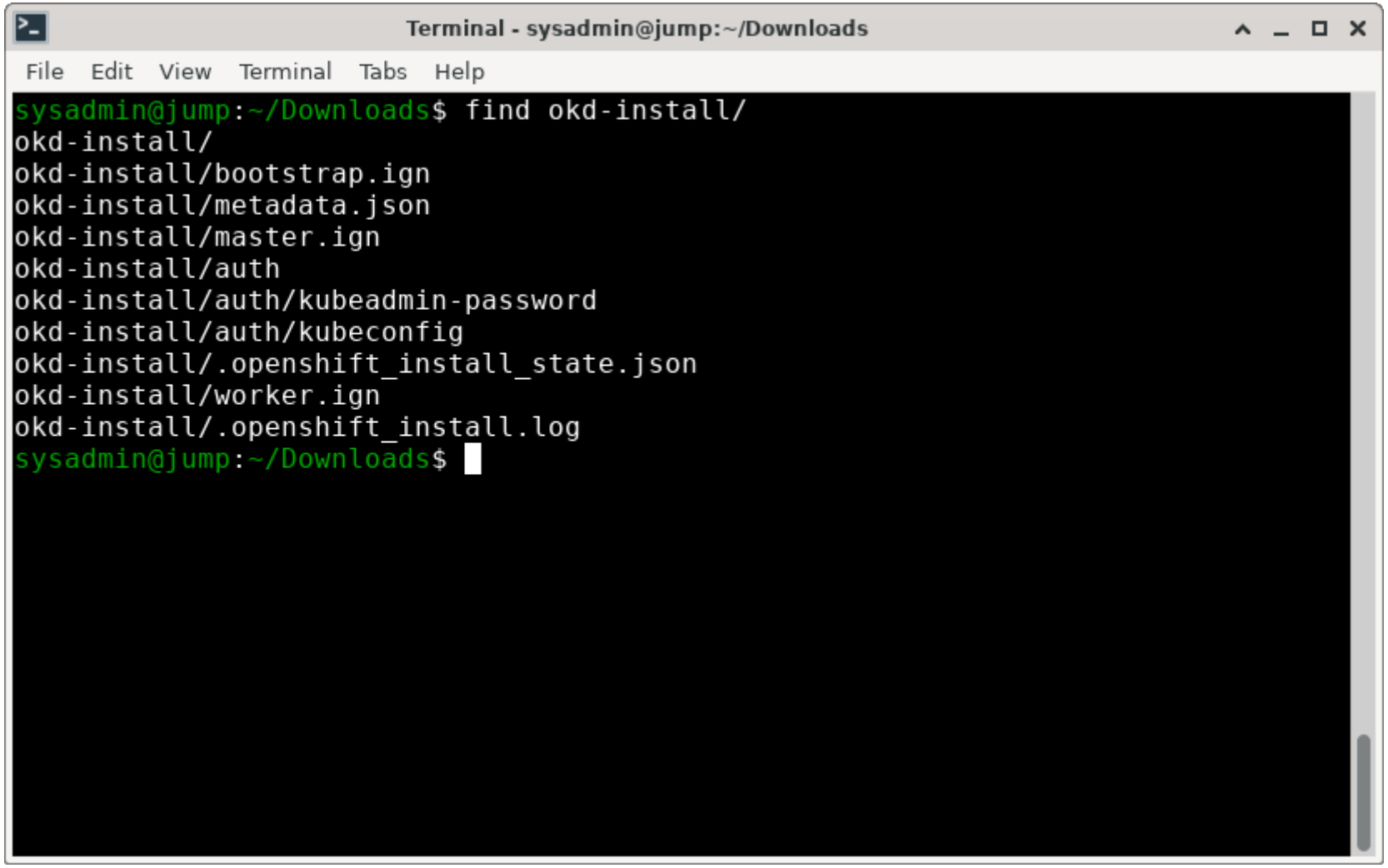
Create installation files



Create installation files



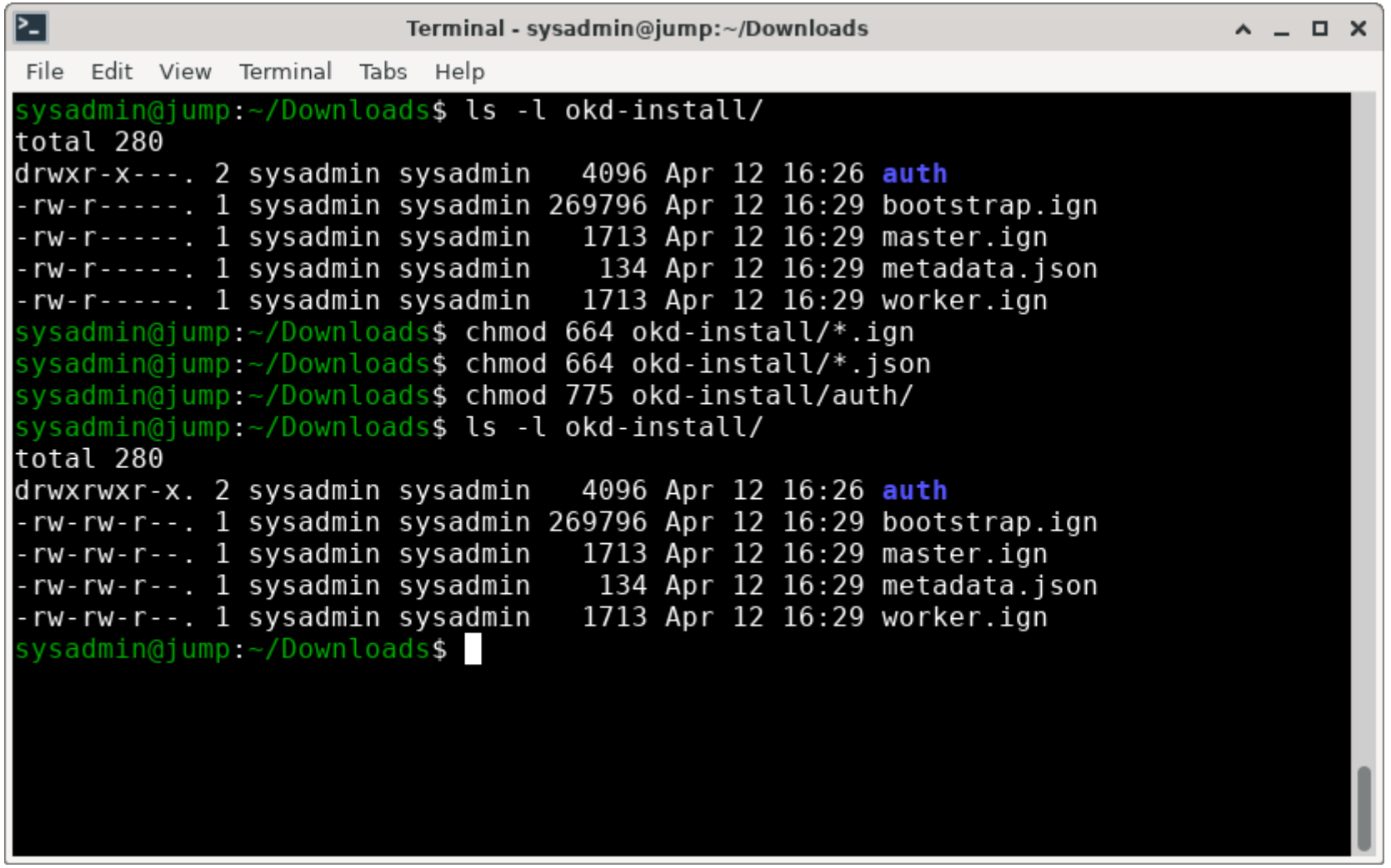
Create installation files



I am going to share my ignition files via web site

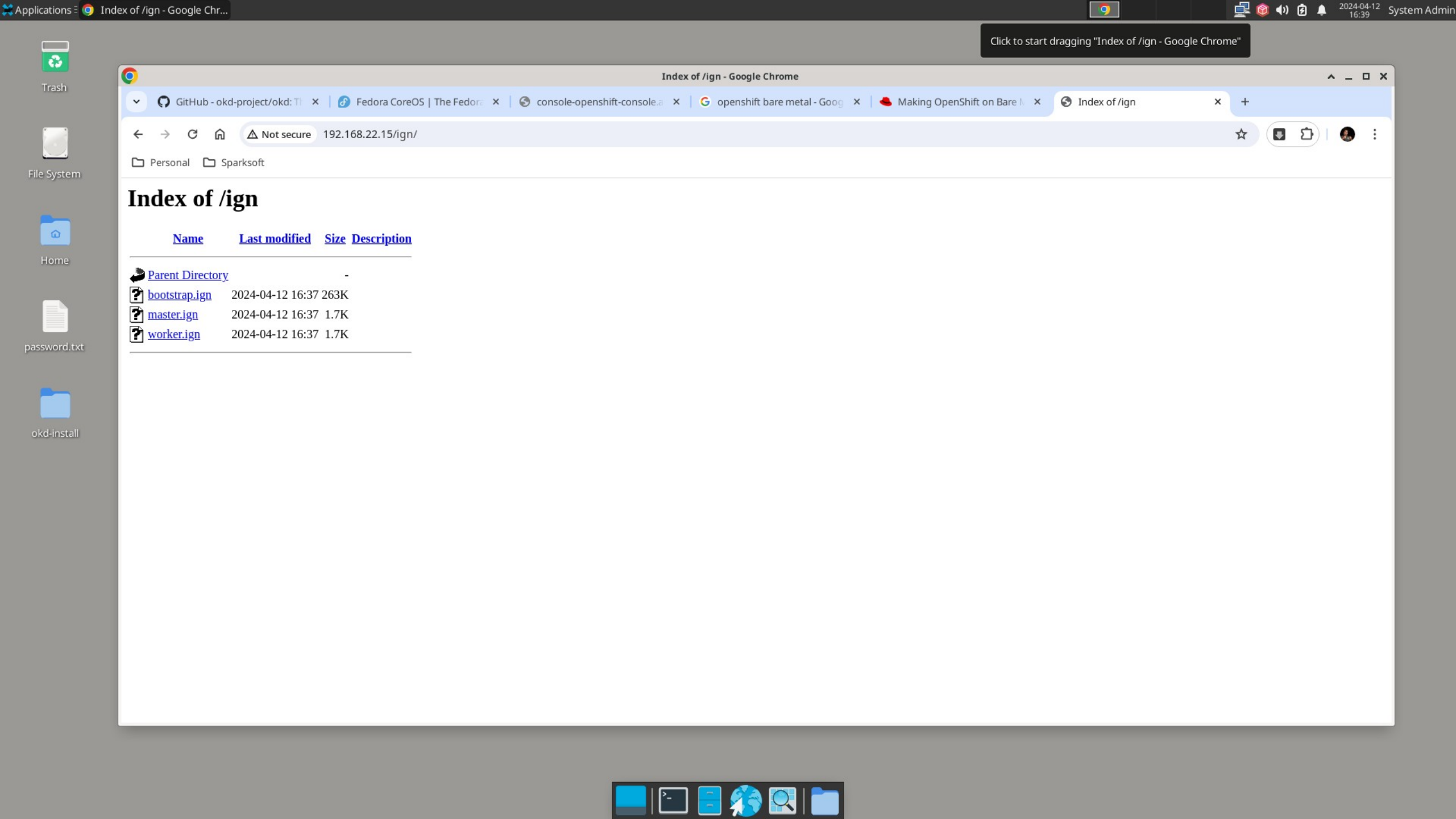
- The permissions are wrong, though

Change permissions



Copy the ign files to the web server

- In my case, it's just my workstation, but it could be anything which is available from the 192.168.22.0/24 network. In my case, my workstation is dual-homed. I could have done this on the haproxy machine, too.


Applications
Index of /ign - Google Chr...
2024-04-12
16:39
System Admin
Click to start dragging "Index of /ign - Google Chrome"
Trash
File System
Home
password.txt
okd-install
Index of /ign - Google Chrome
GitHub - okd-project/okd: T
Fedora CoreOS | The Fedor
console-openshift-console.a
openshift bare metal - Goog
Making OpenShift on Bare M
Index of /ign
Not secure
192.168.22.15/ign/
Personal
Sparksoft
Index of /ign
Name
Last modified
Size
Description
Parent Directory -
bootstrap.ign 2024-04-12 16:37 263K
master.ign 2024-04-12 16:37 1.7K
worker.ign 2024-04-12 16:37 1.7K

Burn media

- I use Brasero

Burn DVD

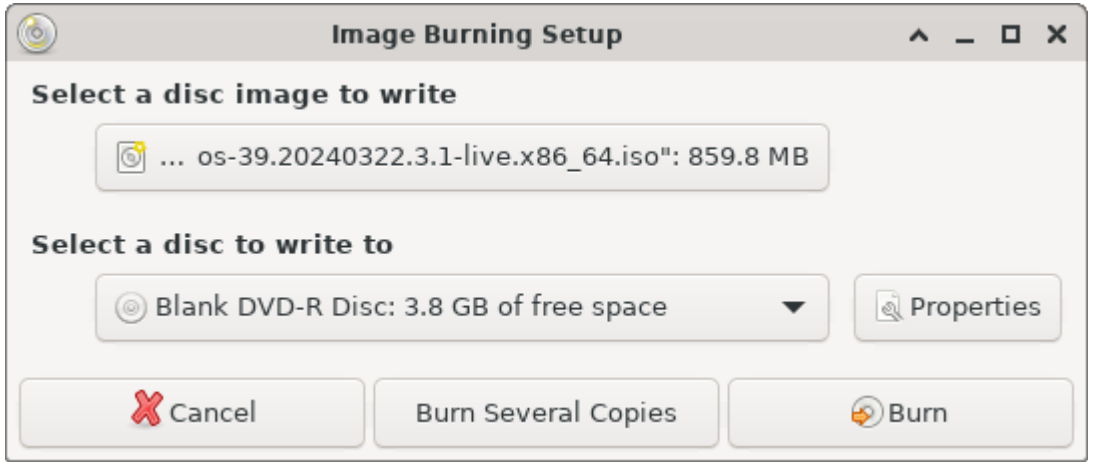
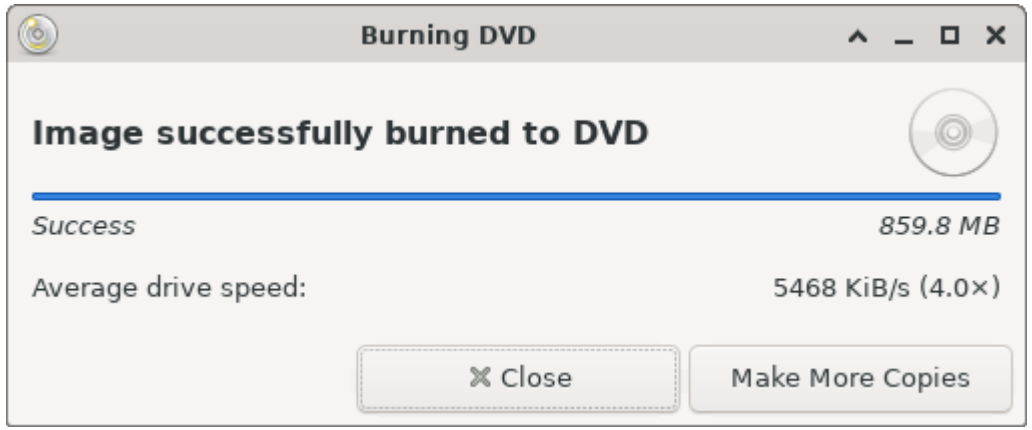


Image Burning Setup
Select a disc image to write
... os-39.20240322.3.1-live.x86_64.iso": 859.8 MB
Select a disc to write to
Blank DVD-R Disc: 3.8 GB of free space
Properties
Cancel
Burn Several Copies
Burn

Burn DVD


Burning DVD
Image successfully burned to DVD
Success
859.8 MB
Average drive speed:
5468 KiB/s (4.0×)
Close
Make More Copies

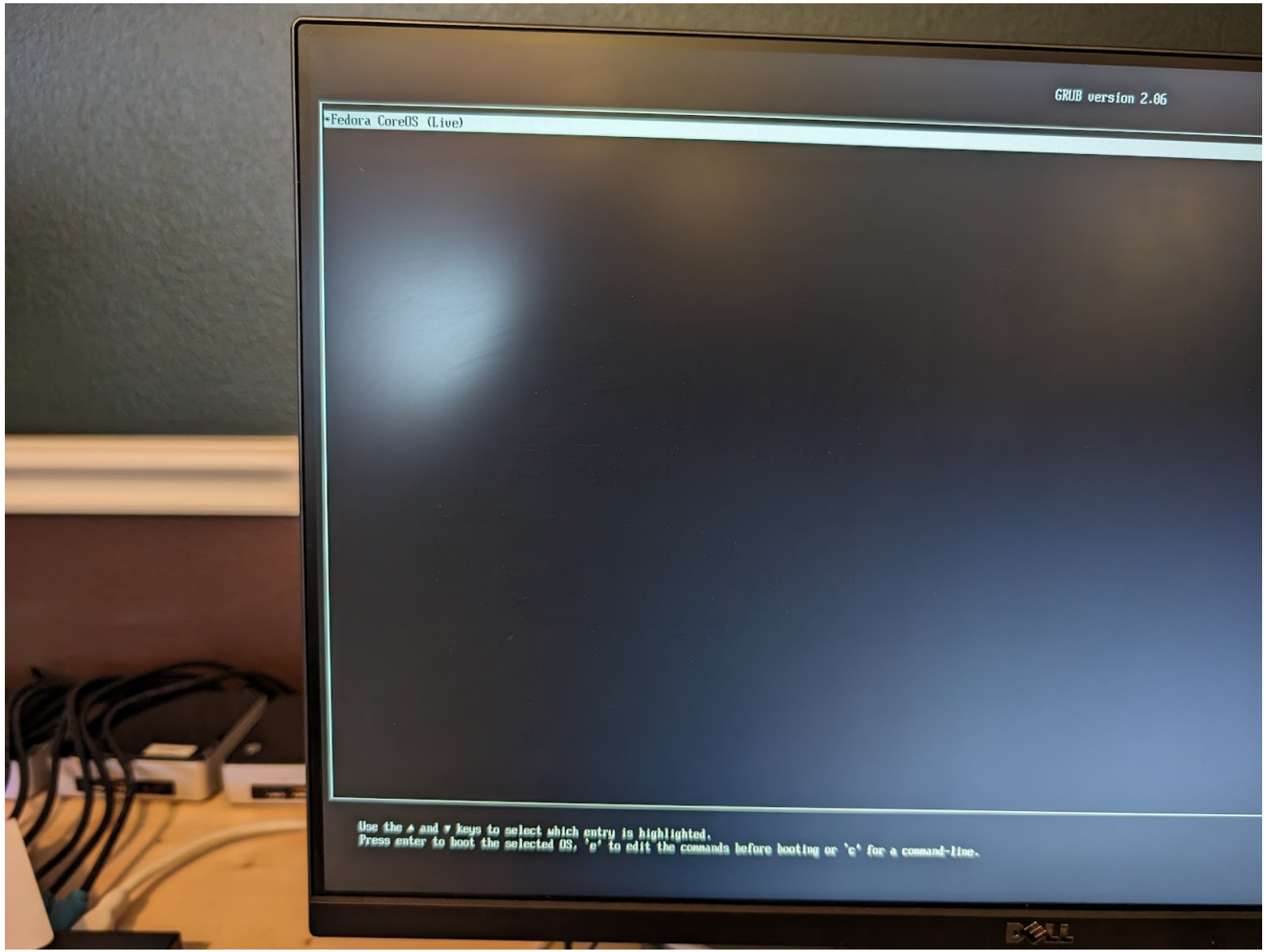
Boot your hardware off the FCOS ISO

- In this case, I'm using a physical drive attached to my NUCs, so I'm burning the image to a DVD drive.
- I'm also doing this in KVM virtual machines so I can capture screenshots.

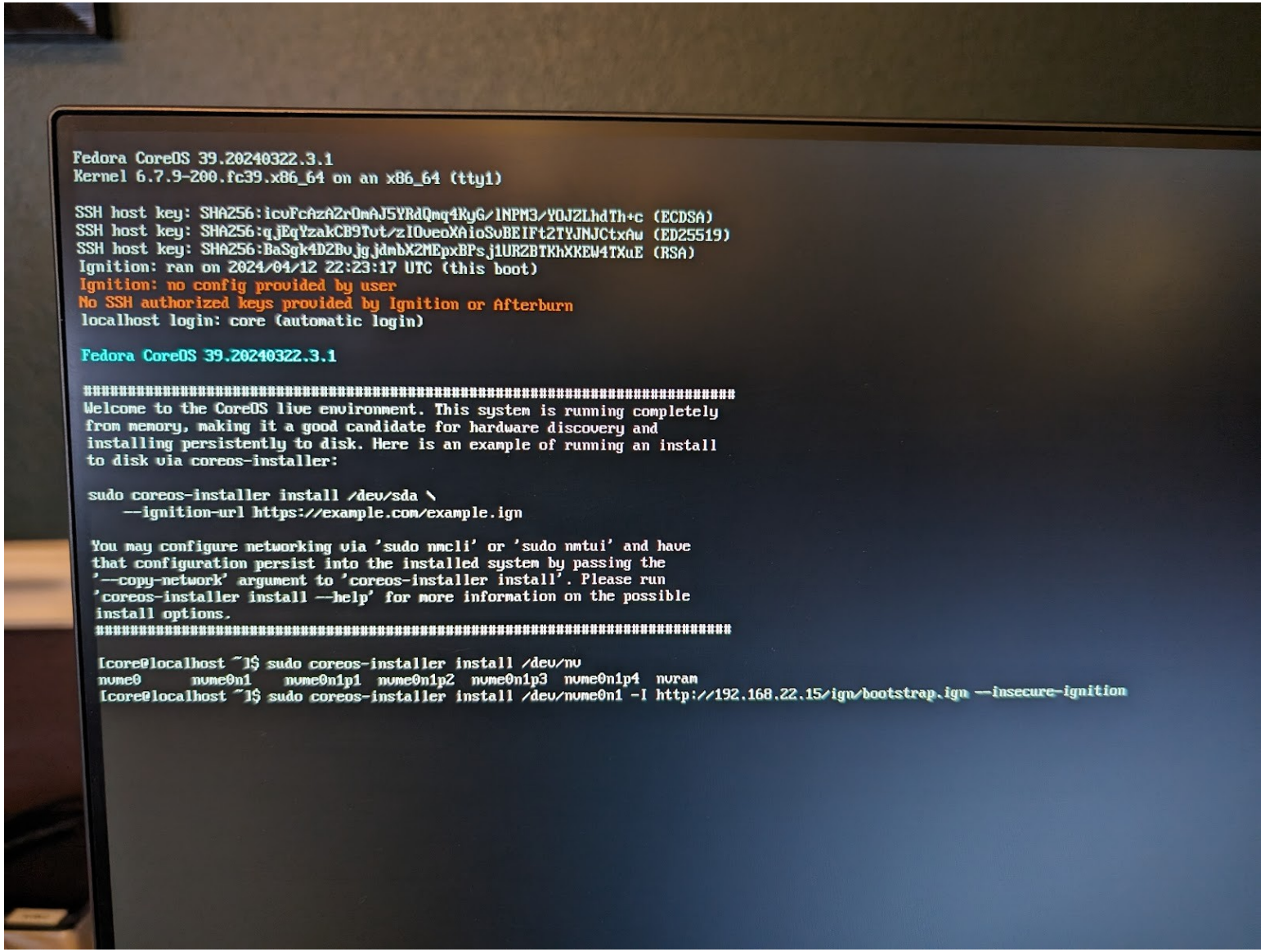
Boot your nodes

Boot your nodes

Boot your nodes



Boot your nodes



```
Fedora CoreOS 39.20240309.3.0
Kernel 6.7.7-200.fc39.x86_64 on an x86_64 (tty1)

SSH host key: SHA256:mJyF4ZHwSM/CRtkOsF9/ej5cRIWFS+dmDiQAtSHaipI (ED25519)
SSH host key: SHA256:T35ARGMbnQ706N9/5MjFVJJVHzWfSGPVTcDJ1eiTJrk (ECDSA)
SSH host key: SHA256:TMd3FSGQBKJpjpWmBJMf0yZDQTOkFu4Mo4RYIUZDyMA (RSA)
enp1s0: 192.168.22.200 fe80::cb14:904e:38e:e683
Ignition: ran on 2024/04/12 22:31:05 UTC (this boot)
Ignition: no config provided by user
No SSH authorized keys provided by Ignition or Afterburn
okd-bootstrap login: core (automatic login)

Fedora CoreOS 39.20240309.3.0

################################################################################
Welcome to the CoreOS live environment. This system is running completely
from memory, making it a good candidate for hardware discovery and
installing persistently to disk. Here is an example of running an install
to disk via coreos-installer:

sudo coreos-installer install /dev/sda \
    --ignition-url https://example.com/example.ign

You may configure networking via 'sudo nmcli' or 'sudo nmtui' and have
that configuration persist into the installed system by passing the
'--copy-network' argument to 'coreos-installer install'. Please run
'coreos-installer install --help' for more information on the possible
install options.
################################################################################

[core@okd-bootstrap ~]$ sudo coreos-installer install /dev/vda -I http://192.168.22.15/ign/bootstrap.ign --insecure-ignition_
```

```
Fedora CoreOS 39.20240309.3.0
Kernel 6.7.7-200.fc39.x86_64 on an x86_64 (tty1)

SSH host key: SHA256:VNEdwKmJ6svYqyzqLO0fnhYvS6fdPu84AYyzIKO3s+o (ECDSA)
SSH host key: SHA256:KWgJjRXIUr2A7frIAdCw97FK4+7I2e3H0SiQBI+CIq0 (ED25519)
SSH host key: SHA256:e2EyOI5ituo3gFb2AHJeerv/yUy6CI8Yrt1hP0mUNUg (RSA)
enp1s0: 192.168.22.201 fe80::2b3f:1fbf:8e45:f26b
Ignition: ran on 2024/04/12 22:36:10 UTC (this boot)
Ignition: no config provided by user
No SSH authorized keys provided by Ignition or Afterburn
okd-cp-1 login: core (automatic login)

Fedora CoreOS 39.20240309.3.0

################################################################################
Welcome to the CoreOS live environment. This system is running completely
from memory, making it a good candidate for hardware discovery and
installing persistently to disk. Here is an example of running an install
to disk via coreos-installer:

sudo coreos-installer install /dev/sda \
    --ignition-url https://example.com/example.ign

You may configure networking via 'sudo nmcli' or 'sudo nmtui' and have
that configuration persist into the installed system by passing the
'--copy-network' argument to 'coreos-installer install'. Please run
'coreos-installer install --help' for more information on the possible
install options.
################################################################################

[core@okd-cp-1 ~]$ sudo coreos-installer install /dev/vda -I http://192.168.22.15/ign/master.ign --insecure-ignition_
```

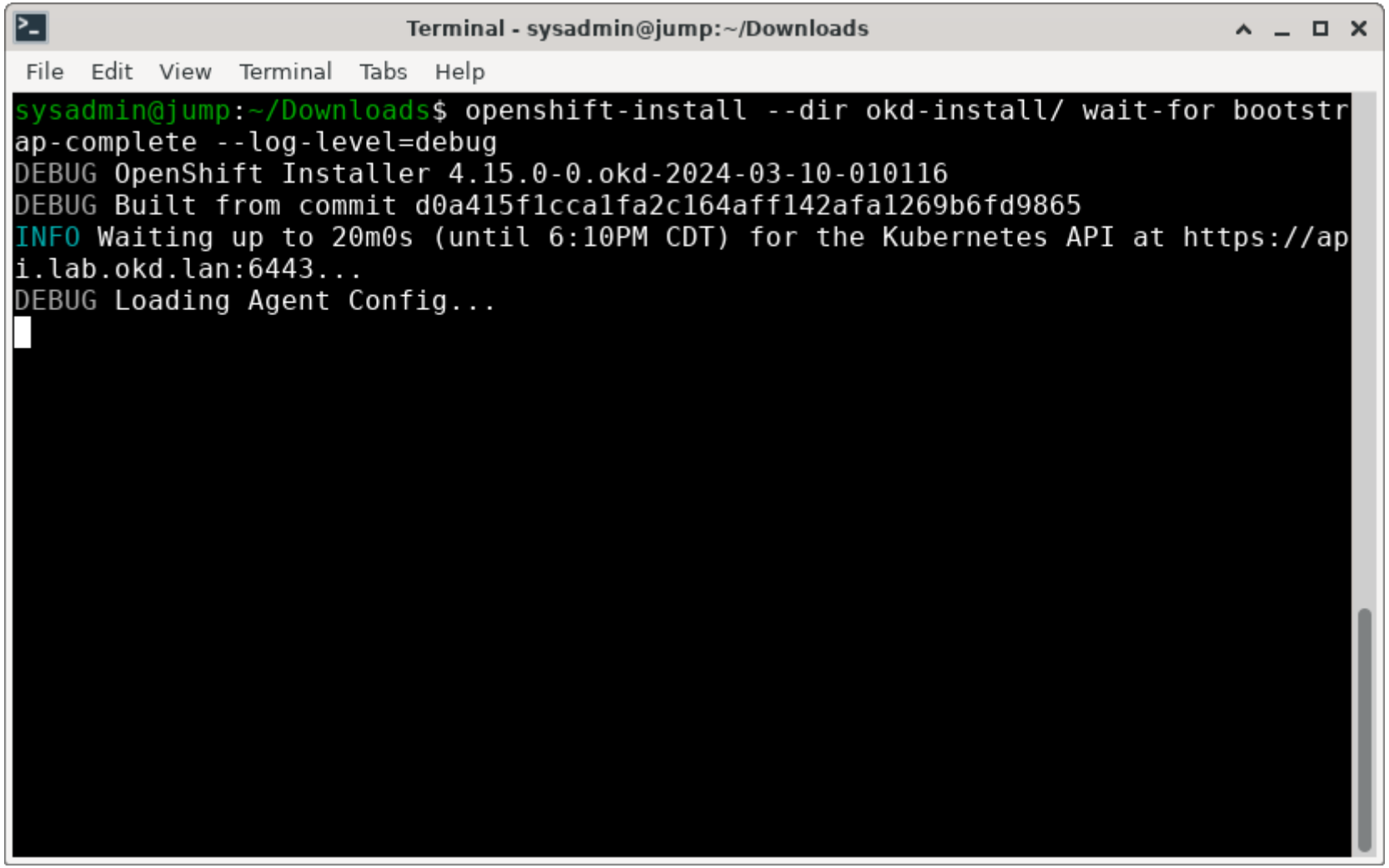
```
Fedora CoreOS 39.20240309.3.0
Kernel 6.7.7-200.fc39.x86_64 on an x86_64 (tty1)

SSH host key: SHA256:Wh4evFoT0zklPX+eG4/qLB3p66pKoCzm9pNNArNjvWE (ECDSA)
SSH host key: SHA256:IDoZiD/v8No8zvZB8JjaZeFX9aUzR2LP627MIn5g48U (ED25519)
SSH host key: SHA256:4UjpFsIlp/3HGakqRhhzTZc0a9fBQJIHcHIqKgvT5JQ (RSA)
enp1s0: 192.168.22.211 fe80::52ee:6442:6946:d32f
Ignition: ran on 2024/04/12 22:36:26 UTC (this boot)
Ignition: no config provided by user
No SSH authorized keys provided by Ignition or Afterburn
okd-w-1 login: core (automatic login)

Fedora CoreOS 39.20240309.3.0

################################################################################
Welcome to the CoreOS live environment. This system is running completely
from memory, making it a good candidate for hardware discovery and
installing persistently to disk. Here is an example of running an install
to disk via coreos-installer:

sudo coreos-installer install /dev/sda \
    --ignition-url https://example.com/example.ign

You may configure networking via 'sudo nmcli' or 'sudo nmtui' and have
that configuration persist into the installed system by passing the
'--copy-network' argument to 'coreos-installer install'. Please run
'coreos-installer install --help' for more information on the possible
install options.
################################################################################

[core@okd-w-1 ~]$ sudo coreos-installer install /dev/vda -I http://192.168.22.15/ign/worker.ign --insecure-ignition_
```

```
Fedora CoreOS 39.20240309.3.0
Kernel 6.7.7-200.fc39.x86_64 on an x86_64 (tty1)

SSH host key: SHA256:mJyF4ZHwSM/CRtkOsF9/ej5cRIWFS+dmDiQAtSHaipI (ED25519)
SSH host key: SHA256:T35ARGMbnQ706N9/5MjFVJJVHzWfSGPVTcDJ1eiTJrk (ECDSA)
SSH host key: SHA256:TMd3FSGQBKJpjpWmBJMf0yZDQTOkFu4Mo4RYIUZDyMA (RSA)
enp1s0: 192.168.22.200 fe80::cb14:904e:38e:e683
Ignition: ran on 2024/04/12 22:31:05 UTC (this boot)
Ignition: no config provided by user
No SSH authorized keys provided by Ignition or Afterburn
okd-bootstrap login: core (automatic login)

Fedora CoreOS 39.20240309.3.0

################################################################################
Welcome to the CoreOS live environment. This system is running completely
from memory, making it a good candidate for hardware discovery and
installing persistently to disk. Here is an example of running an install
to disk via coreos-installer:

sudo coreos-installer install /dev/sda \
    --ignition-url https://example.com/example.ign

You may configure networking via 'sudo nmcli' or 'sudo nmtui' and have
that configuration persist into the installed system by passing the
'--copy-network' argument to 'coreos-installer install'. Please run
'coreos-installer install --help' for more information on the possible
install options.
################################################################################

[core@okd-bootstrap ~]$ sudo coreos-installer install /dev/vda -I http://192.168.22.15/ign/bootstrap.ign --insecure-ignition
Installing Fedora CoreOS 39.20240309.3.0 x86_64 (512-byte sectors)
> Read disk 2.5 GiB/2.5 GiB (100%)
Writing Ignition config
Install complete.
[core@okd-bootstrap ~]$
```

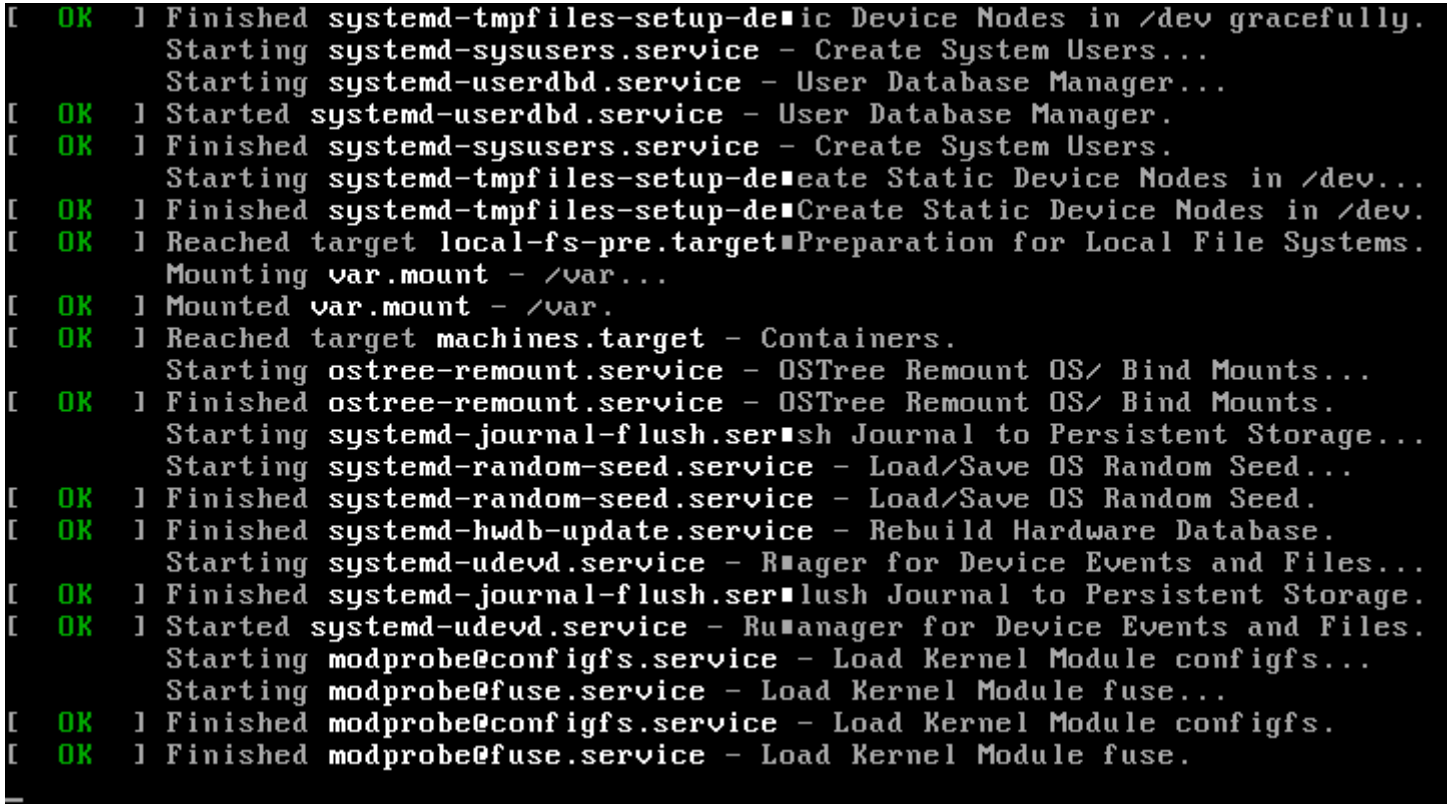
You can watch the installation

- openshift-install --dir okd-install bootstrap-complete --log-level=debug

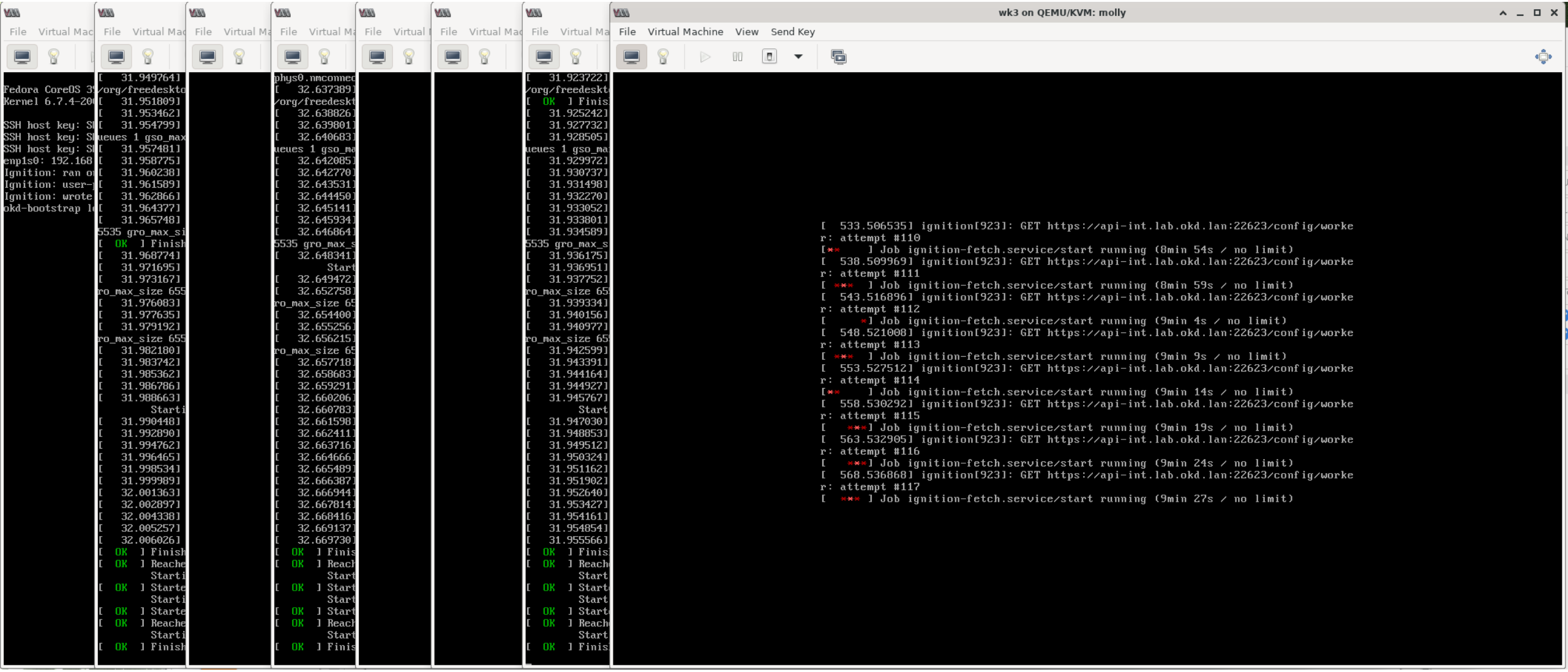
Watch the log



Watch the systems



Watch the systems



Statistics Report for HAProxy - Google Chrome

Statistics Report for HAPr | Releases · okd-project/ok | Clusters | Red Hat OpenSl | Fedora CoreOS | The Fedo | Index of /ign | okd-project/okd: The self

Not secure haproxy:9000/stats

Personal Sparksoft

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				1	1	-	1	4	20 000	1 010			460 104	56 624 512	0	0	0					OPEN								
Backend	0	0		0	0		0	0	2 000	0	0	0s	460 104	56 624 512	0	0		0	0	0	0	2h49m UP		0/0	0	0		0		

k8s_api_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	31	-	9	11	20 000	535			238 954	794 037	0	0	0	0				OPEN								

k8s_api_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-bootstrap	0	0	-	0	31		9	11	-	235	235	7s	236 987	794 037		0		0	0	0	0	3m44s UP	L4OK in 0ms	1/1	Y	-	1	1	2h45m	-
okd-cp-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2h49m DOWN	L4CON in 1ms	1/1	Y	-	1	1	2h49m	-
okd-cp-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2h49m DOWN	L4CON in 0ms	1/1	Y	-	1	1	2h49m	-
okd-cp-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2h49m DOWN	L4CON in 1ms	1/1	Y	-	1	1	2h49m	-
Backend	0	0		0	31		9	11	2 000	535	235	7s	238 954	794 037	0	0		300	0	0	0	3m44s UP		1/1	1	0		1	2h45m	

okd_machine_config_server_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	8	-	4	5	20 000	509			5 709	1 112 541	0	0	0	0				OPEN								

okd_machine_config_server_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-bootstrap	0	0	-	0	3		4	5	-	7	7	4m12s	1 644	1 112 541		0		0	0	0	0	4m16s UP	L4OK in 0ms	1/1	Y	-	1	1	2h44m	-
okd-cp-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2h49m DOWN	L4CON in 1ms	1/1	Y	-	1	1	2h49m	-
okd-cp-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2h49m DOWN	L4CON in 0ms	1/1	Y	-	1	1	2h49m	-
okd-cp-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2h49m DOWN	L4CON in 0ms	1/1	Y	-	1	1	2h49m	-
Backend	0	0		0	8		4	5	2 000	509	7	4m12s	5 709	1 112 541	0	0		502	0	0	0	4m16s UP		1/1	1	0		1	2h44m	

okd_http_ingress_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	0	-	0	0	20 000	0			0	0	0	0	0					OPEN								

okd_http_ingress_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-w-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2h49m DOWN	L4CON in 1ms	1/1	Y	-	1	1	2h49m	-
okd-w-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2h49m DOWN	L4CON in 0ms	1/1	Y	-	1	1	2h49m	-
okd-w-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2h49m DOWN	L4CON in 0ms	1/1	Y	-	1	1	2h49m	-
okd-w-4	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2h49m DOWN	L4CON in 1ms	1/1	Y	-	1	1	2h49m	-
Backend	0	0		0	0		0	0	2 000	0	0	?	0	0	0	0		0	0	0	0	2h49m DOWN		0/0	0	0		1	2h49m	

okd_https_ingress_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	68	-	0	5	20 000	26 674			336 380	0	0	0	0					OPEN								

okd_https_ingress_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-w-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2h49m DOWN	L4CON in 0ms	1/1	Y	-	1	1	2h49m	-
okd-w-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2h49m DOWN	L4CON in 0ms	1/1	Y	-	1	1	2h49m	-
okd-w-3	0	0	-	0	1	-	0	1	-	1	1	2h49m	0	0		0		0	0	0	1	2h49m DOWN	L4CON in 0ms	1/1	Y	-	1	1	2h49m	-
okd-w-4	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2h49m DOWN	L4CON in 0ms	1/1	Y	-	1	1	2h49m	-
Backend	0	0		0	68		0	2	2 000	26 674	1	2h49m	336 380	0	0	0		26 674	0	0	1	2h49m DOWN		0/0	0	0		1	2h49m	

Statistics Report for HAProxy - Google Chrome

Statistics Report for HAPr | Releases · okd-project/ok | Clusters | Red Hat OpenSl | Fedora CoreOS | The Fedo | Index of /ign | okd-project/okd: The self

Not secure haproxy:9000/stats

Personal Sparksoft

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				1	1	-	1	4	20 000	1 084			493 848	60 886 212	0	0	0					OPEN								
Backend	0	0		0	0		0	0	2 000	0	0	0s	493 848	60 886 212	0	0		0	0	0	0	3h1m UP		0/0	0	0		0		

k8s_api_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				7	138	-	43	212	20 000	1 401			14 336 867	222 809 603	0	0	0	0				OPEN								

k8s_api_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-bootstrap	0	0	-	0	191		0	38	-	1 133	721	1m39s	13 583 035	174 514 102		0		23	0	412	181	1m40s DOWN	L4CON in 0ms	1/1	Y	-	4	2	2h47m	-
okd-cp-1	0	0	-	4	168		38	150	-	399	399	0s	593 736	47 733 916		0		0	0	0	0	4m28s UP	L4OK in 0ms	1/1	Y	-	1	1	2h57m	-
okd-cp-2	0	0	-	4	28		5	8	-	162	162	0s	158 129	561 585		0		0	0	0	0	28s UP	L4OK in 0ms	1/1	Y	-	1	1	3h1m	-
okd-cp-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	3h1m DOWN	L4CON in 0ms	1/1	Y	-	1	1	3h1m	-
Backend	0	0		7	138		43	212	2 000	1 401	1 282	0s	14 336 867	222 809 603	0	0		323	0	412	181	16m9s UP		2/2	2	0		1	2h45m	

okd_machine_config_server_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	8	-	0	5	20 000	513			139 693	2 658 969	0	0	0					OPEN								

okd_machine_config_server_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-bootstrap	0	0	-	0	3		0	5	-	10	8	3m50s	133 436	1 189 125		0		0	0	2	1	3m50s DOWN	L4CON in 0ms	1/1	Y	-	4	2	2h48m	-
okd-cp-1	0	0	-	0	1		0	1	-	2	2	3m50s	1 096	734 922		0		0	0	0	0	8m UP	L4OK in 0ms	1/1	Y	-	1	1	2h53m	-
okd-cp-2	0	0	-	0	1		0	1	-	1	1	3m53s	548	367 461		0		0	0	0	0	7m59s UP	L4OK in 0ms	1/1	Y	-	1	1	2h53m	-
okd-cp-3	0	0	-	0	1		0	1	-	1	1	3m54s	548	367 461		0		0	0	0	0	7m52s UP	L4OK in 0ms	1/1	Y	-	1	1	2h53m	-
Backend	0	0		0	8		0	5	2 000	513	12	3m50s	139 693	2 658 969	0	0		502	0	2	1	16m41s UP		3/3	3	0		1	2h44m	

okd_http_ingress_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	0	-	0	0	20 000	0			0	0	0	0	0					OPEN								

okd_http_ingress_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-w-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	3h1m DOWN	L4CON in 0ms	1/1	Y	-	1	1	3h1m	-
okd-w-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	3h1m DOWN	L4CON in 0ms	1/1	Y	-	1	1	3h1m	-
okd-w-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	3h1m DOWN	L4CON in 0ms	1/1	Y	-	1	1	3h1m	-
okd-w-4	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	3h1m DOWN	L4CON in 0ms	1/1	Y	-	1	1	3h1m	-
Backend	0	0		0	0		0	0	2 000	0	0	?	0	0	0	0		0	0	0	0	3h1m DOWN		0/0	0	0		1	3h1m	

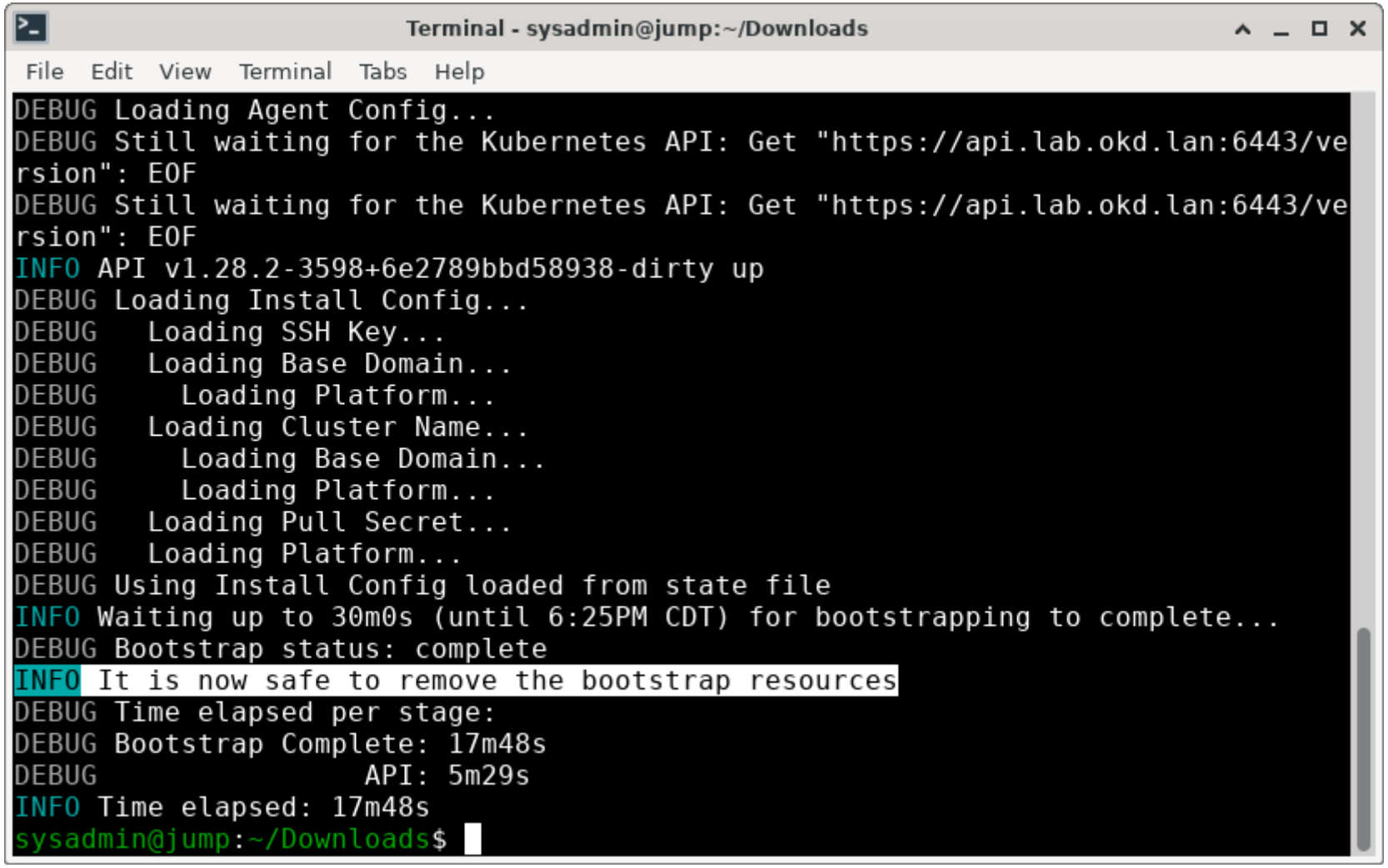
okd_https_ingress_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	68	-	0	5	20 000	26 674			336 380	0	0	0	0					OPEN								

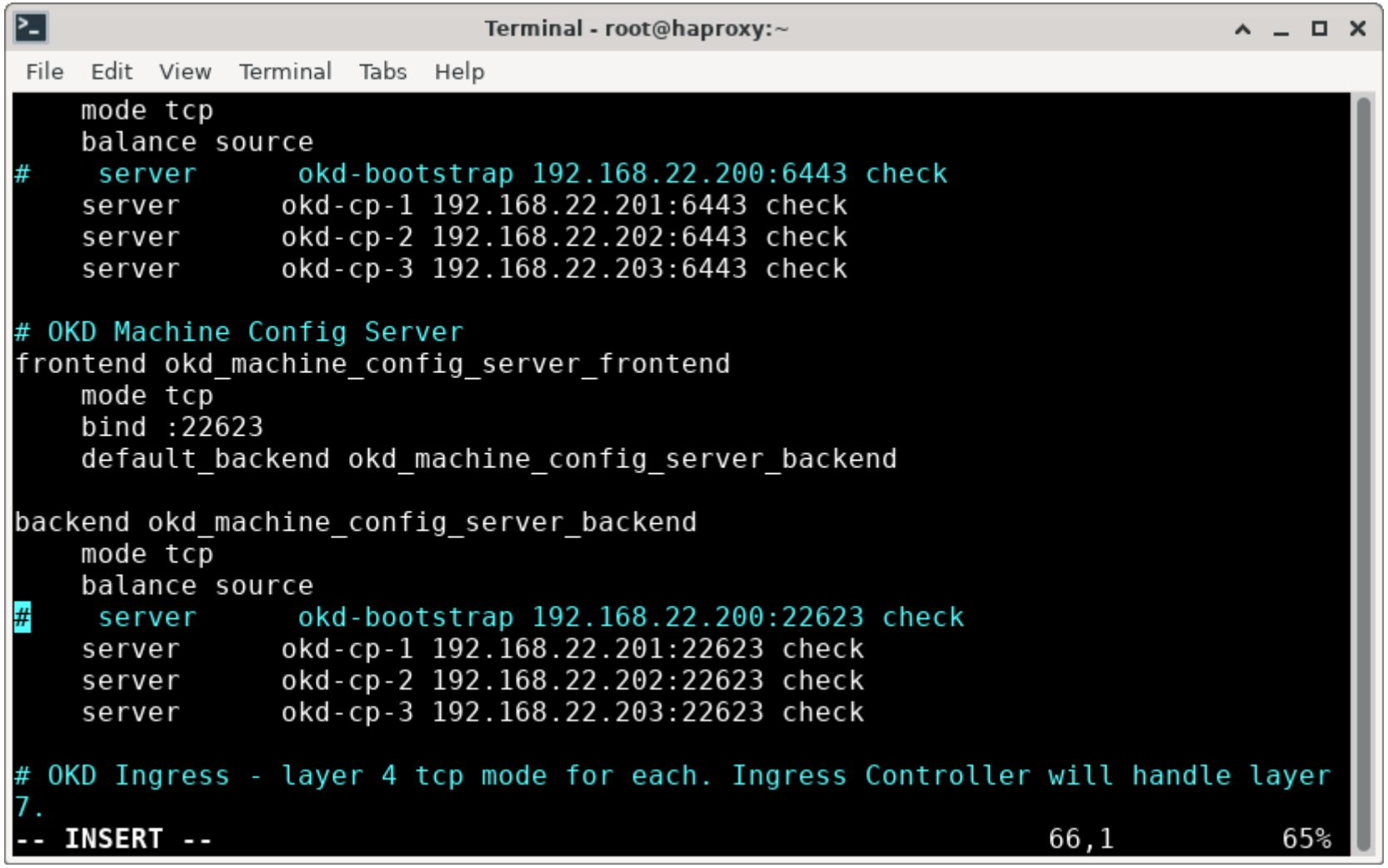
okd_https_ingress_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-w-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	3h1m DOWN	L4CON in 1ms	1/1	Y	-	1	1	3h1m	-
okd-w-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	3h1m DOWN	L4CON in 0ms	1/1	Y	-	1	1	3h1m	-
okd-w-3	0	0	-	0	1		0	1	-	1	1	3h1m	0	0		0		0	0	0	1	3h1m DOWN	L4CON in 0ms	1/1	Y	-	1	1	3h1m	-
okd-w-4	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	3h1m DOWN	L4CON in 0ms	1/1	Y	-	1	1	3h1m	-
Backend	0	0		0	68		0	2	2 000	26 674	1	3h1m	336 380	0	0	0		26 674	0	0	1	3h1m DOWN		0/0	0	0		1	3h1m	

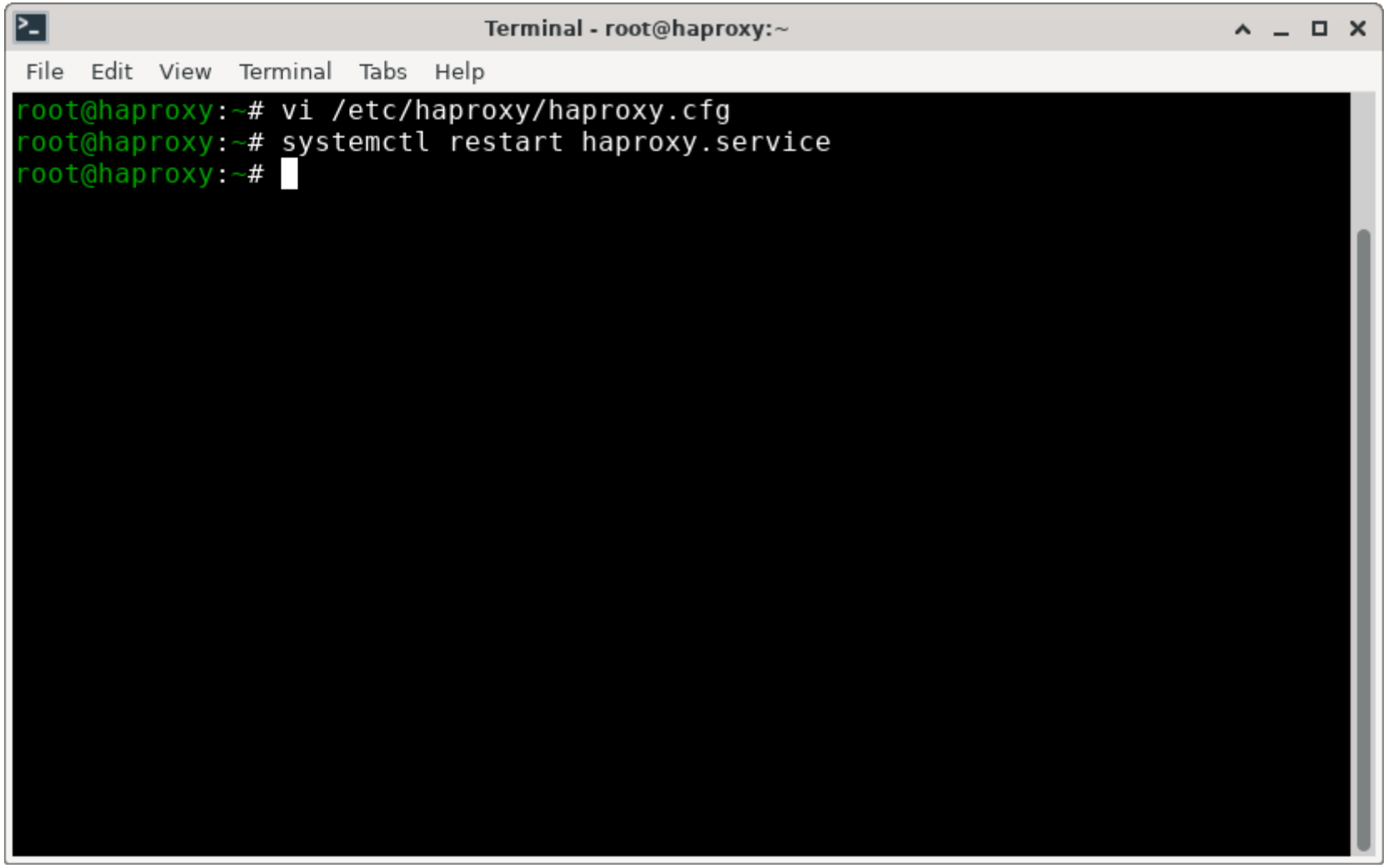
Watch the systems



Watch the systems



Watch the systems



Statistics Report for HAProxy - Google Chrome

Statistics Report for HAPr | Releases · okd-project/ok | Clusters | Red Hat OpenSl | Fedora CoreOS | The Fedo | Index of /ign | okd-project/okd: The self

Not secure haproxy:9000/stats

Personal Sparksoft

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server							
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				1	1	-	1	1	20 000	2			456	52 891	0	0	0					OPEN								
Backend	0	0		0	0		0	0	2 000	0	0	0s	456	52 891	0	0		0	0	0	0	15s UP		0/0	0	0		0		

k8s_api_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server							
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				7	117	-	43	93	20 000	199			159 573	503 499	0	0	0	0				OPEN								

k8s_api_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server							
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-cp-1	0	0	-	1	50		16	41	-	70	70	0s	46 237	168 424		0		0	0	0	0	15s UP	L4OK in 0ms	1/1	Y	-	0	0	0s	-
okd-cp-2	0	0	-	1	26		13	19	-	46	46	0s	37 933	107 962		0		0	0	0	0	15s UP	L4OK in 0ms	1/1	Y	-	0	0	0s	-
okd-cp-3	0	0	-	4	43		14	33	-	83	83	0s	75 403	227 113		0		0	0	0	0	15s UP	L4OK in 0ms	1/1	Y	-	0	0	0s	-
Backend	0	0		7	117		43	93	2 000	199	199	0s	159 573	503 499	0	0		0	0	0	0	15s UP		3/3	3	0		0	0s	

okd_machine_config_server_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server							
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	0	-	0	0	20 000	0			0	0	0	0	0					OPEN								

okd_machine_config_server_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server							
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-cp-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	15s UP	L4OK in 0ms	1/1	Y	-	0	0	0s	-
okd-cp-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	15s UP	L4OK in 0ms	1/1	Y	-	0	0	0s	-
okd-cp-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	15s UP	L4OK in 0ms	1/1	Y	-	0	0	0s	-
Backend	0	0		0	0		0	0	2 000	0	0	?	0	0	0	0		0	0	0	0	15s UP		3/3	3	0		0	0s	

okd_http_ingress_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server							
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	0	-	0	0	20 000	0			0	0	0	0	0					OPEN								

okd_http_ingress_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server							
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-w-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	14s DOWN	L4CON in 1ms	1/1	Y	-	1	1	14s	-
okd-w-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	14s DOWN	L4CON in 0ms	1/1	Y	-	1	1	14s	-
okd-w-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	14s DOWN	L4CON in 1ms	1/1	Y	-	1	1	14s	-
okd-w-4	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	14s DOWN	L4CON in 0ms	1/1	Y	-	1	1	14s	-
Backend	0	0		0	0		0	0	2 000	0	0	?	0	0	0	0		0	0	0	0	14s DOWN		0/0	0	0		1	14s	

okd_https_ingress_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server							
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	0	-	0	0	20 000	0			0	0	0	0	0					OPEN								

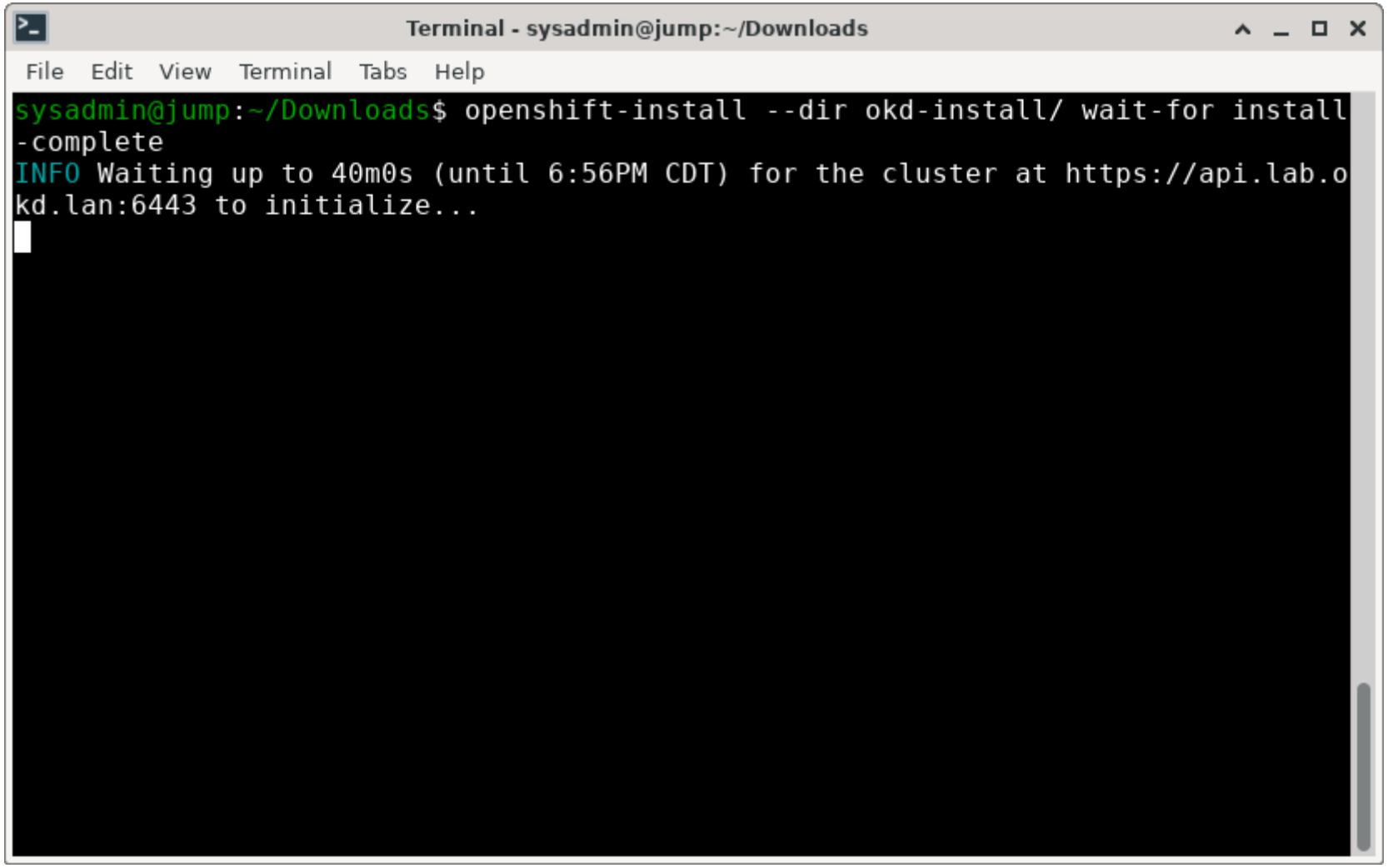
okd_https_ingress_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server							
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-w-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	14s DOWN	L4CON in 0ms	1/1	Y	-	1	1	14s	-
okd-w-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	14s DOWN	L4CON in 1ms	1/1	Y	-	1	1	14s	-
okd-w-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	13s DOWN	L4CON in 1ms	1/1	Y	-	1	1	13s	-
okd-w-4	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	13s DOWN	L4CON in 0ms	1/1	Y	-	1	1	13s	-
Backend	0	0		0	0		0	0	2 000	0	0	?	0	0	0	0		0	0	0	0	13s DOWN		0/0	0	0		1	13s	

Now you can watch the rest of the installation

- openshift-install --dir okd-install wait-for install-complete

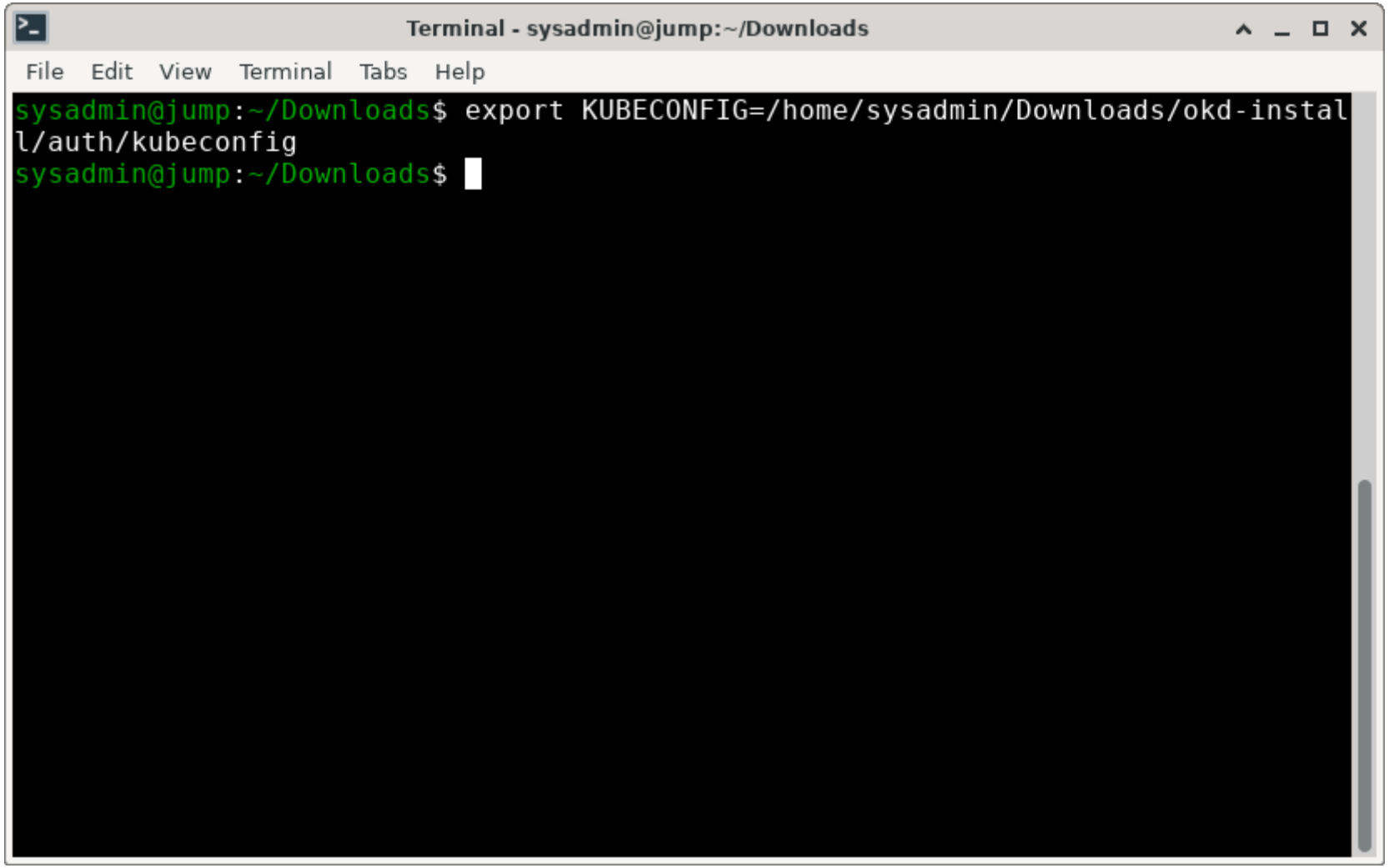
Watch the installation



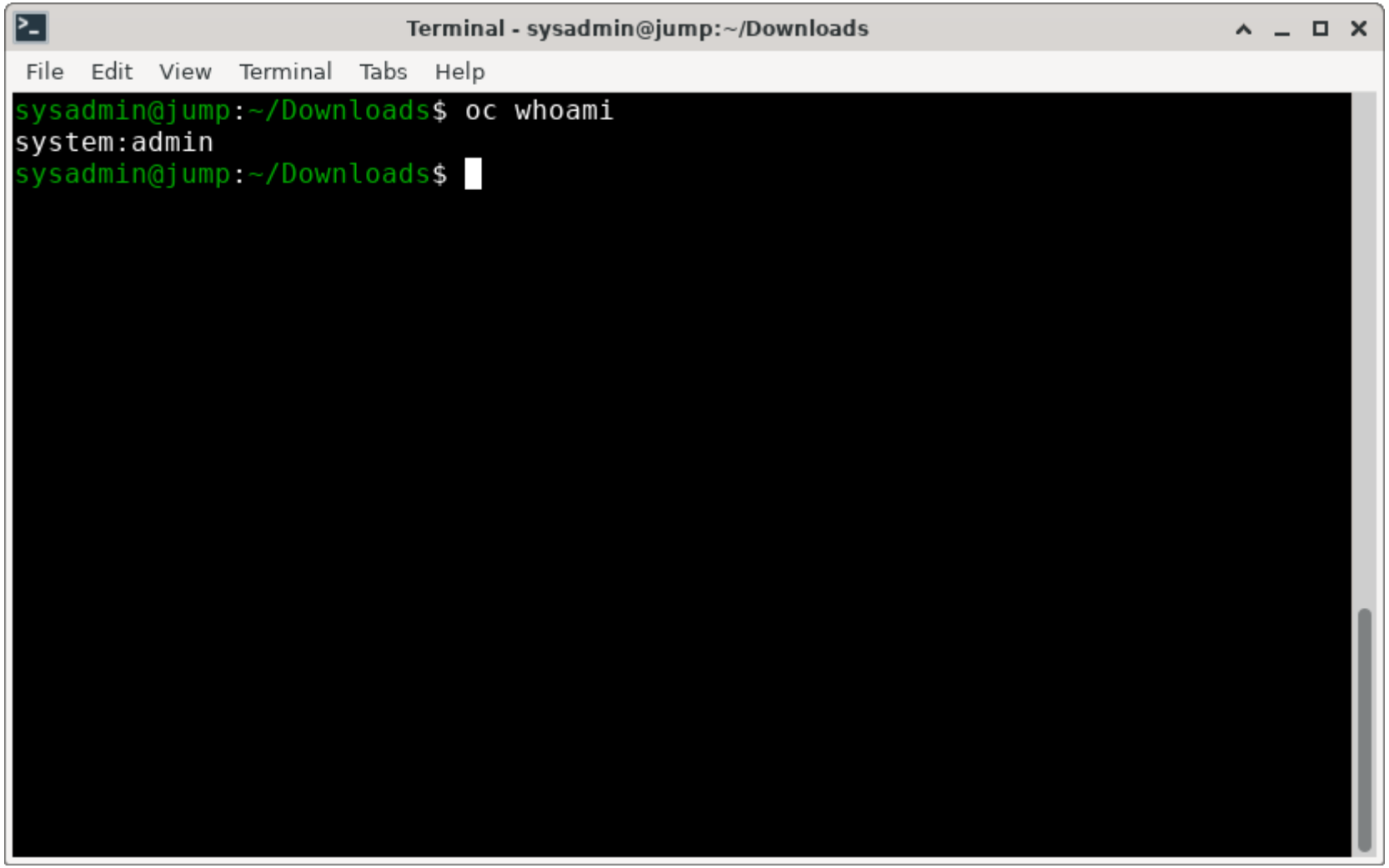
Join the worker nodes to the cluster

- Log into the workstation and authenticate to the cluster
- Set KUBECONFIG variable
- Check identity
- Approve certificate signing requests
- Approve with:
  - oc get csr -o go-template='{{range .items}}{{if not .status}}{{.metadata.name}}{{"\n"}}{{end}}{{end}}' | xargs oc adm certificate approve
- You'll have to do it a couple of times

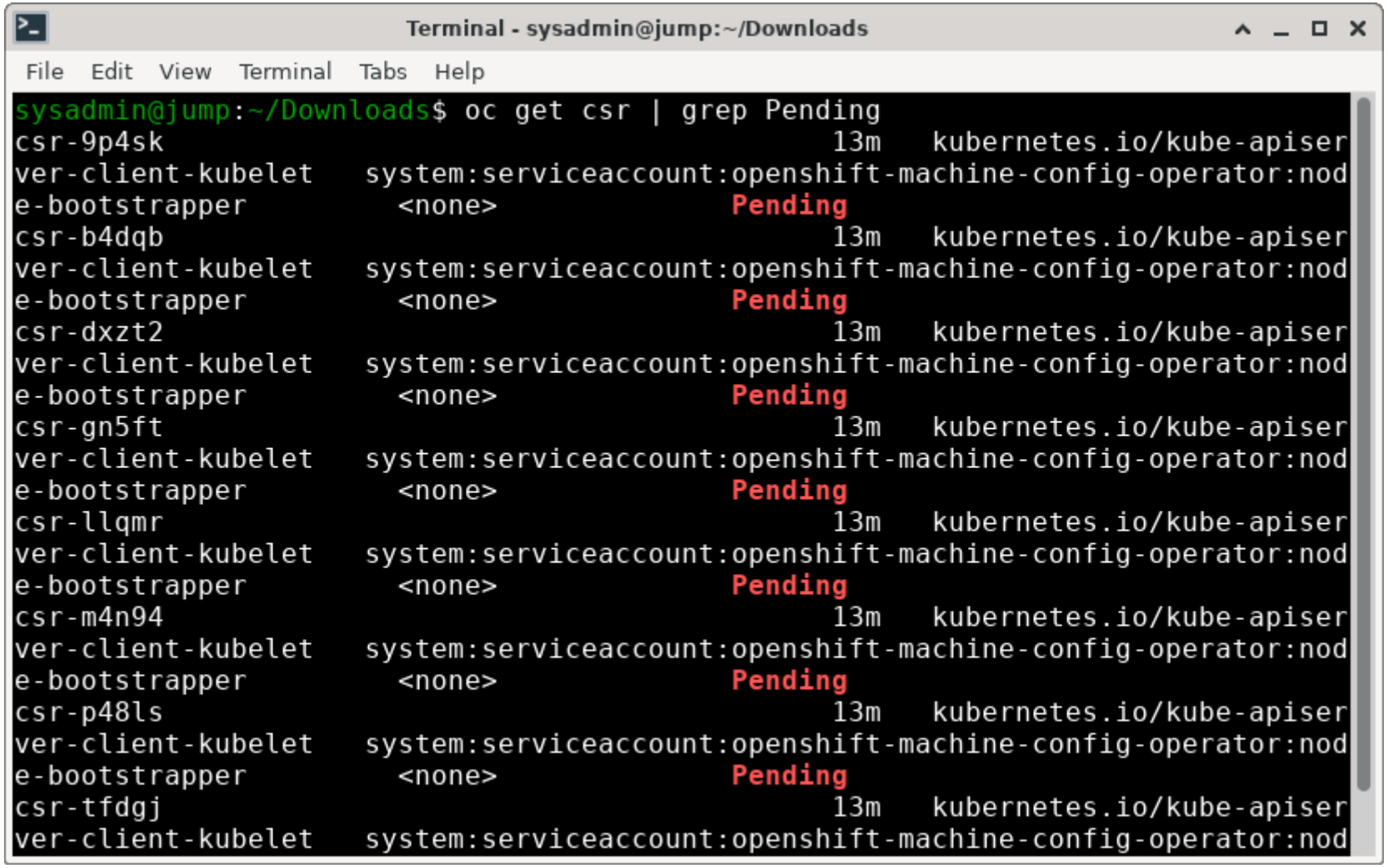
Log in to the workstation



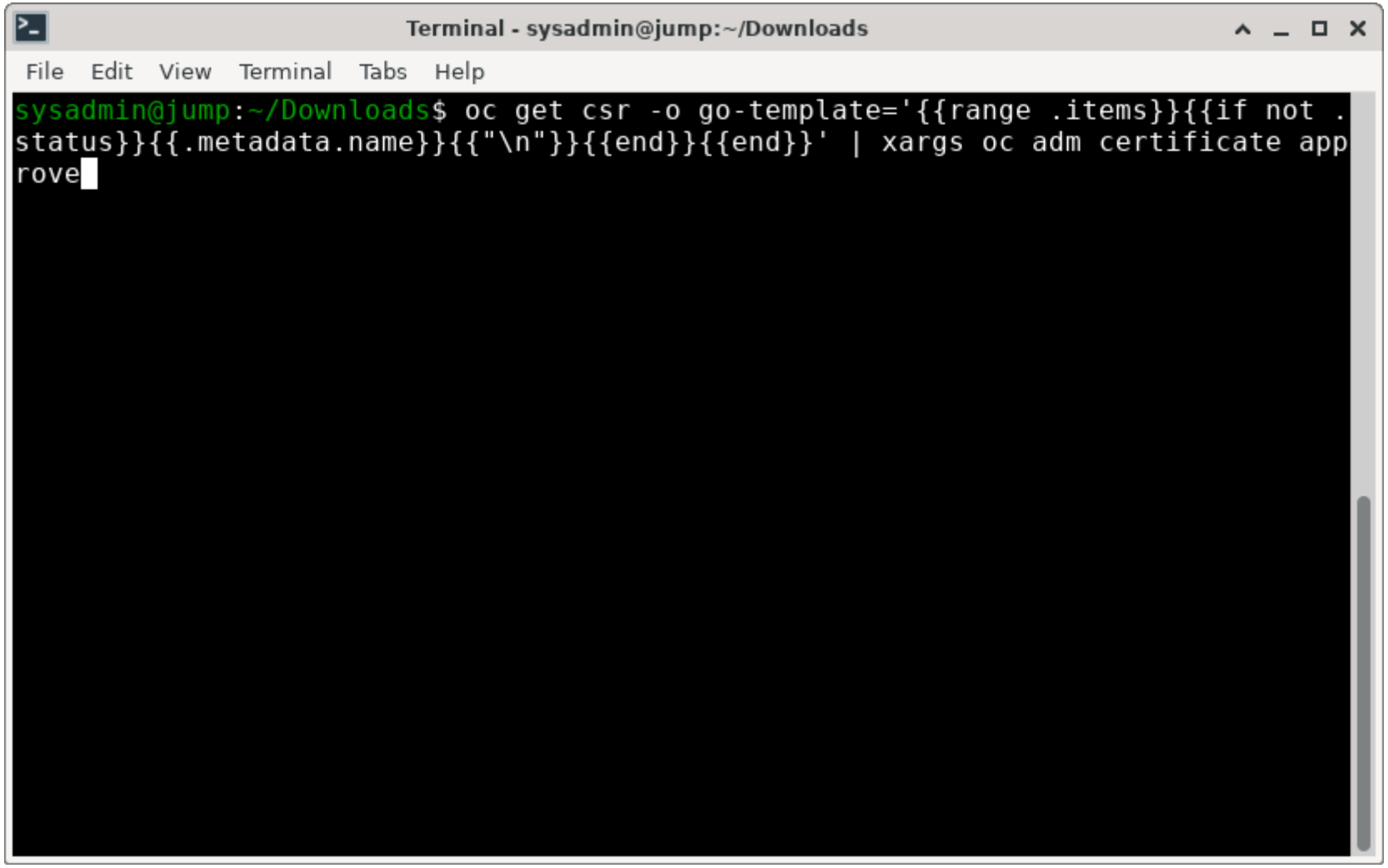
Log in to the workstation



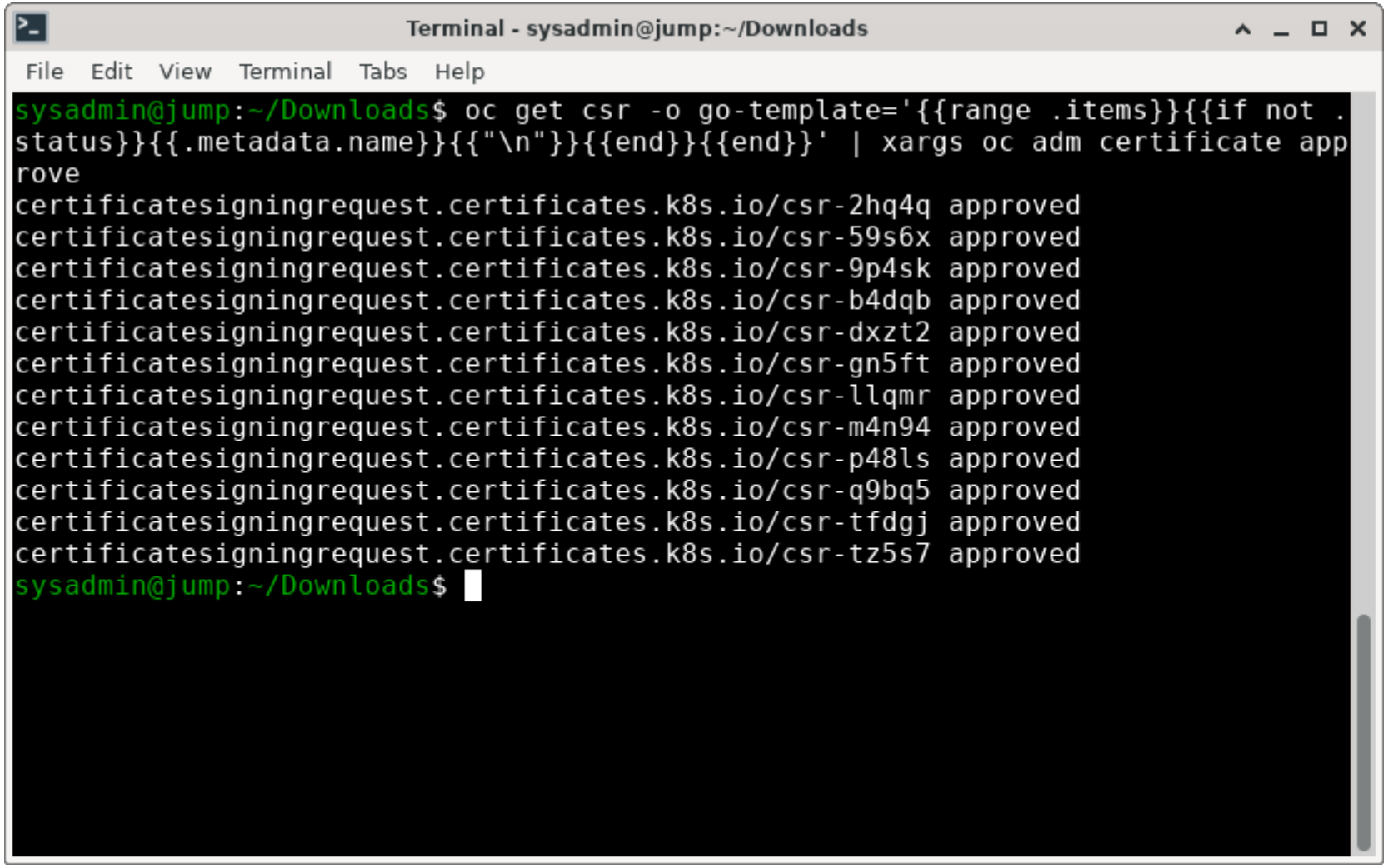
Check CSRs


Terminal - sysadmin@jump:~/Downloads
File Edit View Terminal Tabs Help
sysadmin@jump:~/Downloads$ oc get csr | grep Pending
csr-9p4sk 13m kubernetes.io/kube-apiser
ver-client-kubelet system:serviceaccount:openshift-machine-config-operator:nod
e-bootstrapper <none> Pending
csr-b4dqb 13m kubernetes.io/kube-apiser
ver-client-kubelet system:serviceaccount:openshift-machine-config-operator:nod
e-bootstrapper <none> Pending
csr-dxzt2 13m kubernetes.io/kube-apiser
ver-client-kubelet system:serviceaccount:openshift-machine-config-operator:nod
e-bootstrapper <none> Pending
csr-gn5ft 13m kubernetes.io/kube-apiser
ver-client-kubelet system:serviceaccount:openshift-machine-config-operator:nod
e-bootstrapper <none> Pending
csr-llqmr 13m kubernetes.io/kube-apiser
ver-client-kubelet system:serviceaccount:openshift-machine-config-operator:nod
e-bootstrapper <none> Pending
csr-m4n94 13m kubernetes.io/kube-apiser
ver-client-kubelet system:serviceaccount:openshift-machine-config-operator:nod
e-bootstrapper <none> Pending
csr-p48ls 13m kubernetes.io/kube-apiser
ver-client-kubelet system:serviceaccount:openshift-machine-config-operator:nod
e-bootstrapper <none> Pending
csr-tfdgj 13m kubernetes.io/kube-apiser
ver-client-kubelet system:serviceaccount:openshift-machine-config-operator:nod

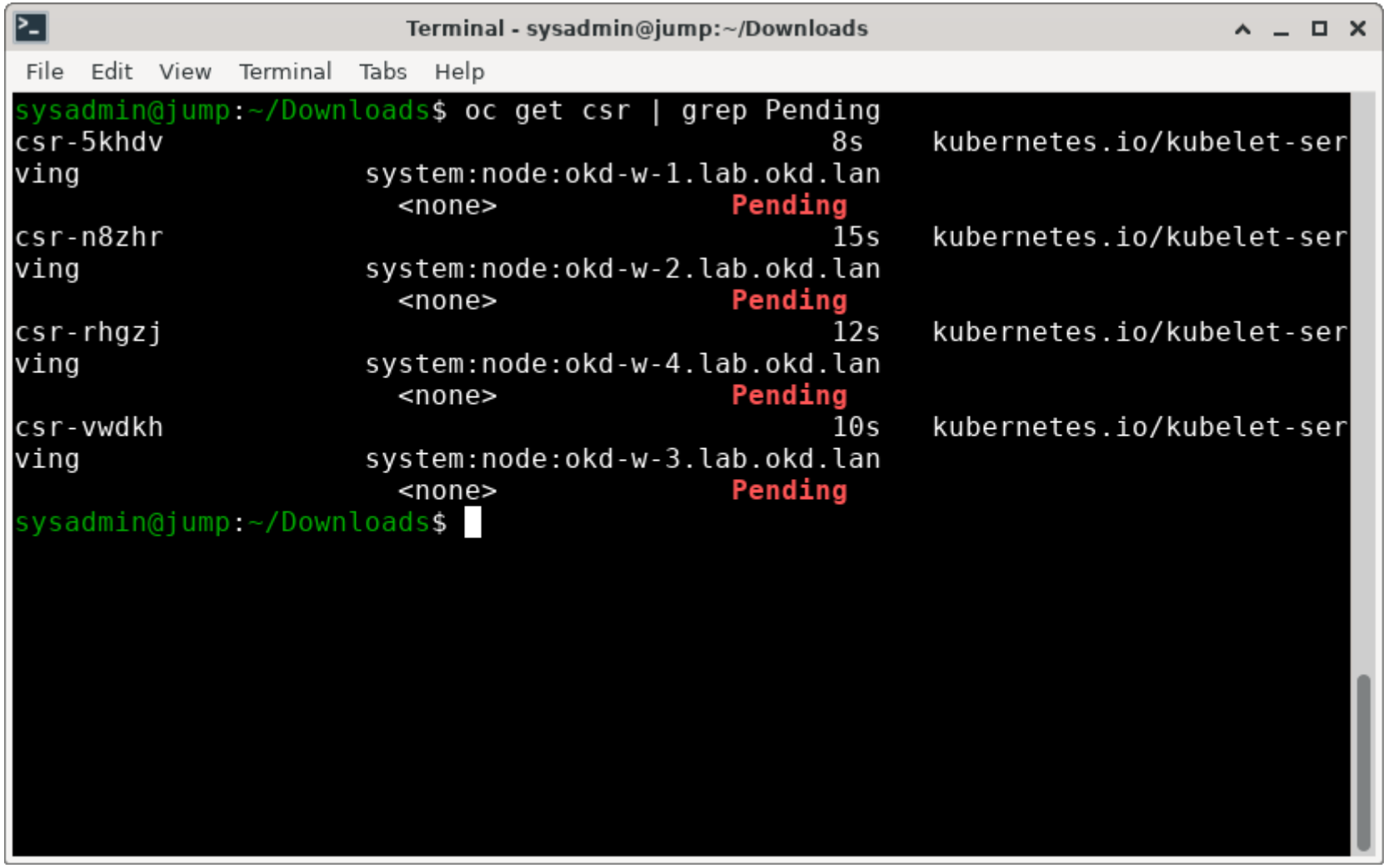
Check CSRs


Terminal - sysadmin@jump:~/Downloads
File Edit View Terminal Tabs Help
sysadmin@jump:~/Downloads$ oc get csr -o go-template='{{range .items}}{{if not .
status}}{{.metadata.name}}{{"\n"}}{{end}}{{end}}' | xargs oc adm certificate app
rove

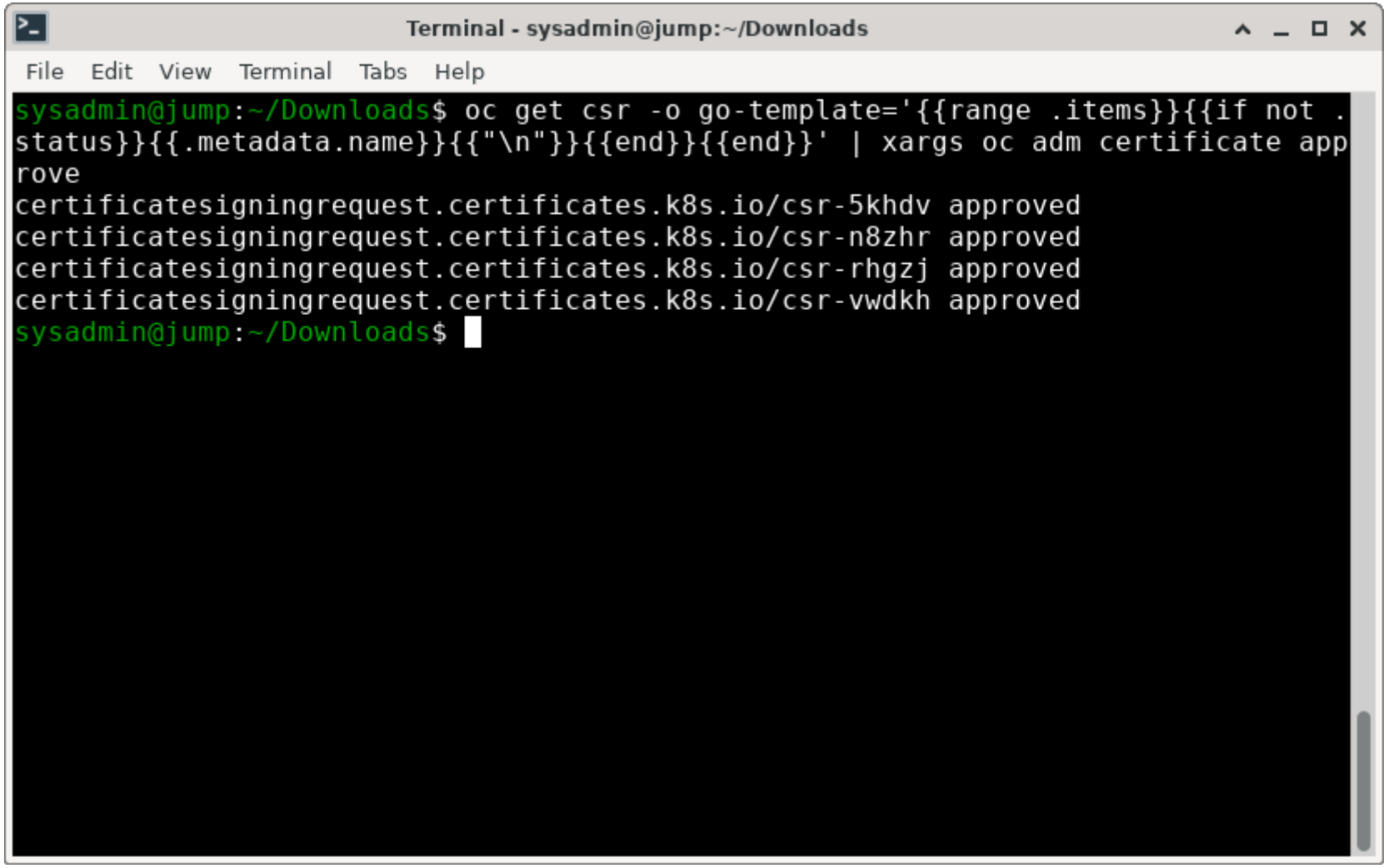
Check CSRs


Terminal - sysadmin@jump:~/Downloads
File Edit View Terminal Tabs Help
sysadmin@jump:~/Downloads$ oc get csr -o go-template='{{range .items}}{{if not .
status}}{{.metadata.name}}{{"\n"}}{{end}}{{end}}' | xargs oc adm certificate app
rove
certificatesigningrequest.certificates.k8s.io/csr-2hq4q approved
certificatesigningrequest.certificates.k8s.io/csr-59s6x approved
certificatesigningrequest.certificates.k8s.io/csr-9p4sk approved
certificatesigningrequest.certificates.k8s.io/csr-b4dqb approved
certificatesigningrequest.certificates.k8s.io/csr-dxzt2 approved
certificatesigningrequest.certificates.k8s.io/csr-gn5ft approved
certificatesigningrequest.certificates.k8s.io/csr-llqmr approved
certificatesigningrequest.certificates.k8s.io/csr-m4n94 approved
certificatesigningrequest.certificates.k8s.io/csr-p48ls approved
certificatesigningrequest.certificates.k8s.io/csr-q9bq5 approved
certificatesigningrequest.certificates.k8s.io/csr-tfdgj approved
certificatesigningrequest.certificates.k8s.io/csr-tz5s7 approved
sysadmin@jump:~/Downloads$

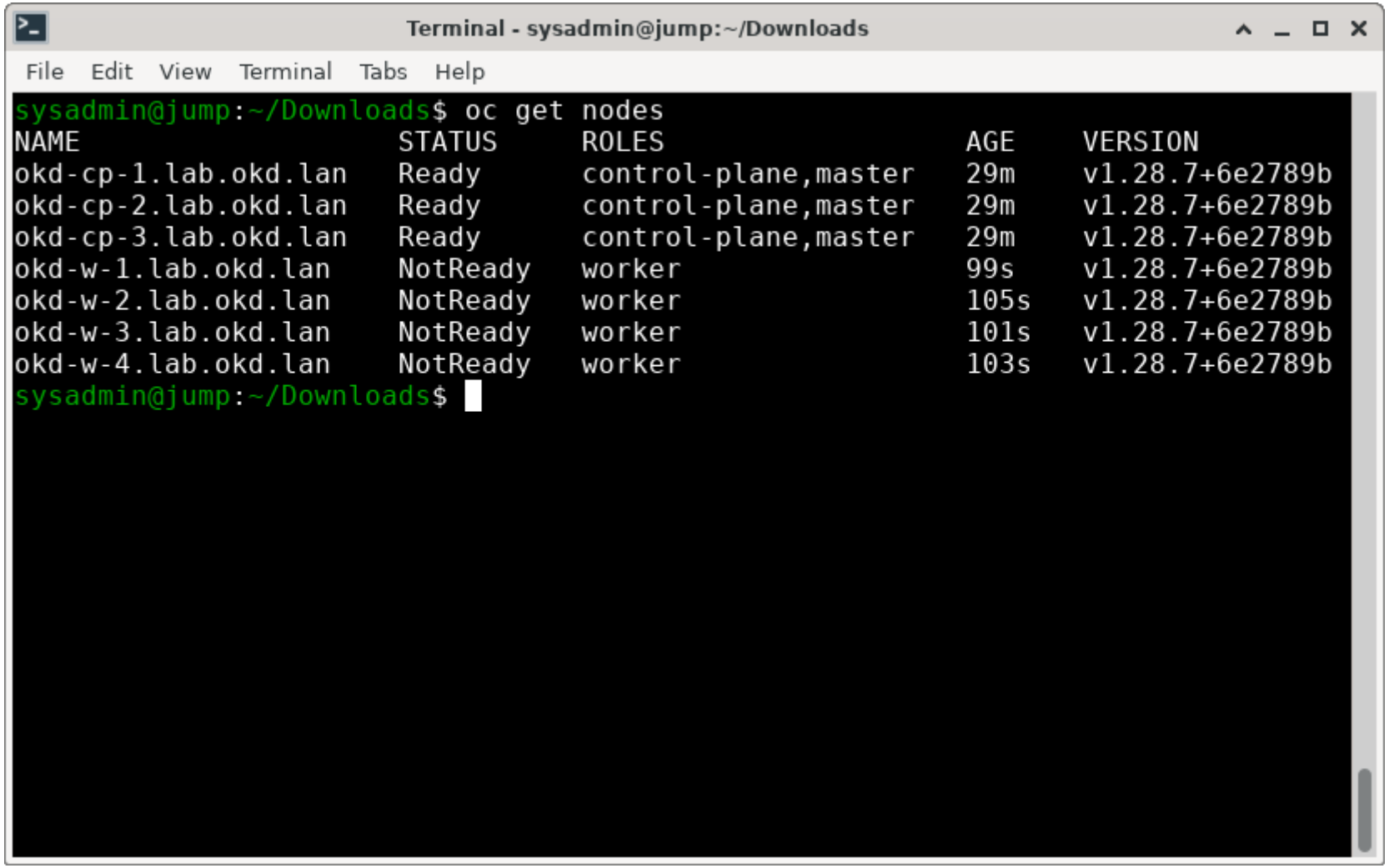
Check CSRs


Terminal - sysadmin@jump:~/Downloads
File Edit View Terminal Tabs Help
sysadmin@jump:~/Downloads$ oc get csr | grep Pending
csr-5khdv 8s kubernetes.io/kubelet-ser
ving system:node:okd-w-1.lab.okd.lan
<none> Pending
csr-n8zhr 15s kubernetes.io/kubelet-ser
ving system:node:okd-w-2.lab.okd.lan
<none> Pending
csr-rhgzj 12s kubernetes.io/kubelet-ser
ving system:node:okd-w-4.lab.okd.lan
<none> Pending
csr-vwdkh 10s kubernetes.io/kubelet-ser
ving system:node:okd-w-3.lab.okd.lan
<none> Pending
sysadmin@jump:~/Downloads$

Check CSRs


Terminal - sysadmin@jump:~/Downloads
File Edit View Terminal Tabs Help
sysadmin@jump:~/Downloads$ oc get csr -o go-template='{{range .items}}{{if not .
status}}{{.metadata.name}}{{"\n"}}{{end}}{{end}}' | xargs oc adm certificate app
rove
certificatesigningrequest.certificates.k8s.io/csr-5khdv approved
certificatesigningrequest.certificates.k8s.io/csr-n8zhr approved
certificatesigningrequest.certificates.k8s.io/csr-rhgzj approved
certificatesigningrequest.certificates.k8s.io/csr-vwdkh approved
sysadmin@jump:~/Downloads$

Check CSRs


Terminal - sysadmin@jump:~/Downloads
File Edit View Terminal Tabs Help
sysadmin@jump:~/Downloads$ oc get nodes
NAME STATUS ROLES AGE VERSION
okd-cp-1.lab.okd.lan Ready control-plane,master 29m v1.28.7+6e2789b
okd-cp-2.lab.okd.lan Ready control-plane,master 29m v1.28.7+6e2789b
okd-cp-3.lab.okd.lan Ready control-plane,master 29m v1.28.7+6e2789b
okd-w-1.lab.okd.lan NotReady worker 99s v1.28.7+6e2789b
okd-w-2.lab.okd.lan NotReady worker 105s v1.28.7+6e2789b
okd-w-3.lab.okd.lan NotReady worker 101s v1.28.7+6e2789b
okd-w-4.lab.okd.lan NotReady worker 103s v1.28.7+6e2789b
sysadmin@jump:~/Downloads$

Statistics Report for HAProxy - Google Chrome

Statistics Report for HAPr | Releases · okd-project/ok | Clusters | Red Hat OpenSl | Fedora CoreOS | The Fedo | Index of /ign | okd-project/okd: The self-

Not secure haproxy:9000/stats

Personal Sparksoft

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				1	1	-	1	3	20 000	82			36 936	4 372 114	0	0	0					OPEN								
Backend	0	0		0	0		0	0	2 000	0	0	0s	36 936	4 372 114	0	0		0	0	0	0	13m40s UP		0/0	0	0		0		

k8s_api_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				1	190	-	55	382	20 000	4 644			5 000 458	41 425 569	0	0	0					OPEN								

k8s_api_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-cp-1	0	0	-	0	704		9	79	-	2 682	1 622	47s	1 940 008	25 524 399		0		350	7	1060	8	13m8s UP	L4OK in 0ms	1/1	Y	-	3	1	12s	-
okd-cp-2	0	0	-	1	26		18	21	-	1 013	1 013	0s	979 583	4 225 489		0		0	0	0	0	13m40s UP	L4OK in 0ms	1/1	Y	-	0	0	0s	-
okd-cp-3	0	0	-	0	61		28	66	-	2 017	2 017	36s	2 080 867	11 675 681		0		0	0	0	0	13m40s UP	L4OK in 0ms	1/1	Y	-	0	0	0s	-
Backend	0	0		1	190		55	381	2 000	4 644	4 652	0s	5 000 458	41 425 569	0	0		350	7	1060	8	13m40s UP		3/3	3	0		0	0s	

okd_machine_config_server_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	0	-	0	0	20 000	0			0	0	0	0	0					OPEN								

okd_machine_config_server_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-cp-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	13m40s UP	L4OK in 0ms	1/1	Y	-	0	0	0s	-
okd-cp-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	13m40s UP	L4OK in 0ms	1/1	Y	-	0	0	0s	-
okd-cp-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	13m40s UP	L4OK in 0ms	1/1	Y	-	0	0	0s	-
Backend	0	0		0	0		0	0	2 000	0	0	?	0	0	0	0		0	0	0	0	13m40s UP		3/3	3	0		0	0s	

okd_http_ingress_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	0	-	0	0	20 000	0			0	0	0	0	0					OPEN								

okd_http_ingress_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-w-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	13m39s DOWN	L4CON in 0ms	1/1	Y	-	1	1	13m39s	-
okd-w-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	13m39s DOWN	L4CON in 0ms	1/1	Y	-	1	1	13m39s	-
okd-w-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	13m39s DOWN	L4CON in 0ms	1/1	Y	-	1	1	13m39s	-
okd-w-4	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	13m39s DOWN	L4CON in 0ms	1/1	Y	-	1	1	13m39s	-
Backend	0	0		0	0		0	0	2 000	0	0	?	0	0	0	0		0	0	0	0	13m39s DOWN		0/0	0	0		1	13m39s	

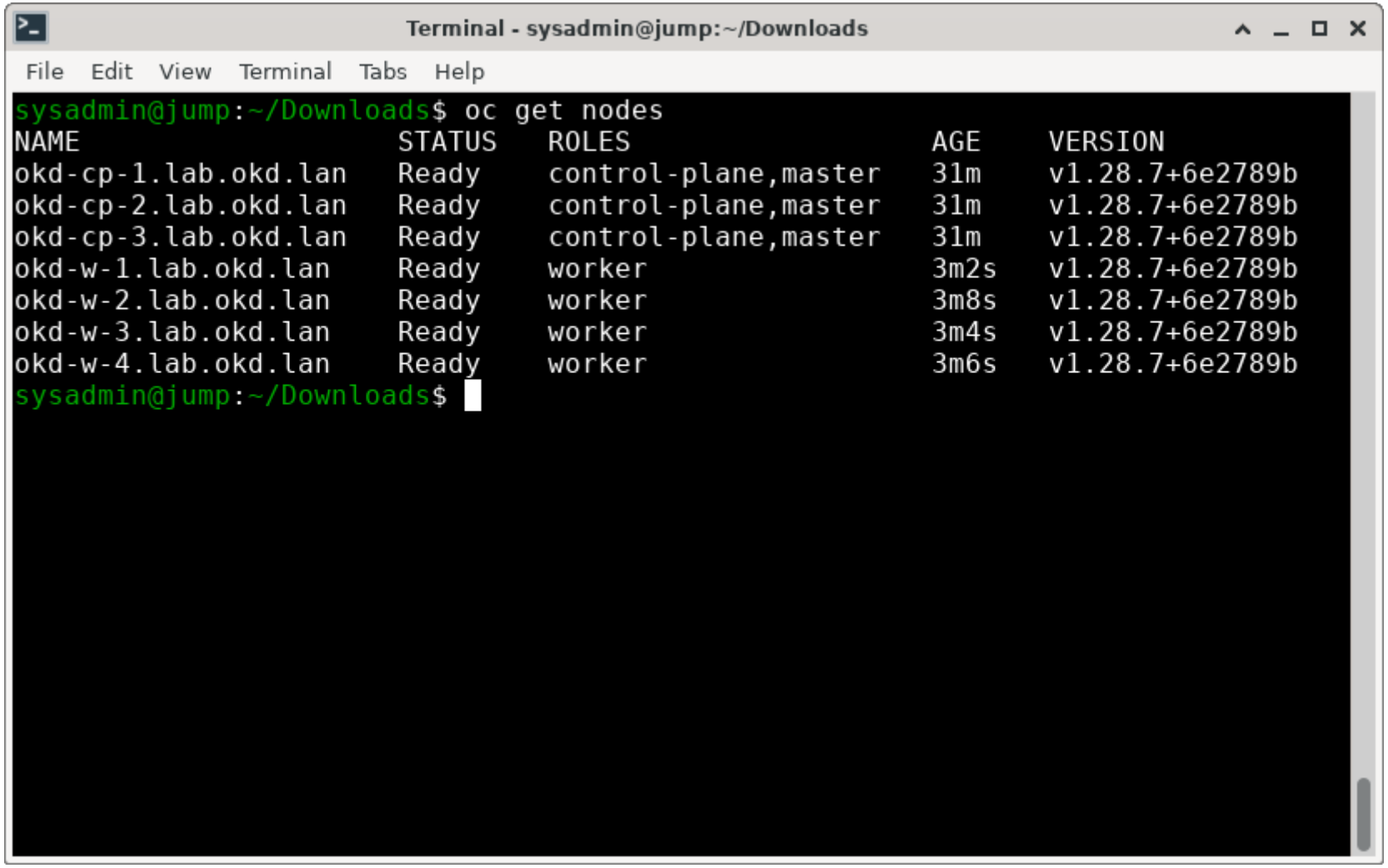
okd_https_ingress_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	0	-	0	0	20 000	0			0	0	0	0	0					OPEN								

okd_https_ingress_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-w-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	13m39s DOWN	L4CON in 0ms	1/1	Y	-	1	1	13m39s	-
okd-w-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	13m39s DOWN	L4CON in 0ms	1/1	Y	-	1	1	13m39s	-
okd-w-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	13m38s DOWN	L4CON in 1ms	1/1	Y	-	1	1	13m38s	-
okd-w-4	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	13m38s DOWN	L4CON in 0ms	1/1	Y	-	1	1	13m38s	-
Backend	0	0		0	0		0	0	2 000	0	0	?	0	0	0	0		0	0	0	0	13m38s DOWN		0/0	0	0		1	13m38s	

Check CSRs


Terminal - sysadmin@jump:~/Downloads
File Edit View Terminal Tabs Help
sysadmin@jump:~/Downloads$ oc get nodes
NAME STATUS ROLES AGE VERSION
okd-cp-1.lab.okd.lan Ready control-plane,master 31m v1.28.7+6e2789b
okd-cp-2.lab.okd.lan Ready control-plane,master 31m v1.28.7+6e2789b
okd-cp-3.lab.okd.lan Ready control-plane,master 31m v1.28.7+6e2789b
okd-w-1.lab.okd.lan Ready worker 3m2s v1.28.7+6e2789b
okd-w-2.lab.okd.lan Ready worker 3m8s v1.28.7+6e2789b
okd-w-3.lab.okd.lan Ready worker 3m4s v1.28.7+6e2789b
okd-w-4.lab.okd.lan Ready worker 3m6s v1.28.7+6e2789b
sysadmin@jump:~/Downloads$

Statistics Report for HAProxy - Google Chrome

Statistics Report for HAPr | Releases · okd-project/ok | Clusters | Red Hat OpenSl | Fedora CoreOS | The Fedo | Index of /ign | okd-project/okd: The self

Not secure haproxy:9000/stats

Personal Sparksoft

	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				1	1	-	1	3	20 000	89			40 128	4 752 356	0	0	0					OPEN								
Backend	0	0		0	0		0	0	2 000	0	0	0s	40 128	4 752 356	0	0		0	0	0	0	14m51s UP		0/0	0	0		0		

k8s_api_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	190	-	75	382	20 000	4 733			5 280 158	47 808 543	0	0	0					OPEN								

k8s_api_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-cp-1	0	0	-	0	704		14	79	-	2 715	1 655	32s	2 146 810	30 807 151		0		350	7	1060	8	14m19s UP	L4OK in 0ms	1/1	Y	-	3	1	12s	-
okd-cp-2	0	0	-	0	26		23	25	-	1 049	1 049	9s	1 040 908	5 297 365		0		0	0	0	0	14m51s UP	L4OK in 0ms	1/1	Y	-	0	0	0s	-
okd-cp-3	0	0	-	0	61		38	66	-	2 037	2 037	28s	2 092 440	11 704 027		0		0	0	0	0	14m51s UP	L4OK in 0ms	1/1	Y	-	0	0	0s	-
Backend	0	0		0	190		75	381	2 000	4 733	4 741	9s	5 280 158	47 808 543	0	0		350	7	1060	8	14m51s UP		3/3	3	0		0	0s	

okd_machine_config_server_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	0	-	0	0	20 000	0			0	0	0	0	0					OPEN								

okd_machine_config_server_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-cp-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	14m51s UP	L4OK in 1ms	1/1	Y	-	0	0	0s	-
okd-cp-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	14m51s UP	L4OK in 0ms	1/1	Y	-	0	0	0s	-
okd-cp-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	14m51s UP	L4OK in 0ms	1/1	Y	-	0	0	0s	-
Backend	0	0		0	0		0	0	2 000	0	0	?	0	0	0	0		0	0	0	0	14m51s UP		3/3	3	0		0	0s	

okd_http_ingress_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	0	-	0	0	20 000	0			0	0	0	0	0					OPEN								

okd_http_ingress_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-w-1	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	29s UP	L4OK in 1ms	1/1	Y	-	1	1	14m21s	-
okd-w-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	14m50s DOWN	L4CON in 1ms	1/1	Y	-	1	1	14m50s	-
okd-w-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	14m50s DOWN	L4CON in 1ms	1/1	Y	-	1	1	14m50s	-
okd-w-4	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	9s UP	L4OK in 1ms	1/1	Y	-	1	1	14m41s	-
Backend	0	0		0	0		0	0	2 000	0	0	?	0	0	0	0		0	0	0	0	29s UP		2/2	2	0		1	14m21s	

okd_https_ingress_frontend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	10	-	0	3	20 000	56			21 919	158 761	0	0	0					OPEN								

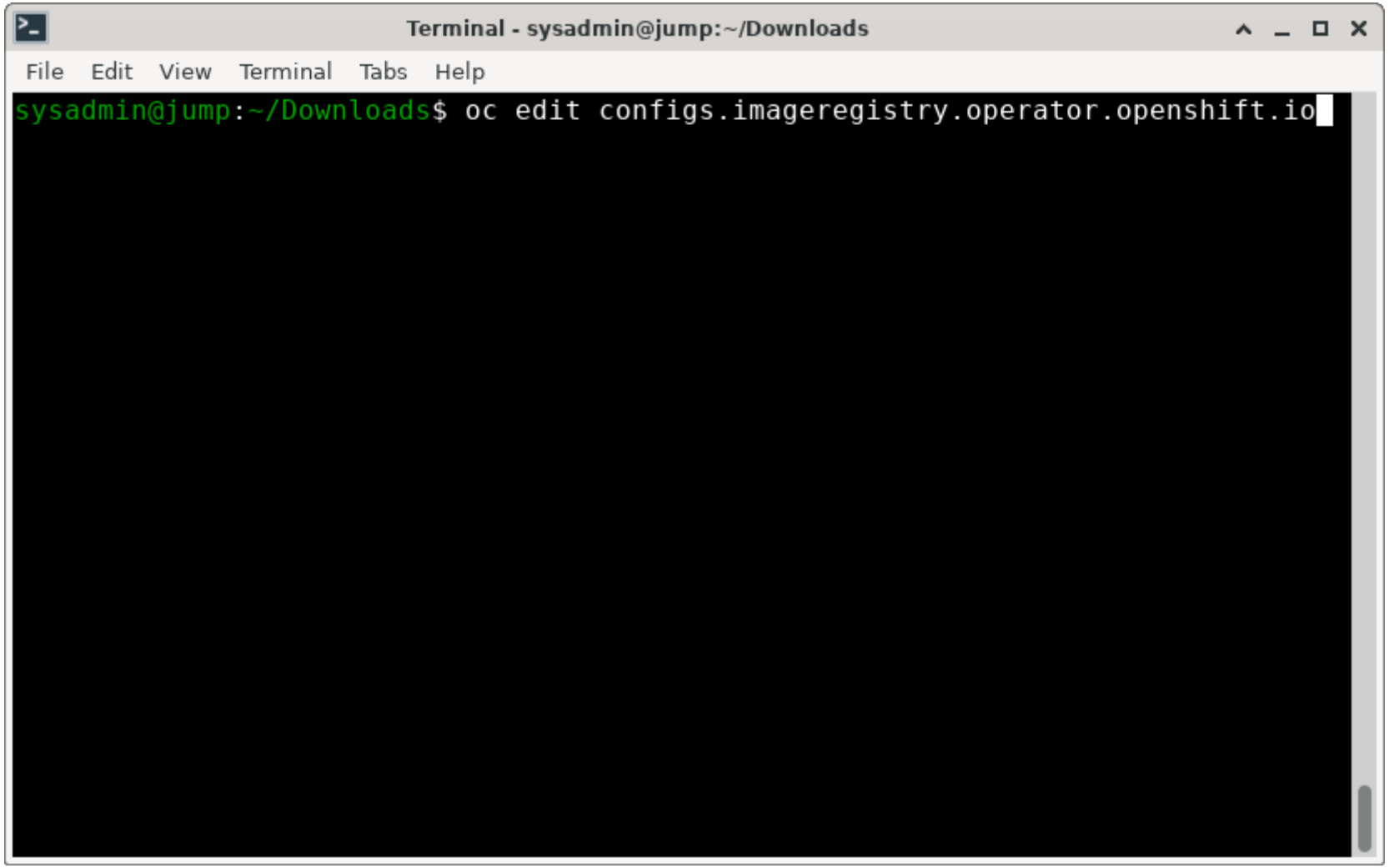
okd_https_ingress_backend

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
okd-w-1	0	0	-	0	6		0	2	-	30	30	17s	12 045	81 795		0		0	0	0	0	29s UP	L4OK in 0ms	1/1	Y	-	1	1	14m21s	-
okd-w-2	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	14m50s DOWN	L4CON in 1ms	1/1	Y	-	1	1	14m50s	-
okd-w-3	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	14m49s DOWN	L4CON in 1ms	1/1	Y	-	1	1	14m49s	-
okd-w-4	0	0	-	0	10		0	2	-	17	17	2s	9 024	76 966		0		0	0	0	0	8s UP	L4OK in 1ms	1/1	Y	-	1	1	14m41s	-
Backend	0	0		0	10		0	2	2 000	56	47	2s	21 919	158 761	0	0		9	0	0	0	29s UP		2/2	2	0		1	14m20s	

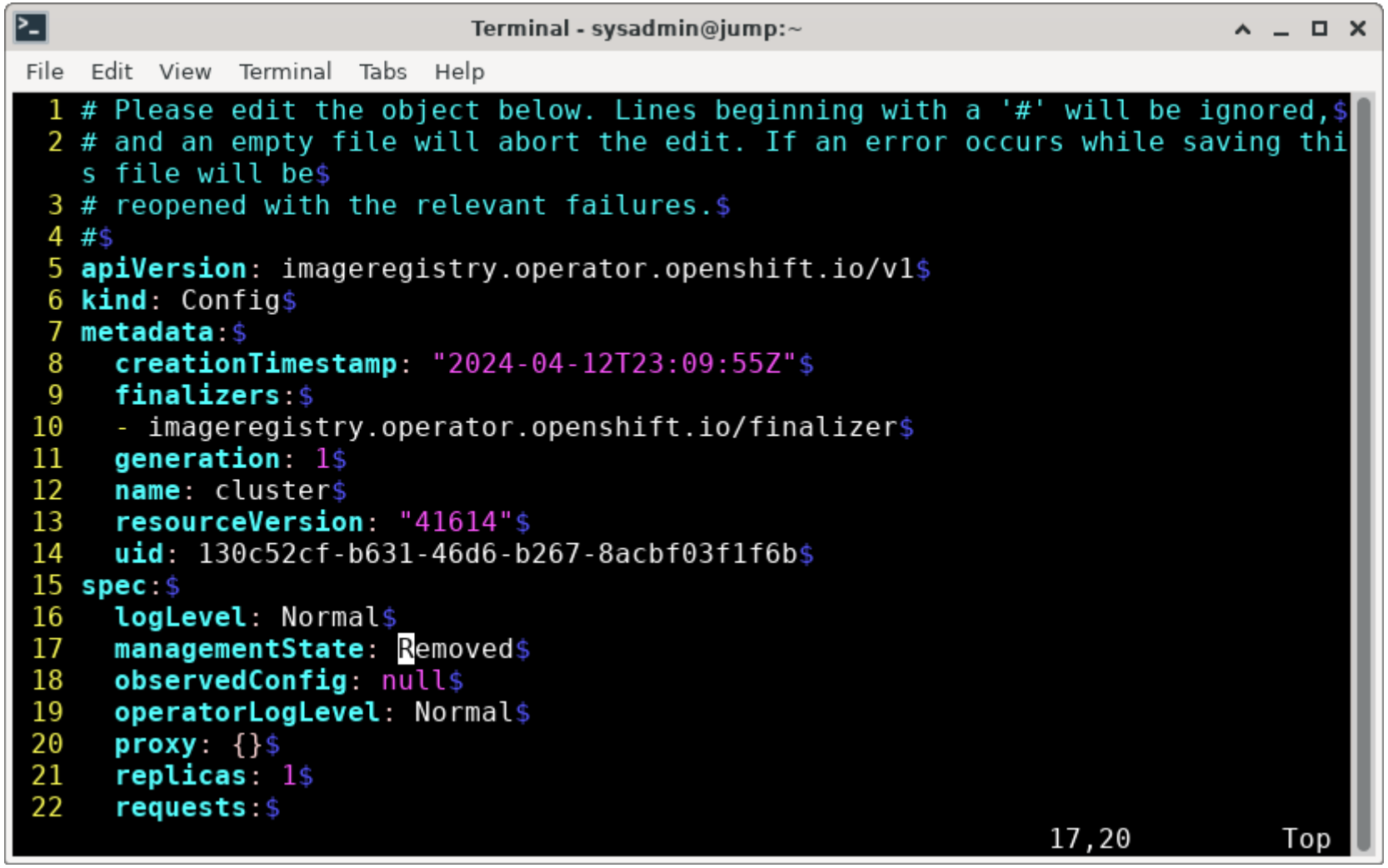
Configure storage for registry

- We'll use the NFS storage we set up earlier for the registry
- oc edit configs.imageregistry.operator.openshift.io

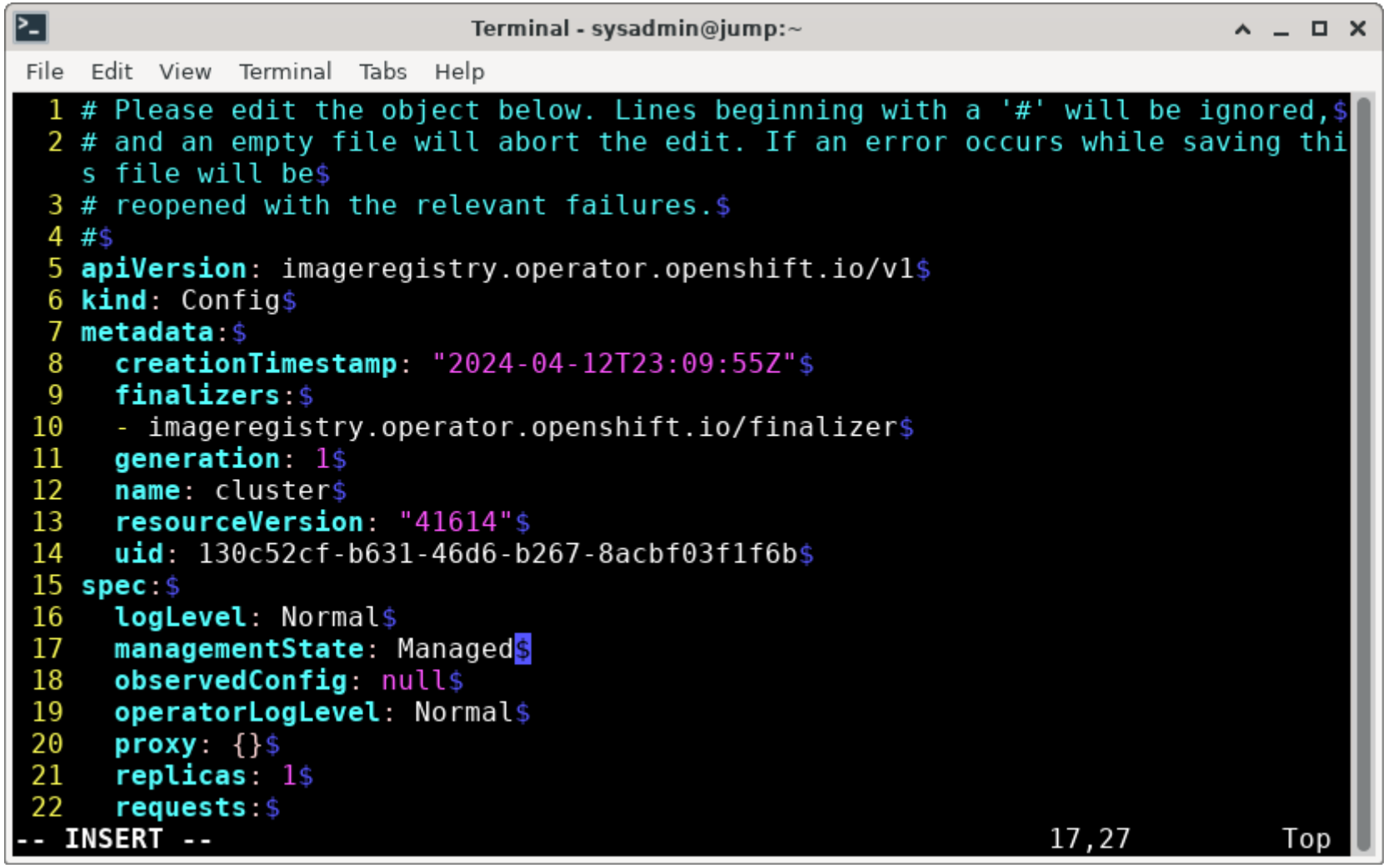
Set up storage



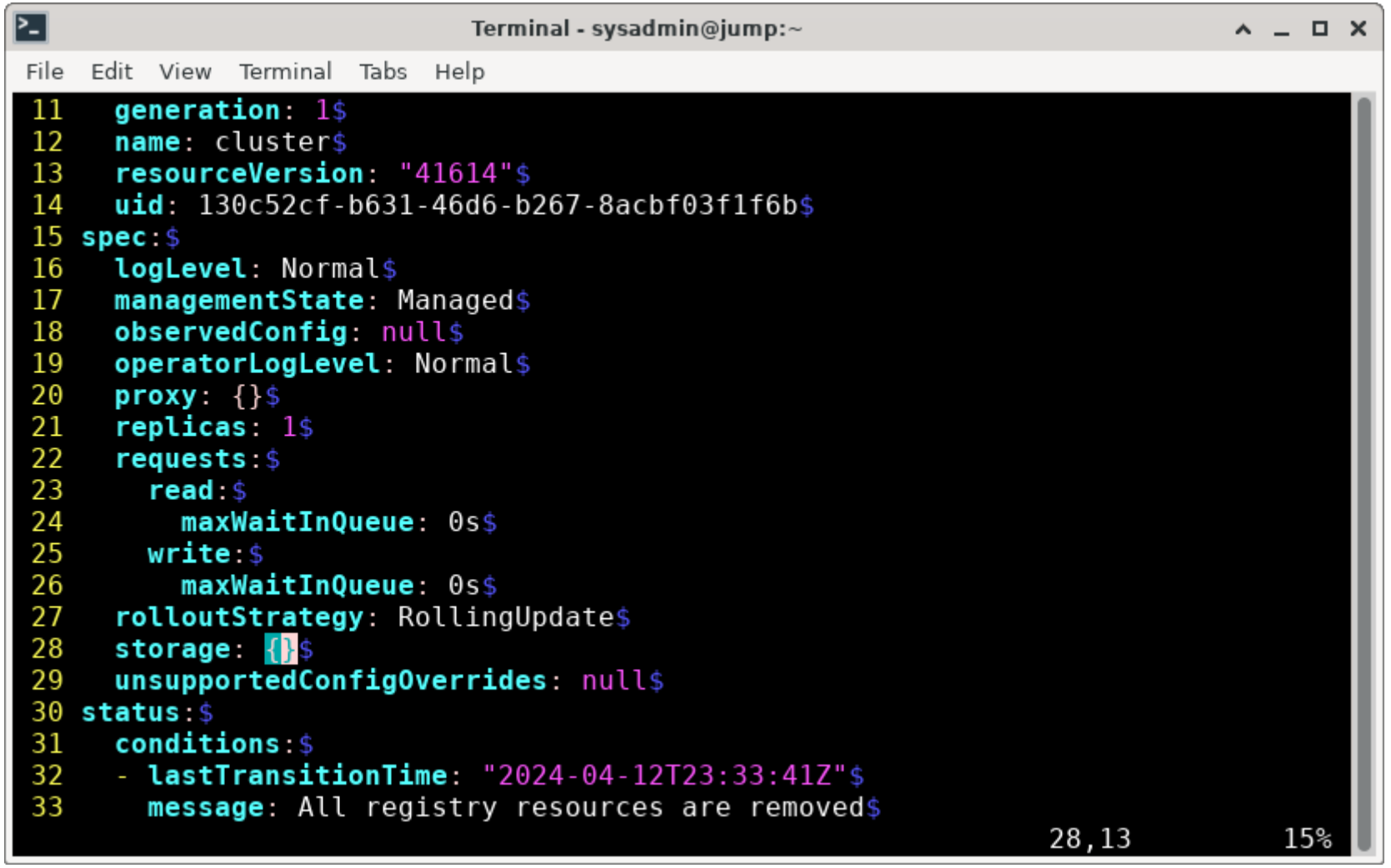
Set up storage



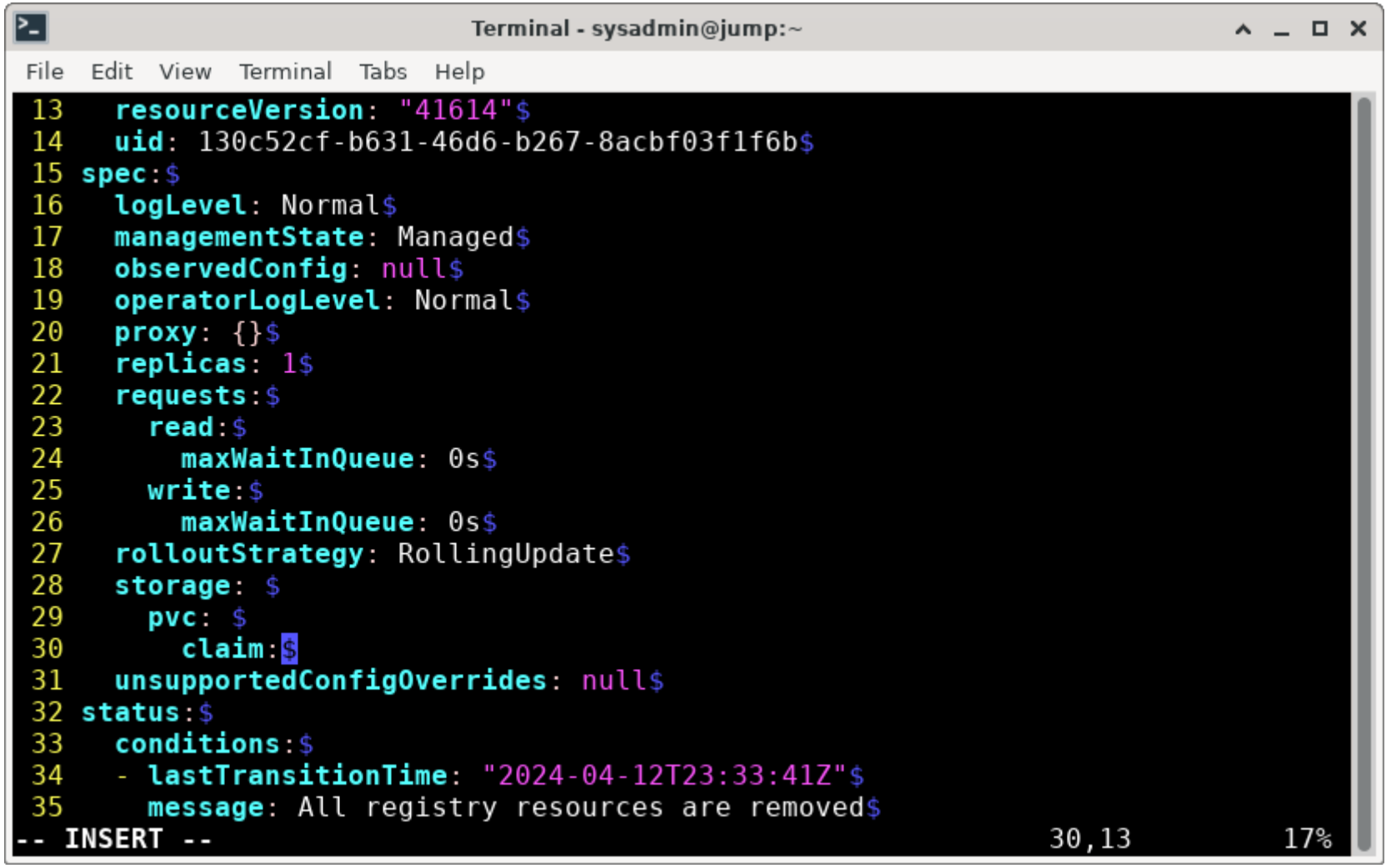
Set up storage



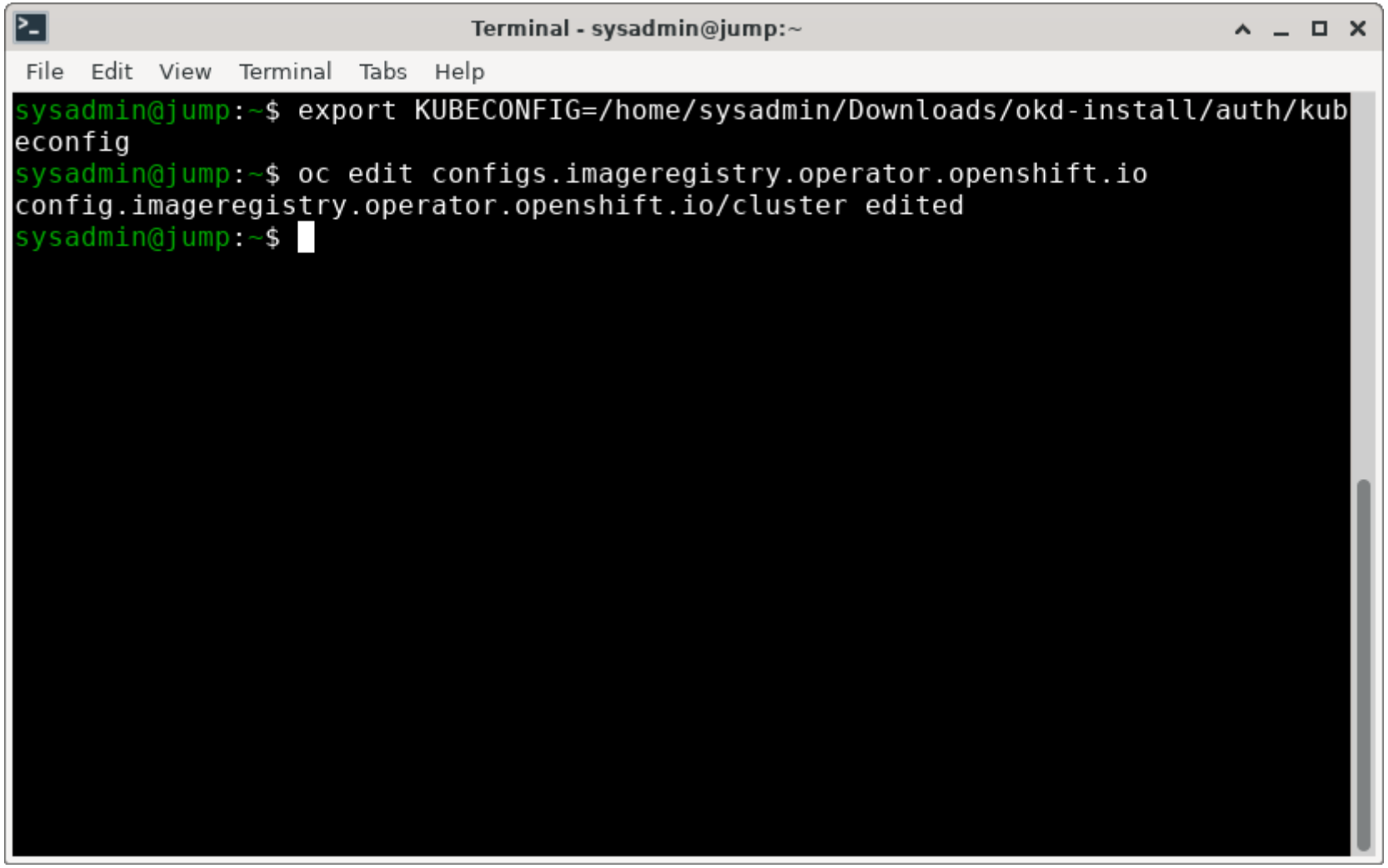
Set up storage



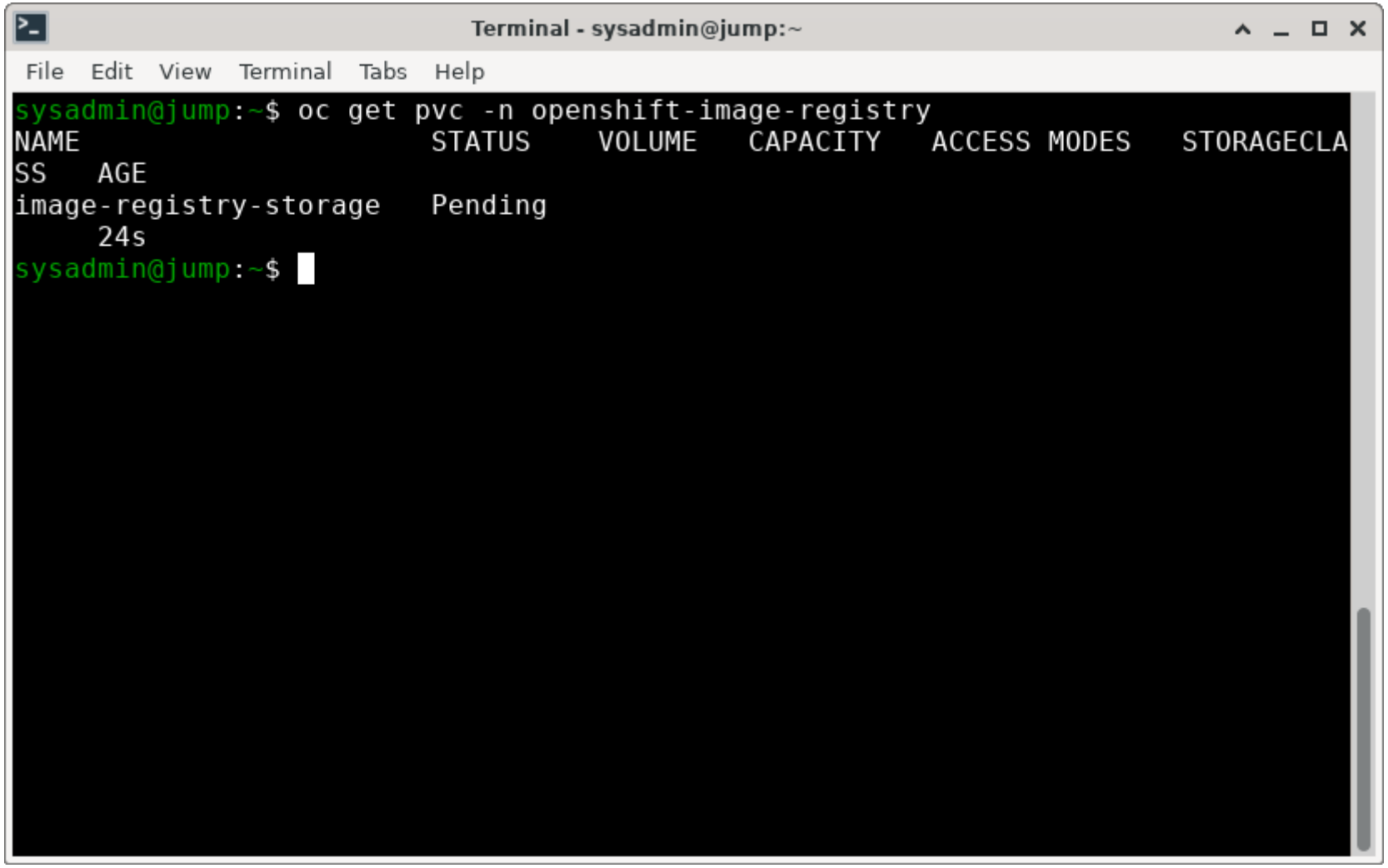
Set up storage



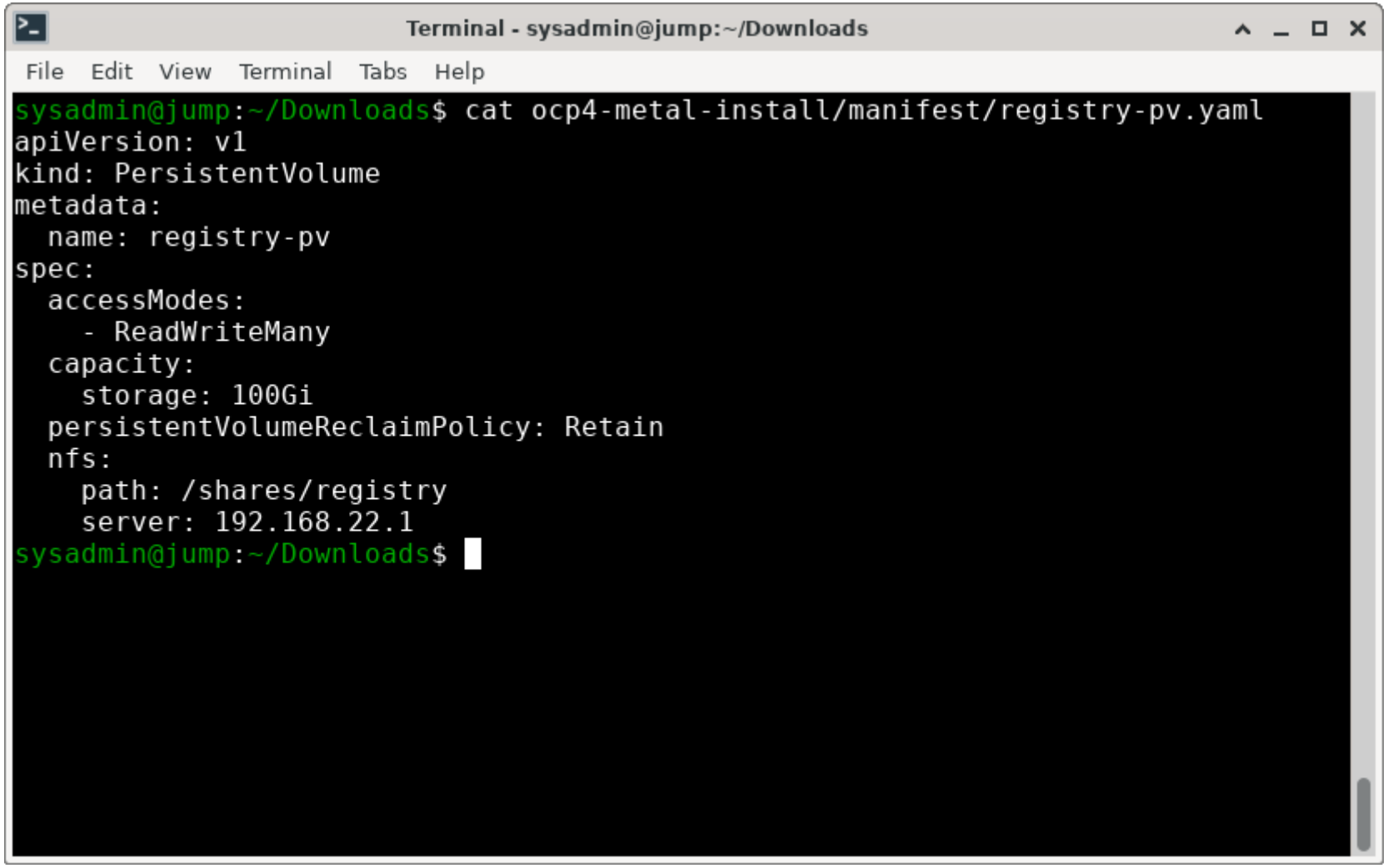
Set up storage



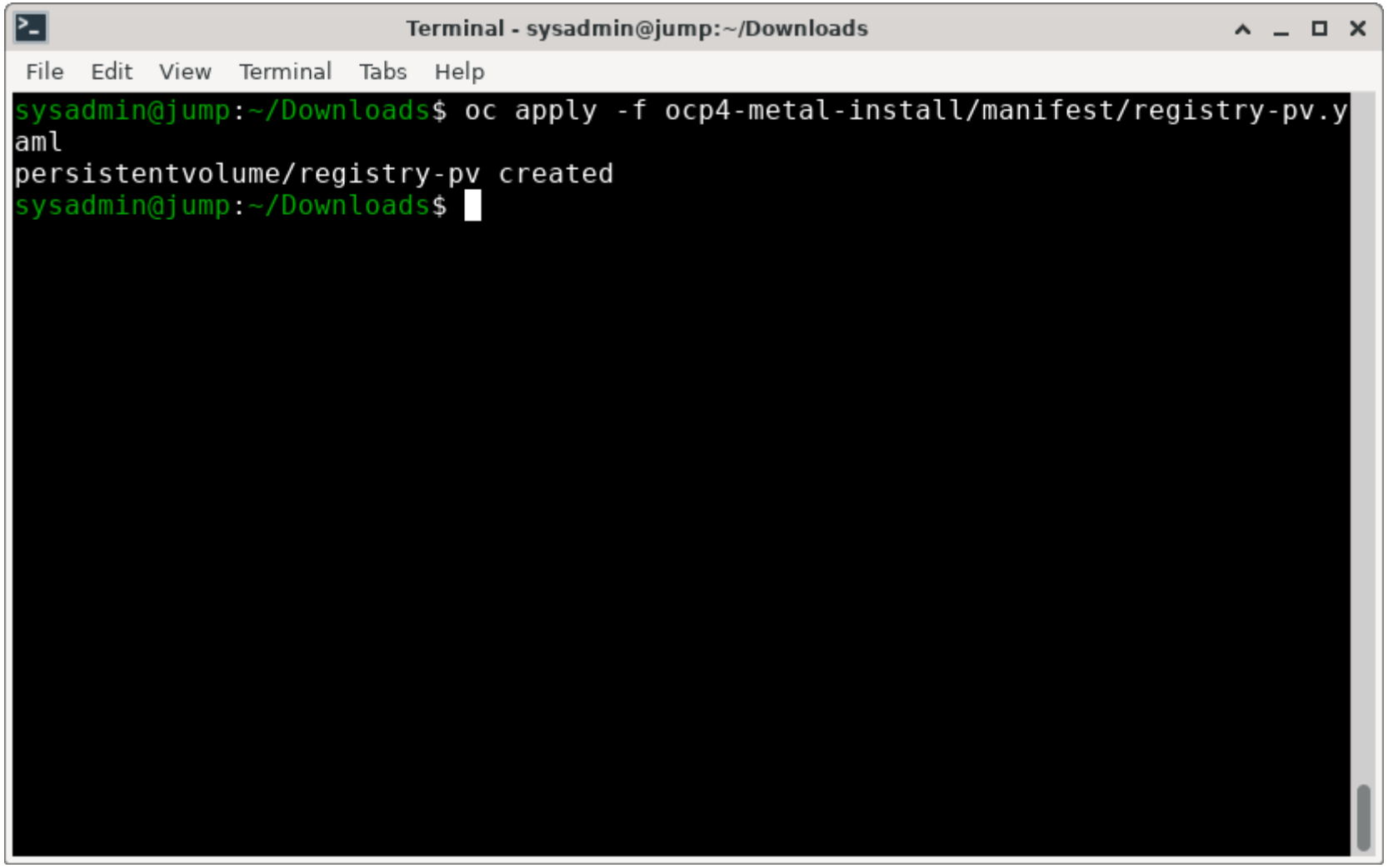
Set up storage



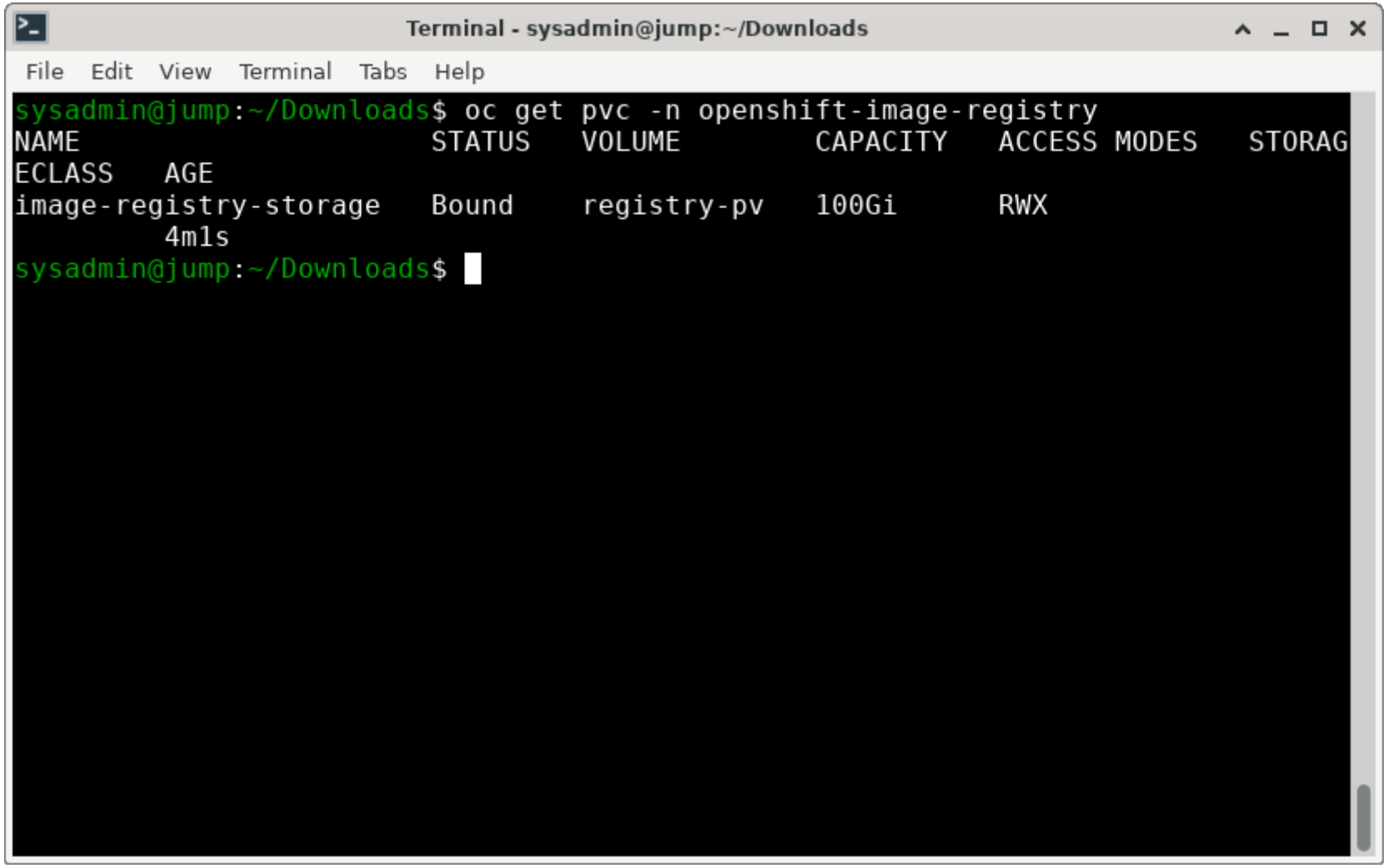
Set up storage



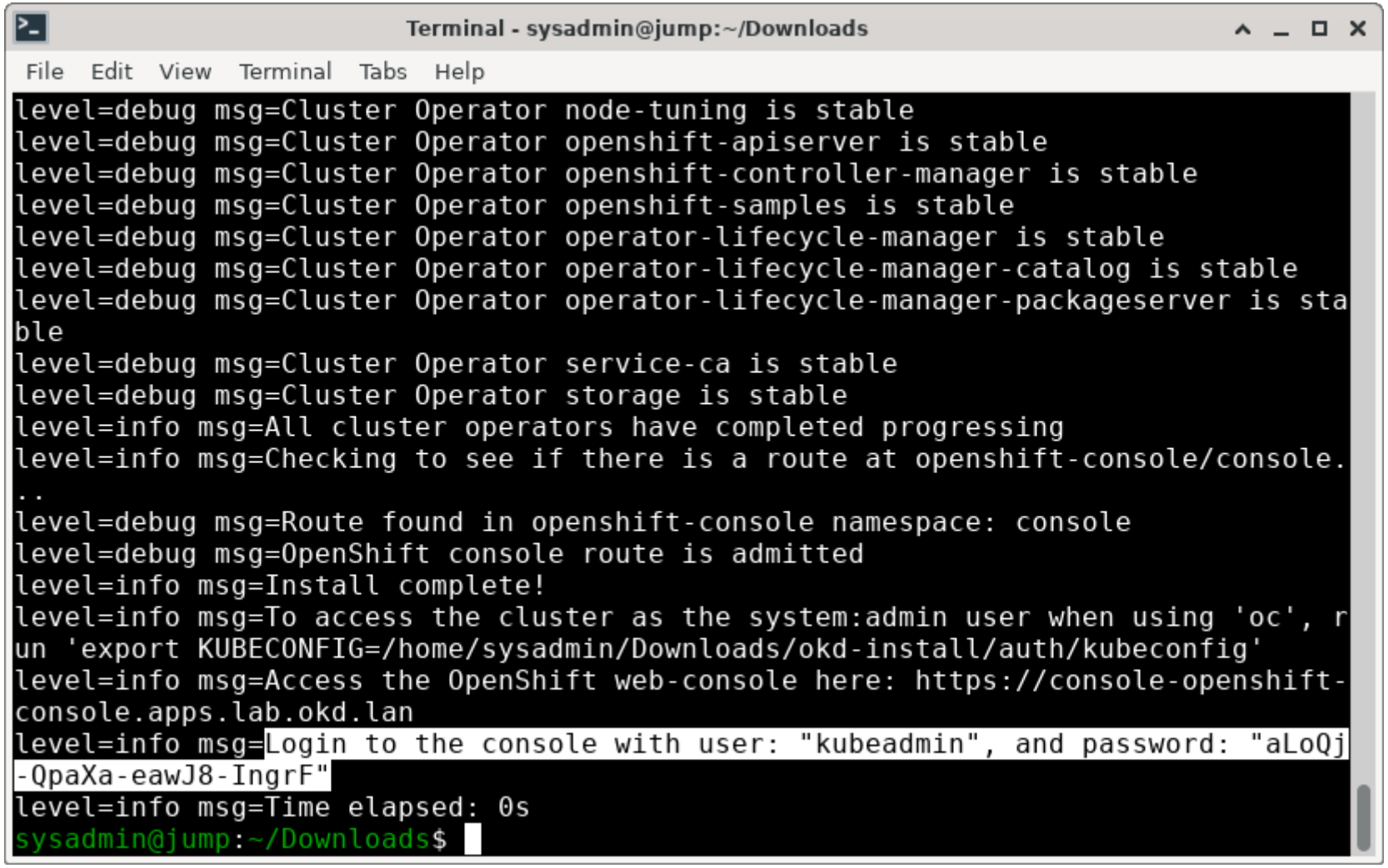
Set up storage



Set up storage

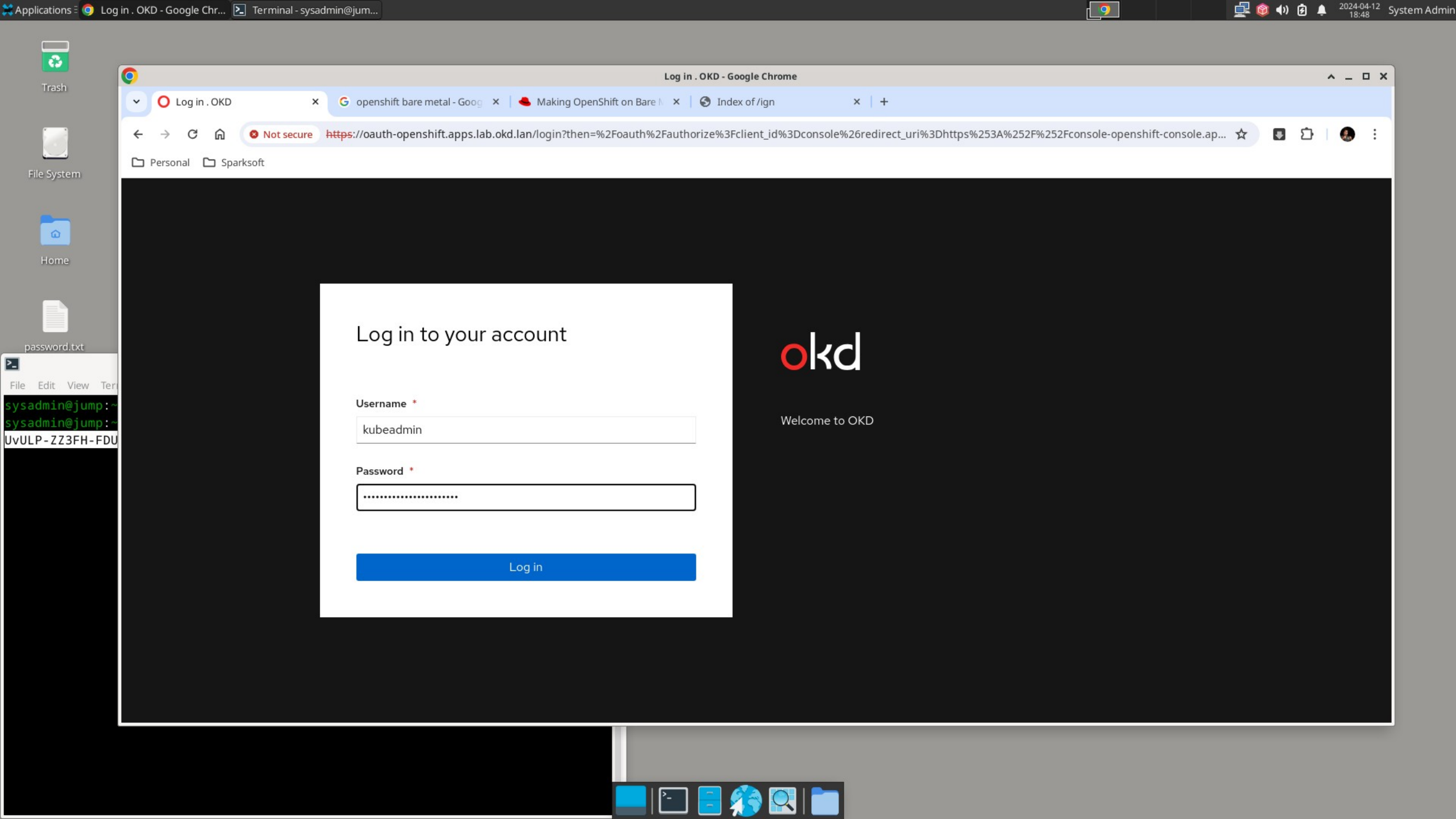


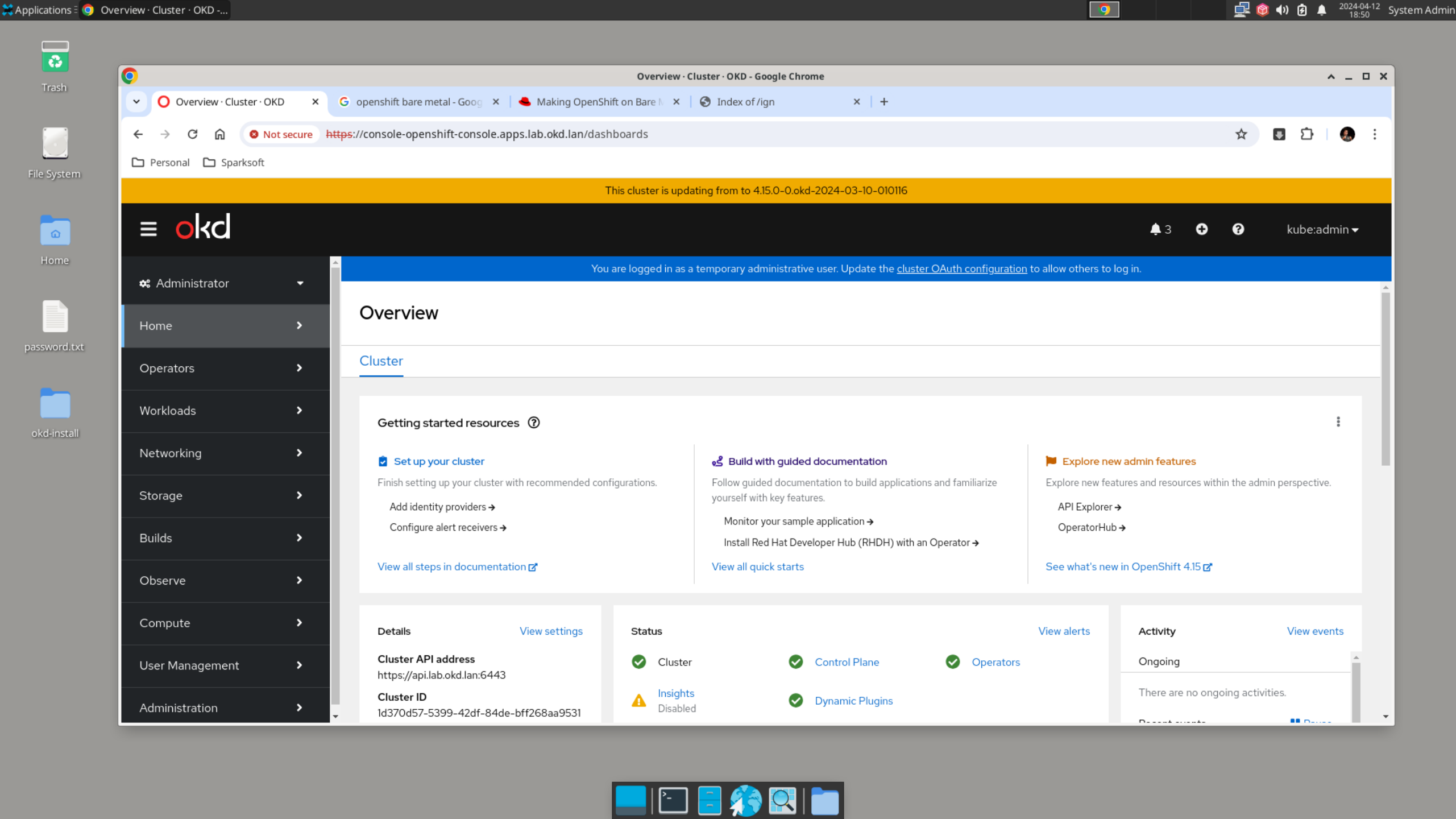
Setupp is finally complete



Log into the console!

- https://console-openshift-console.apps.lab.okd.lan


Applications
Log in . OKD - Google Chr...
Terminal - sysadmin@jum...
2024-04-12
18:48
System Admin
Trash
File System
Home
password.txt
File Edit View Ter
sysadmin@jump:~
sysadmin@jump:~
UvULP-ZZ3FH-FDU
Log in . OKD - Google Chrome
Log in . OKD
openshift bare metal - Goog
Making OpenShift on Bare M
Index of /ign
Not secure
https://oauth-openshift.apps.lab.okd.lan/login?then=%2Foauth%2Fauthorize%3Fclient_id%3Dconsole%26redirect_uri%3Dhttps%253A%252F%252Fconsole-openshift-console.ap...
Personal
Sparksoft
Log in to your account
Username *
kubeadmin
Password *
Log in
okd
Welcome to OKD


Applications
Overview · Cluster · OKD -...
2024-04-12
18:50
System Admin
Trash
File System
Home
password.txt
okd-install
Overview · Cluster · OKD - Google Chrome
Overview · Cluster · OKD
openshift bare metal - Goog
Making OpenShift on Bare M
Index of /ign
Not secure
https://console-openshift-console.apps.lab.okd.lan/dashboards
Personal
Sparksoft
This cluster is updating from to 4.15.0-0.okd-2024-03-10-010116
okd
3
kube:admin
Administrator
Home
Operators
Workloads
Networking
Storage
Builds
Observe
Compute
User Management
Administration
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Overview
Cluster
Getting started resources
Set up your cluster
Finish setting up your cluster with recommended configurations.
Add identity providers
Configure alert receivers
View all steps in documentation
Build with guided documentation
Follow guided documentation to build applications and familiarize yourself with key features.
Monitor your sample application
Install Red Hat Developer Hub (RHDH) with an Operator
View all quick starts
Explore new admin features
Explore new features and resources within the admin perspective.
API Explorer
OperatorHub
See what's new in OpenShift 4.15
Details
View settings
Cluster API address
https://api.lab.okd.lan:6443
Cluster ID
1d370d57-5399-42df-84de-bff268aa9531
Status
View alerts
Cluster
Control Plane
Operators
Insights
Disabled
Dynamic Plugins
Activity
View events
Ongoing
There are no ongoing activities.

And that’s a wrap!

- Now you have an on-prem OKD cluster to play with!
- Note that I did this in my office with some **really** old Intel NUC computers. It’s running just fine.
- I hope you’ve enjoyed this, thank you so much for coming!

Thank You!

Any questions?