jamk.fi

Linux server

Home assignment

Timo Lehosvuo
M3426

Fall 2019
Information and Communication Technology
Cyber Security

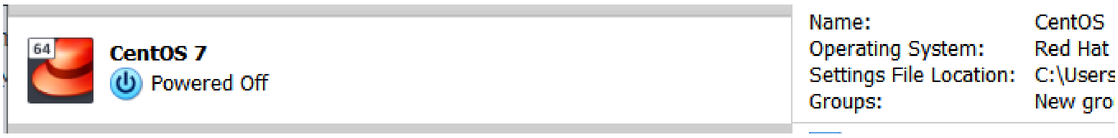
Jyväskylän ammattikorkeakoulu
JAMK University of Applied Sciences

1 Introduction

My home assignment was to create and host my own server for freely selective purpose. I decide to create a Minecraft server on my laptop in a virtual environment using VirtualBox.

2 Getting started

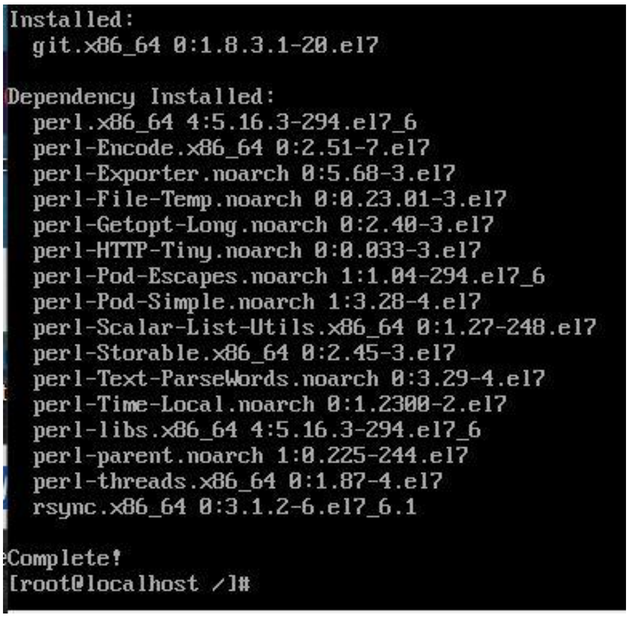
I downloaded CentOS 7 from https://wiki.centos.org/Download to run the server on.



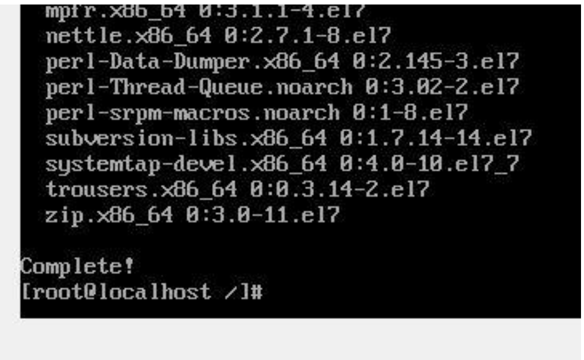
CentOS 7
Powered Off

Name: CentOS
Operating System: Red Hat
Settings File Location: C:\Users
Groups: New gro

After firing up the virtual machine I had to install packages “git” and “Development Tools” to be able to build “mcrcon tool” using the “yum install” command:



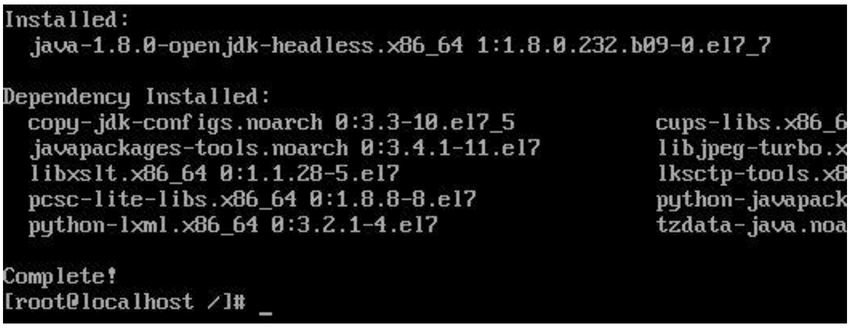
```
Installed:
  git.x86_64 0:1.8.3.1-20.el7

Dependency Installed:
  perl.x86_64 4:5.16.3-294.el7_6
  perl-Encode.x86_64 0:2.51-7.el7
  perl-Exporter.noarch 0:5.68-3.el7
  perl-File-Temp.noarch 0:0.23.01-3.el7
  perl-Getopt-Long.noarch 0:2.40-3.el7
  perl-HTTP-Tiny.noarch 0:0.033-3.el7
  perl-Pod-Escapes.noarch 1:1.04-294.el7_6
  perl-Pod-Simple.noarch 1:3.28-4.el7
  perl-Scalar-List-Utils.x86_64 0:1.27-248.el7
  perl-Storable.x86_64 0:2.45-3.el7
  perl-Text-ParseWords.noarch 0:3.29-4.el7
  perl-Time-Local.noarch 0:1.2300-2.el7
  perl-libs.x86_64 4:5.16.3-294.el7_6
  perl-parent.noarch 1:0.225-244.el7
  perl-threads.x86_64 0:1.87-4.el7
  rsync.x86_64 0:3.1.2-6.el7_6.1

Complete!
[root@localhost /]#
```



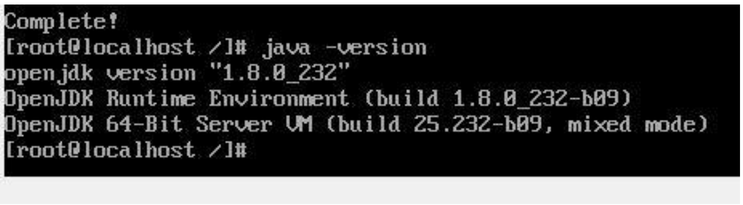
```
  mpfr.x86_64 0:3.1.1-4.el7
  nettle.x86_64 0:2.7.1-8.el7
  perl-Data-Dumper.x86_64 0:2.145-3.el7
  perl-Thread-Queue.noarch 0:3.02-2.el7
  perl-srpm-macros.noarch 0:1-8.el7
  subversion-libs.x86_64 0:1.7.14-14.el7
  systemtap-devel.x86_64 0:4.0-10.el7_7
  trousers.x86_64 0:0.3.14-2.el7
  zip.x86_64 0:3.0-11.el7

Complete!
[root@localhost /]#
```

Development Tools

In order to be able to run Minecraft I needed to download Java 8. There are newer Java versions (9, 10, 11), but these versions have known bugs that might crash or slow the server. I download the headless version because it uses less system resources and has fewer dependencies:

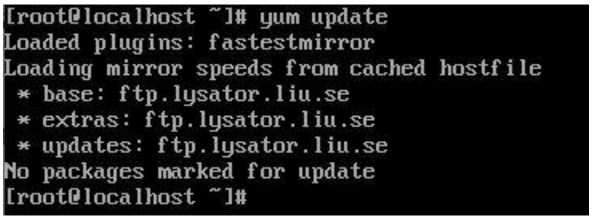


```
Installed:
  java-1.8.0-openjdk-headless.x86_64 1:1.8.0.232.b09-0.el7_7

Dependency Installed:
  copy-jdk-configs.noarch 0:3.3-10.el7_5          cups-libs.x86_6
  javapackages-tools.noarch 0:3.4.1-11.el7        libjpeg-turbo.x
  libxslt.x86_64 0:1.1.28-5.el7                   lksctp-tools.x8
  pcsc-lite-libs.x86_64 0:1.8.8-8.el7             python-javapack
  python-lxml.x86_64 0:3.2.1-4.el7                tzdata-java.noa

Complete!
[root@localhost /]# _
```



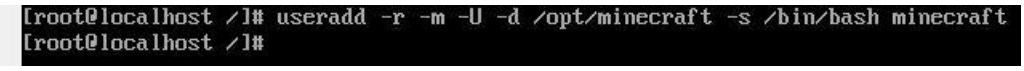
```
Complete!
[root@localhost /]# java -version
openjdk version "1.8.0_232"
OpenJDK Runtime Environment (build 1.8.0_232-b09)
OpenJDK 64-Bit Server VM (build 25.232-b09, mixed mode)
[root@localhost /]#
```

I also updated all my packages with “yum update” so there were no outdated ones:



```
[root@localhost ~]# yum update
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
 * base: ftp.lysator.liu.se
 * extras: ftp.lysator.liu.se
 * updates: ftp.lysator.liu.se
No packages marked for update
[root@localhost ~]#
```

The service should not be run as “root” so I created a user “Minecraft” specifically to run the service:



```
[root@localhost /]# useradd -r -m -U -d /opt/minecraft -s /bin/bash minecraft
[root@localhost /]#
```

parameters:

-r = creates a system account

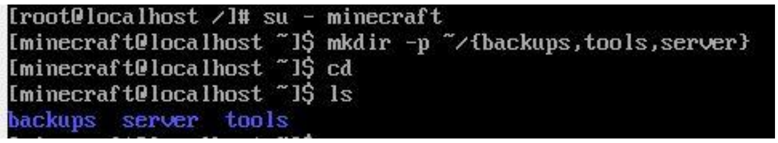
-m = creates a home directory

-U = creates a group with the same name as the user and adds the user to it

-d = user’s home directory is used as login directory

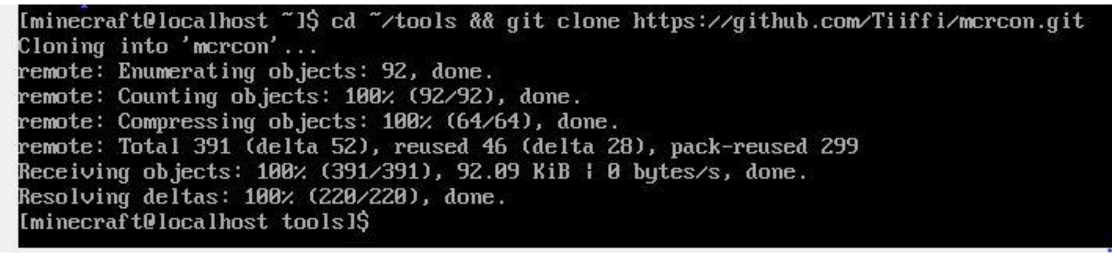
-s = name of the user’s login shell

Giving then user a password is a bad idea since it makes it possible to login via SSH so I left that out. I switched over to user “Minecraft” and created three folders (backups, tools, server) in the home directory:



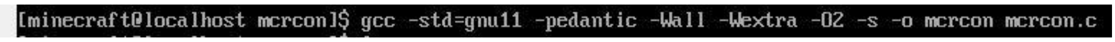
```
[root@localhost /]# su - minecraft
[minecraft@localhost ~]$ mkdir -p ~/{backups,tools,server}
[minecraft@localhost ~]$ cd
[minecraft@localhost ~]$ ls
backups  server  tools
```

Navigated to the folder “tools” and copied the “mcrcon” source code from github:



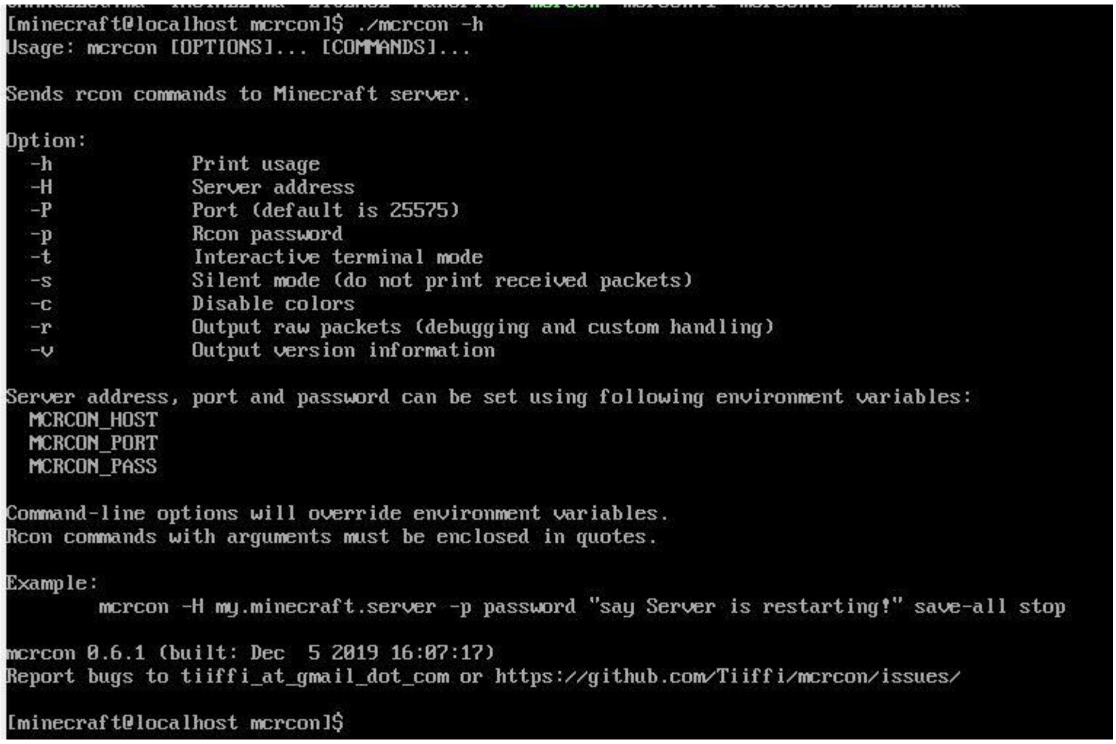
```
[minecraft@localhost ~]$ cd ~/tools && git clone https://github.com/Tiiffi/mcrcon.git
Cloning into 'mcrcon'...
remote: Enumerating objects: 92, done.
remote: Counting objects: 100% (92/92), done.
remote: Compressing objects: 100% (64/64), done.
remote: Total 391 (delta 52), reused 46 (delta 28), pack-reused 299
Receiving objects: 100% (391/391), 92.09 KiB | 0 bytes/s, done.
Resolving deltas: 100% (220/220), done.
[minecraft@localhost tools]$
```

then built the mcrcon:



```
[minecraft@localhost mcrcon]$ gcc -std=gnu11 -pedantic -Wall -Wextra -O2 -s -o mcrcon mcrcon.c
```

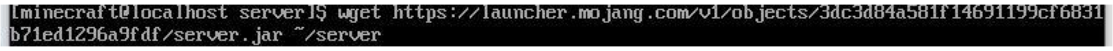
and tested that it worked:



```
[minecraft@localhost mcrcon]$ ./mcrcon -h
Usage: mcrcon [OPTIONS]... [COMMANDS]...

Sends rcon commands to Minecraft server.

Option:
  -h            Print usage
  -H            Server address
  -P            Port (default is 25575)
  -p            Rcon password
  -t            Interactive terminal mode
  -s            Silent mode (do not print received packets)
  -c            Disable colors
  -r            Output raw packets (debugging and custom handling)
  -v            Output version information

Server address, port and password can be set using following environment variables:
  MCRCON_HOST
  MCRCON_PORT
  MCRCON_PASS

Command-line options will override environment variables.
Rcon commands with arguments must be enclosed in quotes.

Example:
        mcrcon -H my.minecraft.server -p password "say Server is restarting!" save-all stop

mcrcon 0.6.1 (built: Dec  5 2019 16:07:17)
Report bugs to tiiffi_at_gmail_dot_com or https://github.com/Tiiffi/mcrcon/issues/

[minecraft@localhost mcrcon]$
```

Now I can connect to the Minecraft server and execute commands.

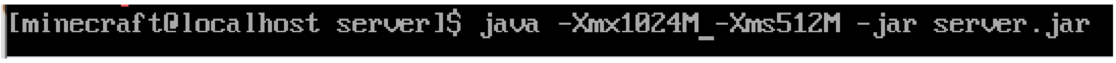
Finally, I downloaded the actual Minecraft server from the Minecrafts official page:



```
[minecraft@localhost server]$ wget https://launcher.mojang.com/v1/objects/3dc3d84a581f14691199cf6831
b71ed1296a9fdf/server.jar ~/server
```

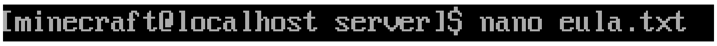
3 Configuration

Starting the Minecraft server:

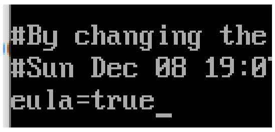


```
[minecraft@localhost server]$ java -Xmx1024M_-Xms512M -jar server.jar
```

I needed to change the properties and agree on the EULA:

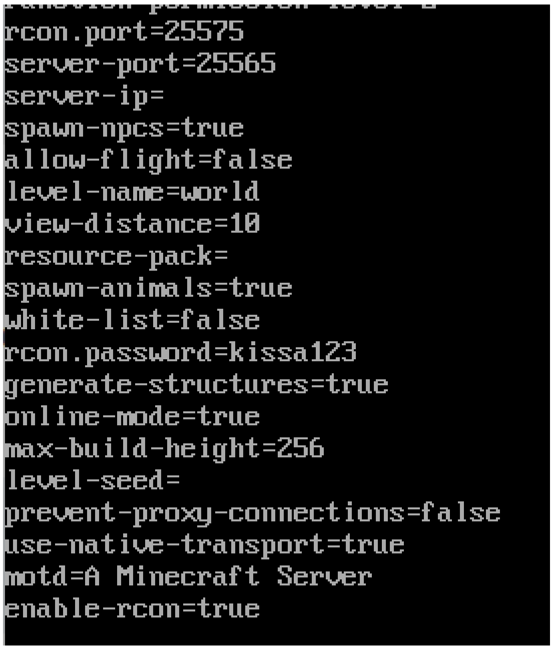


```
[minecraft@localhost server]$ nano eula.txt
```



```
#By changing the
#Sun Dec 08 19:0
eula=true_
```

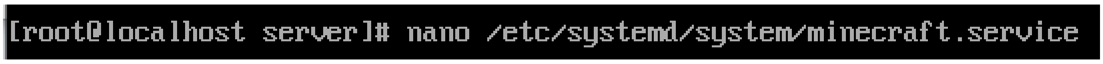
Changed the value from false to true



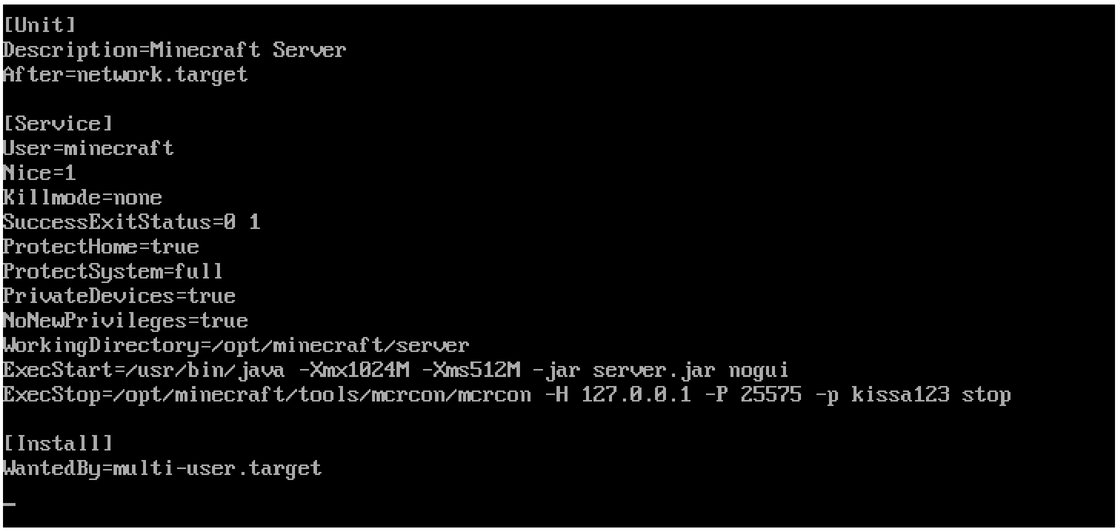
```
rcon.port=25575
server-port=25565
server-ip=
spawn-npcs=true
allow-flight=false
level-name=world
view-distance=10
resource-pack=
spawn-animals=true
white-list=false
rcon.password=kissa123
generate-structures=true
online-mode=true
max-build-height=256
level-seed=
prevent-proxy-connections=false
use-native-transport=true
motd=A Minecraft Server
enable-rcon=true
```

Changed "enable-rcon" from false to true and gave rcon a password (rcon.password=kissa123)

Then I created a system unit file minecraft.service in the /etc/systemd/system directory (needed to switch to root for this):



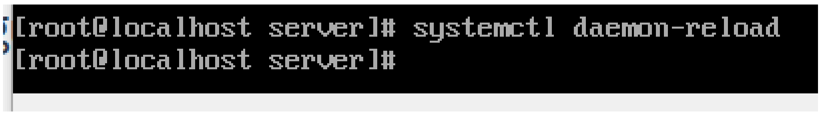
```
[root@localhost server]# nano /etc/systemd/system/minecraft.service
```



```
[Unit]
Description=Minecraft Server
After=network.target

[Service]
User=minecraft
Nice=1
Killmode=none
SuccessExitStatus=0 1
ProtectHome=true
ProtectSystem=full
PrivateDevices=true
NoNewPrivileges=true
WorkingDirectory=/opt/minecraft/server
ExecStart=/usr/bin/java -Xmx1024M -Xms512M -jar server.jar nogui
ExecStop=/opt/minecraft/tools/mcrcon/mcrcon -H 127.0.0.1 -P 25575 -p kissa123 stop

[Install]
WantedBy=multi-user.target
_
```

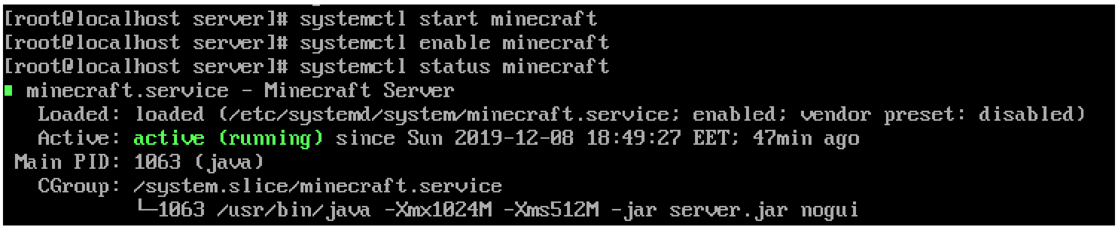
The "user=minecraft" parameter means that the user minecraft runs the service instead of root, which is good for security

Restarted the daemon so to changes would come to an effect:



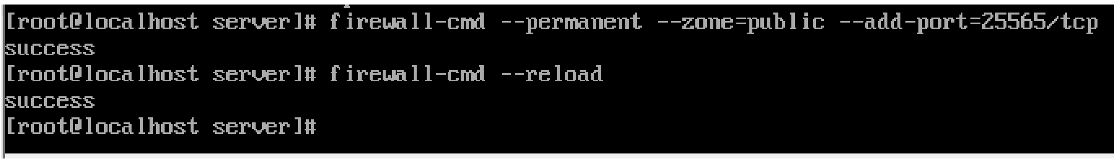
```
[root@localhost server]# systemctl daemon-reload
[root@localhost server]#
```

Then started the Minecraft service and enabled it to start on boot:



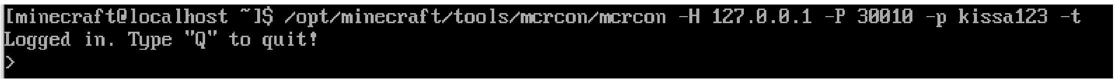
```
[root@localhost server]# systemctl start minecraft
[root@localhost server]# systemctl enable minecraft
[root@localhost server]# systemctl status minecraft
● minecraft.service - Minecraft Server
   Loaded: loaded (/etc/systemd/system/minecraft.service; enabled; vendor preset: disabled)
   Active: active (running) since Sun 2019-12-08 18:49:27 EET; 47min ago
 Main PID: 1063 (java)
   CGroup: /system.slice/minecraft.service
           └─1063 /usr/bin/java -Xmx1024M -Xms512M -jar server.jar nogui
```

I wanted to be able to connect to the server from outside of my local network so I needed to open a port for the server:

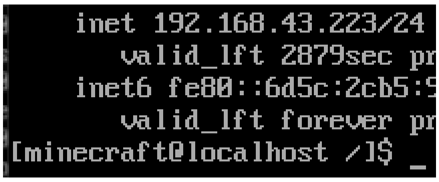


```
[root@localhost server]# firewall-cmd --permanent --zone=public --add-port=25565/tcp
success
[root@localhost server]# firewall-cmd --reload
success
[root@localhost server]#
```

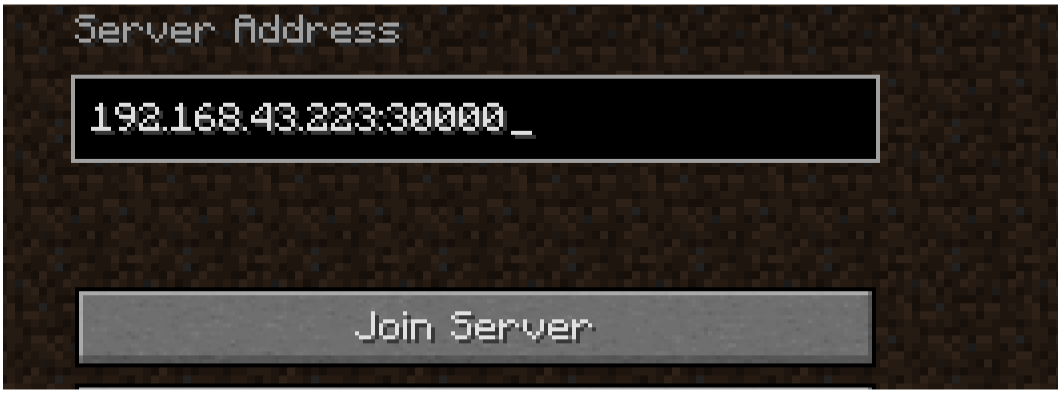
Tested if I could access the terminal and play the actual game (I could):



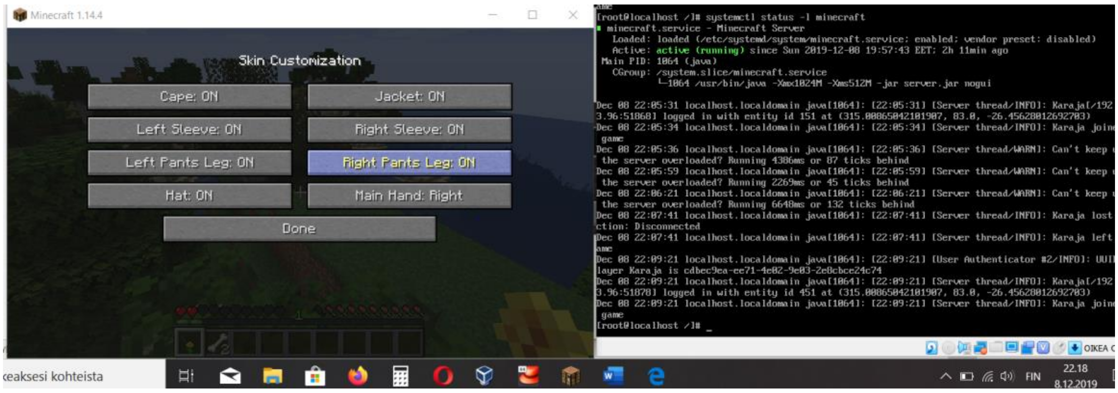
```
[minecraft@localhost ~]$ /opt/minecraft/tools/mcrcon/mcrcon -H 127.0.0.1 -P 30010 -p kissa123 -t
Logged in. Type "Q" to quit!
>
```



```
    inet 192.168.43.223/24
       valid_lft 2879sec pr
    inet6 fe80::6d5c:2cb5:9
       valid_lft forever pr
[minecraft@localhost /]$ _
```



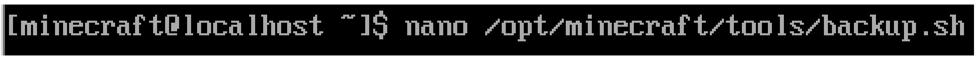
192.168.43.223:30000_



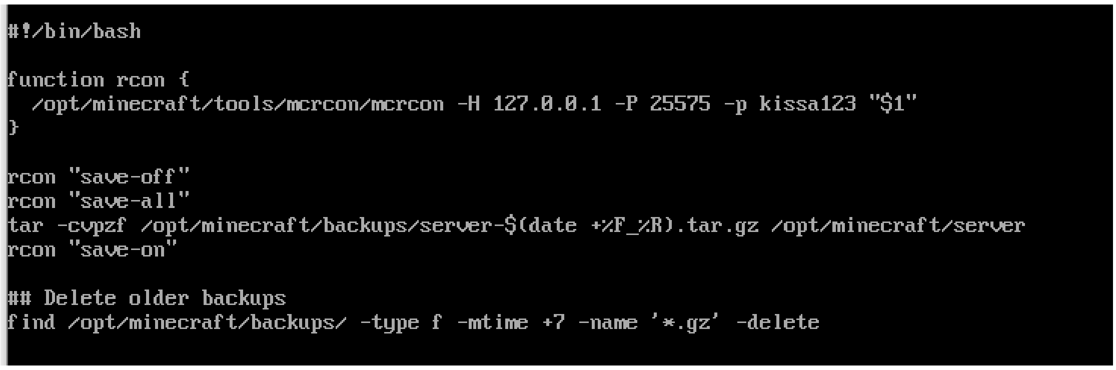
```
[root@localhost /]# systemctl status -l minecraft
● minecraft.service - Minecraft Server
   Loaded: loaded (/etc/systemd/system/minecraft.service; enabled; vendor preset: disabled)
   Active: active (running) since Sun 2019-12-08 19:57:43 EET; 2h 11min ago
 Main PID: 1064 (java)
   CGroup: /system.slice/minecraft.service
           └─1064 /usr/bin/java -Xmx1024M -Xms512M -jar server.jar nogui

Dec 08 22:05:31 localhost.localdomain java[1064]: [22:05:31] [Server thread/INFO]: Karaja[/192
3.96:51868] logged in with entity id 151 at (315.00865042101907, 83.0, -26.45628012692703)
Dec 08 22:05:34 localhost.localdomain java[1064]: [22:05:34] [Server thread/INFO]: Karaja joine
 game
Dec 08 22:05:36 localhost.localdomain java[1064]: [22:05:36] [Server thread/WARN]: Can't keep u
 the server overloaded? Running 4386ms or 87 ticks behind
Dec 08 22:05:59 localhost.localdomain java[1064]: [22:05:59] [Server thread/WARN]: Can't keep u
 the server overloaded? Running 2269ms or 45 ticks behind
Dec 08 22:06:21 localhost.localdomain java[1064]: [22:06:21] [Server thread/WARN]: Can't keep u
 the server overloaded? Running 6648ms or 132 ticks behind
Dec 08 22:07:41 localhost.localdomain java[1064]: [22:07:41] [Server thread/INFO]: Karaja lost
ction: Disconnected
Dec 08 22:07:41 localhost.localdomain java[1064]: [22:07:41] [Server thread/INFO]: Karaja left
ame
Dec 08 22:09:21 localhost.localdomain java[1064]: [22:09:21] [User Authenticator #2/INFO]: UUI
layer Karaja is cdbec9ea-ee71-4e02-9e03-2e8cbce24c74
Dec 08 22:09:21 localhost.localdomain java[1064]: [22:09:21] [Server thread/INFO]: Karaja[/192
3.96:51878] logged in with entity id 451 at (315.00865042101907, 83.0, -26.45628012692703)
Dec 08 22:09:21 localhost.localdomain java[1064]: [22:09:21] [Server thread/INFO]: Karaja joine
 game
[root@localhost /]# _
```

I also wanted to backup the server everyday and to do this I used a script and crontab.

Creating the backup file and the script:

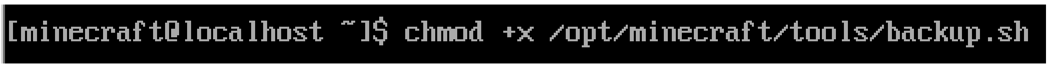


```
[minecraft@localhost ~]$ nano /opt/minecraft/tools/backup.sh
```



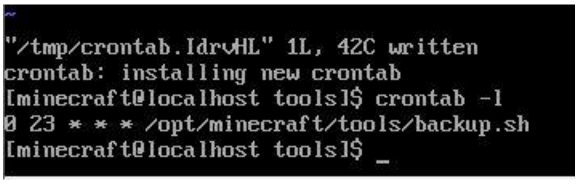
```
#!/bin/bash

function rcon {
  /opt/minecraft/tools/mcrcon/mcrcon -H 127.0.0.1 -P 25575 -p kissa123 "$1"
}

rcon "save-off"
rcon "save-all"
tar -cvpzf /opt/minecraft/backups/server-$(date +%F_%R).tar.gz /opt/minecraft/server
rcon "save-on"

## Delete older backups
find /opt/minecraft/backups/ -type f -mtime +7 -name '*.gz' -delete
```

In order for the script to be executable I needed to change the permissions:



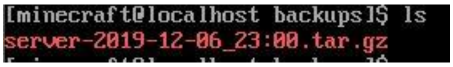
```
[minecraft@localhost ~]$ chmod +x /opt/minecraft/tools/backup.sh
```

finally the crontab and checked that it works:



```
~
"/tmp/crontab.IdrvHL" 1L, 42C written
crontab: installing new crontab
[minecraft@localhost tools]$ crontab -l
0 23 * * * /opt/minecraft/tools/backup.sh
[minecraft@localhost tools]$ _
```

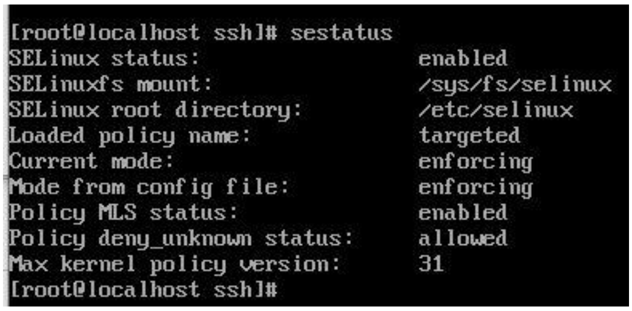
cronjob runs once a day at 23.00



```
[minecraft@localhost backups]$ ls
server-2019-12-06_23:00.tar.gz
```

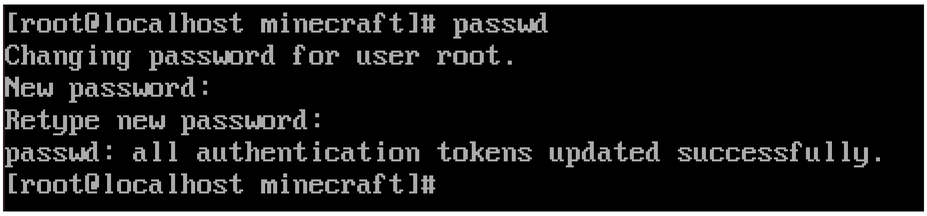
4 Configuration for security

The first thing I did was to make sure SElinux was enable and enforcing:

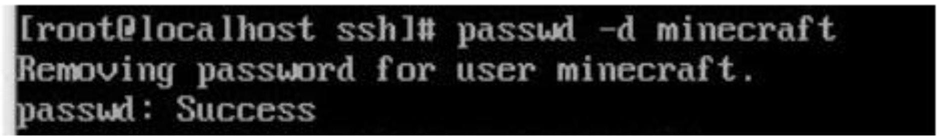


```
[root@localhost ssh]# sestatus
SELinux status:                 enabled
SELinuxfs mount:                /sys/fs/selinux
SELinux root directory:         /etc/selinux
Loaded policy name:             targeted
Current mode:                   enforcing
Mode from config file:          enforcing
Policy MLS status:              enabled
Policy deny_unknown status:     allowed
Max kernel policy version:      31
[root@localhost ssh]#
```

Changed root password and made sure user “minecraft” does not have a password:



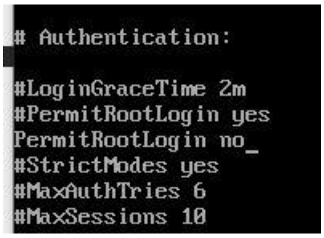
```
[root@localhost minecraft]# passwd
Changing password for user root.
New password:
Retype new password:
passwd: all authentication tokens updated successfully.
[root@localhost minecraft]#
```



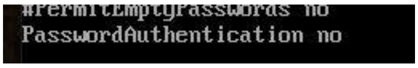
```
[root@localhost ssh]# passwd -d minecraft
Removing password for user minecraft.
passwd: Success
```

Removed remote root login via SSH, password authentication and changed SSH port.

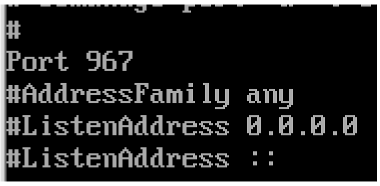
These are located in the file /etc/ssh/sshd_config:



```
# Authentication:

#LoginGraceTime 2m
#PermitRootLogin yes
PermitRootLogin no_
#StrictModes yes
#MaxAuthTries 6
#MaxSessions 10
```

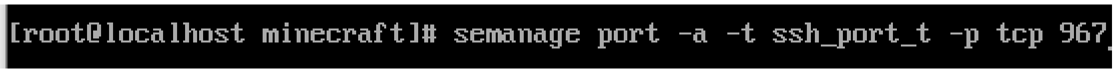


```
#PermitEmptyPasswords no
PasswordAuthentication no
```

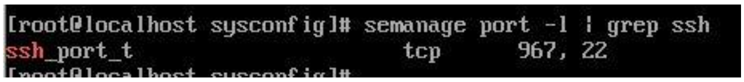


```
#
Port 967
#AddressFamily any
#ListenAddress 0.0.0.0
#ListenAddress ::
```

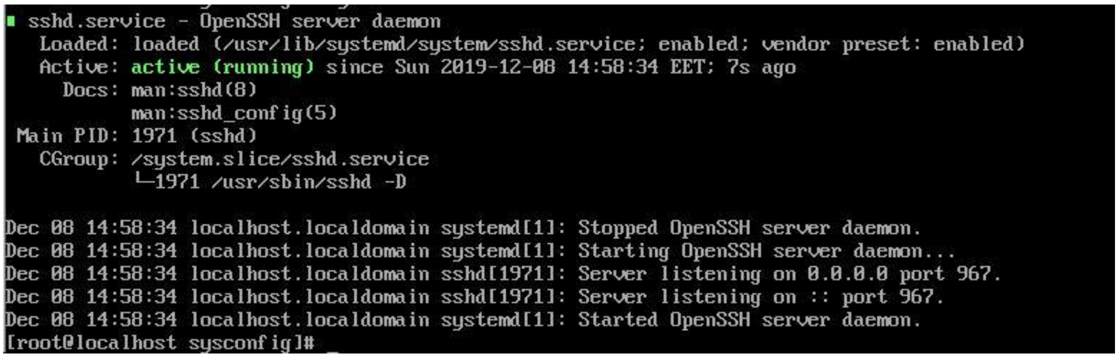
Changed the port in the SElinux system:



```
[root@localhost minecraft]# semanage port -a -t ssh_port_t -p tcp 967
```

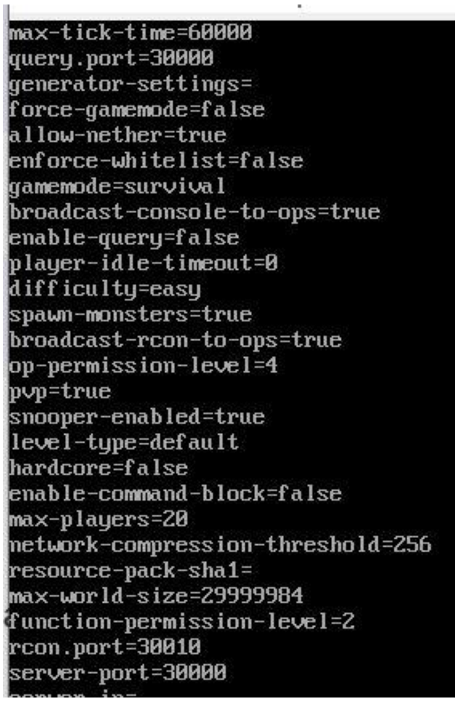


```
[root@localhost sysconfig]# semanage port -l | grep ssh
ssh_port_t                     tcp      967, 22
[root@localhost sysconfig]#
```

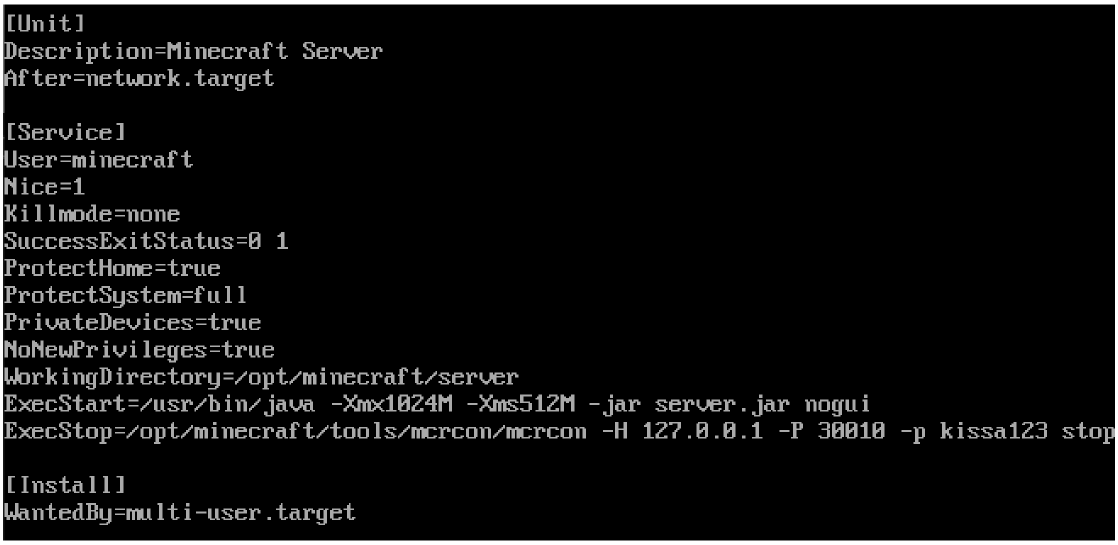


```
■ sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset: enabled)
   Active: active (running) since Sun 2019-12-08 14:58:34 EET; 7s ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1971 (sshd)
   CGroup: /system.slice/sshd.service
           └─1971 /usr/sbin/sshd -D

Dec 08 14:58:34 localhost.localdomain systemd[1]: Stopped OpenSSH server daemon.
Dec 08 14:58:34 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Dec 08 14:58:34 localhost.localdomain sshd[1971]: Server listening on 0.0.0.0 port 967.
Dec 08 14:58:34 localhost.localdomain sshd[1971]: Server listening on :: port 967.
Dec 08 14:58:34 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
[root@localhost sysconfig]# _
```

Did the same thing for the server and rcon-ports:

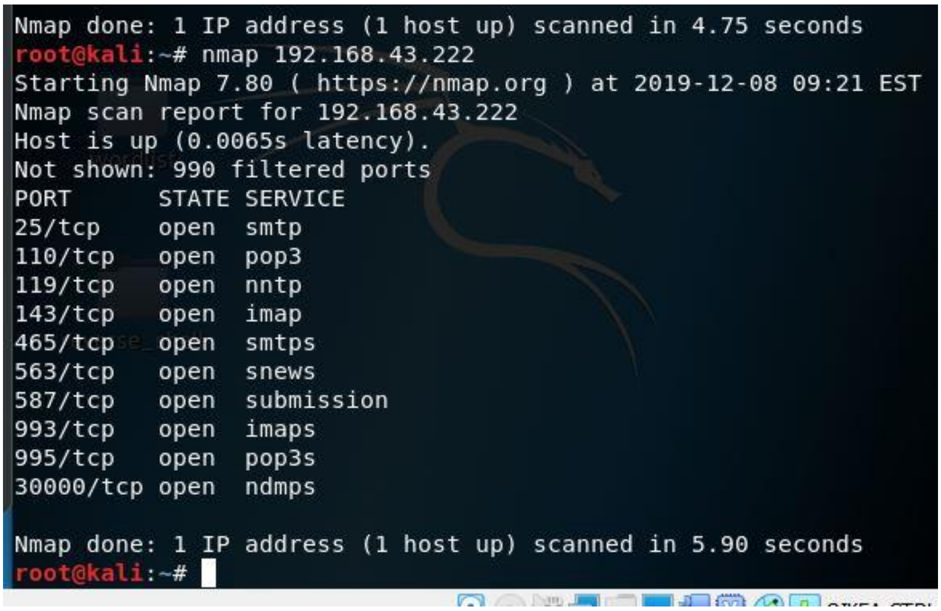


```
max-tick-time=60000
query.port=30000
generator-settings=
force-gamemode=false
allow-nether=true
enforce-whitelist=false
gamemode=survival
broadcast-console-to-ops=true
enable-query=false
player-idle-timeout=0
difficulty=easy
spawn-monsters=true
broadcast-rcon-to-ops=true
op-permission-level=4
pvp=true
snooper-enabled=true
level-type=default
hardcore=false
enable-command-block=false
max-players=20
network-compression-threshold=256
resource-pack-sha1=
max-world-size=29999984
function-permission-level=2
rcon.port=30010
server-port=30000
server-ip=
```



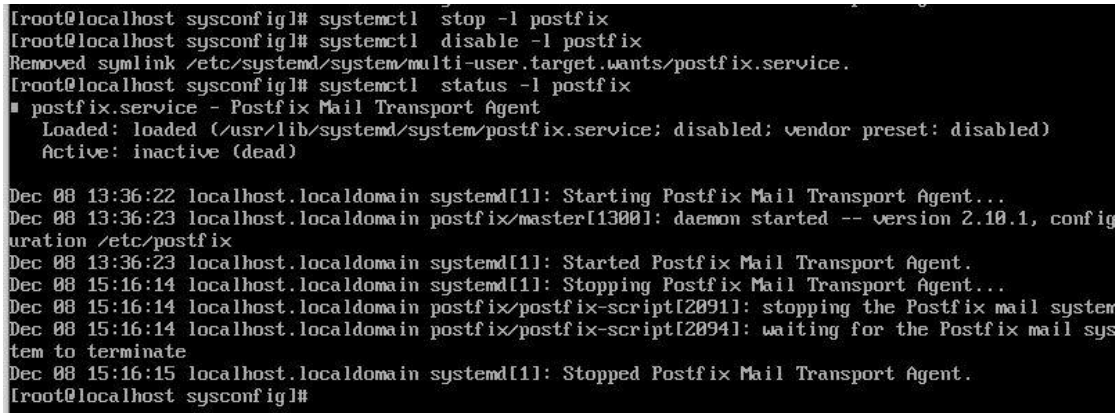
```
[Unit]
Description=Minecraft Server
After=network.target

[Service]
User=minecraft
Nice=1
Killmode=none
SuccessExitStatus=0 1
ProtectHome=true
ProtectSystem=full
PrivateDevices=true
NoNewPrivileges=true
WorkingDirectory=/opt/minecraft/server
ExecStart=/usr/bin/java -Xmx1024M -Xms512M -jar server.jar nogui
ExecStop=/opt/minecraft/tools/mcrcon/mcrcon -H 127.0.0.1 -P 30010 -p kissa123 stop

[Install]
WantedBy=multi-user.target
```

I used nmap to scan my own server to see any open ports and gets some hints for possible services I do not need:



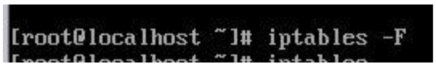
```
Nmap done: 1 IP address (1 host up) scanned in 4.75 seconds
root@kali:~# nmap 192.168.43.222
Starting Nmap 7.80 ( https://nmap.org ) at 2019-12-08 09:21 EST
Nmap scan report for 192.168.43.222
Host is up (0.0065s latency).
Not shown: 990 filtered ports
PORT      STATE SERVICE
25/tcp    open  smtp
110/tcp   open  pop3
119/tcp   open  nntp
143/tcp   open  imap
465/tcp   open  smtps
563/tcp   open  snews
587/tcp   open  submission
993/tcp   open  imaps
995/tcp   open  pop3s
30000/tcp open  ndmps

Nmap done: 1 IP address (1 host up) scanned in 5.90 seconds
root@kali:~# 
```

A lot of mail services and ports. Disabled a postfix service:

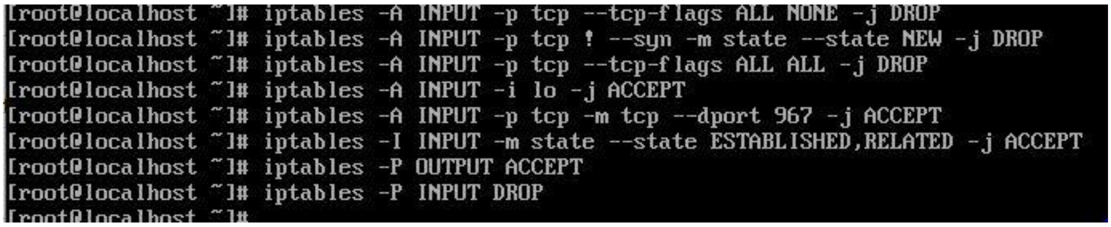


```
[root@localhost sysconfig]# systemctl  stop -l postfix
[root@localhost sysconfig]# systemctl  disable -l postfix
Removed symlink /etc/systemd/system/multi-user.target.wants/postfix.service.
[root@localhost sysconfig]# systemctl  status -l postfix
■ postfix.service - Postfix Mail Transport Agent
   Loaded: loaded (/usr/lib/systemd/system/postfix.service; disabled; vendor preset: disabled)
   Active: inactive (dead)

Dec 08 13:36:22 localhost.localdomain systemd[1]: Starting Postfix Mail Transport Agent...
Dec 08 13:36:23 localhost.localdomain postfix/master[1300]: daemon started -- version 2.10.1, config
uration /etc/postfix
Dec 08 13:36:23 localhost.localdomain systemd[1]: Started Postfix Mail Transport Agent.
Dec 08 15:16:14 localhost.localdomain systemd[1]: Stopping Postfix Mail Transport Agent...
Dec 08 15:16:14 localhost.localdomain postfix/postfix-script[2091]: stopping the Postfix mail system
Dec 08 15:16:14 localhost.localdomain postfix/postfix-script[2094]: waiting for the Postfix mail sys
tem to terminate
Dec 08 15:16:15 localhost.localdomain systemd[1]: Stopped Postfix Mail Transport Agent.
[root@localhost sysconfig]#
```

Reset my iptables rules and made some new ones:



```
[root@localhost ~]# iptables -F
```



```
[root@localhost ~]# iptables -A INPUT -p tcp --tcp-flags ALL NONE -j DROP
[root@localhost ~]# iptables -A INPUT -p tcp ! --syn -m state --state NEW -j DROP
[root@localhost ~]# iptables -A INPUT -p tcp --tcp-flags ALL ALL -j DROP
[root@localhost ~]# iptables -A INPUT -i lo -j ACCEPT
[root@localhost ~]# iptables -A INPUT -p tcp -m tcp --dport 967 -j ACCEPT
[root@localhost ~]# iptables -I INPUT -m state --state ESTABLISHED,RELATED -j ACCEPT
[root@localhost ~]# iptables -P OUTPUT ACCEPT
[root@localhost ~]# iptables -P INPUT DROP
[root@localhost ~]#
```

I also opened the necessary ports for my minecraft server (30000, 30010)

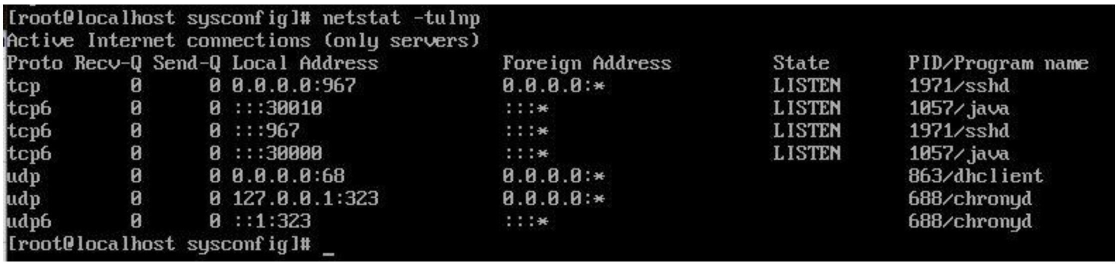
1st line blocks null packets

2nd line blocks syn-flood attacks

3rd line blocks XMAS packets

4th adds localhost interface

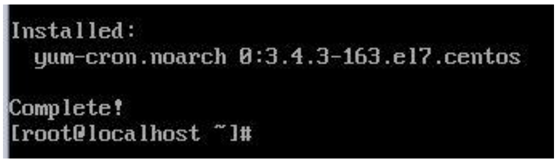
and here is what I am left with:



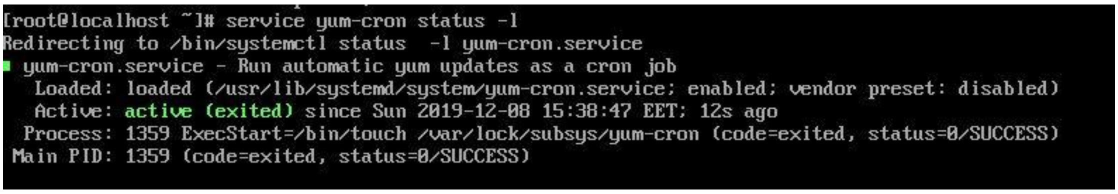
```
[root@localhost sysconfig]# netstat -tulnp
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State       PID/Program name
tcp        0      0 0.0.0.0:967             0.0.0.0:*               LISTEN      1971/sshd
tcp6       0      0 :::30010                :::*                    LISTEN      1057/java
tcp6       0      0 :::967                  :::*                    LISTEN      1971/sshd
tcp6       0      0 :::30000                :::*                    LISTEN      1057/java
udp        0      0 0.0.0.0:68              0.0.0.0:*                           863/dhclient
udp        0      0 127.0.0.1:323           0.0.0.0:*                           688/chronyd
udp6       0      0 ::1:323                 :::*                                688/chronyd
[root@localhost sysconfig]# _
```

Minecraft, ssh, dhcp and chronyd (time and date) services

Installed yum-cron which automatically updates my packages (not necessarily a security enchantment but updating packages might fix some exploits):

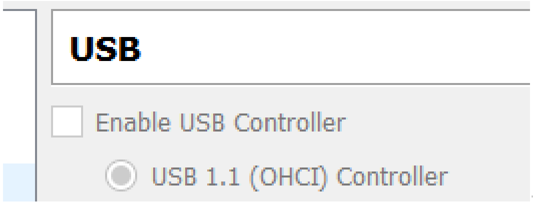


```
Installed:
  yum-cron.noarch 0:3.4.3-163.el7.centos

Complete!
[root@localhost ~]#
```



```
[root@localhost ~]# service yum-cron status -l
Redirecting to /bin/systemctl status  -l yum-cron.service
■ yum-cron.service - Run automatic yum updates as a cron job
   Loaded: loaded (/usr/lib/systemd/system/yum-cron.service; enabled; vendor preset: disabled)
   Active: active (exited) since Sun 2019-12-08 15:38:47 EET; 12s ago
  Process: 1359 ExecStart=/bin/touch /var/lock/subsys/yum-cron (code=exited, status=0/SUCCESS)
 Main PID: 1359 (code=exited, status=0/SUCCESS)
```

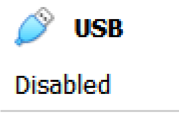
Disabled USB ports and just in case USB detection:



USB

☐ Enable USB Controller

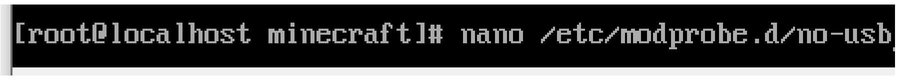
● USB 1.1 (OHCI) Controller



USB

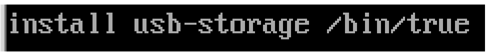
Disabled

Created “no-usb” file:



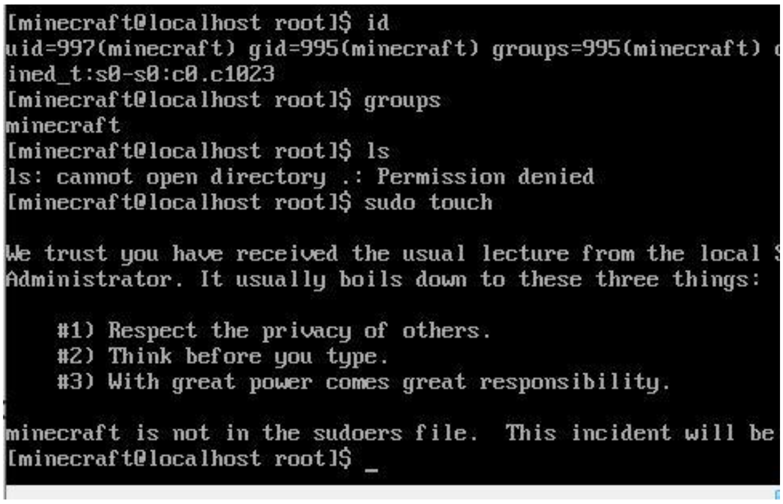
```
[root@localhost minecraft]# nano /etc/modprobe.d/no-usb
```

and added the following:

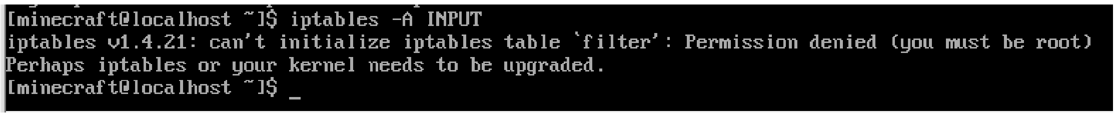


```
install usb-storage /bin/true
```

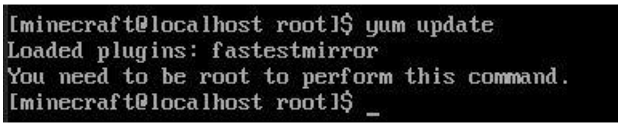
Last thing I did was to check if the user “minecraft” had the right permissions:



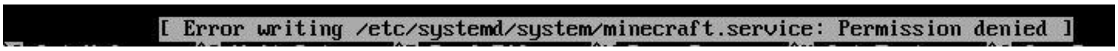
```
[minecraft@localhost root]$ id
uid=997(minecraft) gid=995(minecraft) groups=995(minecraft) c
ined_t:s0-s0:c0.c1023
[minecraft@localhost root]$ groups
minecraft
[minecraft@localhost root]$ ls
ls: cannot open directory .: Permission denied
[minecraft@localhost root]$ sudo touch

We trust you have received the usual lecture from the local S
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

minecraft is not in the sudoers file.  This incident will be
[minecraft@localhost root]$ _
```



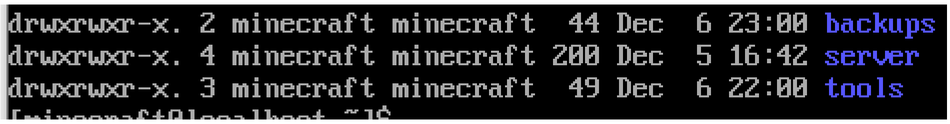
```
[minecraft@localhost ~]$ iptables -A INPUT
iptables v1.4.21: can't initialize iptables table `filter': Permission denied (you must be root)
Perhaps iptables or your kernel needs to be upgraded.
[minecraft@localhost ~]$ _
```



```
[minecraft@localhost root]$ yum update
Loaded plugins: fastestmirror
You need to be root to perform this command.
[minecraft@localhost root]$ _
```



```
            [ Error writing /etc/systemd/system/minecraft.service: Permission denied ]
```



```
drwxrwxr-x. 2 minecraft minecraft  44 Dec  6 23:00 backups
drwxrwxr-x. 4 minecraft minecraft 200 Dec  5 16:42 server
drwxrwxr-x. 3 minecraft minecraft  49 Dec  6 22:00 tools
```

Obviously, the user “minecraft” can make changes in its home directory (server properties etc.).

5 Preferences

- https://www.spigotmc.org/threads/guide-securing-a-linux-server.20096/
- https://www.spigotmc.org/threads/securing-our-minecraft-server-against-hackers-and-griefers.372174/
- https://linuxize.com/post/how-to-install-minecraft-server-on-centos-7/
- https://www.thegeekdiary.com/centos-rhel-how-to-find-if-a-network-port-is-open-or-not/
- Course material from optima