

Linnaeus University

Faculty of Technology – Department of Computer Science

20HT –1DV512 – Operating Systems

Group Assignment 1

Student group number: 31

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Task 1.

Our work had been started with installing VMWare 15.5.

The Host OS is Windows 10 64 bit built 2019.

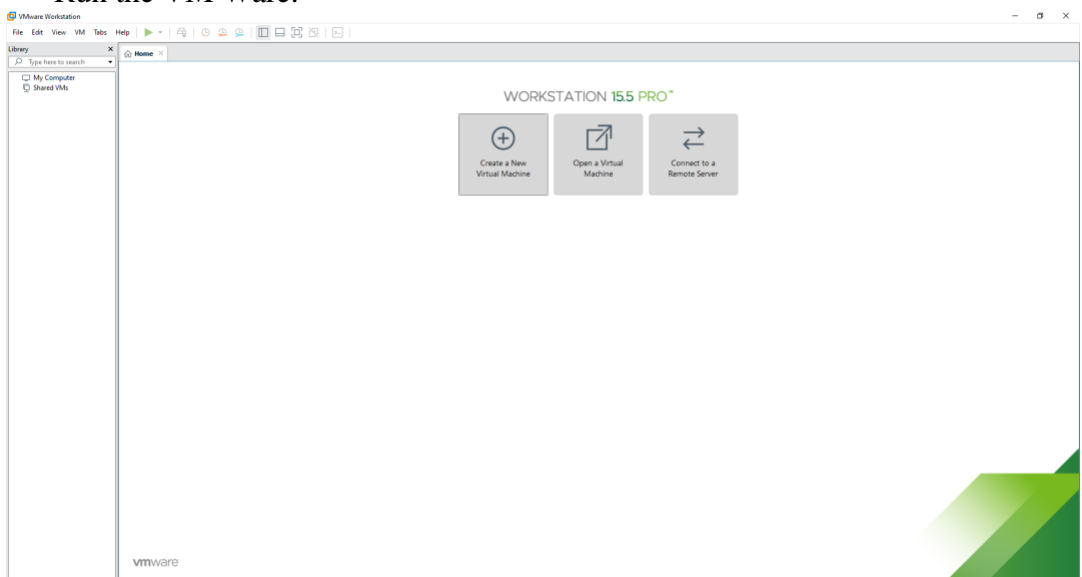
Task 2.

1. FreeBSD Source files.

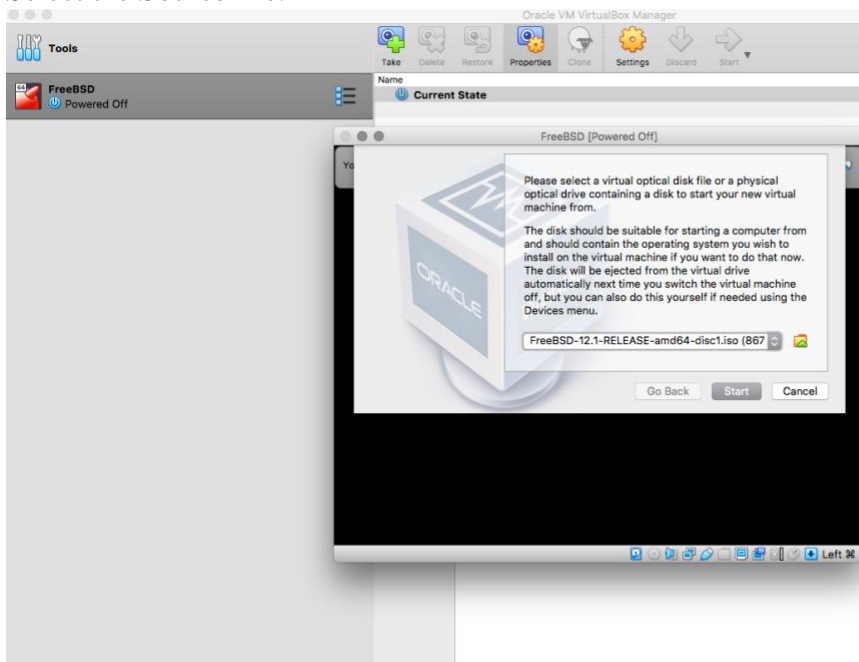
| | | | |
|---|--------------------|-----------------|--------------|
|  FreeBSD-12.2-RELEASE-amd64-bootonly.iso | 11/30/2020 2:15 AM | Disc Image File | 353,970 KB |
|  FreeBSD-12.2-RELEASE-amd64-disc1.iso | 11/30/2020 3:19 AM | Disc Image File | 942,480 KB |
|  FreeBSD-12.2-RELEASE-amd64-memstick.img | 11/30/2020 3:20 AM | Disc Image File | 1,031,209 KB |

2. VM Configuration for FreeBSD

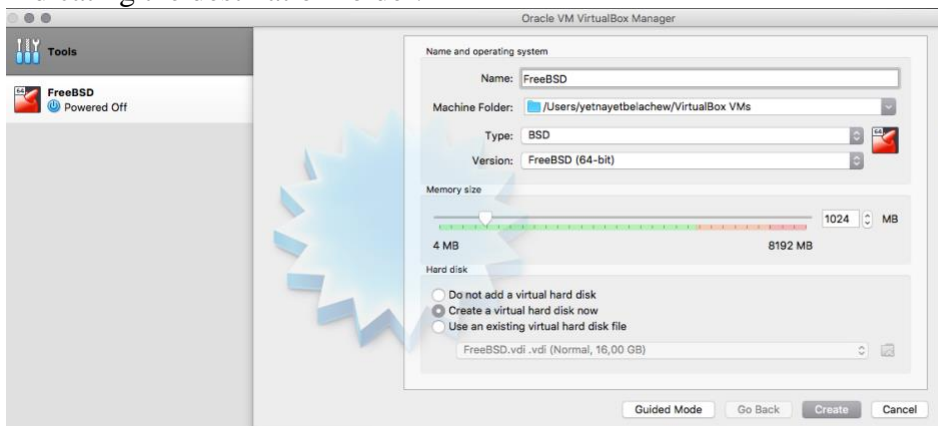
- Run the VM Ware.



- Select the Source file.



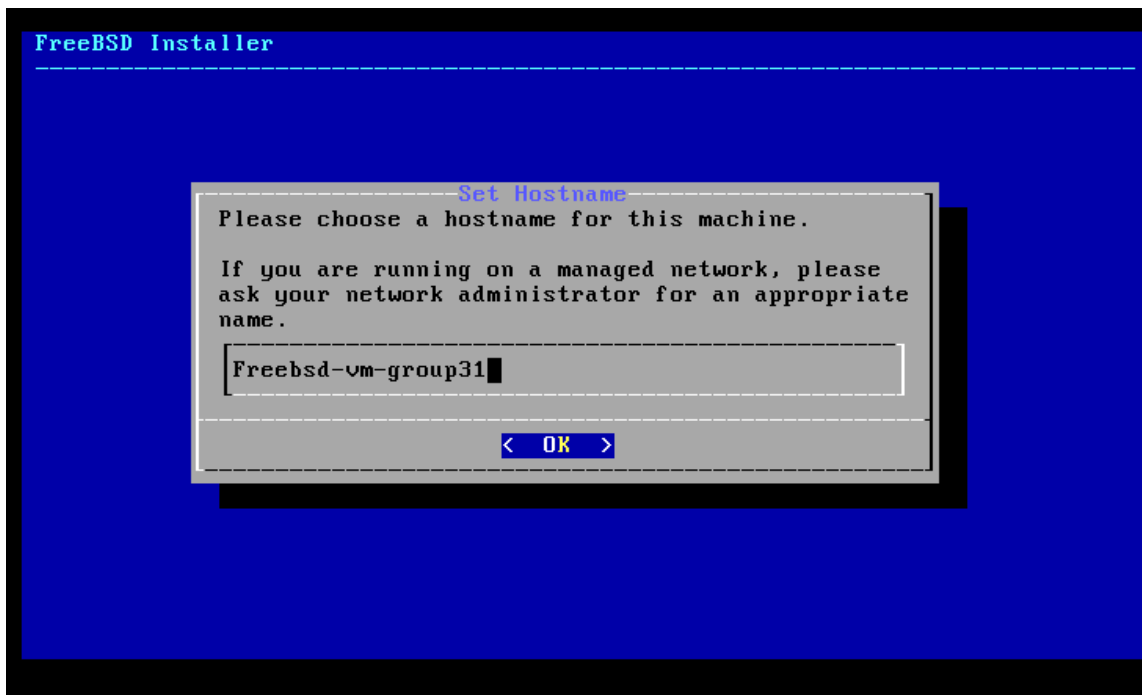
- Indicating the destination folder.



- Some settings and installer interface.



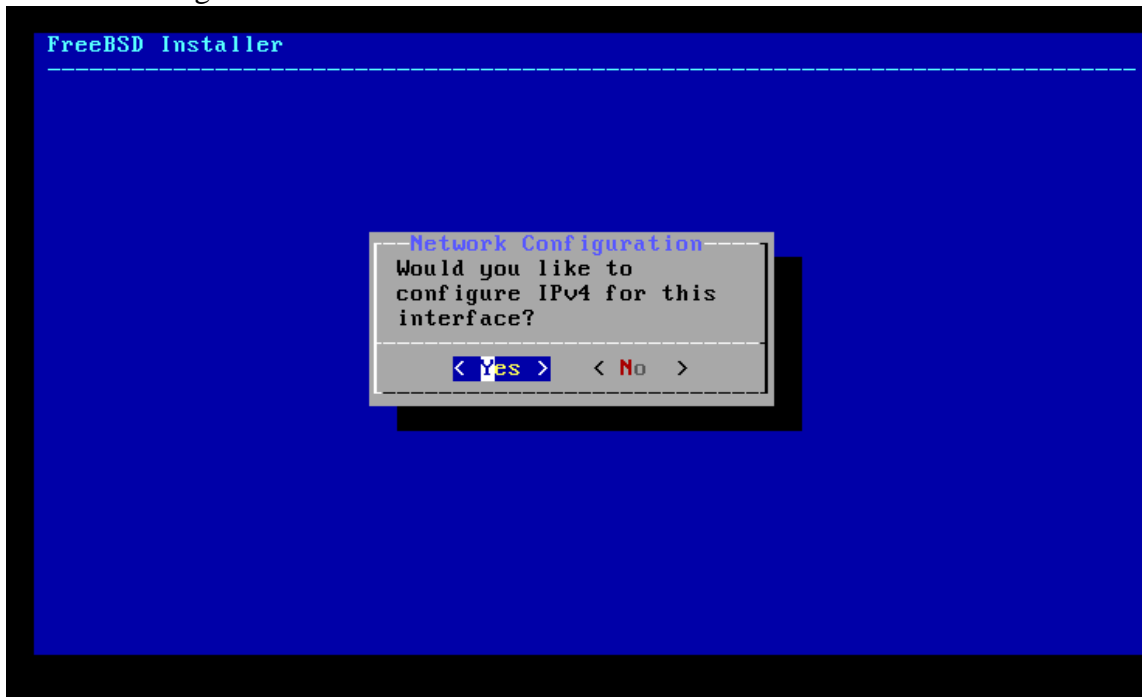
- Add Host Name



- The installing screenshot.



- Network settings.



- After setting network.

FreeBSD Installer

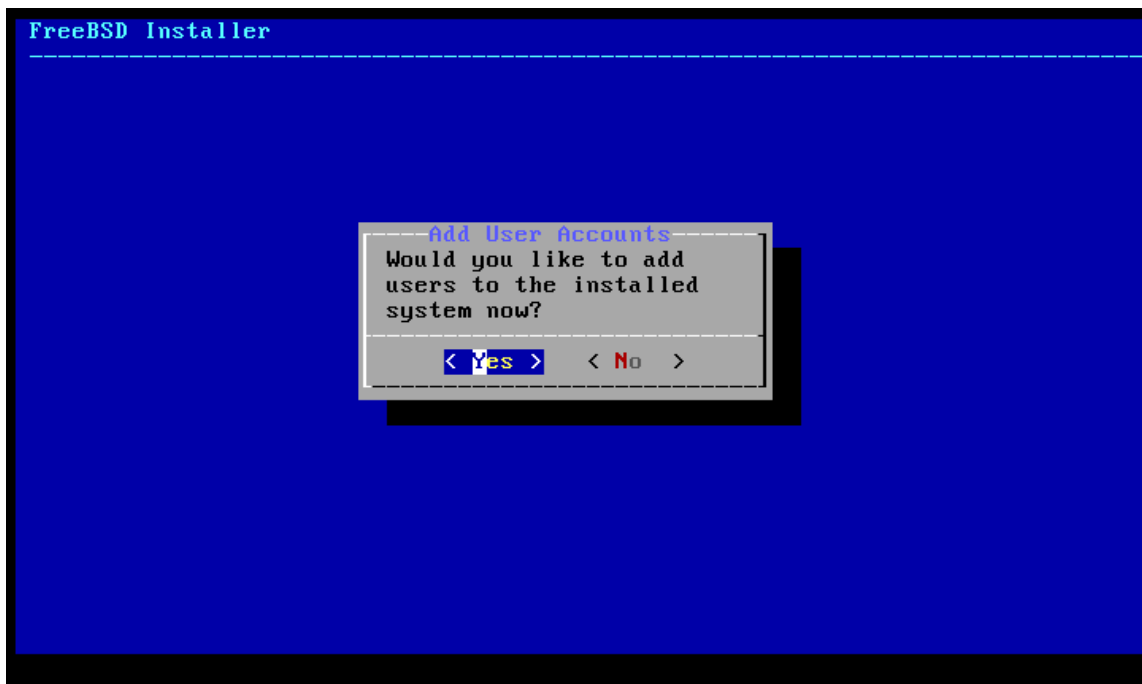
Network Configuration

Resolver Configuration

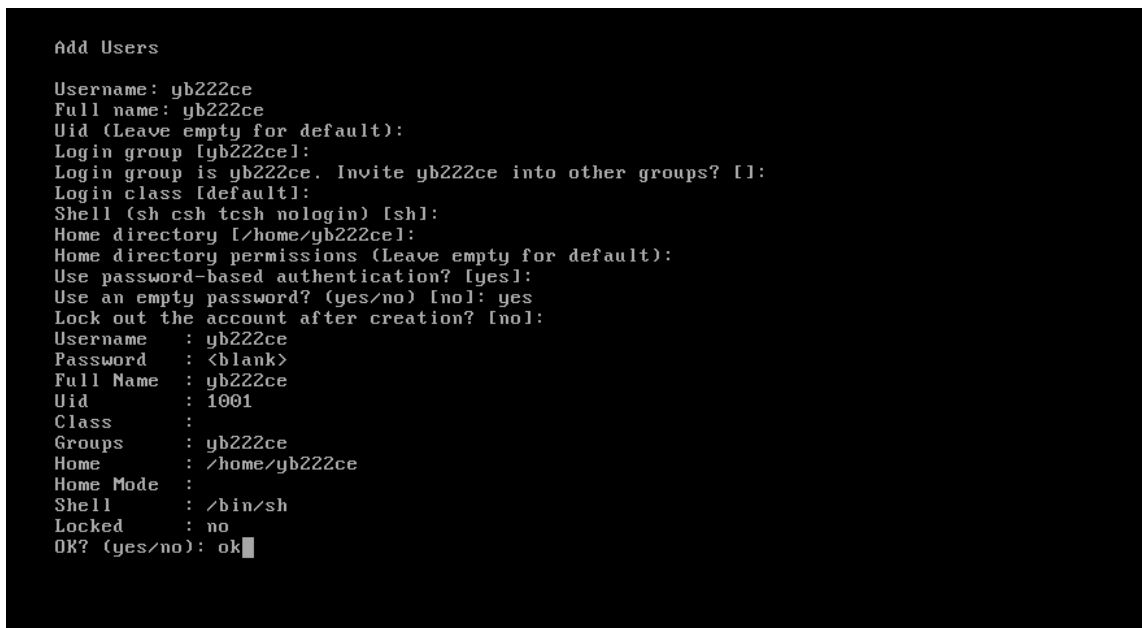
| | |
|-------------|--------------|
| Search | localdomain |
| IPv6 DNS #1 | |
| IPv6 DNS #2 | |
| IPv4 DNS #1 | 83.255.255.1 |
| IPv4 DNS #2 | 83.255.255.2 |

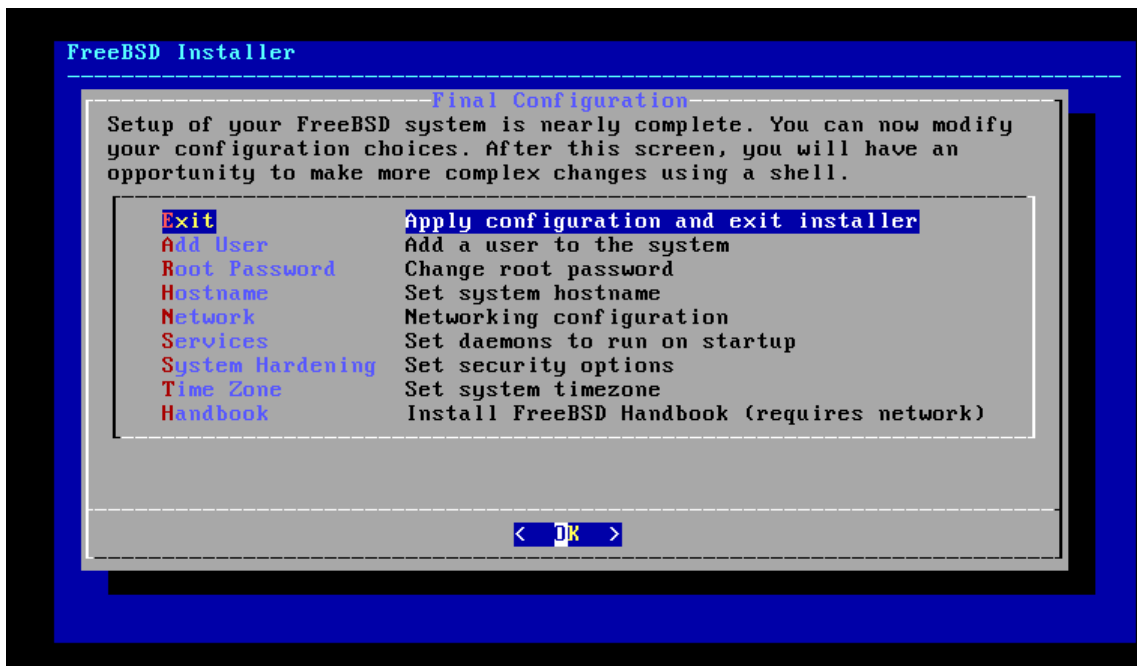
< OK > <Cancel>

- Add user.



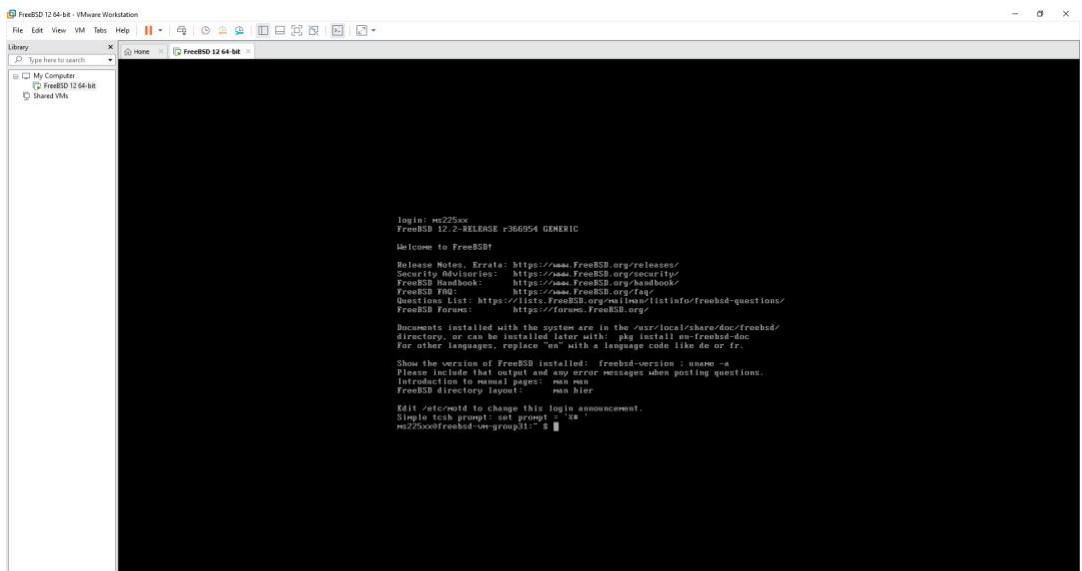
- The last screenshots.



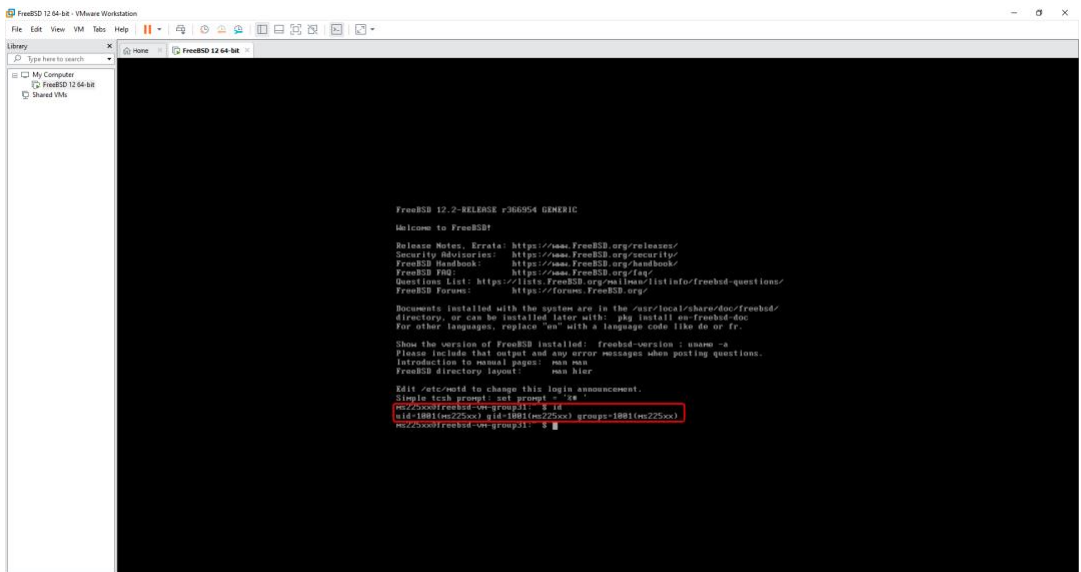


Task 3.

3.1 Log in to your account.



- Run command *id*.



```
FreeBSD 12.0-RELEASE r36954 GENERIC
Welcome to FreeBSD!

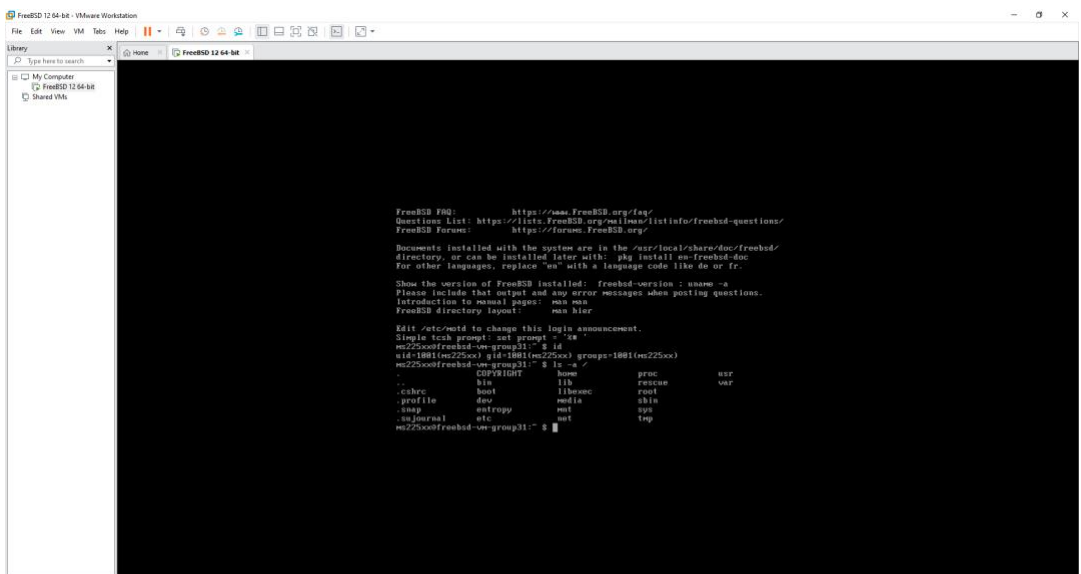
Release Notes: Errata: https://www.freebsd.org/releases/
Security Advisories: https://www.freebsd.org/secure/
FreeBSD Handbook: https://www.freebsd.org/handbook/
FreeBSD FAQ: https://www.freebsd.org/faq/
Questions List: https://lists.freebsd.org/mailman/listinfo/freebsd-questions/
FreeBSD Forum: https://forum.freebsd.org/

Documents installed with the system are in the /usr/local/share/doc/freebsd/
directory, or can be installed later with: pkg install en-freebsd-doc
For other languages, replace "en" with a language code like de or fr.

Show the version of FreeBSD installed: freebsd-version : 12.0-RELEASE
Please include that output and any error messages when posting questions.
Introduction to manual pages: man man
FreeBSD directory layout: man hier

Edit /etc/motd to change this login announcement.
Simple test prompt: set prompt = '%s '
me225coo@freebsd-vm-group31: ~$ id
uid=1881(me225coo) gid=1881(me225coo) groups=1881(me225coo)
me225coo@freebsd-vm-group31: ~$
```

- Log in to root and run *id*.



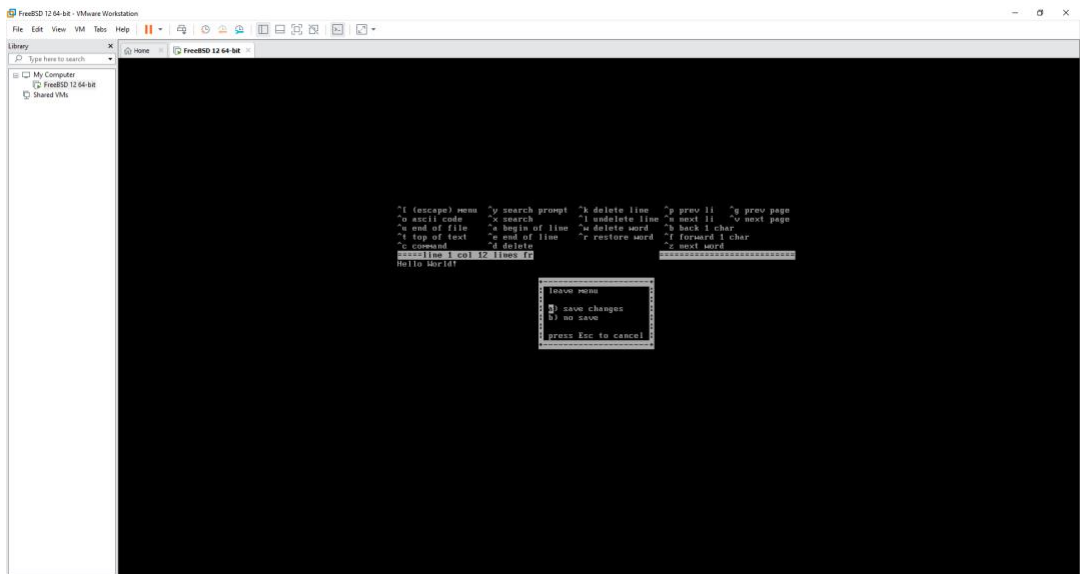
```
FreeBSD FAQ: https://www.freebsd.org/faq/
Questions List: https://lists.freebsd.org/mailman/listinfo/freebsd-questions/
FreeBSD Forum: https://forum.freebsd.org/

Documents installed with the system are in the /usr/local/share/doc/freebsd/
directory, or can be installed later with: pkg install en-freebsd-doc
For other languages, replace "en" with a language code like de or fr.

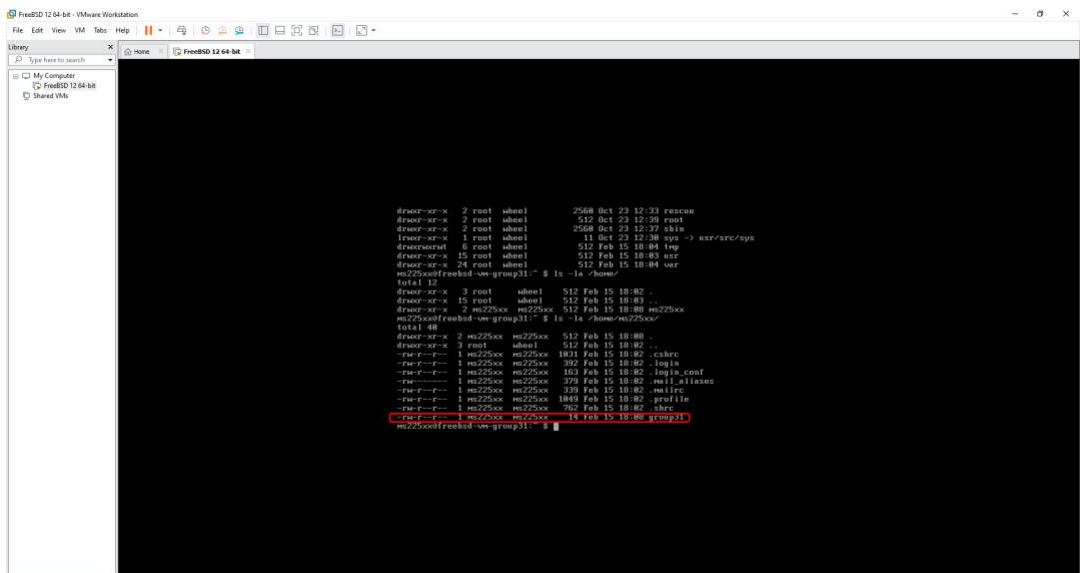
Show the version of FreeBSD installed: freebsd-version : 12.0-RELEASE
Please include that output and any error messages when posting questions.
Introduction to manual pages: man man
FreeBSD directory layout: man hier

Edit /etc/motd to change this login announcement.
Simple test prompt: set prompt = '%s '
me225coo@freebsd-vm-group31: ~$ id
uid=0(root) gid=0(root) groups=0(root)
me225coo@freebsd-vm-group31: ~$
```

- Create the short text *Group31* and save this file.



- And let see the file *group31* created.



- Try to copy this file to home directory. But this file is not copied because of permission.

```

FreeBSD 12 64-bit - VMware Workstation
File Edit View VM Help
Type here to search
My Computer
FreeBSD 12 64-bit
Shared VMs

dracmroot 6 root wheel 512 Feb 15 18:04 tmp
dracmroot 15 root wheel 512 Feb 15 18:03 var
dracmroot 24 root wheel 512 Feb 15 18:04 var
m225xx00freebsd-vm-group31:~$ ls -la ~/home/
total 12
dracmroot 3 root wheel 512 Feb 15 18:02 .
dracmroot 15 root wheel 512 Feb 15 18:03 ..
dracmroot 2 m225xx m225xx 512 Feb 15 18:08 m225xx
m225xx00freebsd-vm-group31:~$ ls -la ~/home/m225xx/
total 48
dracmroot 2 m225xx m225xx 512 Feb 15 18:08 .
dracmroot 3 root wheel 512 Feb 15 18:02 ..
-rw-r--r-- 1 m225xx m225xx 1031 Feb 15 18:02 .cshrc
-rw-r--r-- 1 m225xx m225xx 392 Feb 15 18:02 .login
-rw-r--r-- 1 m225xx m225xx 103 Feb 15 18:02 .login_conf
-rw-r--r-- 1 m225xx m225xx 379 Feb 15 18:02 .mail_aliases
-rw-r--r-- 1 m225xx m225xx 339 Feb 15 18:02 .mailrc
-rw-r--r-- 1 m225xx m225xx 1049 Feb 15 18:02 .profile
-rw-r--r-- 1 m225xx m225xx 762 Feb 15 18:02 .shrc
-rw-r--r-- 1 m225xx m225xx 14 Feb 15 18:08 group31
m225xx00freebsd-vm-group31:~$ cp ~/home/m225xx/group31 ~/home
cp: ~/home/m225xx/group31: No such file or directory
m225xx00freebsd-vm-group31:~$ cp ~/home/m225xx/group31 ~/home
cp: ~/home/group31: Permission denied
m225xx00freebsd-vm-group31:~$

```

3.2 Log in to root account.

```

FreeBSD 12 64-bit - VMware Workstation
File Edit View VM Help
Type here to search
My Computer
FreeBSD 12 64-bit
Shared VMs

login: root
Password:
Feb 15 19:12:33 freebsd-vm-group31 login[1860]: ROOT LOGIN (root) ON tty0
FreeBSD 12.2-RELEASE r300954 GENERIC

Welcome to FreeBSD!

Release Notes, Errata: https://www.FreeBSD.org/releases/
Security Advisories: https://www.FreeBSD.org/security/
FreeBSD Handbook: https://www.FreeBSD.org/handbook/
FreeBSD FAQ: https://www.FreeBSD.org/faq/
Questions List: https://lists.FreeBSD.org/mailman/listinfo/freebsd-questions/
FreeBSD Forum: https://forum.FreeBSD.org/

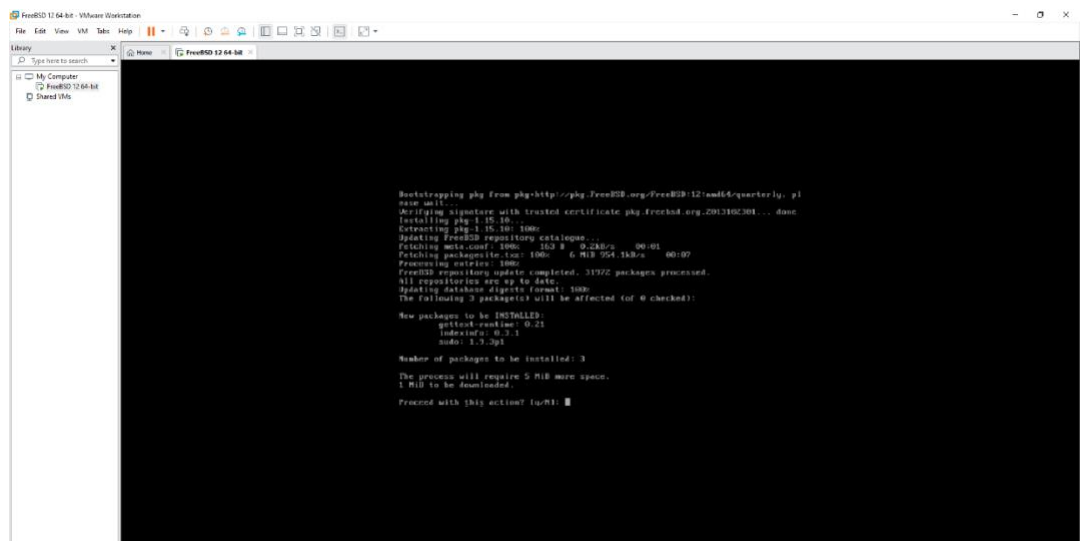
Documents installed with the system are in the /usr/local/share/doc/freebsd/
directory, or can be installed later with: pkg install en-freebsd-doc
For other languages, replace "en" with a language code like de or fr.

Show the version of FreeBSD installed: freebsd-version ; uname -a
Please include that output and any error messages when posting questions.
Introduction to manual pages: man man
FreeBSD directory layout: man hier

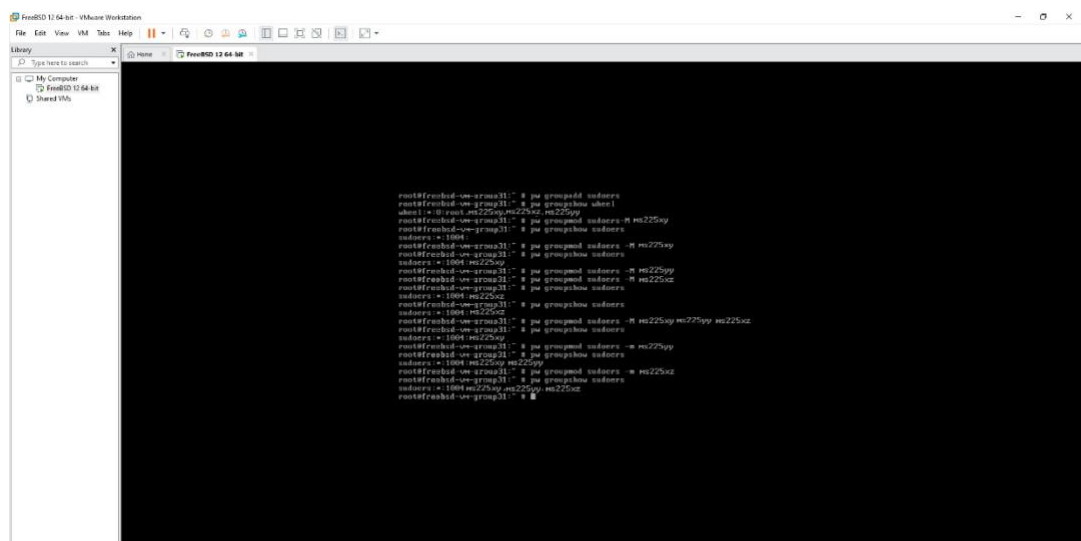
Edit /etc/motd to change this login announcement.
root@freebsd-vm-group31:~$

```

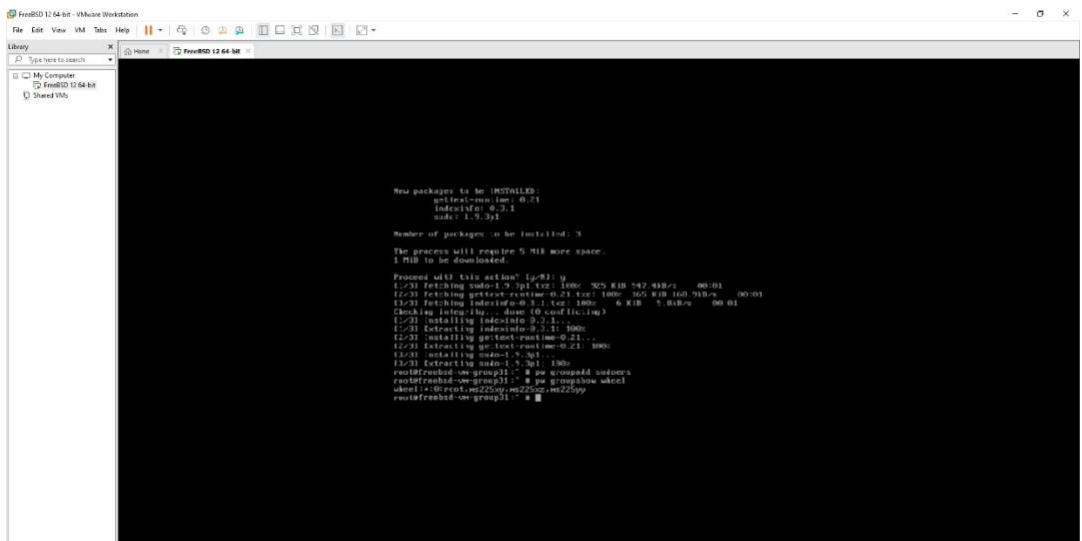
- Install sudo package.



- And then create the group sudoers.



- The next goal is to allow the users to have permissions. And configure the sudo.



```
FreeBSD 12.0-RELEASE - VMware Workstation
File Edit View VM Help
Library
Type here to search
My Computer
FreeBSD 12.0-RELEASE
Shared VMs

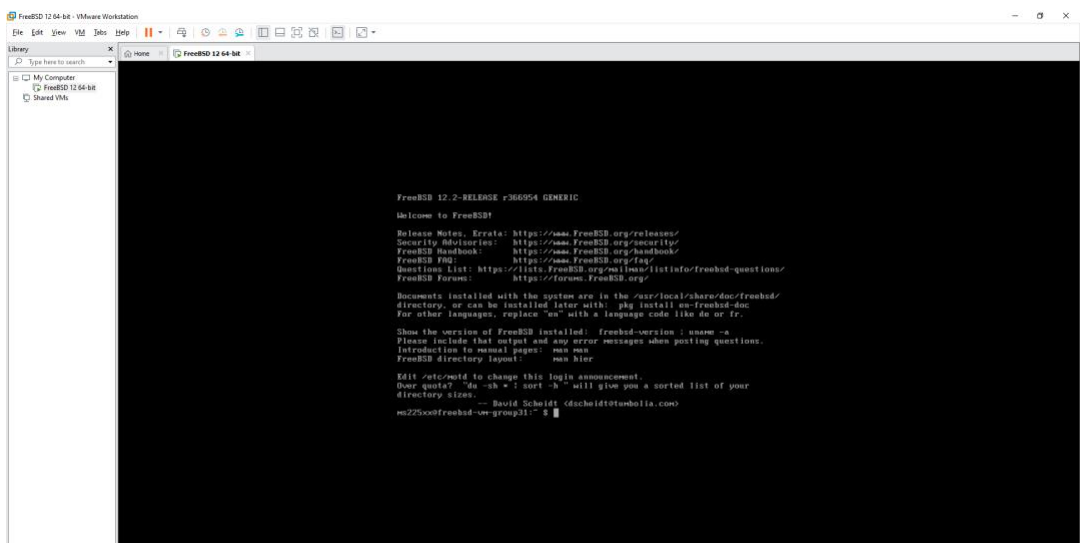
New packages to be installed:
  gettext-runtime 0.21
  indexinfo 0.3.1
  sudo 1.9.3p3

Number of packages to be installed: 3

The process will require 5.9 MB more space.
1 MB to be downloaded.

Proceed with this action? [y/N]: y
12/31 fetching sudo-1.9.3p3.txz: 100% 325 KiB 542 KiB/s 00:01
12/31 fetching gettext-runtime-0.21.txz: 100% 165 KiB 160.9 KiB/s 00:01
12/31 fetching indexinfo-0.3.1.txz: 100% 6 KiB 7.8 KiB/s 00:01
Checking integrity... done (0 conflicts)
12/31 installing indexinfo-0.3.1...
12/31 extracting indexinfo-0.3.1: 100%
12/31 installing gettext-runtime-0.21...
12/31 extracting gettext-runtime-0.21: 100%
12/31 installing sudo-1.9.3p3...
12/31 Extracting sudo-1.9.3p3: 100%
root@freebsd-vm-group1: ~ # pw groupadd sudoers
root@freebsd-vm-group1: ~ # pw groupmod wheel
wheel: * @root, m225yp, m225yp, m225yp
root@freebsd-vm-group1: ~ #
```

3.3 Login to my account.



```
FreeBSD 12.0-RELEASE - VMware Workstation
File Edit View VM Help
Library
Type here to search
My Computer
FreeBSD 12.0-RELEASE
Shared VMs

FreeBSD 12.0-RELEASE GENERIC
Welcome to FreeBSD!

Release Notes, Errata: https://www.freebsd.org/releases/
Security Advisories: https://www.freebsd.org/security/
FreeBSD Handbook: https://www.freebsd.org/handbook/
FreeBSD FAQ: https://www.freebsd.org/faq/
Questions List: https://lists.freebsd.org/mailman/listinfo/freebsd-questions/
FreeBSD Forums: https://forums.freebsd.org/

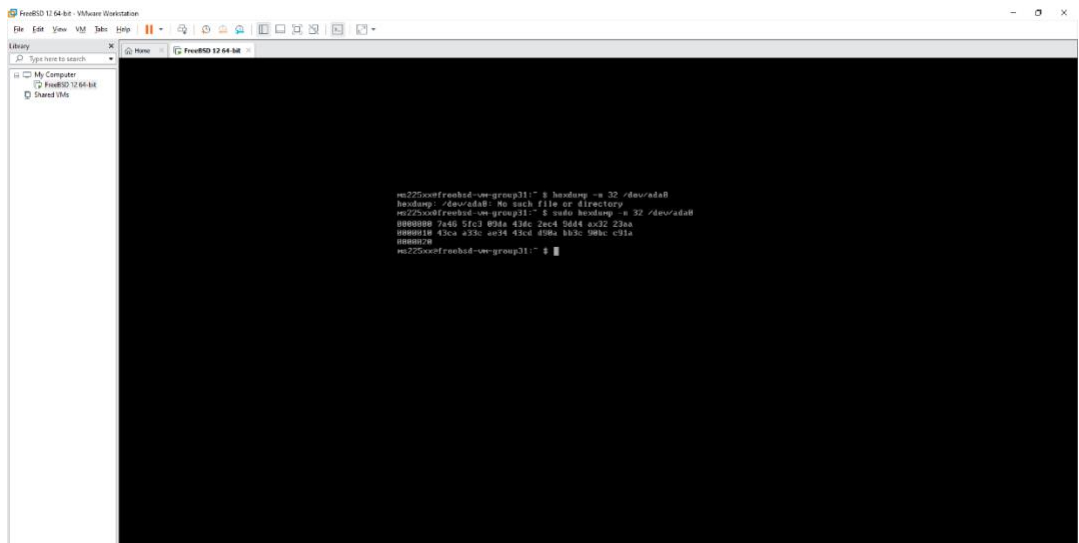
Documents installed with the system are in the /usr/local/share/doc/freebsd/
directory, or can be installed later with: pkg install en-freebsd-doc
For other languages, replace "en" with a language code like de or fr.

Show the version of FreeBSD installed: freebsd-version ; uname -a
Introduction to manual pages: man man
FreeBSD directory layout: man hier

Edit /etc/motd to change this login announcement.
Over quota? "du -sh * | sort -h" will give you a sorted list of your
directory sizes.
-- David Scheidt dscheidt@tutanota.com
m225yp@freebsd-vm-group1: ~ #
```

At first, the command `hexdump -n 32 /dev/ada0` can be executed without using `sudo`. The result shows below. *Permission denied*. And then the above command can be

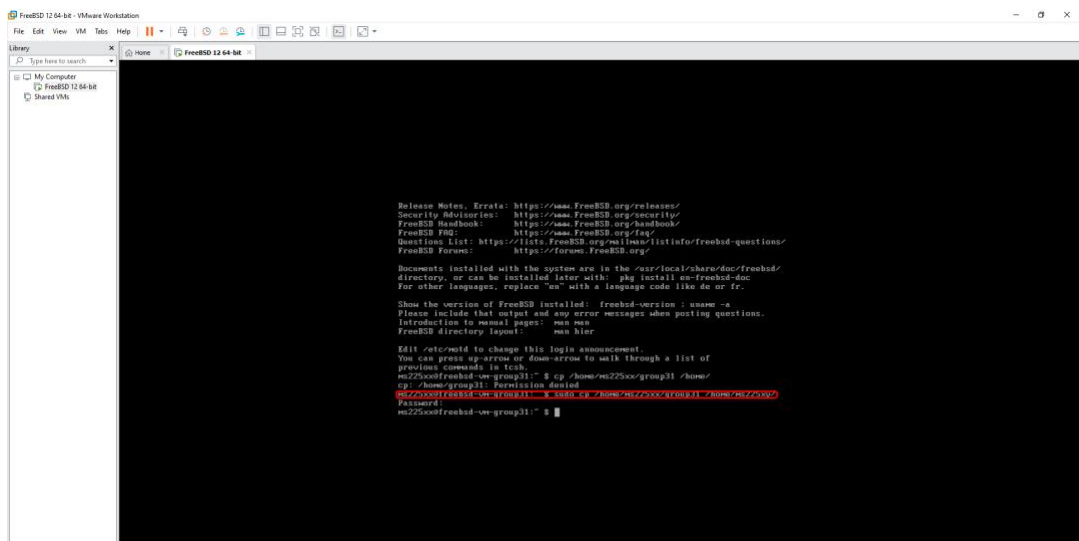
executed using `sudo` – `sudo hexdump -n 32 /dev/ada0`. The result shows correct answer.



```
FreeBSD 12.04-RELEASE - VMware Workstation
File Edit View VM Help
Type here to search
My Computer
  FreeBSD 12.04-RELEASE
  Shared VMs

m225coofreebsd-vm-group31 ~ % hexdump -n 32 /dev/ada0
hexdump: /dev/ada0: no such file or directory
m225coofreebsd-vm-group31 ~ % sudo hexdump -n 32 /dev/ada0
00000000 7440 5fc3 094a 436c 2ec4 5d44 ac32 23aa
00000010 43ca a13b ec14 436c 094a 436c 094a c31a
00000020
m225coofreebsd-vm-group31 ~ %
```

3.4 The copying of simple text file can be accomplished using `sudo`.



```
FreeBSD 12.04-RELEASE - VMware Workstation
File Edit View VM Help
Type here to search
My Computer
  FreeBSD 12.04-RELEASE
  Shared VMs

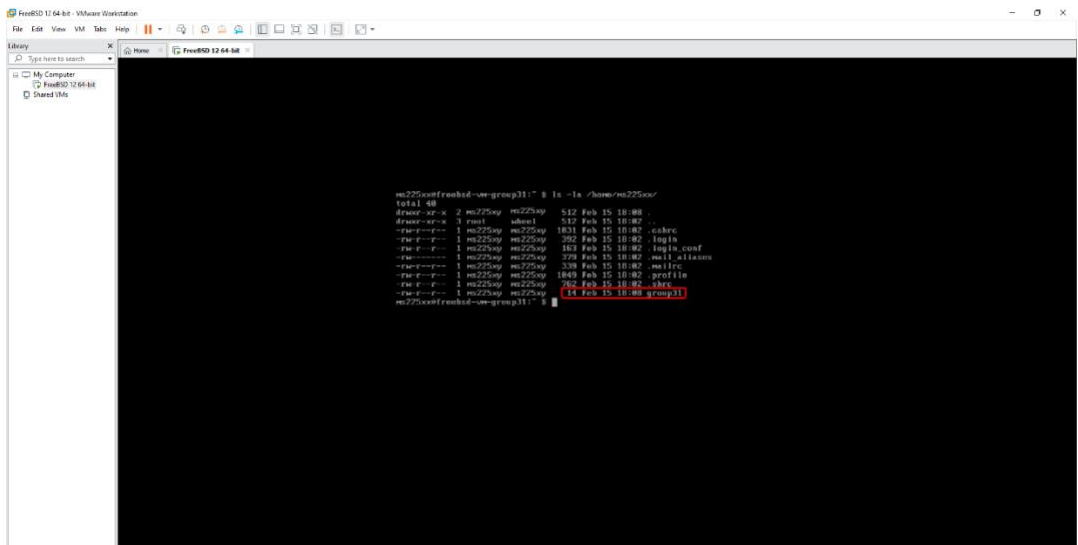
Release Notes, Errata: https://www.FreeBSD.org/releases/
Security Advisories: https://www.FreeBSD.org/security/
FreeBSD Handbook: https://www.FreeBSD.org/handbook/
FreeBSD FAQ: https://www.FreeBSD.org/faq/
Questions List: https://lists.FreeBSD.org/mailman/listinfo/freebsd-questions/
FreeBSD Forum: https://forums.FreeBSD.org/

Documents installed with the system are in the /usr/local/share/doc/freebsd/
directory, or can be installed later with: pkg install en-freebsd-doc
For other languages, replace "en" with a language code like de or fr.

Show the version of FreeBSD installed: freebsd-version ; uname -a
Please include that output and any error messages when posting questions.
Introduction to manual pages: man man
FreeBSD directory layout: man hier

Edit /etc/motd to change this login announcement.
You can press up-arrow or down-arrow to walk through a list of
previous commands in tech.
m225coofreebsd-vm-group31 ~ % cp /home/m225coofreebsd-vm-group31 /home/
cp: /home/m225coofreebsd-vm-group31: Permission denied
m225coofreebsd-vm-group31 ~ %
m225coofreebsd-vm-group31 ~ %
```

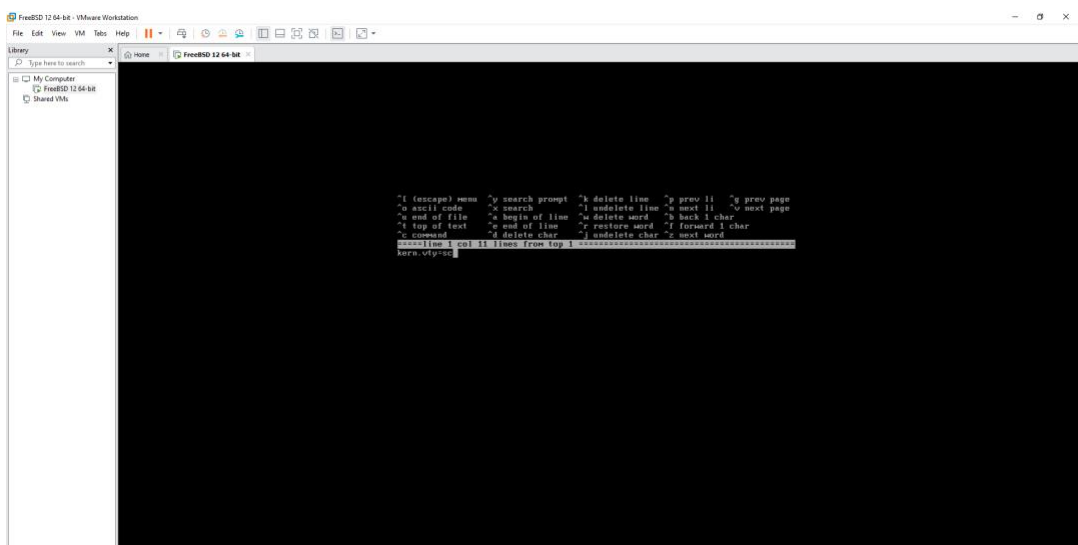
And the result after copying simple text shows below.



```
m225sc@freeshid-ue-group31:~$ ls -la /home/m225sc/
total 48
drwxr-xr-x 2 m225sc m225sc 512 Feb 15 18:48 .
drwxr-xr-x 3 root   wheel  512 Feb 15 18:48 ..
-rw-r--r-- 1 m225sc m225sc 1831 Feb 15 18:48 .cdirc
-rw-r--r-- 1 m225sc m225sc 282 Feb 15 18:48 login
-rw-r--r-- 1 m225sc m225sc 183 Feb 15 18:48 login.conf
-rw-r--r-- 1 m225sc m225sc 278 Feb 15 18:48 mail.alias
-rw-r--r-- 1 m225sc m225sc 238 Feb 15 18:48 mailrc
-rw-r--r-- 1 m225sc m225sc 1849 Feb 15 18:48 profile
-rw-r--r-- 1 m225sc m225sc 282 Feb 15 18:48 .shrc
-rw-r--r-- 1 m225sc m225sc 114 Feb 15 18:48 group31
m225sc@freeshid-ue-group31:~$
```

3.5 Video Section.

- Adding the line *kern.vty=sc* in the loader.conf file. The screenshot shows below.

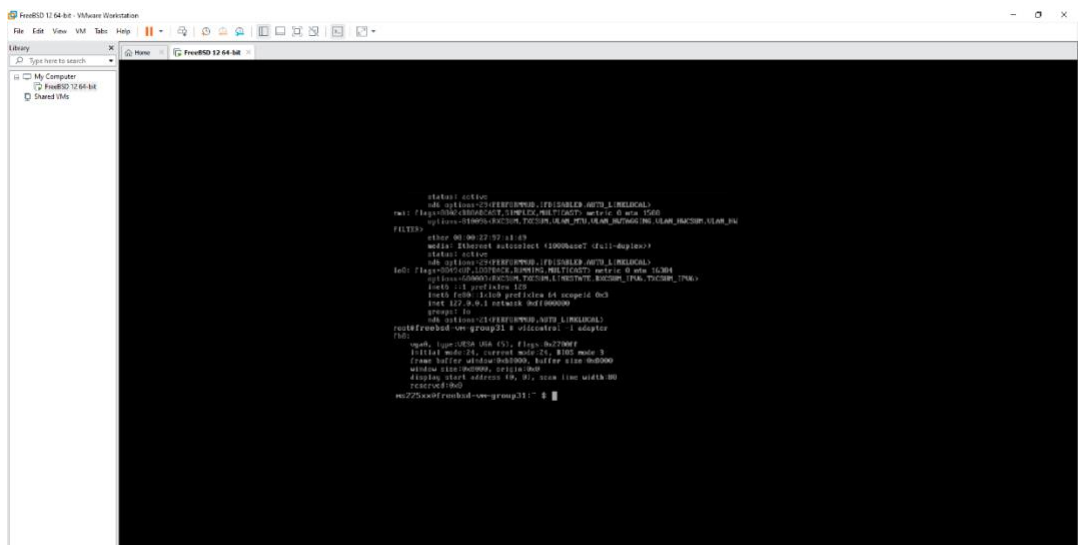


```

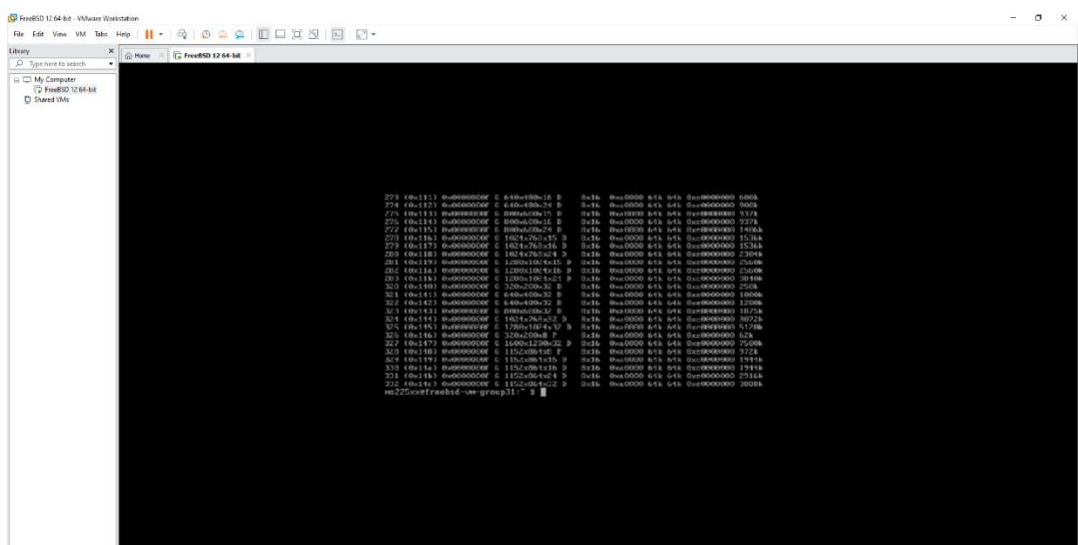
[! (escape) menu      ^y search prompt  ^k delete line  ^p prev ll  ^g prev page
^a ascii code        ^_ search        ^l undelete line ^_ next ll  ^_ next page
^e end of file        ^_ begin of line ^w delete word  ^b back 1 char
^t top of text        ^_ end of line  ^_ restore word  ^f forward 1 char
^_ command            ^d delete char  ^j undelete char ^_ next word

#end of loader.conf
kern.vty=sc
```


- And then check the video using the command `vidcontrol -i adapter`.



- At this time. Let's check the available display mode using the command `vidcontrol -i mode`. The result is same as below.



- After inputting some data to rc.conf file to set the screen resolution and rebooting.

The final result.

3.6 About ZSH.

- At first, download the package zsh and install the zsh.

Create

Remove

Properties

| Name | IPv4 Address/Mask | IPv6 Address/Mask | DHCP Server |
|---------------------------------------|-------------------|-------------------|---------------------------------|
| VirtualBox Host-Only Ethernet Adapter | 192.168.56.1/24 | | <input type="checkbox"/> Enable |

Adapter DHCP Server

☐ Configure Adapter Automatically

☒ Configure Adapter Manually

IPv4 Address: 192.168.56.1

IPv4 Network Mask: 255.255.255.0

IPv6 Address: fe80::2424:4b42:b029:c1be

IPv6 Prefix Length: 64

Apply Reset

- And VM Adapter settings.

FreeBSD group 19-11 - Settings

Network

Adapter 1 Adapter 2 Adapter 3 Adapter 4

☒ Enable Network Adapter

Attached to: Host-only Adapter

Name: VirtualBox Host-Only Ethernet Adapter

Advanced

Adapter Type: Intel PRO/1000 MT Desktop (82540EM)

Promiscuous Mode: Deny

MAC Address: 080027995F2E

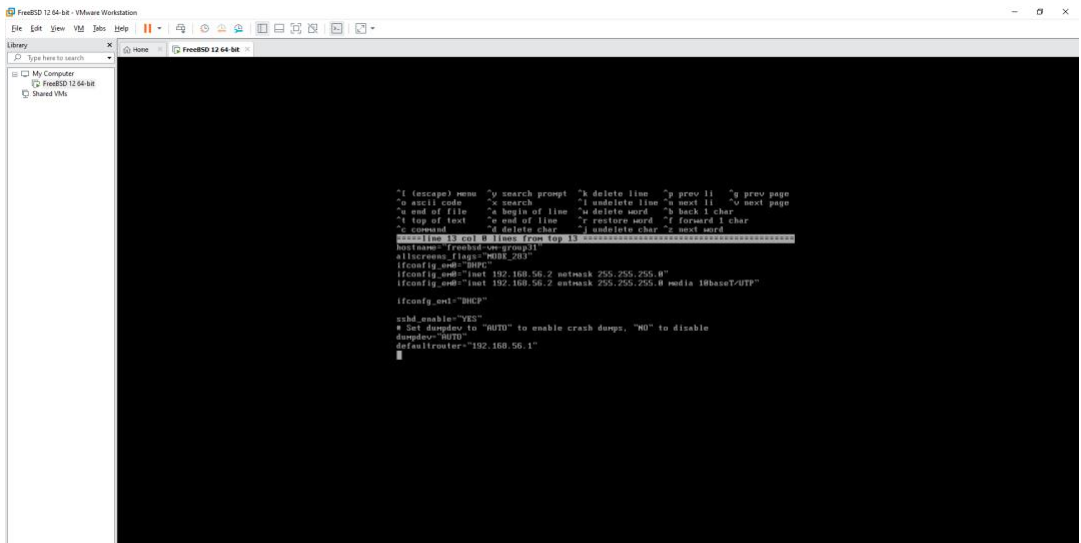
☒ Cable Connected

Port Forwarding

Invalid settings detected

OK Cancel

- The rc.conf settings for adapters em0 and em1 can be set.



```
FreeBSD 12.64-bit - VMware Workstation
File Edit View VM Help
Type here to search
My Computer
  FreeBSD 12.64-bit
  Shared VMs

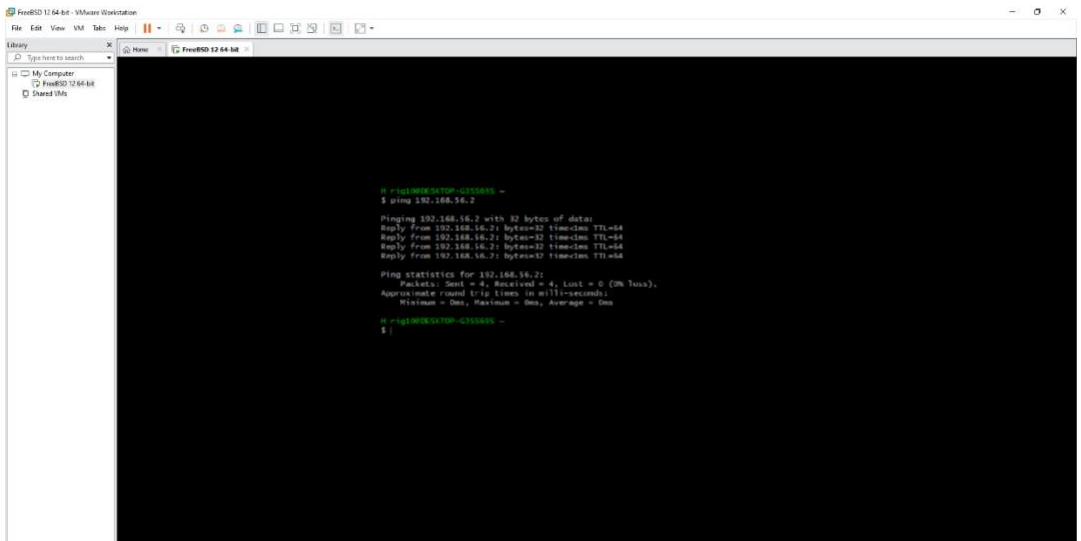
"i (escape) menu  "y search prompt  "k delete line  "p prev ll  "g prev page
"o end of file  "x search  "l delete line  "q next ll  "v next page
"u end of line  "A begin of line  "u delete word  "b back 1 char
"t top of text  "e end of line  "r restore word  "f forward 1 char
"z command  "d delete char  "j delete char  "z next word

MouseLeft - 1 Ctrl B 0 line from top 13
business (FreeBSD vm group)
allscreen_flags="MIR2_203"
ifconfig_ens="DHCP"
ifconfig_ens="inet 192.168.56.2 netmask 255.255.255.0"
ifconfig_ens="inet 192.168.56.2 netmask 255.255.255.0 media 10baseT-UTP"

ifconfig_ens="DHCP"

usb_enable="YES"
# Set dumpdev to "AUTO" to enable crash dumps, "NO" to disable
dumpdev="AUTO"
defaultrouter="192.168.56.1"
```

- And test the connection using the command *ping 192.168.100.2*



```
FreeBSD 12.64-bit - VMware Workstation
File Edit View VM Help
Type here to search
My Computer
  FreeBSD 12.64-bit
  Shared VMs

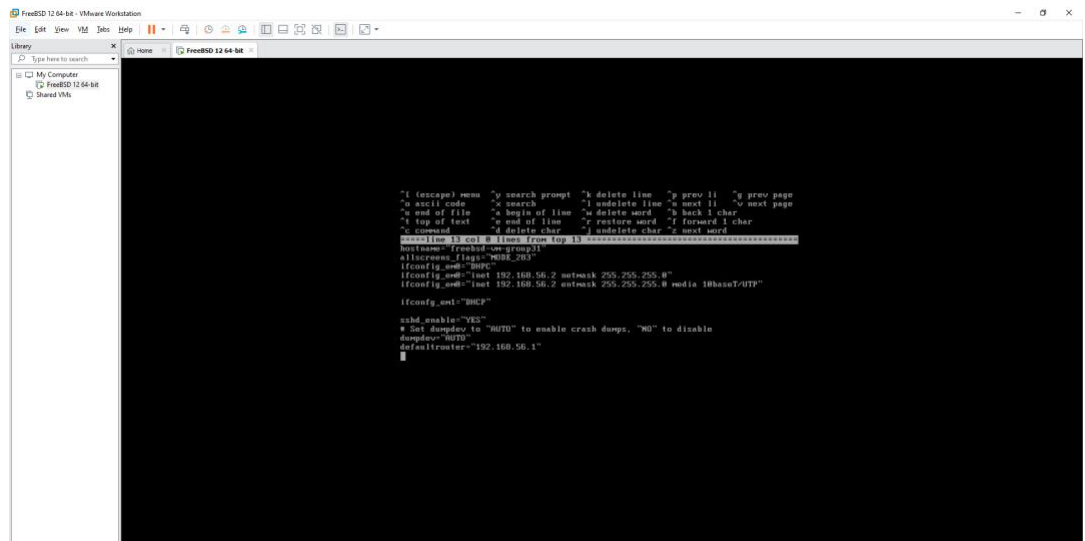
W rigin@DESKTOP-GTSSK55 ~
$ ping 192.168.56.2

Pinging 192.168.56.2 with 32 bytes of data:
Reply from 192.168.56.2: bytes=32 time=1ms TTL=64
Reply from 192.168.56.2: bytes=32 time=1ms TTL=64
Reply from 192.168.56.2: bytes=32 time=1ms TTL=64
Reply from 192.168.56.2: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.56.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

W rigin@DESKTOP-GTSSK55 ~
$ !
```

- Enable the SSH server within VM.

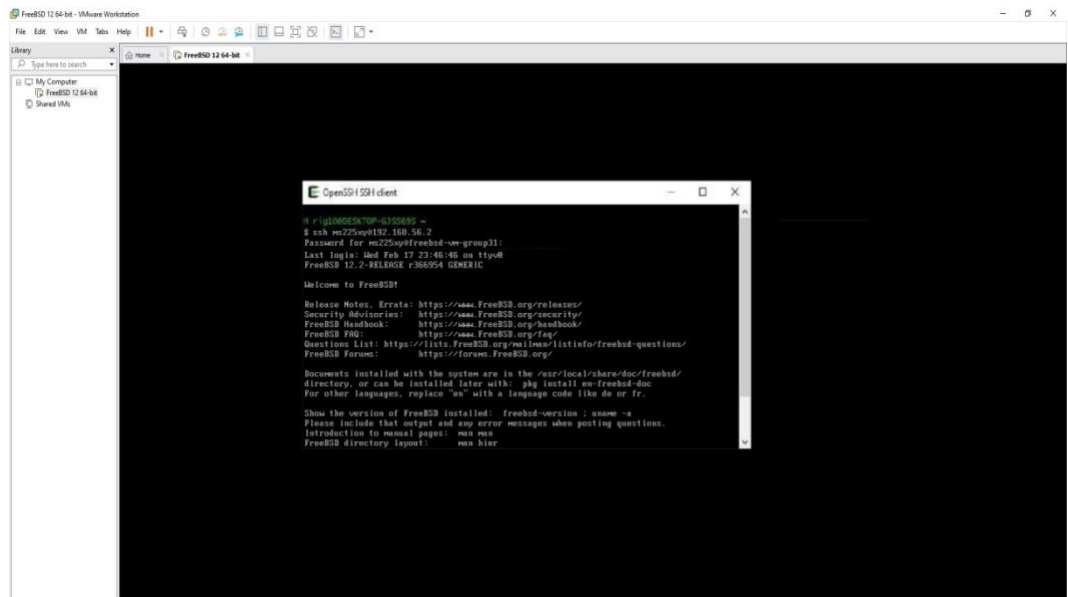


```

# Enable sshd in the system
#
# sshd_enable="YES"
# Set dumpdev to "AUTO" to enable crash dumps, "NO" to disable
dumpdev="AUTO"
defaultrooter="192.168.56.1"

```

- Log in with terminal of host OS .



```

$ ssh root@freebsd-vm-group31
Last login: Wed Feb 17 22:46:46 on ttyd0
FreeBSD 12.0-RELEASE: root@freebsd-vm-group31:~$
Welcome to FreeBSD!

Release Notes: Errata: https://www.FreeBSD.org/releases/
Security Advisories: https://www.FreeBSD.org/security/
FreeBSD Handbook: https://www.FreeBSD.org/handbook/
FreeBSD FAQ: https://www.FreeBSD.org/faq/
Questions List: https://lists.FreeBSD.org/mailman/listinfo/freebsd-questions/
FreeBSD Forum: https://forum.FreeBSD.org/

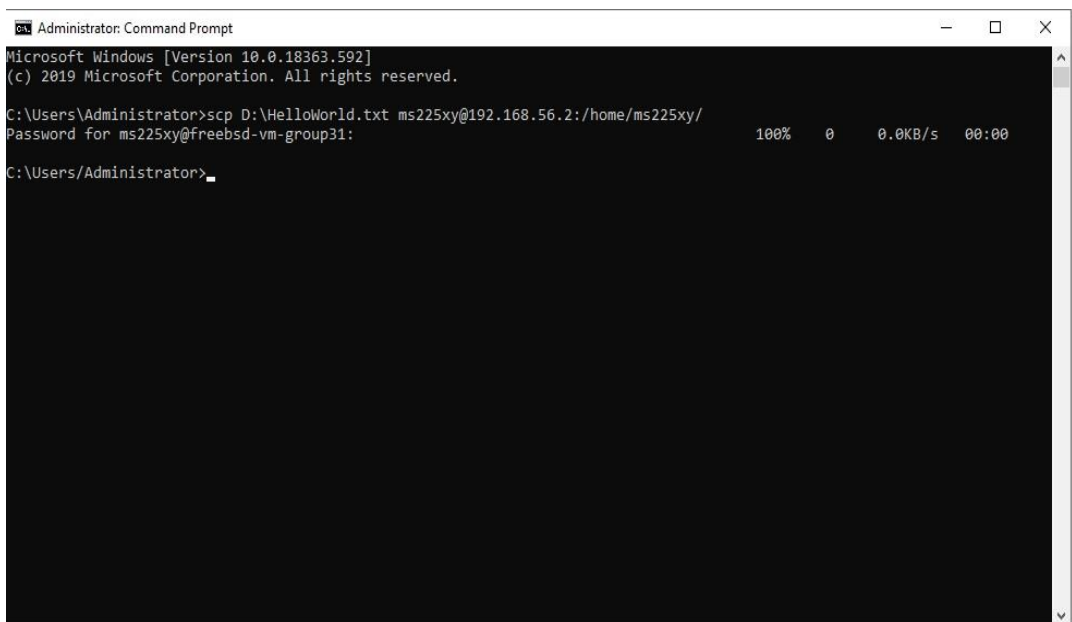
Documents installed with the system are in the /usr/local/share/doc/freebsd/
directory, or can be installed later with: pkg install www.freebsd-doc
For other languages, replace "en" with a language code like de or fr.

Show the version of FreeBSD installed: freebsd-version ; uname -a
Please include that output and any error messages when posting questions.
Introduction to manual pages: man man
FreeBSD directory layout: man hier

```

3.9 Copy the HelloWorld.txt from my OS to FreeBSD.

- Run the copy command using *scp* in my OS terminal.

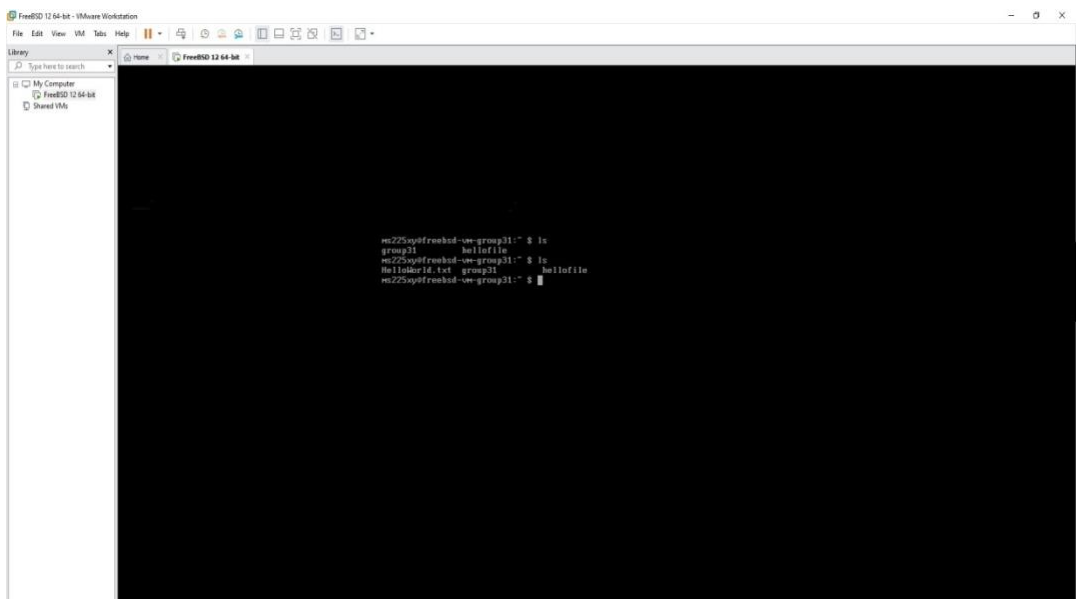


```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.18363.592]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>scp D:\HelloWorld.txt ms225xy@192.168.56.2:/home/ms225xy/
Password for ms225xy@freebsd-vm-group31:
100% 0 0.0KB/s 00:00

C:\Users\Administrator>
```

- The FreeBSD shows the copied file.



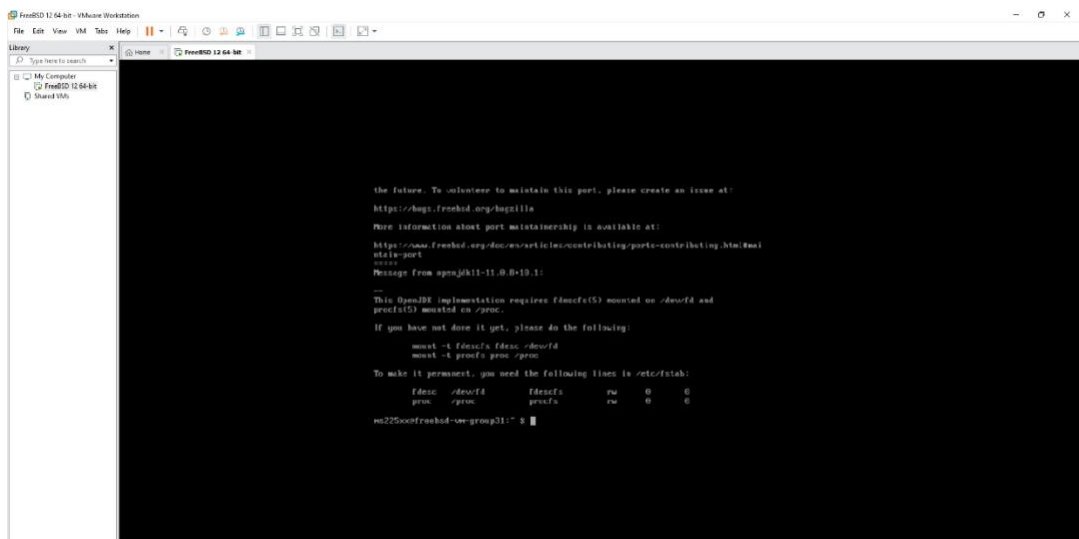
```
FreeBSD 12 64-bit - VMware Workstation
File Edit View VM Help
Library
Type here to search
My Computer
FreeBSD 12 64-bit
Shared VMs

ms225xy@freebsd-vm-group31:~$ ls
group31  hellofile
ms225xy@freebsd-vm-group31:~$ ls
HelloWorld.txt  group31  hellofile
ms225xy@freebsd-vm-group31:~$
```

Task 4. Developing in Java in FreeBSD

4.1 Install OpenJDK 11 in my FreeBSD VM

The courses are same below.



```
the future. To volunteer to maintain this port, please create an issue at:
https://github.com/freshos/ports

More information about port maintainership is available at:
https://www.freshos.org/doc/en/articles/contributing/ports-contributing.html#maintainer-port

Message from openjdk11-11.0.8-10.1:

This OpenJDK implementation requires fbsvcfs(5) mounted on /dev/fd and
preifs(5) mounted on /proc.

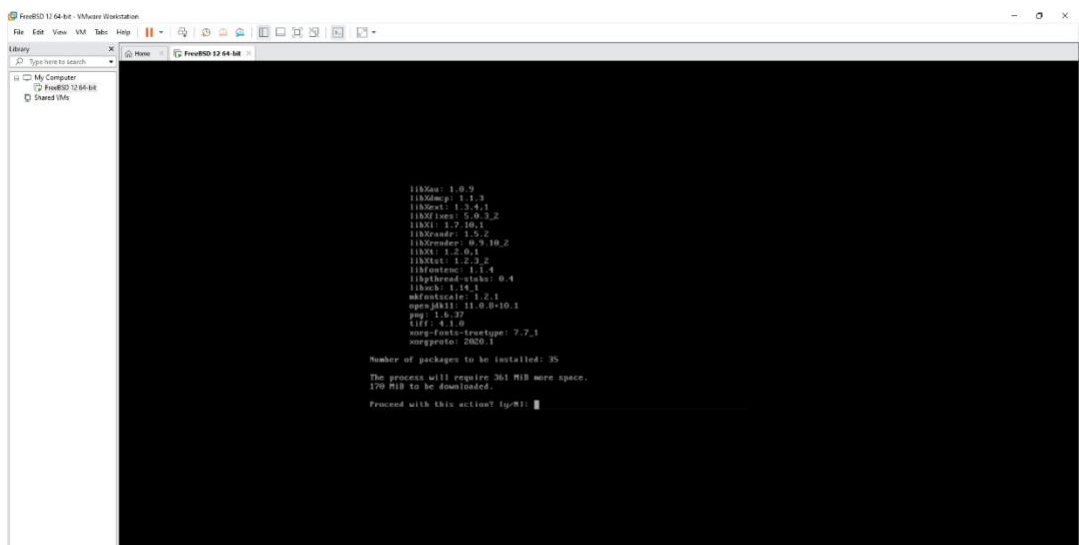
If you have not done it yet, please do the following:

mount -t fbsvcfs fddev /dev/fd
mount -t preifs proc /proc

To make it permanent, you need the following lines in /etc/fstab:

fddev /dev/fd fbsvcfs rw 0 0
proc /proc preifs rw 0 0

m225@freshos-ov-group31:~$
```



```
libkdev: 1.0.9
libkdev: 1.1.3
libkdev: 1.3.4.1
libkdev: 5.0.1.2
libkdev: 1.7.10.1
libkdev: 1.5.2
libkdev: 0.9.10.2
libkdev: 1.2.0.1
libkdev: 1.2.3.2
libkdev: 1.1.4
libkdev: 0.4
libkdev: 1.14.1
libkdev: 1.2.1
openjdk11: 11.0.8-10.1
ppl: 1.0.17
libffi: 4.1.0
org-fsckfs-type: 7.7.1
org-fsckfs: 2020.1

Number of packages to be installed: 35
The process will require 361 MiB more space.
170 MiB to be downloaded.

Proceed with this action? [y/N]:
```

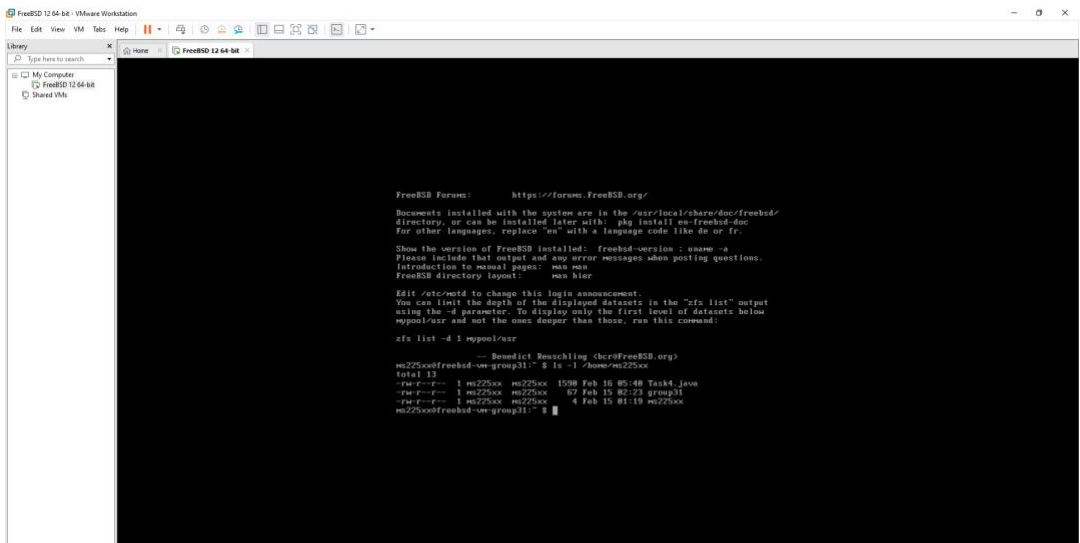
4.2 The Java Code

```

Task4.java
1  import java.io.BufferedReader;
2  import java.io.File;
3  import java.io.IOException;
4  import java.io.InputStreamReader;
5
6  // Group 31: ms225xx
7
8  public class Task4 {
9      public static void main(String[] args) throws IOException, InterruptedException {
10         //to send
11         //scp -P 2222 Task4.java mehmetcb@192.168.2.2:/home/mehmetcb/
12         //-----
13         //printing id command and exit code
14         ProcessBuilder processBuilder=new ProcessBuilder();
15         processBuilder.command("id");
16         Process id=processBuilder.start();
17
18         BufferedReader reader=new BufferedReader(new InputStreamReader(id.getInputStream()));
19         String line;
20         while ((line=reader.readLine())!=null){
21             System.out.println(line);
22         }
23         int code=id.waitFor();
24         System.out.println("exit code= "+code);
25         //-----
26         //-----
27         //Switch directory and "find . -name 'rc*' " command
28         processBuilder.directory(new File( getname: "/"etc));
29         processBuilder.command("find",".", "-name", "rc*");
30
31         Process find=processBuilder.start();
32         reader=new BufferedReader(new InputStreamReader(find.getInputStream()));
33
34         while ((line=reader.readLine())!=null){
35             System.out.println(line);
36         }
37         code=find.waitFor();
38         System.out.println("exit code= "+code);
39         //-----
40
41     }
42 }

```

4.3 Source code transferred successively.



```

FreeBSD 12.04-bit - VMware Workstation
File Edit View VM Help
Library
Type here to search
My Computer
FreeBSD 12.04-bit
Shared VMs

FreeBSB Forums: https://forum.FreeBSB.org/

Documents installed with the system are in the /usr/local/share/doc/freebsd/
directory, or can be installed later with: pkg install en-freebsd-doc
For other languages, replace "en" with a language code like de or fr.

Show the version of FreeBSB installed: freebsd-version : name -a
Please include that output and any error messages when posting questions.
Introduction to manual pages: man man
FreeBSB directory layout: man hier

Edit /etc/motd to change this login announcement.
You can limit the depth of the displayed datasets in the "zfs list" output
using the -d parameter. To display only the first level of datasets below
mypool/xsr and not the ones deeper than those, run this command:

zfs list -d 1 mypool/xsr

-- Benedict Reuschling (chr@freeBSB.org)
ms225xx@freebsd-vm-group31:~$ ls -l /home/ms225xx
total 13
-rw-r--r--  1 ms225xx  ms225xx  1508 Feb 16 05:48 Task4.java
-rw-r--r--  1 ms225xx  ms225xx   87 Feb 15 02:23 group31
-rw-r--r--  1 ms225xx  ms225xx   4 Feb 15 01:15 ms225xx
ms225xx@freebsd-vm-group31:~$

```

- And then compile the java code using javac.

