Lab9 – Cowrie Honeypot (@Home version)

Document your commands or take screenshots. Answer questions in english or finnish.

The lab uses preconfigured CentOS7 Virtual Machine with Docker. Use the following credentials for the VM: root/root66

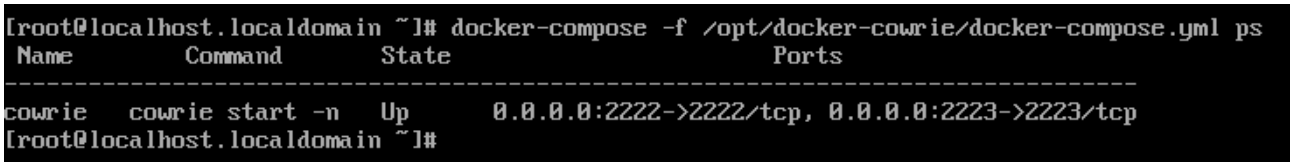
- **Initial steps**

Retrieve the pre-installed VM image for Cowrie SSH Honeypot from \\ghost.labranet.jamk.fi\virtuaalikoneet\TTKS\Cowrie-Honeypot.ova and import appliance to VirtualBox. Set the network interface to Bridged and start the VM. If the VirtualBox nags about the interface configurations, press OK.

When you have login to VM check that your VM has retrieved IP address from the DHCP server and try to wget www.iltasanomat.fi, so you can verify that VM have access on Internet. Then run the following command:

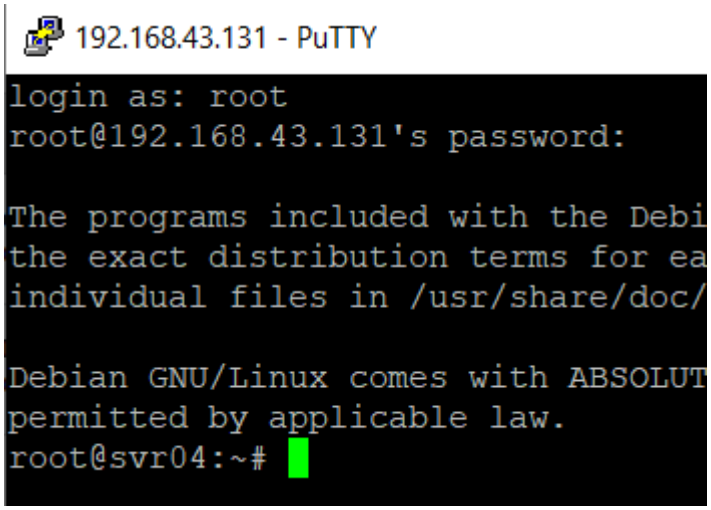
docker-compose -f /opt/docker-cowrie/docker-compose.yml ps

You should be informed that there is Docker container named "cowrie" up and running.



- **Create a connection to Virtual Machine using Host computer**

Use your Putty or other SSH client such as PowerShell and create connection using VM machine's IP address and port 2222. Use the following credentials: root/123456



When you have established the connection, leave a mark that you were inside the machine using following command: touch <your-student-id>.txt, where <your-student-id> is your actual student ID. Then wget some web site and try to ping i.e. google.com. In addition, try to create a new user using command adduser or useadd. Can you? Finally, exit the SSH session.

```
root@svr04:~# touch M3426.txt
root@svr04:~# wget www.iltasanomat.fi
--2020-03-31 18:04:57--  http://www.iltasanomat.fi
Connecting to www.iltasanomat.fi:80... connected.
HTTP request sent, awaiting response... [('SSL routines', 'ssl3_get_record', 'wr
ong version number')]
2020-03-31 18:04:58 ERROR 301: Moved Permanently
root@svr04:~# wget www.iltalehti.fi
--2020-03-31 18:05:32--  http://www.iltalehti.fi
Connecting to www.iltalehti.fi:80... connected.
HTTP request sent, awaiting response... [('SSL routines', 'ssl3_get_record', 'wrong
 number')]
2020-03-31 18:05:32 ERROR 301: Moved Permanently
root@svr04:~# ping google.com
PING google.com (29.89.32.244) 56(84) bytes of data.
64 bytes from google.com (29.89.32.244): icmp_seq=1 ttl=50 time=41.9 ms
64 bytes from google.com (29.89.32.244): icmp_seq=2 ttl=50 time=40.5 ms
64 bytes from google.com (29.89.32.244): icmp_seq=3 ttl=50 time=43.1 ms
64 bytes from google.com (29.89.32.244): icmp_seq=4 ttl=50 time=43.2 ms
^C
--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 907ms
rtt min/avg/max/mdev = 48.264/50.352/52.441/2.100 ms
root@svr04:~#
```

```
Changing the user information for teppo
Enter the new value, or press ENTER for the default
        Username []: teppo
        Full Name []: asd
        Room Number []: 23
        Work Phone []: 234
        Home Phone []: 234
        Mobile Phone []: 2345
        Country []: asdf
        City []: sdgrg
        Language []: asrg
        Favorite movie []: argasr
        Other []: asrgasrg
Is the information correct? [Y/n] Y
Ok, starting over

Changing the user information for teppo
Enter the new value, or press ENTER for the default
        Username []: adr
        Full Name []:
```

it was an endless loop trying to create a user

- **Exploring logs**

Use VM's console and navigate to $COWRIE_VAR/log/cowrie. In this directory locates cowrie.json file.

```
[root@localhost.localdomain ~]# cd $COWRIE_VAR/log/cowrie
[root@localhost.localdomain cowrie]# ls
cowrie.json  cowrie.json.2020-03-04
[root@localhost.localdomain cowrie]# _
```

What information this log file contains?

information about the servers/users activity. wgets, commands, logins etc…

Find the information about who has tried to login before you and which credentials were used. Find at least 4 attempts and write them down.


```
{"eventid":"cowrie.login.failed","username":"root","password":"root66","message":"login attempt [root/root66] failed",
```

```
{"eventid":"cowrie.login.failed","username":"admin","password":"admin","message":"login attempt [admin/admin] failed"
```

```
{"eventid":"cowrie.login.failed","username":"test","password":"test","message":"login attempt [test/test] failed"
```

```
{"eventid":"cowrie.login.success","username":"jamk","password":"ttks0800","message":"login attempt [jamk/ttks0800] succeeded",
```


Which account was used to successful login on honeypot?

{"eventid":"cowrie.login.success","username":"jamk","password":"ttks0800","message":"login attempt [jamk/ttks0800] succeeded",

jamk/ttks0800

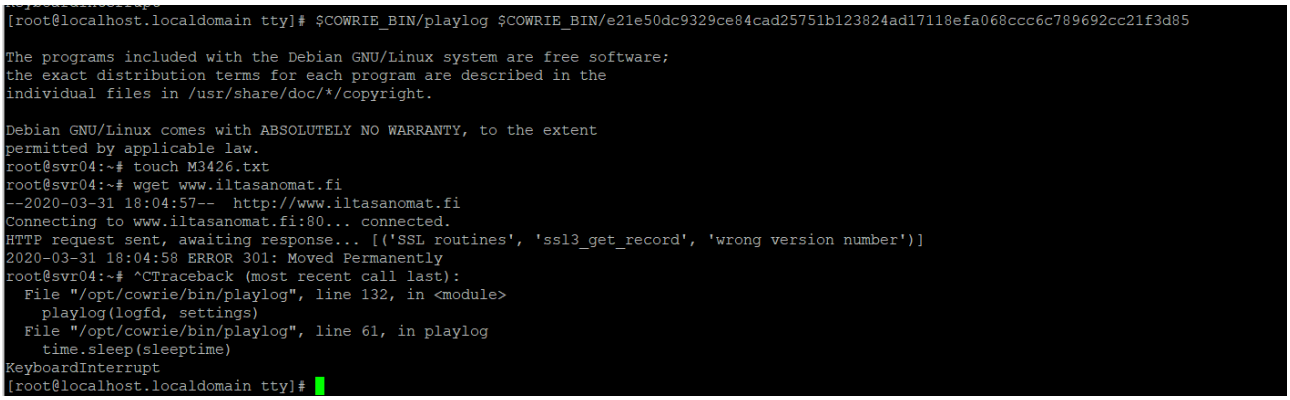
Verify also that you can you find your own login information from the log file (root/123456).

{"eventid":"cowrie.login.success","username":"root","password":"123456","message":"login attempt [root/123456] succeeded",

List the contents of the tty directory ($COWRIE_VAR/lib/cowrie/tty). Directory should now contain a file that holding records about the actions that you took on honeypot. Copy the file from the tty directory to the $COWRIE_BIN directory. Then replay the copied log file using the executable using following syntax:

$COWRIE_BIN/playlog $COWRIE_BIN/<name-of-the-log-file>

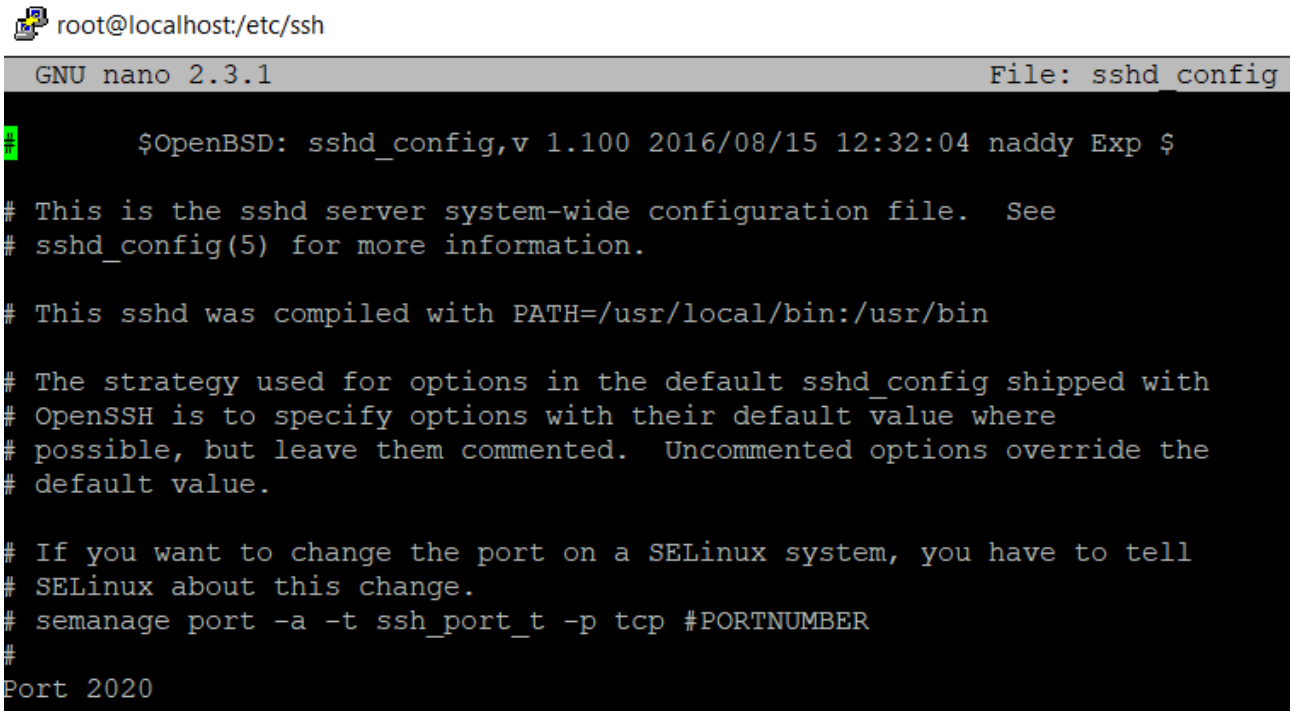
What does it show? Can you see the replay of the commands that you made before?

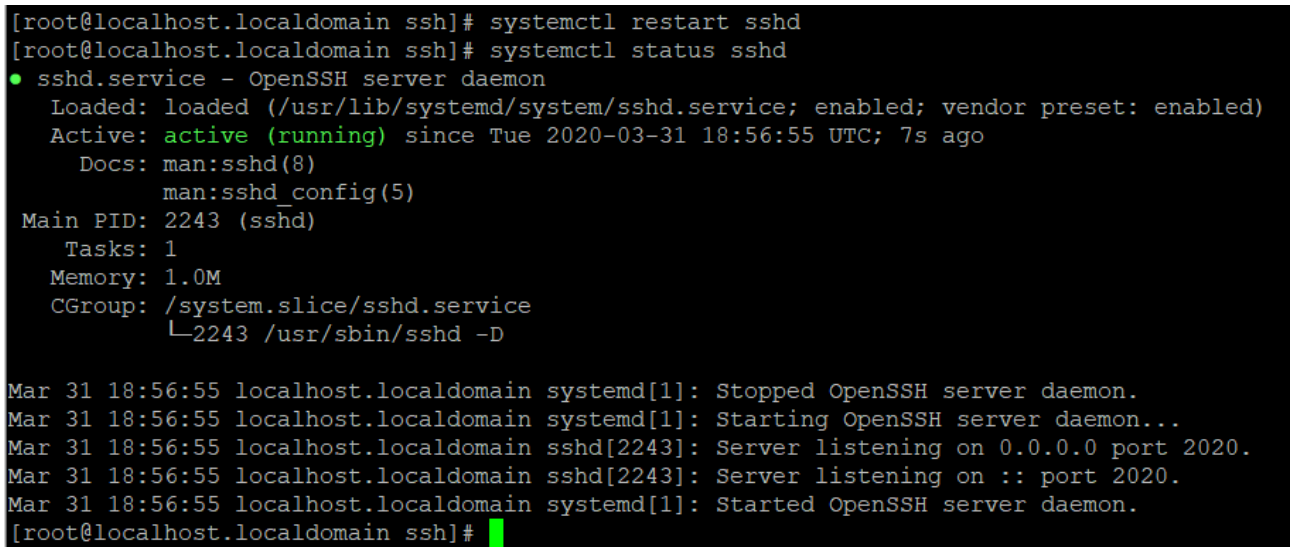


shows a replay of my actions. Pretty cool

- ## Changing Cowrie settings

By default, Cowrie is running at port 2222, and the actual SSH service is listening on its default port 22. We want to change things so that the SSH connection to the port 22 goes inside to the honeypot, and behind the port 2020 is the actual SSH service. Find a way to do that. Hint: Redirect the traffic from port 22 to 2222 using iptables and change the actual SSH service to listen port 2020.





Find out how to add “fake user” for Cowrie, by fake means user that gets inside honeypot. Use following syntax for the credentials: <your-student-id>:x:<your-student-id>. Hint: Modify $COWRIE_ETC/userdb.txt file and restart the Docker container using command:

```
# '*' for password
# '!' at the start
# '/' can be used
#
root:x:!root
root:x:123456
root:x:!/honeypot/
jamk:x:ttks0800
tomcat:x:!tomcat
oracle:x:!oracle
M3426:x:M3426
```

docker-compose -f /opt/docker-cowrie/docker-compose.yml restart cowrie

```
[root@localhost.localdomain ~]# docker-compose -f /opt/docker-cowrie/docker-compose.yml restart cowrie
Restarting cowrie ... done
[root@localhost.localdomain ~]#
```

Prove that the changes you made works as expected:

- When you create SSH connection to port 22 and use credentials <your-student-id>/<your-student-id> for login, you end up inside honeypot

```
login as: M3426
M3426@192.168.43.131's password:

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
M3426@svr04:~$ ls -la
d-wxrw--wt 1 5508 5508 4096 2020-03-31 19:33 .
d-wxrw--wt 1 5508 5508 4096 2020-03-31 19:33 ..
M3426@svr04:~$ hostname
svr04
M3426@svr04:~$
```


```
{"eventid":"cowrie.login.success","username":"M3426","password":"M3426","message":"login attempt [M3426/M3426] succeeded","sens
{"eventid":"cowrie.client.size","width":80,"height":24,"message":"Terminal Size: 80 24","sensor":"5ac69e16f286","timestamp":"20
{"eventid":"cowrie.session.params","arch":"linux-x64-lsb","message":[],"sensor":"5ac69e16f286","timestamp":"2020-03-31T19:32:10
{"eventid":"cowrie.command.input","input":"ls -la","message":"CMD: ls -la","sensor":"5ac69e16f286","timestamp":"2020-03-31T19:3
{"eventid":"cowrie.command.input","input":"hostname","message":"CMD: hostname","sensor":"5ac69e16f286","timestamp":"2020-03-31T
{"eventid":"cowrie.session.connect","src_ip":"172.30.0.1","src_port":46314,"dst_ip":"172.30.0.2","dst_port":2222,"session":"2f1
{"eventid":"cowrie.client.version","version":"b'SSH-2.0-PuTTY_Release_0.70'","message":"Remote SSH version: b'SSH-2.0-PuTTY_Rel
{"eventid":"cowrie.client.kex","hassh":"0425c279610910d2d9aef3b285e59b86","hasshAlgorithms":"curve25519-sha256@libssh.org,ecdh-
{"eventid":"cowrie.login.success","username":"M3426","password":"M3426","message":"login attempt [M3426/M3426] succeeded","sens
{"eventid":"cowrie.client.size","width":80,"height":24,"message":"Terminal Size: 80 24","sensor":"5ac69e16f286","timestamp":"20
{"eventid":"cowrie.session.params","arch":"linux-x64-lsb","message":[],"sensor":"5ac69e16f286","timestamp":"2020-03-31T19:33:00
{"eventid":"cowrie.command.input","input":"ls -la","message":"CMD: ls -la","sensor":"5ac69e16f286","timestamp":"2020-03-31T19:3
{"eventid":"cowrie.command.input","input":"hostname","message":"CMD: hostname","sensor":"5ac69e16f286","timestamp":"2020-03-31T
```

- When you create SSH connection to port 2222 and use credentials <your-student-id>/<your-student-id> for login, you end up inside honeypot

```
login as: M3426
M3426@192.168.43.131's password:

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the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
M3426@svr04:~$ ls -la
d-wxrw--wt 1 5508 5508 4096 2020-03-31 19:32 .
d-wxrw--wt 1 5508 5508 4096 2020-03-31 19:32 ..
M3426@svr04:~$ hostname
svr04
M3426@svr04:~$
```
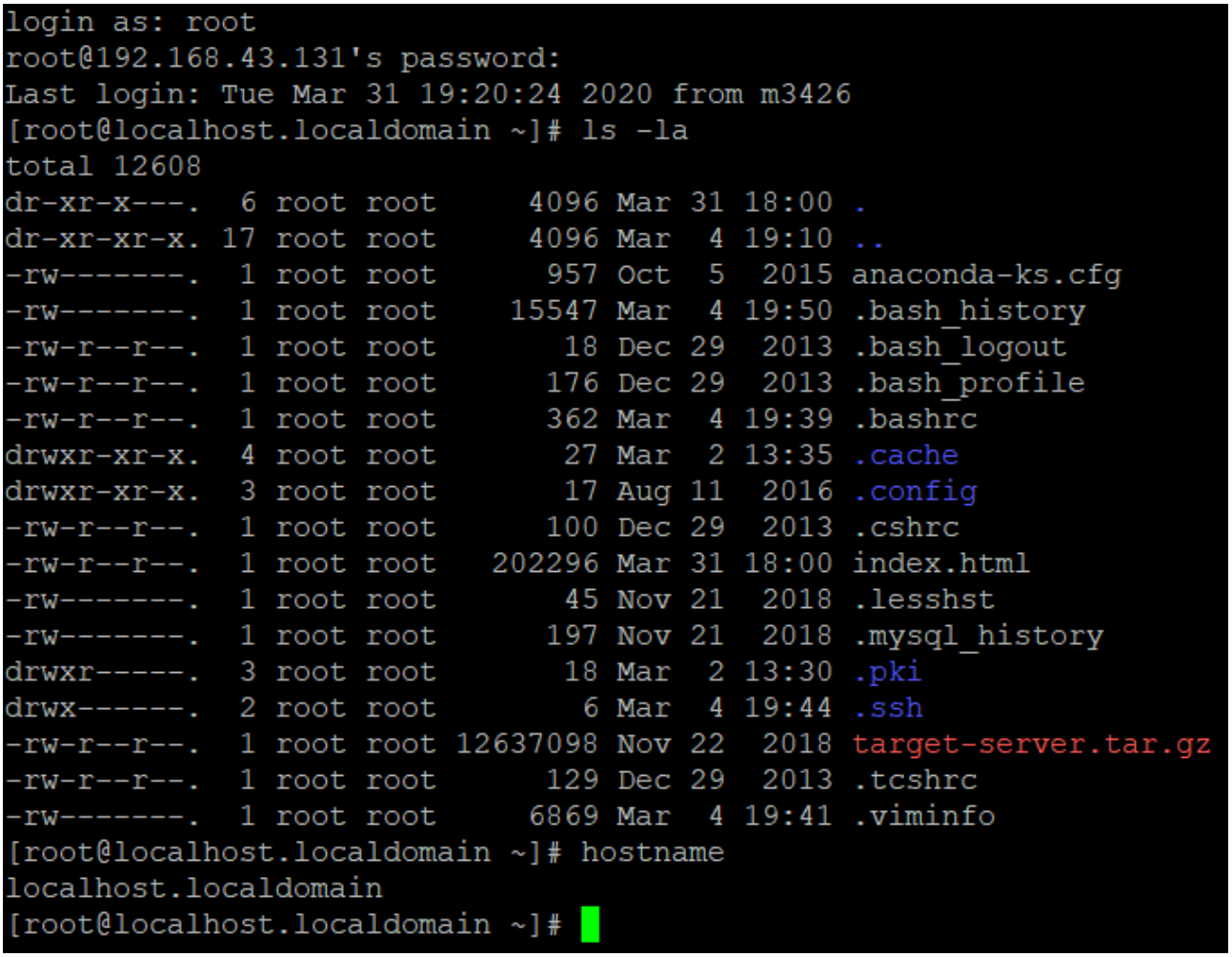


```
{"eventid":"cowrie.login.success","username":"M3426","password":"M3426","message":"login attempt [M3426/M3426] succeeded","sens
{"eventid":"cowrie.client.size","width":80,"height":24,"message":"Terminal Size: 80 24","sensor":"5ac69e16f286","timestamp":"20
{"eventid":"cowrie.session.params","arch":"linux-x64-lsb","message":[],"sensor":"5ac69e16f286","timestamp":"2020-03-31T19:32:10
{"eventid":"cowrie.command.input","input":"ls -la","message":"CMD: ls -la","sensor":"5ac69e16f286","timestamp":"2020-03-31T19:3
{"eventid":"cowrie.command.input","input":"hostname","message":"CMD: hostname","sensor":"5ac69e16f286","timestamp":"2020-03-31T
{"eventid":"cowrie.session.connect","src_ip":"172.30.0.1","src_port":46314,"dst_ip":"172.30.0.2","dst_port":2222,"session":"2f1
{"eventid":"cowrie.client.version","version":"b'SSH-2.0-PuTTY_Release_0.70'","message":"Remote SSH version: b'SSH-2.0-PuTTY_Rel
{"eventid":"cowrie.client.kex","hassh":"0425c279610910d2d9aef3b285e59b86","hasshAlgorithms":"curve25519-sha256@libssh.org,ecdh-
{"eventid":"cowrie.login.success","username":"M3426","password":"M3426","message":"login attempt [M3426/M3426] succeeded","sens
{"eventid":"cowrie.client.size","width":80,"height":24,"message":"Terminal Size: 80 24","sensor":"5ac69e16f286","timestamp":"20
{"eventid":"cowrie.session.params","arch":"linux-x64-lsb","message":[],"sensor":"5ac69e16f286","timestamp":"2020-03-31T19:33:00
{"eventid":"cowrie.command.input","input":"ls -la","message":"CMD: ls -la","sensor":"5ac69e16f286","timestamp":"2020-03-31T19:3
{"eventid":"cowrie.command.input","input":"hostname","message":"CMD: hostname","sensor":"5ac69e16f286","timestamp":"2020-03-31T
```


- When you create SSH connection to port 2020 and use credentials root/root66 for login, you end up inside host as a real root user


login as: root
root@192.168.43.131's password:
Last login: Tue Mar 31 19:20:24 2020 from m3426
[root@localhost.localdomain ~]# ls -la
total 12608
dr-xr-x---. 6 root root 4096 Mar 31 18:00 .
dr-xr-xr-x. 17 root root 4096 Mar 4 19:10 ..
-rw-------. 1 root root 957 Oct 5 2015 anaconda-ks.cfg
-rw-------. 1 root root 15547 Mar 4 19:50 .bash_history
-rw-r--r--. 1 root root 18 Dec 29 2013 .bash_logout
-rw-r--r--. 1 root root 176 Dec 29 2013 .bash_profile
-rw-r--r--. 1 root root 362 Mar 4 19:39 .bashrc
drwxr-xr-x. 4 root root 27 Mar 2 13:35 .cache
drwxr-xr-x. 3 root root 17 Aug 11 2016 .config
-rw-r--r--. 1 root root 100 Dec 29 2013 .cshrc
-rw-r--r--. 1 root root 202296 Mar 31 18:00 index.html
-rw-------. 1 root root 45 Nov 21 2018 .lesshst
-rw-------. 1 root root 197 Nov 21 2018 .mysql_history
drwxr-----. 3 root root 18 Mar 2 13:30 .pki
drwx------. 2 root root 6 Mar 4 19:44 .ssh
-rw-r--r--. 1 root root 12637098 Nov 22 2018 target-server.tar.gz
-rw-r--r--. 1 root root 129 Dec 29 2013 .tcshrc
-rw-------. 1 root root 6869 Mar 4 19:41 .viminfo
[root@localhost.localdomain ~]# hostname
localhost.localdomain
[root@localhost.localdomain ~]#