



Lab 9

CS 5-1 - BSCS – Operating System Lab

Name: Sharaiz Ahmed

SAP: 57288

Task 1:

A screenshot of a Kali Linux desktop environment. The terminal window shows a series of commands run by the user 'sharaiz'. The commands include creating a user 'sharaiz' with a home directory, switching to the user 'sharaiz', changing the password, adding the user to the 'developers' group, and attempting to check group membership. The terminal output indicates that the user 'sharaiz' already exists and that the 'group' command was not found.

```
(kali㉿kali)-[~]
$ sudo useradd -m sharaiz
useradd: warning: the home directory /home/sharaiz already exists.
useradd: Not copying any file from skel directory into it.

(kali㉿kali)-[~]
$ su sharaiz
Password:
su: Authentication failure

(kali㉿kali)-[~]
$ sudo passwd sharaiz
New password:
Retype new password:
passwd: password updated successfully

(kali㉿kali)-[~]
$ sudo groupadd developers

(kali㉿kali)-[~]
$ sudo usermod -aG developers sharaiz

(kali㉿kali)-[~]
$ group developers
Command 'group' not found, did you mean:
  command 'groups' from deb coreutils
Try: sudo apt install <deb name>

(kali㉿kali)-[~]
$ groups developers
groups: 'developers': no such user

(kali㉿kali)-[~]
```

A screenshot of a Kali Linux desktop environment. In the foreground, a terminal window titled "Text Editor" is open, showing a command-line session. The session starts with an error message about combined options, followed by attempts to remove users from groups and delete users, which fail due to user non-existence or missing mail spool. It then tries to switch to a non-existent user ("su devuser") and ends with a prompt for a password.

```
kali@kali: ~
[~] $ sudo gpasswd -d devuser developers
Removing user devuser from group developers
[~] $ sudo delgroup developers
[~] $ sudo userdel -r sharaiz
userdel: user 'sharaiz' does not exist
[~] $ sudo userdel -r devuser
userdel: devuser mail spool (/var/mail/devuser) not found
[~] $ sudo userdel -r devuser
userdel: user 'devuser' does not exist
[~] $ sudo userdel devuser
userdel: user 'devuser' does not exist
[~] $ su devuser
su: user devuser does not exist or the user entry does not contain all the required fields
[~] $
```

Task 2:

A screenshot of a Kali Linux desktop environment. In the foreground, a terminal window titled "/home/kali" is open, showing a command-line session. It starts with creating a new system group named "group". Then it attempts to add a user to an existing group, which fails because the home directory already exists. It then creates a new user "student1", changes its ownership to "student1", sets permissions to "u+rwx", and then changes them back to "o-rwx". Finally, it lists the file's permissions, showing they are now "o-rwx".

```
/home/kali
File Actions Edit View Help
group
Add a system group

adduser USER GROUP
Add an existing user to an existing group

[~] $ sudo useradd -m student1
useradd: warning: the home directory /home/student1 already exists.
useradd: Not copying any file from skel directory into it.

[~] $ sudo chown student1 /home/student1/workspace/project.txt

[~] $ sudo chmod u+rwx /home/student1/workspace/project.txt

[~] $ sudo chmod g+rx /home/student1/workspace/project.txt

[~] $ sudo chmod o-rwx /home/student1/workspace/project.txt

[~] $ ls -l /home/student1/workspace/project.txt
-rw-r-- 1 student1 root 16 Nov 3 02:42 /home/student1/workspace/project.txt
[~] $
```

(kali㉿kali)-[~]\$ sudo chmod +t /home/student1/workspace

(kali㉿kali)-[~]\$ sudo chmod u+s /home/student1/workspace/runme.sh

chmod: cannot access '/home/student1/workspace/runme.sh': No such file or directory

(kali㉿kali)-[~]\$ sudo chmod u+s /home/student1/workspace/runme.sh

chmod: cannot access '/home/student1/workspace/runme.sh': No such file or directory

(kali㉿kali)-[~]\$ sudo bash -c 'echo -e "#!/bin/bash\necho Hello from runme.sh" > /home/student1/workspace/runme.sh'

(kali㉿kali)-[~]\$ sudo chmod +x /home/student1/workspace/runme.sh

(kali㉿kali)-[~]\$ sudo chmod u+s /home/student1/workspace/runme.sh

(kali㉿kali)-[~]\$ ls -l /home/student1/workspace/runme.sh

-rwsr-xr-x 1 root root 37 Nov 3 02:48 /home/student1/workspace/runme.sh

(kali㉿kali)-[~]\$

File Edit Simple Text Editor Help

(kali㉿kali)-[~]\$ sudo chmod u+s /home/student1/workspace/runme.sh

chmod: cannot access '/home/student1/workspace/runme.sh': No such file or directory

(kali㉿kali)-[~]\$ sudo bash -c 'echo -e "#!/bin/bash\necho Hello from runme.sh" > /home/student1/workspace/runme.sh'

(kali㉿kali)-[~]\$ sudo chmod +x /home/student1/workspace/runme.sh

(kali㉿kali)-[~]\$ sudo chmod u+s /home/student1/workspace/runme.sh

(kali㉿kali)-[~]\$ ls -l /home/student1/workspace/runme.sh

-rwsr-xr-x 1 root root 37 Nov 3 02:48 /home/student1/workspace/runme.sh

(kali㉿kali)-[~]\$ sudo mkdir /home/student1/workspace/shared

(kali㉿kali)-[~]\$ sudo chmod g+s /home/student1/workspace/shared

(kali㉿kali)-[~]\$ ls -ld /home/student1/workspace/shared

drwxr-sr-x 2 root root 4096 Nov 3 02:49 /home/student1/workspace/shared

(kali㉿kali)-[~]\$

Task 3:

```
(kali㉿kali)-[~]
└─$ sudo systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/usr/lib/systemd/system/ssh.service; enabled; preset: disabled)
     Active: active (running) since Mon 2025-09-15 02:49:11 EDT; 1 month 18 days ago
       Docs: man:sshd(8)
              man:sshd_config(5)
   Main PID: 2341 (sshd)
      Tasks: 1 (limit: 2208)
     Memory: 4.7M (peak: 9.4M)
        CPU: 384ms
      CGroup: /system.slice/ssh.service
             └─2341 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"

Sep 15 02:49:10 kali systemd[1]: Starting ssh.service - OpenBSD Secure Shell server ...
Sep 15 02:49:11 kali sshd[2341]: Server listening on 0.0.0.0 port 22.
Sep 15 02:49:11 kali sshd[2341]: Server listening on :: port 22.
Sep 15 02:49:11 kali sshd[2341]: Started ssh.service - OpenBSD Secure Shell server.
Oct 23 17:53:26 kali sshd-session[122880]: Accepted publickey for kali from 10.0.2.15 port 46530 ssh2: ED25519 SHA256:rPYzTxtOj3VfmI9Fu92ytXosYKq5Mx+aPfAKpHwvCok
Oct 23 17:53:26 kali sshd-session[122880]: pam_unix(sshd:session): session opened for user kali(uid=1000) by kali(uid=0)
Oct 23 17:53:26 kali sshd-session[122880]: pam_unix(sshd:session): session closed for user kali
Oct 23 17:53:33 kali sshd-session[122967]: Accepted publickey for kali from 10.0.2.15 port 53100 ssh2: ED25519 SHA256:rPYzTxtOj3VfmI9Fu92ytXosYKq5Mx+aPfAKpHwvCok
Oct 23 17:53:33 kali sshd-session[122967]: pam_unix(sshd:session): session opened for user kali(uid=1000) by kali(uid=0)
Oct 23 17:53:34 kali sshd-session[122967]: pam_unix(sshd:session): session closed for user kali

(kali㉿kali)-[~]
└─$ sudo systemctl start apache2
sudo systemctl enable apache2

Synchronizing state of apache2.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable apache2
Created symlink '/etc/systemd/system/multi-user.target.wants/apache2.service' → '/usr/lib/systemd/system/apache2.service'.
```

```
(kali㉿kali)-[~]
└─$ sudo systemctl start apache2
sudo systemctl enable apache2

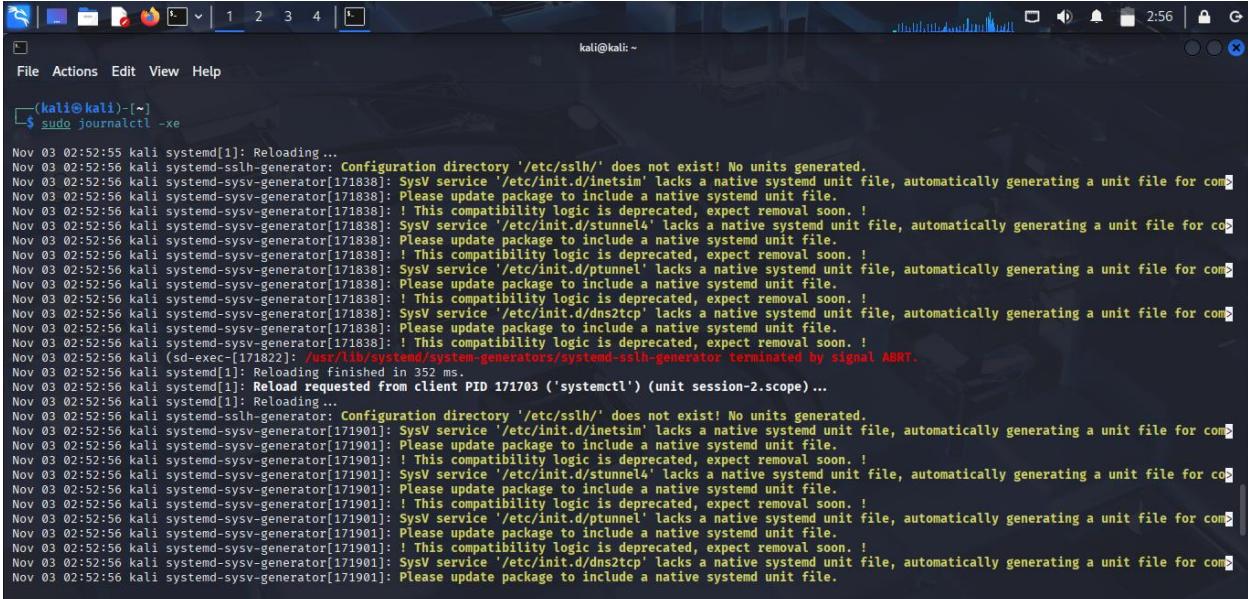
Synchronizing state of apache2.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable apache2
Created symlink '/etc/systemd/system/multi-user.target.wants/apache2.service' → '/usr/lib/systemd/system/apache2.service'.

(kali㉿kali)-[~]
└─$ sudo systemctl restart apache2

(kali㉿kali)-[~]
└─$ sudo systemctl stop apache2
sudo systemctl disable apache2

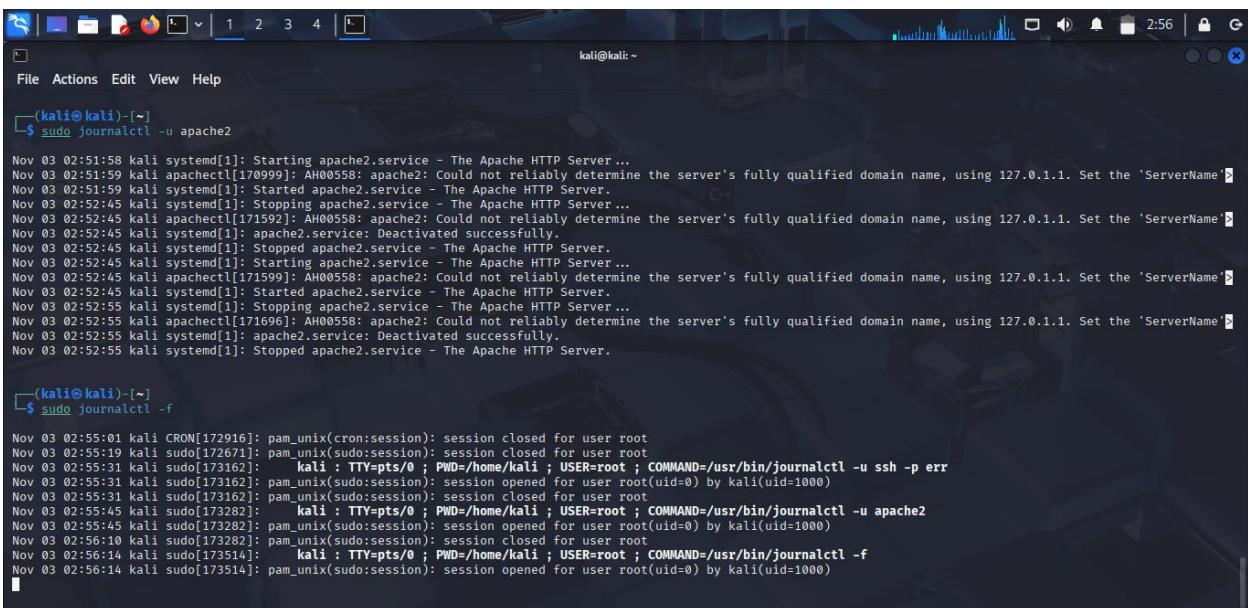
Synchronizing state of apache2.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install disable apache2
Removed '/etc/systemd/system/multi-user.target.wants/apache2.service'.
```

Task 4:



```
(kali㉿kali)-[~]
$ sudo journalctl -xe

Nov 03 02:52:55 kali systemd[1]: Reloading ...
Nov 03 02:52:56 kali systemd-sshd-generator: Configuration directory '/etc/sshd/' does not exist! No units generated.
Nov 03 02:52:56 kali systemd-sysv-generator[171838]: SysV service '/etc/init.d/inetutils' lacks a native systemd unit file, automatically generating a unit file for compatibility logic is deprecated, expect removal soon.
Nov 03 02:52:56 kali systemd-sysv-generator[171838]: Please update package to include a native systemd unit file.
Nov 03 02:52:56 kali systemd-sysv-generator[171838]: ! This compatibility logic is deprecated, expect removal soon.
Nov 03 02:52:56 kali systemd-sysv-generator[171838]: SysV service '/etc/init.d/stunnel4' lacks a native systemd unit file, automatically generating a unit file for compatibility logic is deprecated, expect removal soon.
Nov 03 02:52:56 kali systemd-sysv-generator[171838]: Please update package to include a native systemd unit file.
Nov 03 02:52:56 kali systemd-sysv-generator[171838]: ! This compatibility logic is deprecated, expect removal soon.
Nov 03 02:52:56 kali systemd-sysv-generator[171838]: SysV service '/etc/init.d/ptunnel' lacks a native systemd unit file, automatically generating a unit file for compatibility logic is deprecated, expect removal soon.
Nov 03 02:52:56 kali systemd-sysv-generator[171838]: Please update package to include a native systemd unit file.
Nov 03 02:52:56 kali systemd-sysv-generator[171838]: ! This compatibility logic is deprecated, expect removal soon.
Nov 03 02:52:56 kali systemd-sysv-generator[171838]: SysV service '/etc/init.d/dns2tcp' lacks a native systemd unit file, automatically generating a unit file for compatibility logic is deprecated, expect removal soon.
Nov 03 02:52:56 kali systemd-sysv-generator[171838]: Please update package to include a native systemd unit file.
Nov 03 02:52:56 kali systemd-sysv-generator[171838]: ! This compatibility logic is deprecated, expect removal soon.
Nov 03 02:52:56 kali (sd-exec-[171822]: /usr/lib/systemd/system-generators/systemd-sshd-generator terminated by signal ABRT.
Nov 03 02:52:56 kali systemd[1]: Reloading finished in 352 ms.
Nov 03 02:52:56 kali systemd[1]: Reload requested from client PID 171703 ('systemctl') (unit session-2.scope) ...
Nov 03 02:52:56 kali systemd[1]: Reloading...
Nov 03 02:52:56 kali systemd-sshd-generator: Configuration directory '/etc/sshd/' does not exist! No units generated.
Nov 03 02:52:56 kali systemd-sysv-generator[171901]: SysV service '/etc/init.d/inetutils' lacks a native systemd unit file, automatically generating a unit file for compatibility logic is deprecated, expect removal soon.
Nov 03 02:52:56 kali systemd-sysv-generator[171901]: Please update package to include a native systemd unit file.
Nov 03 02:52:56 kali systemd-sysv-generator[171901]: ! This compatibility logic is deprecated, expect removal soon.
Nov 03 02:52:56 kali systemd-sysv-generator[171901]: SysV service '/etc/init.d/stunnel4' lacks a native systemd unit file, automatically generating a unit file for compatibility logic is deprecated, expect removal soon.
Nov 03 02:52:56 kali systemd-sysv-generator[171901]: Please update package to include a native systemd unit file.
Nov 03 02:52:56 kali systemd-sysv-generator[171901]: ! This compatibility logic is deprecated, expect removal soon.
Nov 03 02:52:56 kali systemd-sysv-generator[171901]: SysV service '/etc/init.d/ptunnel' lacks a native systemd unit file, automatically generating a unit file for compatibility logic is deprecated, expect removal soon.
Nov 03 02:52:56 kali systemd-sysv-generator[171901]: Please update package to include a native systemd unit file.
Nov 03 02:52:56 kali systemd-sysv-generator[171901]: ! This compatibility logic is deprecated, expect removal soon.
Nov 03 02:52:56 kali systemd-sysv-generator[171901]: SysV service '/etc/init.d/dns2tcp' lacks a native systemd unit file, automatically generating a unit file for compatibility logic is deprecated, expect removal soon.
Nov 03 02:52:56 kali systemd-sysv-generator[171901]: Please update package to include a native systemd unit file.
```



```
(kali㉿kali)-[~]
$ sudo journalctl -u apache2

Nov 03 02:51:58 kali systemd[1]: Starting apache2.service - The Apache HTTP Server ...
Nov 03 02:51:59 kali apachectl[170999]: apache2: Could not reliably determine the server's fully qualified domain name, using 127.0.1.1. Set the 'ServerName' or 'ServerAlias' directive in the configuration file.
Nov 03 02:51:59 kali systemd[1]: Started apache2.service - The Apache HTTP Server.
Nov 03 02:52:45 kali systemd[1]: Stopping apache2.service - The Apache HTTP Server ...
Nov 03 02:52:45 kali apachectl[171592]: AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 127.0.1.1. Set the 'ServerName' or 'ServerAlias' directive in the configuration file.
Nov 03 02:52:45 kali systemd[1]: apache2.service: Deactivated successfully.
Nov 03 02:52:45 kali systemd[1]: Stopped apache2.service - The Apache HTTP Server.
Nov 03 02:52:45 kali systemd[1]: Starting apache2.service - The Apache HTTP Server ...
Nov 03 02:52:45 kali apachectl[171599]: AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 127.0.1.1. Set the 'ServerName' or 'ServerAlias' directive in the configuration file.
Nov 03 02:52:45 kali systemd[1]: Started apache2.service - The Apache HTTP Server.
Nov 03 02:52:55 kali systemd[1]: Stopping apache2.service - The Apache HTTP Server ...
Nov 03 02:52:55 kali apachectl[171696]: AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 127.0.1.1. Set the 'ServerName' or 'ServerAlias' directive in the configuration file.
Nov 03 02:52:55 kali systemd[1]: apache2.service: Deactivated successfully.
Nov 03 02:52:55 kali systemd[1]: Stopped apache2.service - The Apache HTTP Server.

(kali㉿kali)-[~]
$ sudo journalctl -f

Nov 03 02:55:01 kali CRON[172916]: pam_unix(cron:session): session closed for user root
Nov 03 02:55:19 kali sudo[172671]: pam_unix(sudo:session): session closed for user root
Nov 03 02:55:31 kali sudo[173162]:          kai : TTY:pts/0 ; PWD=/home/kali ; USER=root ; COMMAND=/usr/bin/journalctl -u ssh -p err
Nov 03 02:55:31 kali sudo[173162]: pam_unix(sudo:session): session opened for user root(uid=0) by kali(uid=1000)
Nov 03 02:55:31 kali sudo[173162]: pam_unix(sudo:session): session closed for user root
Nov 03 02:55:45 kali sudo[173282]:          kai : TTY:pts/0 ; PWD=/home/kali ; USER=root ; COMMAND=/usr/bin/journalctl -u apache2
Nov 03 02:55:45 kali sudo[173282]: pam_unix(sudo:session): session opened for user root(uid=0) by kali(uid=1000)
Nov 03 02:56:10 kali sudo[173282]: pam_unix(sudo:session): session closed for user root
Nov 03 02:56:14 kali sudo[173514]:          kai : TTY:pts/0 ; PWD=/home/kali ; USER=root ; COMMAND=/usr/bin/journalctl -f
Nov 03 02:56:14 kali sudo[173514]: pam_unix(sudo:session): session opened for user root(uid=0) by kali(uid=1000)
```

Task 5:

```
kali@kali: ~
File Actions Edit View Help
└─$ ssh-keygen -t rsa -b 4096 -C "sharaiz.ahmed@gmail.com"
Generating public/private rsa key pair.
Enter file in which to save the key (/home/kali/.ssh/id_rsa):
Enter passphrase for /home/kali/.ssh/id_rsa" (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/kali/.ssh/id_rsa
Your public key has been saved in /home/kali/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:x0ug1tAP9Yfa8zPqFLNL3+OMLYAx0I0884//voPO1OK sharaiz.ahmed@gmail.com
The key's randomart image is:
+---[RSA 4096]---+
|+o+.
|=+o+ . .
| oo=.. . o
| 0oo. o .
|.0=o S .
| 0o.o o
| 0+=o+ 0
..+o+o+.
..o+o+E=+
+---[SHA256]---+
(kali㉿kali)-[~]
└─$ ssh-copy-id user@server-ip
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/kali/.ssh/id_rsa.pub"
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed
/usr/bin/ssh-copy-id: ERROR: ssh: Could not resolve hostname server-ip: Temporary failure in name resolution

(kali㉿kali)-[~]
└─$ sudo nano /etc/ssh/sshd_config
```

```
kali@kali: ~
File Actions Edit View Help
Ign1 http://http.kali.org/kali kali-rolling/main amd64 ufw all 0.36.2-9
Ign1 http://http.kali.org/kali kali-rolling/main amd64 ufw all 0.36.2-9
Ign1 http://http.kali.org/kali kali-rolling/main amd64 ufw all 0.36.2-9
Err1 http://http.kali.org/kali kali-rolling/main amd64 ufw all 0.36.2-9
Temporary failure resolving 'http.kali.org'
Error: Failed to fetch http://http.kali.org/kali/pool/main/u/ufw/ufw_0.36.2-9_all.deb Temporary failure resolving 'http.kali.org'
Error: Unable to fetch some archives, maybe run apt-get update or try with --fix-missing?

(kali㉿kali)-[~]
└─$ sudo systemctl restart ssh
sudo systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/usr/lib/systemd/system/ssh.service; enabled; preset: disabled)
     Active: active (running) since Mon 2025-11-03 03:20:09 EST; 57ms ago
       Docs: man:sshd(8)
          Main PID: 185407 (sshd)
             Tasks: 1 (limit: 2208)
            Memory: 1.5M (peak: 2M)
              CPU: 68ms
             CGroup: /system.slice/ssh.service
                     └─185407 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"

Nov 03 03:20:08 kali systemd[1]: Starting ssh.service - OpenBSD Secure Shell server ...
Nov 03 03:20:09 kali sshd[185407]: Server listening on 0.0.0.0 port 2222.
Nov 03 03:20:09 kali sshd[185407]: Server listening on :: port 2222.
Nov 03 03:20:09 kali systemd[1]: Started ssh.service - OpenBSD Secure Shell server.

(kali㉿kali)-[~]
```