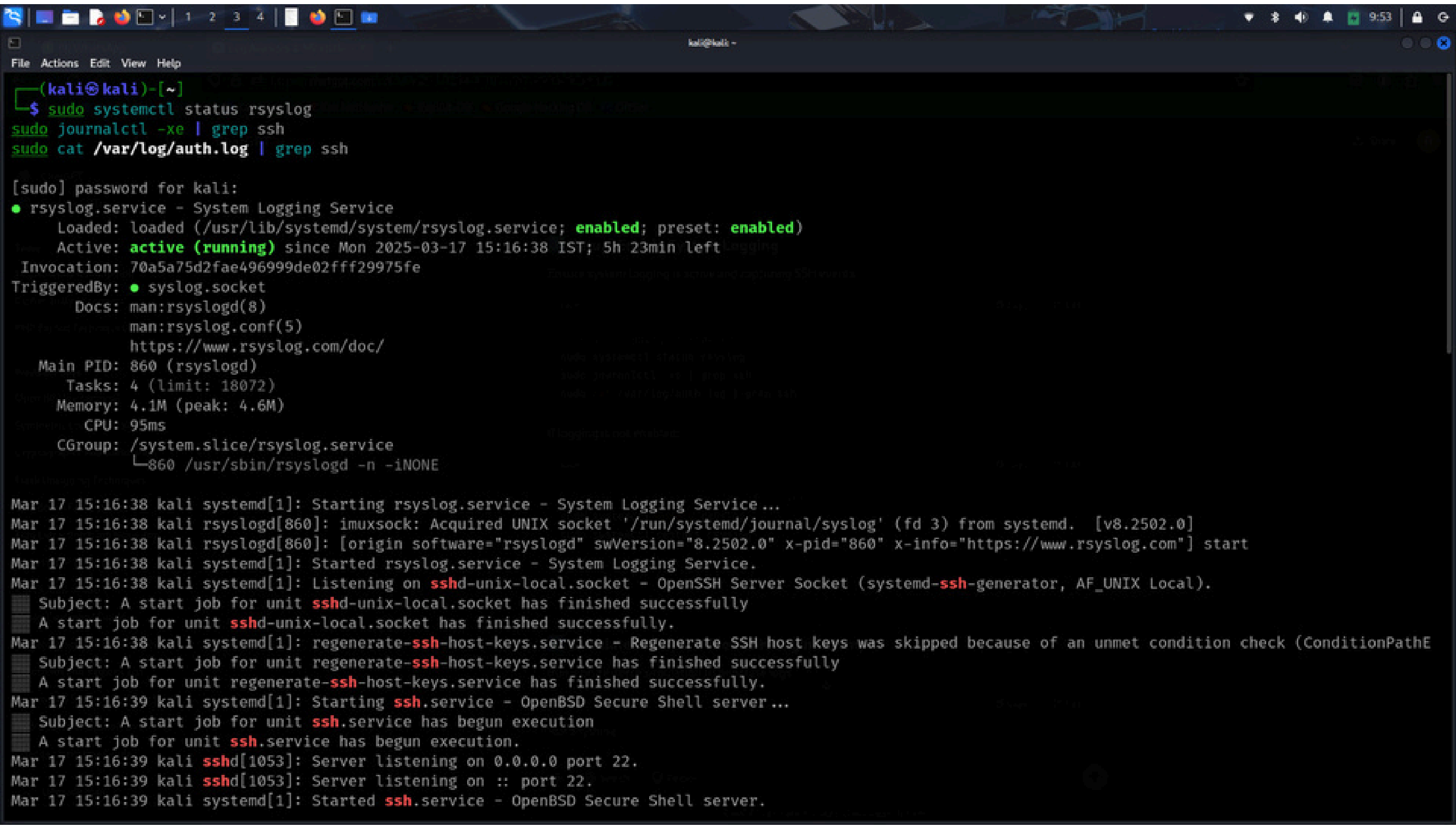
POC TASK 6

Setup: Enable System Logging

Ensure system logging is active and capturing SSH events.

Verify logging is enabled:



```
┌──(kali㉿kali)-[~]
└─$ sudo systemctl status rsyslog
sudo journalctl -xe | grep ssh
sudo cat /var/log/auth.log | grep ssh

[sudo] password for kali:
● rsyslog.service - System Logging Service
     Loaded: loaded (/usr/lib/systemd/system/rsyslog.service; enabled; preset: enabled)
     Active: active (running) since Mon 2025-03-17 15:16:38 IST; 5h 23min left
 Invocation: 70a5a75d2fae496999de02fff29975fe
TriggeredBy: ● syslog.socket
       Docs: man:rsyslogd(8)
             man:rsyslog.conf(5)
             https://www.rsyslog.com/doc/
   Main PID: 860 (rsyslogd)
      Tasks: 4 (limit: 18072)
     Memory: 4.1M (peak: 4.6M)
        CPU: 95ms
     CGroup: /system.slice/rsyslog.service
             └─860 /usr/sbin/rsyslogd -n -iNONE

Mar 17 15:16:38 kali systemd[1]: Starting rsyslog.service - System Logging Service...
Mar 17 15:16:38 kali rsyslogd[860]: imuxsock: Acquired UNIX socket '/run/systemd/journal/syslog' (fd 3) from systemd.  [v8.2502.0]
Mar 17 15:16:38 kali rsyslogd[860]: [origin software="rsyslogd" swVersion="8.2502.0" x-pid="860" x-info="https://www.rsyslog.com"] start
Mar 17 15:16:38 kali systemd[1]: Started rsyslog.service - System Logging Service.
Mar 17 15:16:38 kali systemd[1]: Listening on sshd-unix-local.socket - OpenSSH Server Socket (systemd-ssh-generator, AF_UNIX Local).
░░ Subject: A start job for unit sshd-unix-local.socket has finished successfully
░░ A start job for unit sshd-unix-local.socket has finished successfully.
Mar 17 15:16:38 kali systemd[1]: regenerate-ssh-host-keys.service - Regenerate SSH host keys was skipped because of an unmet condition check (ConditionPathE
░░ Subject: A start job for unit regenerate-ssh-host-keys.service has finished successfully
░░ A start job for unit regenerate-ssh-host-keys.service has finished successfully.
Mar 17 15:16:39 kali systemd[1]: Starting ssh.service - OpenBSD Secure Shell server...
░░ Subject: A start job for unit ssh.service has begun execution
░░ A start job for unit ssh.service has begun execution.
Mar 17 15:16:39 kali sshd[1053]: Server listening on 0.0.0.0 port 22.
Mar 17 15:16:39 kali sshd[1053]: Server listening on :: port 22.
Mar 17 15:16:39 kali systemd[1]: Started ssh.service - OpenBSD Secure Shell server.
```

sudo systemctl status rsyslog

sudo journalctl -xe | grep ssh

sudo cat /var/log/auth.log | grep ssh

If logging is not enabled:

Enable and restart rsyslog if needed;

sudo systemctl enable rsyslog

sudo systemctl restart rsyslog

Simulate Multiple Failed SSH Login Attempts

Run a brute-force simulation to generate logs and Attempt SSH login with incorrect credentials

ssh user@localhost

Enter incorrect passwords multiple times

Alternatively, simulate automated attacks with Hydra:

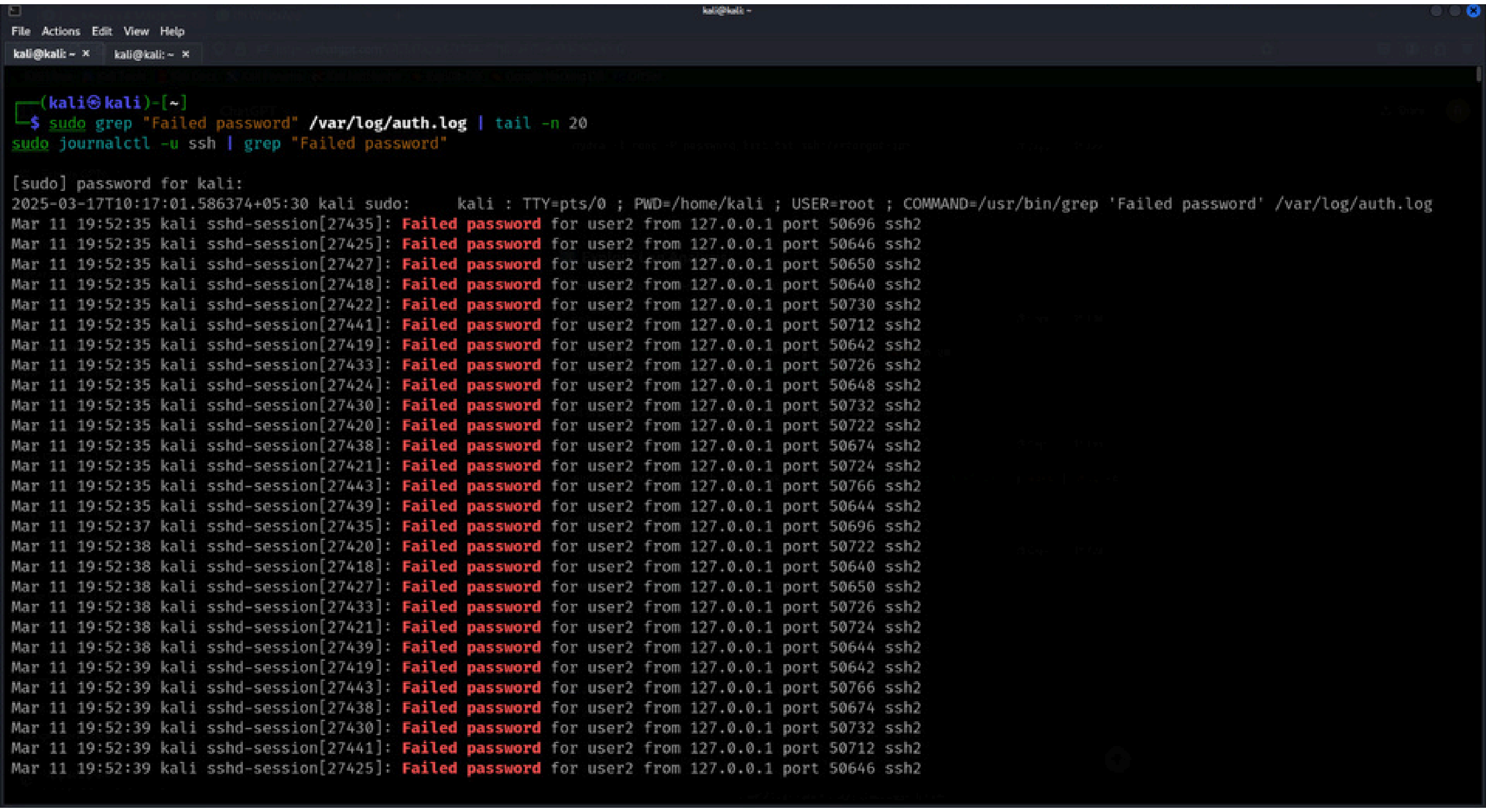
hydra -l root -P password_list.txt ssh://<target-ip>

Exploit: Log Analysis

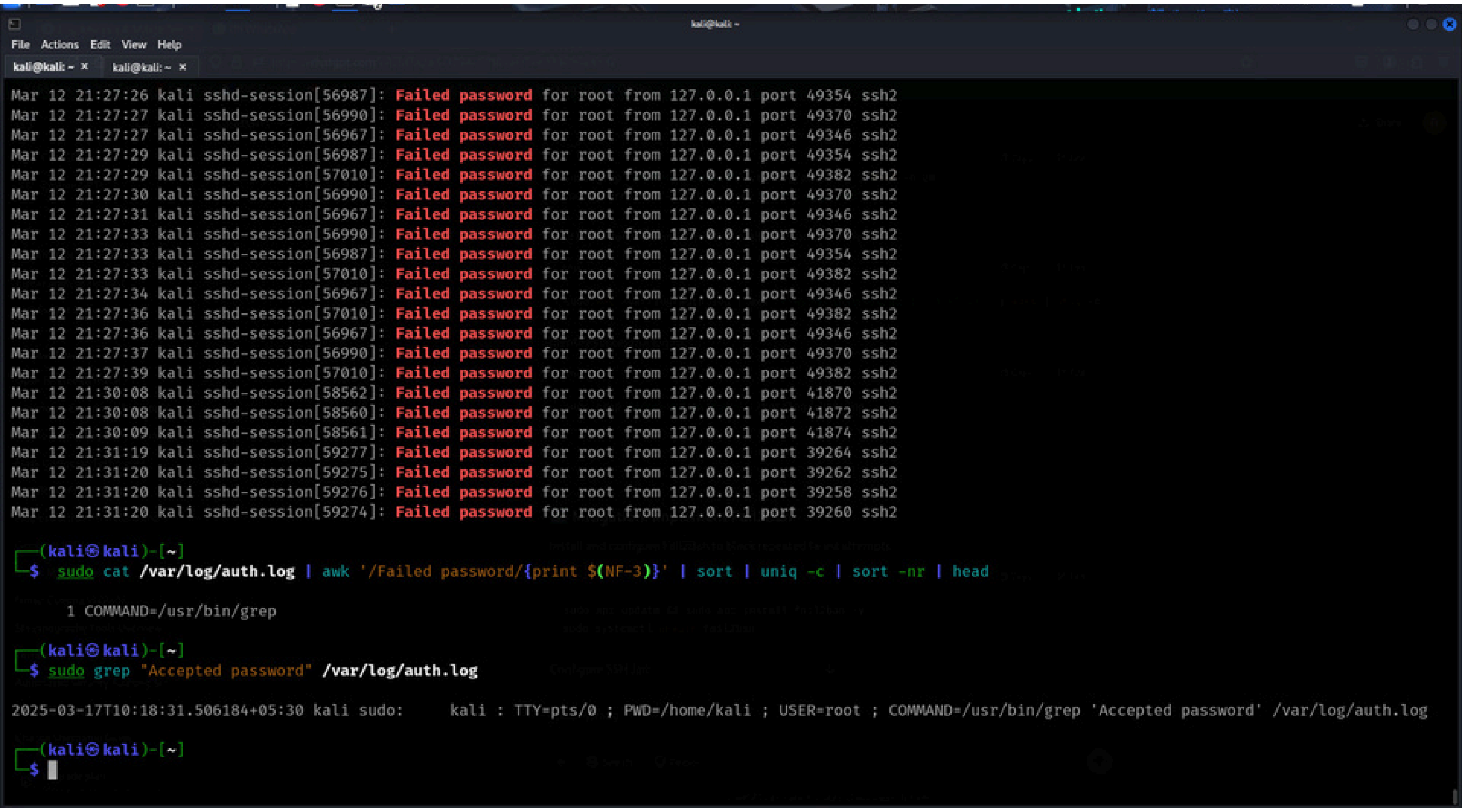
Extract failed login attempts using grep.

sudo grep "Failed password" /var/log/auth.log | tail -n 20

sudo journalctl -u ssh | grep "Failed password"



```
┌──(kali㉿kali)-[~]
└─$ sudo grep "Failed password" /var/log/auth.log | tail -n 20
sudo journalctl -u ssh | grep "Failed password"

[sudo] password for kali:
2025-03-17T10:17:01.586374+05:30 kali sudo:     kali : TTY=pts/0 ; PWD=/home/kali ; USER=root ; COMMAND=/usr/bin/grep 'Failed password' /var/log/auth.log
Mar 11 19:52:35 kali sshd-session[27435]: Failed password for user2 from 127.0.0.1 port 50696 ssh2
Mar 11 19:52:35 kali sshd-session[27425]: Failed password for user2 from 127.0.0.1 port 50646 ssh2
Mar 11 19:52:35 kali sshd-session[27427]: Failed password for user2 from 127.0.0.1 port 50650 ssh2
Mar 11 19:52:35 kali sshd-session[27418]: Failed password for user2 from 127.0.0.1 port 50640 ssh2
Mar 11 19:52:35 kali sshd-session[27422]: Failed password for user2 from 127.0.0.1 port 50730 ssh2
Mar 11 19:52:35 kali sshd-session[27441]: Failed password for user2 from 127.0.0.1 port 50712 ssh2
Mar 11 19:52:35 kali sshd-session[27419]: Failed password for user2 from 127.0.0.1 port 50642 ssh2
Mar 11 19:52:35 kali sshd-session[27433]: Failed password for user2 from 127.0.0.1 port 50726 ssh2
Mar 11 19:52:35 kali sshd-session[27424]: Failed password for user2 from 127.0.0.1 port 50648 ssh2
Mar 11 19:52:35 kali sshd-session[27430]: Failed password for user2 from 127.0.0.1 port 50732 ssh2
Mar 11 19:52:35 kali sshd-session[27420]: Failed password for user2 from 127.0.0.1 port 50722 ssh2
Mar 11 19:52:35 kali sshd-session[27438]: Failed password for user2 from 127.0.0.1 port 50674 ssh2
Mar 11 19:52:35 kali sshd-session[27421]: Failed password for user2 from 127.0.0.1 port 50724 ssh2
Mar 11 19:52:35 kali sshd-session[27443]: Failed password for user2 from 127.0.0.1 port 50766 ssh2
Mar 11 19:52:35 kali sshd-session[27439]: Failed password for user2 from 127.0.0.1 port 50644 ssh2
Mar 11 19:52:37 kali sshd-session[27435]: Failed password for user2 from 127.0.0.1 port 50696 ssh2
Mar 11 19:52:38 kali sshd-session[27420]: Failed password for user2 from 127.0.0.1 port 50722 ssh2
Mar 11 19:52:38 kali sshd-session[27418]: Failed password for user2 from 127.0.0.1 port 50640 ssh2
Mar 11 19:52:38 kali sshd-session[27427]: Failed password for user2 from 127.0.0.1 port 50650 ssh2
Mar 11 19:52:38 kali sshd-session[27433]: Failed password for user2 from 127.0.0.1 port 50726 ssh2
Mar 11 19:52:38 kali sshd-session[27421]: Failed password for user2 from 127.0.0.1 port 50724 ssh2
Mar 11 19:52:38 kali sshd-session[27439]: Failed password for user2 from 127.0.0.1 port 50644 ssh2
Mar 11 19:52:39 kali sshd-session[27419]: Failed password for user2 from 127.0.0.1 port 50642 ssh2
Mar 11 19:52:39 kali sshd-session[27443]: Failed password for user2 from 127.0.0.1 port 50766 ssh2
Mar 11 19:52:39 kali sshd-session[27438]: Failed password for user2 from 127.0.0.1 port 50674 ssh2
Mar 11 19:52:39 kali sshd-session[27430]: Failed password for user2 from 127.0.0.1 port 50732 ssh2
Mar 11 19:52:39 kali sshd-session[27441]: Failed password for user2 from 127.0.0.1 port 50712 ssh2
Mar 11 19:52:39 kali sshd-session[27425]: Failed password for user2 from 127.0.0.1 port 50646 ssh2
```



```
Mar 12 21:27:26 kali sshd-session[56987]: Failed password for root from 127.0.0.1 port 49354 ssh2
Mar 12 21:27:27 kali sshd-session[56990]: Failed password for root from 127.0.0.1 port 49370 ssh2
Mar 12 21:27:27 kali sshd-session[56967]: Failed password for root from 127.0.0.1 port 49346 ssh2
Mar 12 21:27:29 kali sshd-session[56987]: Failed password for root from 127.0.0.1 port 49354 ssh2
Mar 12 21:27:29 kali sshd-session[57010]: Failed password for root from 127.0.0.1 port 49382 ssh2
Mar 12 21:27:30 kali sshd-session[56990]: Failed password for root from 127.0.0.1 port 49370 ssh2
Mar 12 21:27:31 kali sshd-session[56967]: Failed password for root from 127.0.0.1 port 49346 ssh2
Mar 12 21:27:33 kali sshd-session[56990]: Failed password for root from 127.0.0.1 port 49370 ssh2
Mar 12 21:27:33 kali sshd-session[56987]: Failed password for root from 127.0.0.1 port 49354 ssh2
Mar 12 21:27:33 kali sshd-session[57010]: Failed password for root from 127.0.0.1 port 49382 ssh2
Mar 12 21:27:34 kali sshd-session[56967]: Failed password for root from 127.0.0.1 port 49346 ssh2
Mar 12 21:27:36 kali sshd-session[57010]: Failed password for root from 127.0.0.1 port 49382 ssh2
Mar 12 21:27:36 kali sshd-session[56967]: Failed password for root from 127.0.0.1 port 49346 ssh2
Mar 12 21:27:37 kali sshd-session[56990]: Failed password for root from 127.0.0.1 port 49370 ssh2
Mar 12 21:27:39 kali sshd-session[57010]: Failed password for root from 127.0.0.1 port 49382 ssh2
Mar 12 21:30:08 kali sshd-session[58562]: Failed password for root from 127.0.0.1 port 41870 ssh2
Mar 12 21:30:08 kali sshd-session[58560]: Failed password for root from 127.0.0.1 port 41872 ssh2
Mar 12 21:30:09 kali sshd-session[58561]: Failed password for root from 127.0.0.1 port 41874 ssh2
Mar 12 21:31:19 kali sshd-session[59277]: Failed password for root from 127.0.0.1 port 39264 ssh2
Mar 12 21:31:20 kali sshd-session[59275]: Failed password for root from 127.0.0.1 port 39262 ssh2
Mar 12 21:31:20 kali sshd-session[59276]: Failed password for root from 127.0.0.1 port 39258 ssh2
Mar 12 21:31:20 kali sshd-session[59274]: Failed password for root from 127.0.0.1 port 39260 ssh2

┌──(kali㉿kali)-[~]
└─$ sudo cat /var/log/auth.log | awk '/Failed password/{print $(NF-3)}' | sort | uniq -c | sort -nr | head

      1 COMMAND=/usr/bin/grep

┌──(kali㉿kali)-[~]
└─$ sudo grep "Accepted password" /var/log/auth.log

2025-03-17T10:18:31.506184+05:30 kali sudo:     kali : TTY=pts/0 ; PWD=/home/kali ; USER=root ; COMMAND=/usr/bin/grep 'Accepted password' /var/log/auth.log

┌──(kali㉿kali)-[~]
└─$ 
```

Find brute-force attempts (multiple failures from the same IP):

```
sudo cat /var/log/auth.log | awk '/Failed password/{print $(NF-3)}' | sort | uniq -c | sort -nr | head
```

Identify successful logins:

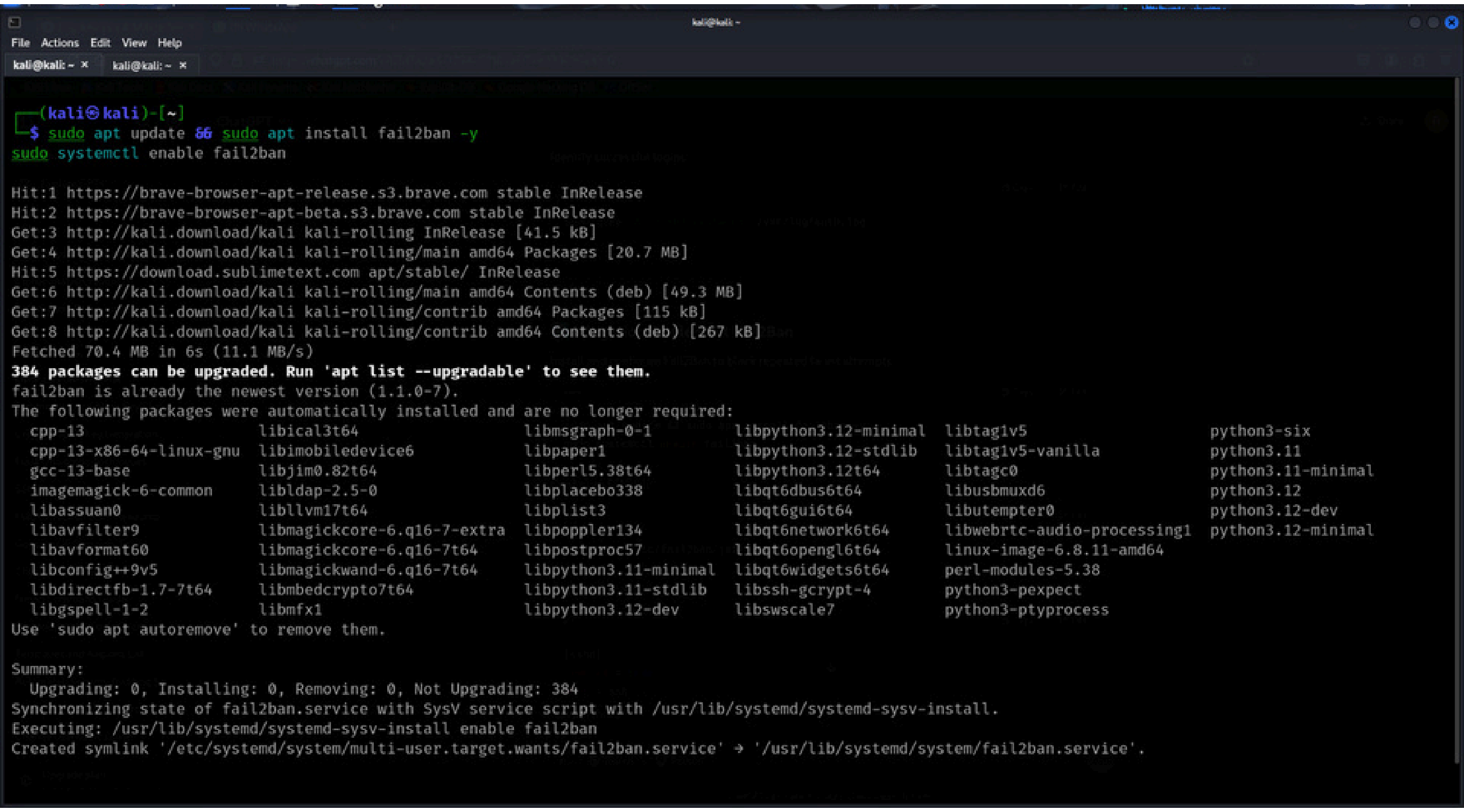
```
sudo grep "Accepted password" /var/log/auth.log
```

Mitigation: Implement Fail2Ban

Install and configure Fail2Ban to block repeated failed attempts.

```
sudo apt update && sudo apt install fail2ban -y
```

```
sudo systemctl enable fail2ban
```

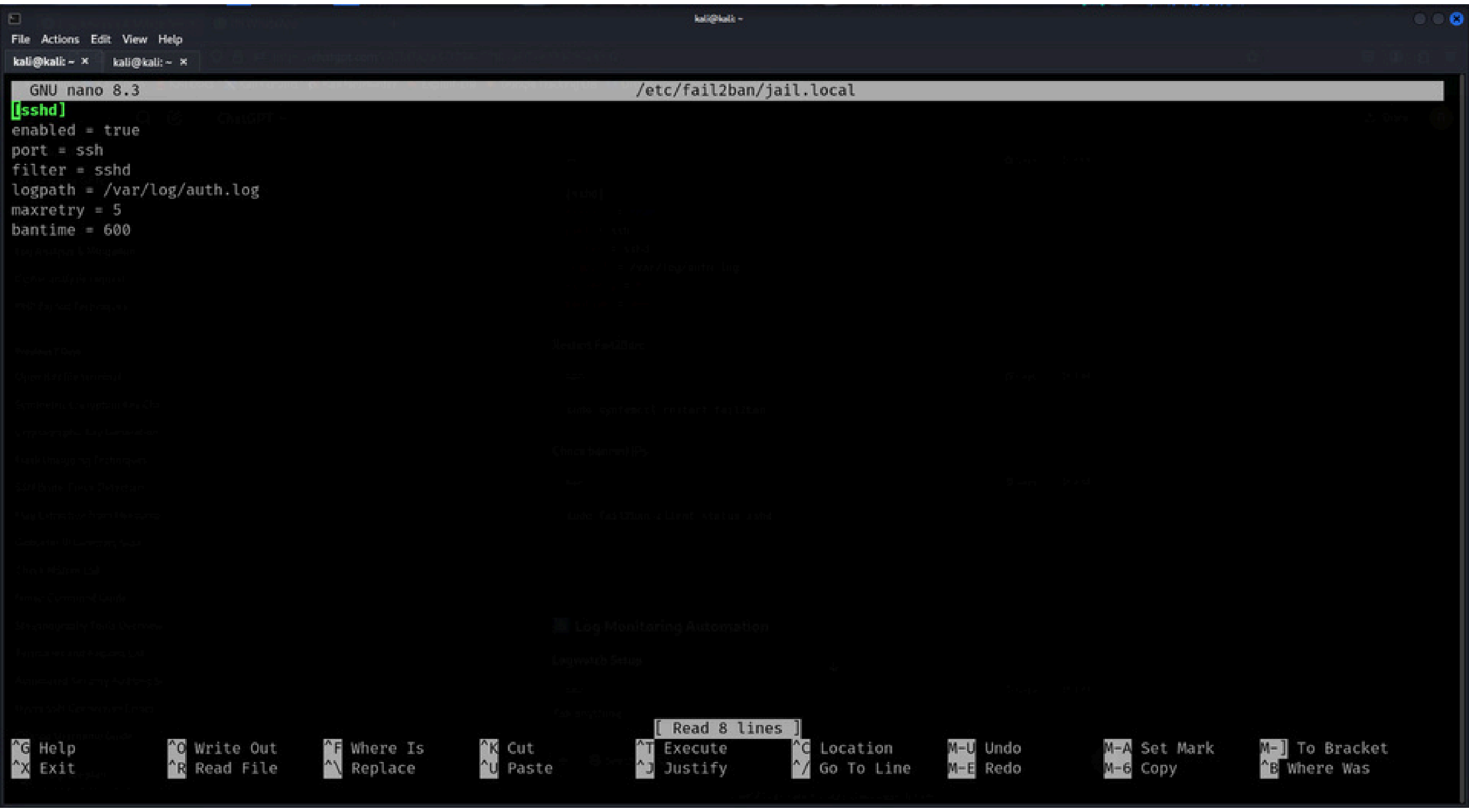


```
┌──(kali㉿kali)-[~]
└─$ sudo apt update && sudo apt install fail2ban -y
sudo systemctl enable fail2ban

Hit:1 https://brave-browser-apt-release.s3.brave.com stable InRelease
Hit:2 https://brave-browser-apt-beta.s3.brave.com stable InRelease
Get:3 http://kali.download/kali kali-rolling InRelease [41.5 kB]
Get:4 http://kali.download/kali kali-rolling/main amd64 Packages [20.7 MB]
Hit:5 https://download.sublimetext.com apt/stable/ InRelease
Get:6 http://kali.download/kali kali-rolling/main amd64 Contents (deb) [49.3 MB]
Get:7 http://kali.download/kali kali-rolling/contrib amd64 Packages [115 kB]
Get:8 http://kali.download/kali kali-rolling/contrib amd64 Contents (deb) [267 kB]
Fetched 70.4 MB in 6s (11.1 MB/s)
384 packages can be upgraded. Run 'apt list --upgradable' to see them.
fail2ban is already the newest version (1.1.0-7).
The following packages were automatically installed and are no longer required:
  cpp-13                    libical3t64                  libmsgraph-0-1          libpython3.12-minimal  libtag1v5                     python3-six
  cpp-13-x86-64-linux-gnu   libimobiledevice6            libpaper1               libpython3.12-stdlib   libtag1v5-vanilla             python3.11
  gcc-13-base               libjim0.82t64                libperl5.38t64          libpython3.12t64       libtagc0                      python3.11-minimal
  imagemagick-6-common      libldap-2.5-0                libplacebo338           libqt6dbus6t64         libusbmuxd6                   python3.12
  libassuan0                libllvm17t64                 libplist3               libqt6gui6t64          libutempter0                  python3.12-dev
  libavfilter9              libmagickcore-6.q16-7-extra  libpoppler134           libqt6network6t64      libwebrtc-audio-processing1   python3.12-minimal
  libavformat60             libmagickcore-6.q16-7t64     libpostproc57           libqt6opengl6t64       linux-image-6.8.11-amd64
  libconfig++9v5            libmagickwand-6.q16-7t64     libpython3.11-minimal   libqt6widgets6t64      perl-modules-5.38
  libdirectfb-1.7-7t64      libmbedcrypto7t64            libpython3.11-stdlib    libssh-gcrypt-4        python3-pexpect
  libgspell-1-2             libmfx1                      libpython3.12-dev       libswscale7            python3-ptyprocess
Use 'sudo apt autoremove' to remove them.

Summary:
  Upgrading: 0, Installing: 0, Removing: 0, Not Upgrading: 384
Synchronizing state of fail2ban.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable fail2ban
Created symlink '/etc/systemd/system/multi-user.target.wants/fail2ban.service' → '/usr/lib/systemd/system/fail2ban.service'.
```

Configure SSH Jail:

sudo nano /etc/fail2ban/jail.local

Add these lines:

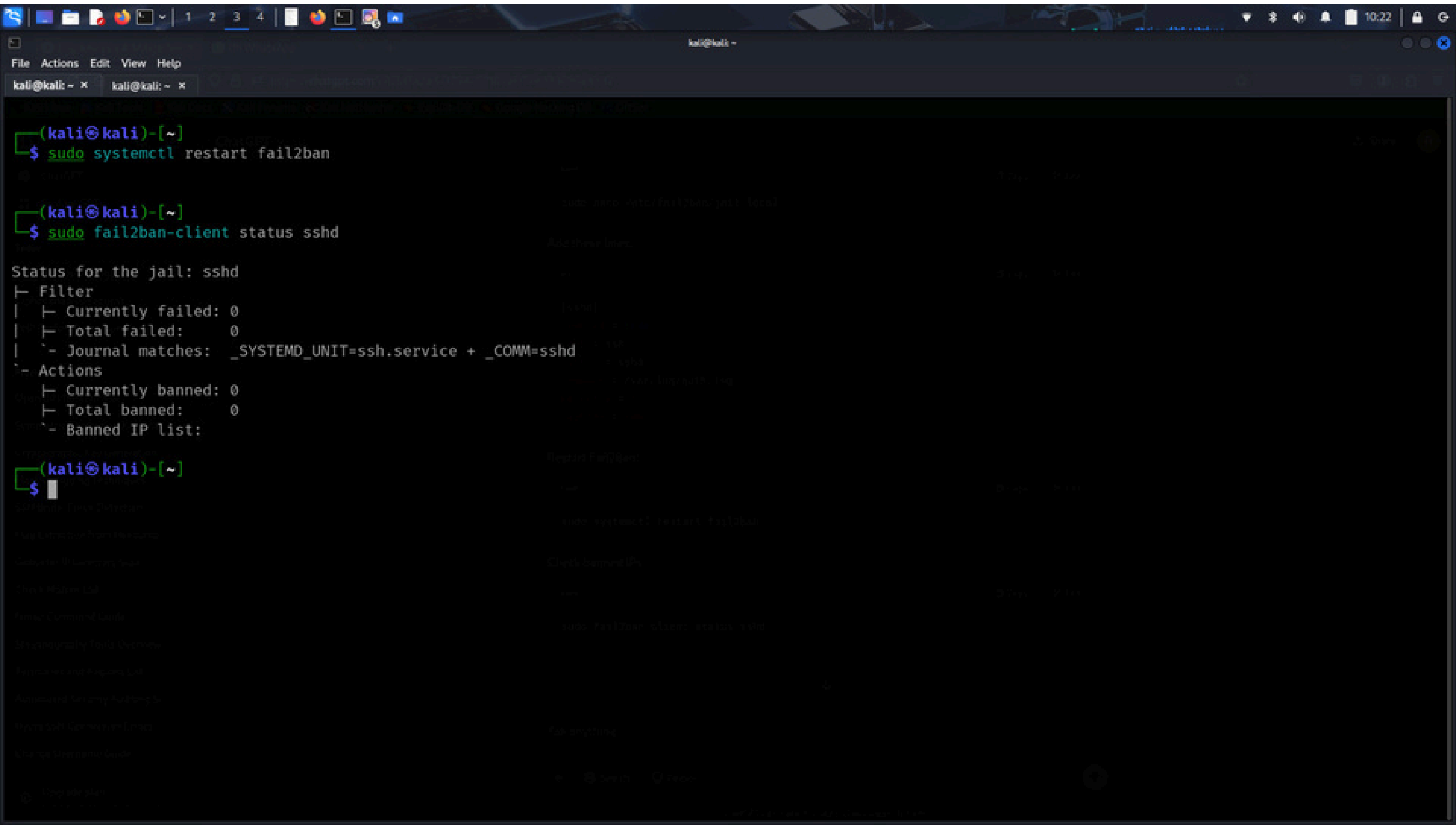


```
[sshd]
enabled = true
port = ssh
filter = sshd
logpath = /var/log/auth.log
maxretry = 5
bantime = 600
```

```
[sshd]

enabled = true

port = ssh

filter = sshd

logpath = /var/log/auth.log

maxretry = 5

bantime = 600
```

Restart Fail2Ban:

```
sudo systemctl restart fail2ban
```



```
┌──(kali㉿kali)-[~]
└─$ sudo systemctl restart fail2ban

┌──(kali㉿kali)-[~]
└─$ sudo fail2ban-client status sshd
Status for the jail: sshd
|- Filter
|  |- Currently failed: 0
|  |- Total failed:     0
|  `- Journal matches:  _SYSTEMD_UNIT=ssh.service + _COMM=sshd
`- Actions
   |- Currently banned: 0
   |- Total banned:     0
   `- Banned IP list:

┌──(kali㉿kali)-[~]
└─$ 
```

Check banned IPs:

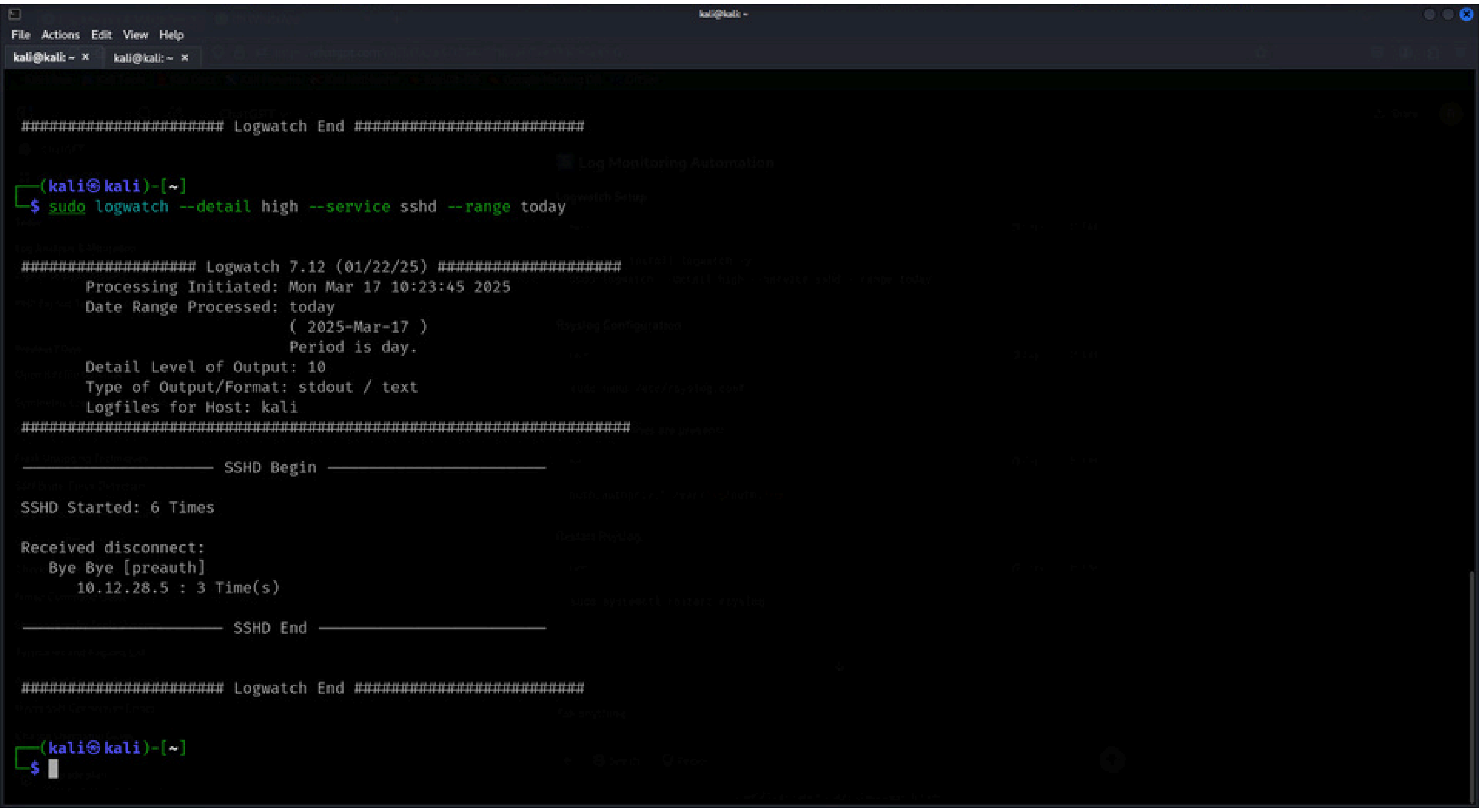
```
sudo fail2ban-client status sshd
```

Log Monitoring Automation

Logwatch Setup

sudo apt install logwatch -y

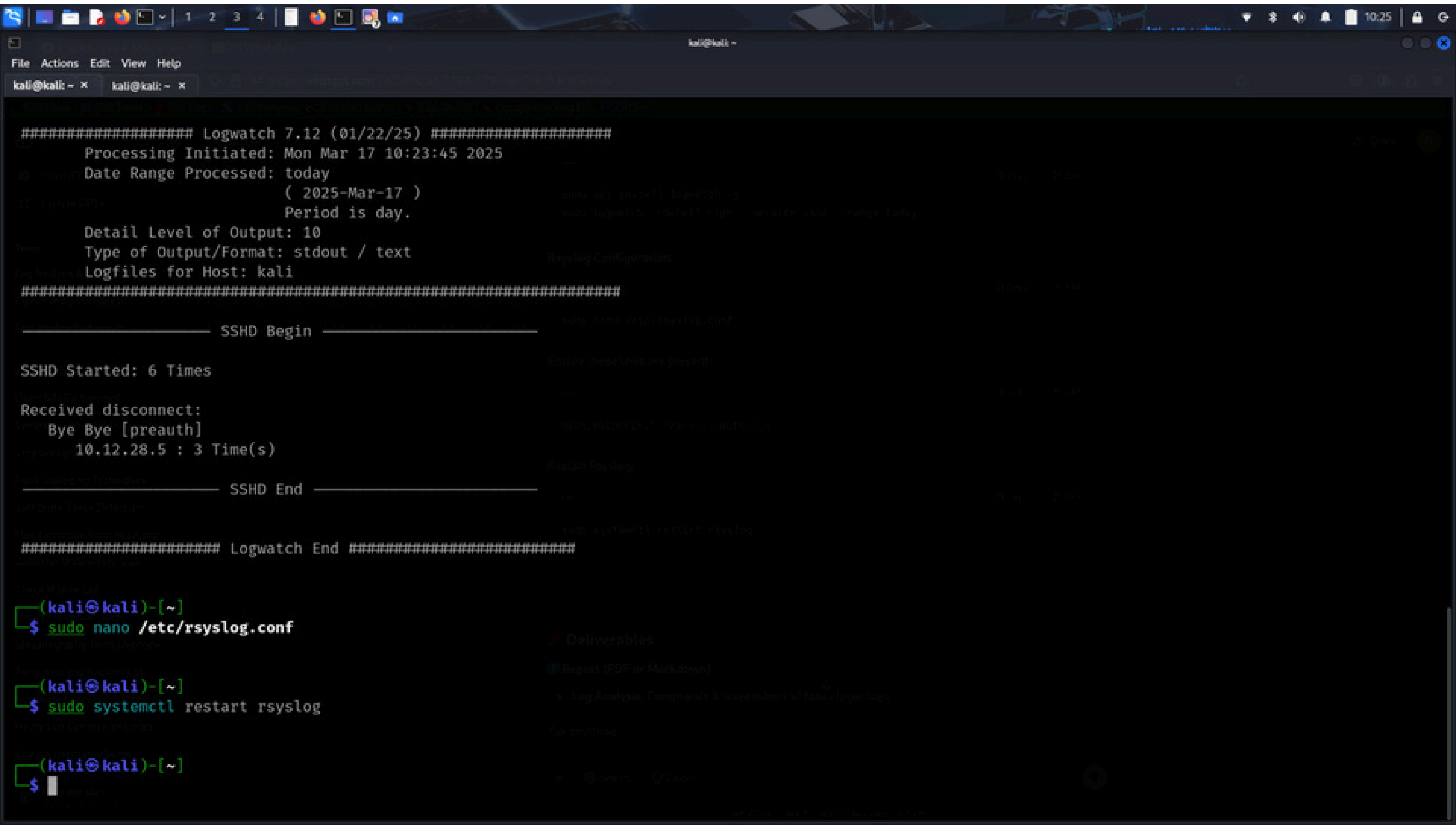
sudo logwatch --detail high --service sshd --range today



```
###################### Logwatch End #########################

┌──(kali㉿kali)-[~]
└─$ sudo logwatch --detail high --service sshd --range today

################### Logwatch 7.12 (01/22/25) ####################
       Processing Initiated: Mon Mar 17 10:23:45 2025
       Date Range Processed: today
                             ( 2025-Mar-17 )
                             Period is day.
       Detail Level of Output: 10
       Type of Output/Format: stdout / text
       Logfiles for Host: kali
##################################################################

 --------------------- SSHD Begin ------------------------

 SSHD Started: 6 Times

 Received disconnect:
    Bye Bye [preauth]
       10.12.28.5 : 3 Time(s)

 ---------------------- SSHD End -------------------------

###################### Logwatch End #########################

┌──(kali㉿kali)-[~]
└─$ 
```

Rsyslog Configuration

sudo nano /etc/rsyslog.conf



```
################### Logwatch 7.12 (01/22/25) ####################
       Processing Initiated: Mon Mar 17 10:23:45 2025
       Date Range Processed: today
                             ( 2025-Mar-17 )
                             Period is day.
       Detail Level of Output: 10
       Type of Output/Format: stdout / text
       Logfiles for Host: kali
##################################################################

 --------------------- SSHD Begin ------------------------

 SSHD Started: 6 Times

 Received disconnect:
    Bye Bye [preauth]
       10.12.28.5 : 3 Time(s)

 ---------------------- SSHD End -------------------------

###################### Logwatch End #########################

┌──(kali㉿kali)-[~]
└─$ sudo nano /etc/rsyslog.conf

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

┌──(kali㉿kali)-[~]
└─$ 
```

Ensure these lines are present:

auth,authpriv.* /var/log/auth.log

Restart Rsyslog:

sudo systemctl restart rsyslog