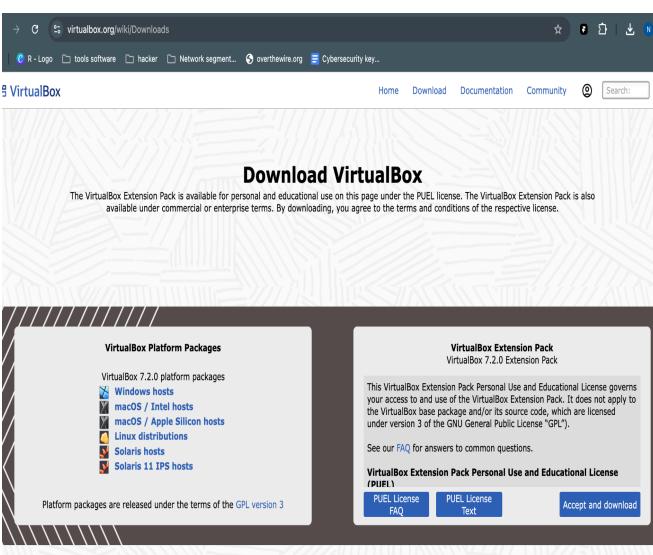


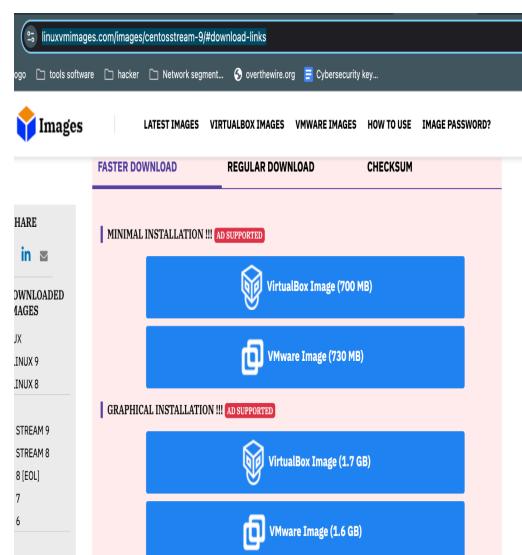
Course End Project

Screenshot

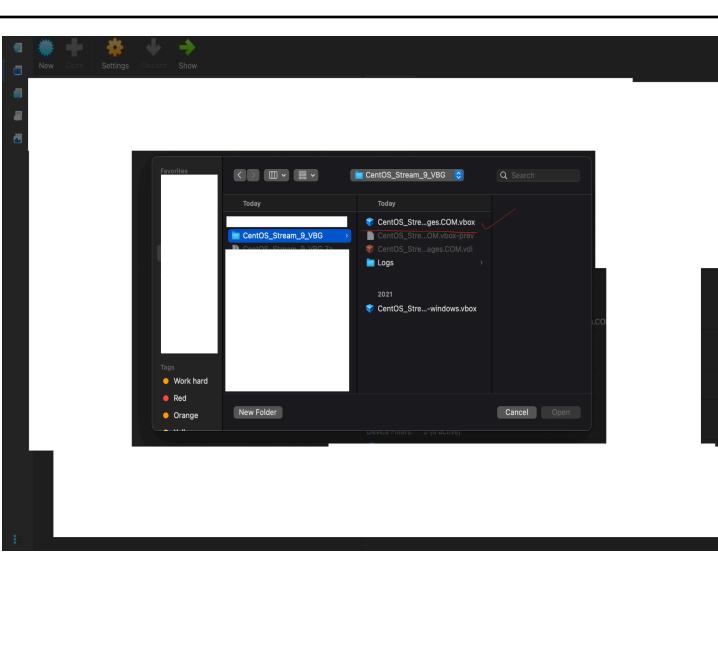
Setup



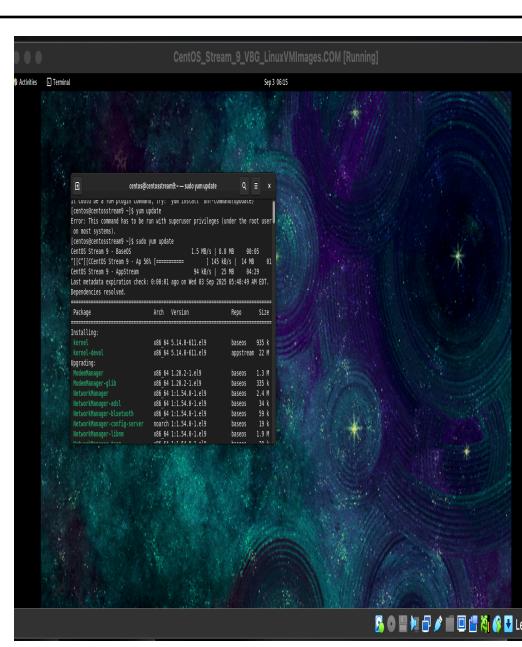
The screenshot shows the VirtualBox download page. It features a sidebar with 'VirtualBox Platform Packages' for various host operating systems and a main content area for the 'VirtualBox Extension Pack'. The extension pack is described as being under the PUEL license. It includes links for 'FAQ', 'PUEL License Text', and a button to 'Accept and download'. Below the sidebar, it says 'Platform packages are released under the terms of the GPL version 3'.



The screenshot shows the linuxvmimages.com website. It has a sidebar with links for HARE, DOWNLOADED IMAGES, and STREAM 9. The main content area is titled 'MINIMAL INSTALLATION !!! AD SUPPORTED' and shows two download options: 'VirtualBox Image (700 MB)' and 'VMware Image (730 MB)'. Below this, it shows 'GRAPHICAL INSTALLATION !!! AD SUPPORTED' with two more download options: 'VirtualBox Image (1.7 GB)' and 'VMware Image (1.6 GB)'.



The screenshot shows a file manager window. A file named 'CentOS_Stream_9_VBG.vbox' is selected and highlighted with a red checkmark. The file is located in a folder named 'CentOS_Stream_ges.COM'. Other files in the folder include 'CentOS_Stream_9_VBG.vmdk', 'Logs', and 'CentOS_Stream_ges.COM.vdi'. The file manager interface includes a toolbar at the top and a sidebar on the left.



The screenshot shows a terminal window with the command 'sudo yum update' running. The output shows several packages being updated, including 'CentOS Stream 9 - BaseOS', 'CentOS Stream 9 - AppStream', and 'CentOS Stream 9 - Extras'. The terminal also displays the message 'Dependencies resolved'.

Honeypot deployment

```
[centos@centosstream9 ~]$ yum install openssh-server
Error: This command has to be run with superuser privileges (under the root user
on most systems).
[centos@centosstream9 ~]$ sudo yum install openssh-server
CentOS Stream 9 - Extras packages      564 B/s | 19 kB     00:34
Package openssh-server-8.7p1-46.el9.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[centos@centosstream9 ~]$ yum sudo install vsftpd
```

```
[centos@centosstream9 ~]$ sudo yum install vsftpd
Last metadata expiration check: 0:01:53 ago on Wed 03 Sep 2025 09:00:44 AM EDT.
Dependencies resolved.
=====
Package           Architecture Version       Repository   Size
=====
Installing:
vsftpd            x86_64      3.0.5-6.el9    appstream   168 k
Transaction Summary
=====
Install 1 Package

Total download size: 168 k
Installed size: 347 k
```

```
[centos@centosstream9 ~]$ yum install httpd
Error: This command has to be run with superuser privileges (under the root user
on most systems).
[centos@centosstream9 ~]$ sudo yum install httpd
Last metadata expiration check: 0:38:51 ago on Wed 03 Sep 2025 09:00:44 AM EDT.
Dependencies resolved.
=====
Package           Architecture Version       Repository   Size
=====
Installing:
httpd            x86_64      2.4.62-7.el9    appstream   46 k
Installing dependencies:
apr              x86_64      1.7.0-12.el9    appstream   123 k
apr-util          x86_64      1.6.1-23.el9    appstream   95 k
apr-util-bdb      x86_64      1.6.1-23.el9    appstream   13 k
centos-logos-httdp noarch     90.8.3.el9     appstream   1.5 M
httpd-core        x86_64      2.4.62-7.el9    appstream   1.5 M
httpd-filesystem  noarch     2.4.62-7.el9    appstream   11 k
httpd-tools        x86_64      2.4.62-7.el9    appstream   80 k
Installing weak dependencies:
apr-util-openssl x86_64      1.6.1-23.el9    appstream   15 k
mod_http2         x86_64      2.0.26-5.el9    appstream   163 k
mod_lua           x86_64      2.4.62-7.el9    appstream   58 k
```

```
#domain=testsite.mydomain.local
<Directory "/var/www/testsite.mydomain.local">
    Options +Indexes
    AllowOverride all
    Require all granted
</Directory>
<VirtualHost *:80>
    DocumentRoot "/var/www/testsite.mydomain.local"
    ServerName "testsite.mydomain.local"
    ServerAdmin "webmaster@mydomain.local.in"
    ErrorLog "logs/testsite.mydomain.local_error_log"
    CustomLog "logs/testsite.mydomain.local_access_log" Combined
</VirtualHost>
```

```
[centos@centosstream9 ~]$ cd /etc/httpd/conf.d
[centos@centosstream9 conf.d]$
```

```
[centos@centosstream9 conf.d]$ sudo vi testsite.mydomain.local.conf
[centos@centosstream9 conf.d]$
```

```
CentOS_Stream_0_VBG_LinuxVMimages.COM [Running]
[centos@centosstream9 conf.d]$ sudo nano testsite.mydomain.local.conf
[centos@centosstream9 conf.d]$ cat testsite.mydomain.local.conf
#domain=testsite.mydomain.local
<Directory '/var/www/testsite.mydomain.local'>
    Options +Indexes
    AllowOverride all
    Require all granted
</Directory>
<VirtualHost *:80>
    DocumentRoot "/var/www/testsite.mydomain.local"
    ServerName "testsite.mydomain.local"
    ServerAdmin "webmaster@mydomain.local.in"
    ErrorLog "logs/testsite.mydomain.local_error_log"
    CustomLog "logs/testsite.mydomain.local_access_log" Combined
</VirtualHost>

[centos@centosstream9 conf.d]$ sudo systemctl start httpd
[centos@centosstream9 conf.d]$
```

```
[centos@centosstream9 ~]$ cd /etc/httpd/conf.d
[centos@centosstream9 conf.d]$ vi testsite.mydomain.local.conf
[centos@centosstream9 conf.d]$ sudo vi testsite.mydomain.local.conf
[centos@centosstream9 conf.d]$ cd /var/www
[centos@centosstream9 www]$ mkdir testsite.mydomain.local
mkdir: cannot create directory 'testsite.mydomain.local': Permission denied
[centos@centosstream9 www]$ sudo mkdir testsite.mydomain.local
[centos@centosstream9 www]$ cd testsite.mydomain.local
[centos@centosstream9 testsite.mydomain.local]$ vi index.html
[centos@centosstream9 testsite.mydomain.local]$ sudo vi index.html
[centos@centosstream9 testsite.mydomain.local]$
```

```

[centos@centosstream9 testsite.mydomain.local]$ ls
index.html reports
[centos@centosstream9 testsite.mydomain.local]$ sudo systemctl start httpd
[centos@centosstream9 testsite.mydomain.local]$ 

```

```

index.html reports
[centos@centosstream9 testsite.mydomain.local]$ sudo systemctl start httpd
[centos@centosstream9 testsite.mydomain.local]$ sudo systemctl enable httpd
Created symlink /etc/systemd/system/multi-user.target.wants/httpd.service → /usr/lib/systemd/system/
httpd.service.
[centos@centosstream9 testsite.mydomain.local]$ firefox http://testsite.mydomain.local

```



```

[centos@centosstream9 testsite.mydomain.local]$ sudo chcon unconfined_u:object_r:httpd_sys_content_t:s0 /reports/
[centos@centosstream9 testsite.mydomain.local]$ 

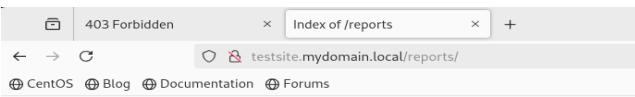
```



```

[centos@centosstream9 www]$ cd testsite.mydomain.local/
[centos@centosstream9 testsite.mydomain.local]$ touch /reports/101.log
touch: cannot touch '/reports/101.log': Permission denied
[centos@centosstream9 testsite.mydomain.local]$ sudo touch /reports/101.log
[centos@centosstream9 testsite.mydomain.local]$ 

```



Index of /reports

Name	Last modified	Size	Description
Parent Directory		-	
101.log	2025-09-04 02:56	0	

Harden SSH Configuration

```

GNU nano 5.6.1
/etc/
# /etc/ssh/sshd_config.d/ which will be automatically included
Include /etc/ssh/sshd_config.d/*.conf

# If you want to change the port on a SELinux system
# SELinux about this change.
# semanage port -a -t ssh_port_t -p tcp #PORTNUM
#
Port 2222
#AddressFamily any
#ListenAddress 0.0.0.0
#ListenAddress ::

#HostKey /etc/ssh/ssh_host_rsa_key
#HostKey /etc/ssh/ssh_host_ecdsa_key
#HostKey /etc/ssh/ssh_host_ed25519_key

# Ciphers and keying
#RekeyLimit default none

```

```

GNU nano 5.6.1
/etc/ssh/sshd_config.d/
#HostKey /etc/ssh/ssh_host_rsa_key
#HostKey /etc/ssh/ssh_host_ecdsa_key
#HostKey /etc/ssh/ssh_host_ed25519_key

# Ciphers and keying
#RekeyLimit default none

# Logging
#SyslogFacility AUTH
#LogLevel INFO

# Authentication:
#LoginGraceTime 2m
PermitRootLogin no
#StrictModes yes
MaxAuthTries 10
#MaxSessions 10

^G Help      ^Q Write Out  ^W Where Is   ^K Cut
^X Exit      ^R Read File  ^L Replace    ^U Paste

```

```

D--deleteall is required
[centos@centosstream9 testsite.mydomain.local]$ sudo semanage port -l
SELinux Port Type          Proto  Port Number
 afs3_callback_port_t       tcp    7001
 afs3_callback_port_t       udp    7001
 afs_bos_port_t             udp    7007
 afs_fs_port_t              tcp    2040
 afs_fs_port_t              udp    7000, 7005
 afs_ka_port_t              udp    7004
 afs_pt_port_t              tcp    7002
 afs_pt_port_t              udp    7002
 afs_vl_port_t              udp    7003
 agentx_port_t              tcp    705

```

soundd_port_t	tcp	8000, 9433, 16001
spamd_port_t	tcp	783, 10026, 10027
speech_port_t	tcp	8036
squid_port_t	tcp	3128, 3401, 4827
squid_port_t	udp	3401, 4827
ssdp_port_t	tcp	1900
ssdp_port_t	udp	1900
ssh_port_t	tcp	2222, 22
stateds_port_t	udp	8125
svn_port_t	tcp	3690
svn_port_t	udp	3690
svrloc_port_t	tcp	427

```

● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled;)
   Active: active (running) since Thu 2025-09-04 05:02:09 EDT; 9s
     Docs: man:sshd(8)
           man:sshd_config(5)
   Main PID: 23654 (sshd)
      Tasks: 1 (limit: 10516)
     Memory: 2.1M (peak: 2.5M)
        CPU: 14ms
       CGroup: /system.slice/sshd.service
               └─23654 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-10>

Sep 04 05:02:09 centosstream9.linuxvmimages.local systemd[1]: Start

```

```

[centos@centosstream9 testsite.mydomain.local]$ sudo firewall-cm
d --permanent --zone=public --add-port=2222/tcp
success
[centos@centosstream9 testsite.mydomain.local]$ 

```

```

centos@centosstream9:/var/www/testsite.mydomain.local$ sudo firewall-cm
d --reload
success
[centos@centosstream9 testsite.mydomain.local]$ 

```

```

[centos@centosstream9 ~]$ sudo adduser user1
[centos@centosstream9 ~]$ sudo passwd user1
Changing password for user user1.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
Sorry, passwords do not match.
passwd: Authentication token manipulation error
[centos@centosstream9 ~]$ sudo passwd user1
Changing password for user user1.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
[centos@centosstream9 ~]$ sudo adduser user2
[centos@centosstream9 ~]$ sudo passwd user2
Changing password for user user2.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
[centos@centosstream9 ~]$ 

```

```

passwd: all authentication tokens updated successfully.
[centos@centosstream9 ~]$ sudo nano /etc/ssh/sshd_config
[centos@centosstream9 ~]$ sudo cat /etc/ssh/sshd_config

```

```

# and KbdInteractiveAuthentication
# WARNING: 'UsePAM no' is not supported by some distributions.
# problems.
#UsePAM no
AllowUsers user1 user2
#AllowAgentForwarding yes
#AllowTcpForwarding yes
#GatewayPorts no

```

```

[centos@centosstream9 ~]$ sudo systemctl restart sshd
[centos@centosstream9 ~]$ 

```

```

[centos@centosstream9 ~]$ ssh user1@testsite.mydomain.local -p 2222
The authenticity of host '[testsite.mydomain.local]:2222 ([127.0.0.1]:2222)' can't be established.
ED25519 key fingerprint is SHA256:CWCMdUrZadeJ8s3ihT4rvs05cwAOSUJ0z8DTPhmcW8U.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '[testsite.mydomain.local]:2222' (ED25519) to the list of known hosts.
+++++
User Name: centos
Password: centos (sudo su -)
user1@testsite.mydomain.local: Permission denied (publickey,gssapi-keyex,gssapi-with-mic).
[centos@centosstream9 ~]$ 

```

```
#IgnoreRhosts yes
# To disable tunneled clear text passwords, change to no here!
#PasswordAuthentication no
PermitEmptyPasswords no

[ Wrote 131 lines ]
^G Help      ^Q Write Out  ^W Where Is  ^K Cut        ^T Execute  ^C Location  M-U Undo
^X Exit      ^R Read File  ^P Replace   ^U Paste     ^J Justify  Go To Line M-E Redo
```

```
[centos@centosstream9 ~]$ sudo systemctl restart sshd
[centos@centosstream9 ~]$
```

```
Warning: Permanently added '[testsite.mydomain.local]:2222' (ED25519) to the list of known hosts.
+-----+
User Name: centos
Password: centos (sudo su -)
user1@testsite.mydomain.local: Permission denied (publickey,gssapi-keyex,gssapi-with-mic).
[centos@centosstream9 ~]$ sudo nano /etc/ssh/sshd_config
[centos@centosstream9 ~]$ sudo systemctl restart sshd
[centos@centosstream9 ~]$ ssh user1@testsite.mydomain.local -p 2222
+-----+
User Name: centos
Password: centos (sudo su -)
user1@testsite.mydomain.local's password:
+-----+
User Name: centos
Password: centos (sudo su -)
[centos@centosstream9 ~]$
```

```
[sudo] password for user1.
user1 is not in the sudoers file. This incident will be reported.
[centos@centosstream9 ~]$ exit
logout
Connection to testsite.mydomain.local closed.
[centos@centosstream9 ~]$ sudo adduser userNotAllowed
[centos@centosstream9 ~]$ sudo passwd userNotAllowed
Changing password for user userNotAllowed.
New password:
BAD PASSWORD: The password contains the user name in some form
Retype new password:
passwd: all authentication tokens updated successfully.
[centos@centosstream9 ~]$ ssh userNotAllowed@testsite.mydomain.local -p 2222
+-----+
User Name: centos
Password: centos (sudo su -)
userNotAllowed@testsite.mydomain.local's password:
Permission denied, please try again.
userNotAllowed@testsite.mydomain.local's password:
```

```
or user root
Sep 4 07:52:14 centosstream9 sshd[4709]: User userNotAllowed from 127.0.0.1 not allowed because not listed in AllowUsers
Sep 4 07:52:19 centosstream9 unix_chkpwd[4713]: password check failed for user (userNotAllowed)
Sep 4 07:52:19 centosstream9 sshd[4709]: pam_unix(sshd:auth): authentication failure; logname= uid=0 euid=0 tty=ssh ruser= rhost=127.0.0.1 user=userNotAllowed
Sep 4 07:52:21 centosstream9 sshd[4709]: Failed password for invalid user userNotAllowed from 127.0.0.1 port 51274 ssh2
Sep 4 08:05:42 centosstream9 gdm-password[4741]: gkr-pam: unlocked login keyring
Sep 4 08:06:12 centosstream9 sudo[4775]: centos : TTY=pts/0 ; PWD=/home/centos ; USER=root ; COMMAND=/bin/cat /var/log/secure
Sep 4 08:06:12 centosstream9 sudo[4775]: pam_unix(sudo:session): session opened for user root(uid=0) by centos(uid=1000)
[centos@centosstream9 ~]$
```

Automated IP Blocking

```
[centos@centosstream9 testsite.mydomain.local]$ sudo yum install epel-release
Last metadata expiration check: 0:41:50 ago on Thu 04 Sep 2025 05:10:22 AM EDT.
Dependencies resolved.
=====
 Package           Arch      Version       Repository      Size
=====
 Installing:
  epel-release     noarch    9-7.el9      extras-common   19 k
 Installing weak dependencies:
  epel-next-release noarch    9-7.el9      extras-common   8.1 k
Transaction Summary
=====
 Install 2 Packages
Total download size: 27 k
```

```
Complete!
[centos@centosstream9 ~]$ sudo systemctl start fail2ban
[centos@centosstream9 ~]$ sudo systemctl enable fail2ban
Created symlink /etc/systemd/system/multi-user.target.wants/fail2ban.service → /usr/lib/systemd/system/fail2ban.service.
[centos@centosstream9 ~]$
```

```
Activities Terminal
[centos@centosstream9 ~]$ sudo nano /etc/fail2ban/jail.local
GNU nano 5.6.1
[sshd]
enabled = true
port = 2222
filter = sshd
logpath = /var/log/secure
maxretry = 3
bantime = 3600
```

```
cat: /etc/fail2ban/jail.local: No such file or directory
[centos@centosstream9 ~]$ sudo nano /etc/fail2ban/jail.local
[centos@centosstream9 ~]$ sudo systemctl start fail2ban
[centos@centosstream9 ~]$ sudo systemctl enable fail2ban
[centos@centosstream9 ~]$
```

```
Sorry, but the jail sshd does not exist.
[centos@centosstream9 ~]$ sudo cat /etc/fail2ban/jail.local
[sshd]
enabled = true
port = 2222
filter = sshd
logpath = /var/log/secure
maxretry = 3
bantime = 3600
[centos@centosstream9 ~]$ sudo systemctl restart fail2ban
[centos@centosstream9 ~]$ sudo fail2ban-client status sshd
Status for the jail: sshd
|- Filter
| |- Currently failed: 0
| |- Total failed: 0
| |- Journal matches: _SYSTEMD_UNIT=sshd.service + _COMM=sshd + _COMM=sshd-session
- Actions
  |- Currently banned: 0
  |- Total banned: 0
  |- Banned IP list:
[centos@centosstream9 ~]$
```

```
Only firewalld.service could not be found.
[centos@centosstream9 ~]$ sudo yum install firewalld -y
Last metadata expiration check: 4:16:53 ago on Fri 05 Sep 2025 06:52:28 AM EDT.
Package firewalld-1.3.4-15.el9.noarch is already installed.
Dependencies resolved.
Nothing to do.
Complete!
```

```
[centos@centosstream9 ~]$ sudo systemctl enable firewalld
[centos@centosstream9 ~]$ sudo systemctl start firewalld
[centos@centosstream9 ~]$
```

```
[centos@centosstream9 ~]$ sudo systemctl enable firewalld
[centos@centosstream9 ~]$ sudo systemctl start firewalld
[centos@centosstream9 ~]$
```

```
[centos@centosstream9 ~]$ sudo nano /etc/fail2ban/jail.local
[centos@centosstream9 ~]$
```

```
[centos@centosstream9 ~]$ sudo nano /etc/fail2ban/jail.local
[centos@centosstream9 ~]$ cat /etc/fail2ban/jail.local
[sshd]
enabled = true
port = 2222
filter = sshd
logpath = /var/log/secure
maxretry = 3
bantime = 3600
action = firewalld-ipset
[centos@centosstream9 ~]$
```

```
action = firewallcmd-ipset  
[centos@centosstream9 ~]$ sudo systemctl restart firewalld  
[centos@centosstream9 ~]$
```

```
[root@centosstream9 ~]# sudo fail2ban-client status
Status
|- Number of jail:      1
|- Jail list: sshd
[centos@centosstream9 ~]$
```

```
5242 /usr/bin/python3 -s /usr/sbin/firewalld --nofork --noplug
Sep 05 11:24:07 centosstream9.linuxvmimages.local systemd[1]: Starting firewalld ->
Sep 05 11:24:08 centosstream9.linuxvmimages.local systemd[1]: Started firewalld ->
[centos@centosstream9 ~]$ sudo fail2ban-client status
Status
|- Number of jail:      1
`- Jail list:  sshd
[centos@centosstream9 ~]$ sudo fail2ban-client status sshd
Status for the jail: sshd
|- Filter
| |- Currently failed: 0
| |- Total failed:      0
| ` Journal matches:   _SYSTEMD_UNIT=sshd.service + _COMM=sshd + _COMM=sshd-session
n
`- Actions
  |- Currently banned: 0
  |- Total banned:      0
  `- Banned IP list:
[centos@centosstream9 ~]$
```

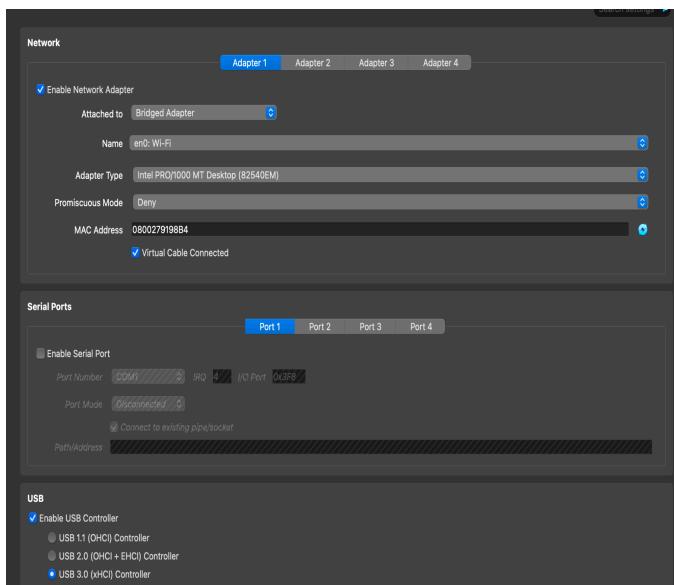
```
- Banned IP list:  
[centos@centosstream9 ~]$ ssh -p 2222 user1@testsite.mydomain.local  
+-----+  
LINUXVMIMAGES.COM  
+-----+  
User Name: centos  
Password: centos (sudo su -)  
user1@testsite.mydomain.local's password:  
Permission denied, please try again.  
user1@testsite.mydomain.local's password:  
Permission denied, please try again.  
user1@testsite.mydomain.local's password:  
Received disconnect from 127.0.0.1 port 2222:2: Too many authentication failures  
Disconnected from 127.0.0.1 port 2222  
[centos@centosstream9 ~]$
```

```
sshd'  
025-09-05 11:24:08,308 fail2ban.jail [3272]: INFO Jail 'sshd' uses sy  
temd {}  
025-09-05 11:24:08,308 fail2ban.jail [3272]: INFO Initiated 'systemd'  
backend  
025-09-05 11:24:08,309 fail2ban.filter [3272]: INFO maxLines: 1  
025-09-05 11:24:08,325 fail2ban.filtersystemd [3272]: INFO [sshd] Added journa  
l match for: 'SYSTEMD UNIT:sshd.service + _COMM:sshd + _COMM:sshd-session'  
025-09-05 11:24:08,325 fail2ban.filter [3272]: INFO maxRetry: 3  
025-09-05 11:24:08,325 fail2ban.filter [3272]: INFO findtime: 600  
025-09-05 11:24:08,325 fail2ban.actions [3272]: INFO banTime: 3600  
025-09-05 11:24:08,325 fail2ban.filter [3272]: INFO encoding: UTF-8  
025-09-05 11:24:08,327 fail2ban.filtersystemd [3272]: INFO [sshd] Jail is in o  
peration now (process new journal entries)  
025-09-05 11:24:08,329 fail2ban.jail [3272]: INFO Jail 'sshd' started  
025-09-05 11:42:30,237 fail2ban.filter [3272]: INFO [sshd] Ignore 127.0  
0.1 by ignoreself rule  
025-09-05 11:42:34,118 fail2ban.filter [3272]: INFO [sshd] Ignore 127.0  
0.1 by ignoreself rule  
025-09-05 11:42:40,105 fail2ban.filter [3272]: INFO [sshd] Ignore 127.0  
0.1 by ignoreself rule  
025-09-05 11:42:41,368 fail2ban.filter [3272]: INFO [sshd] Ignore 127.0  
0.1 by ignoreself rule  
centos@centosstream9 ~]$ █
```

```
[centos@centosstream9 ~]$ sudo firewall-cmd --list-all
public (active)
  target: default
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpcv6-client ssh
  ports: 2222/tcp
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
[centos@centosstream9 ~]$ sudo firewall-cmd --list-ips
usage: 'firewall-cmd --help' for usage information or see firewall-cmd(1) man page
firewall-cmd: error: unrecognized arguments: --list-ips
[centos@centosstream9 ~]$ sudo firewall-cmd --list-all | grep banned
[centos@centosstream9 ~]$ sudo tail -n 50 /var/log/fail2ban.log
```

```
[centos@centosstream9 ~]$ cat /var/log/fail2ban.log
cat: /var/log/fail2ban.log: Permission denied
[centos@centosstream9 ~]$ sudo cat /var/log/fail2ban.log
2025-09-04 06:09:26,818 fail2ban.server      [4042]: INFO  -----
2025-09-04 06:09:26,818 fail2ban.server      [4042]: INFO  Starting Fail2ban v
1.1.0
2025-09-04 06:09:26,819 fail2ban.observer    [4042]: INFO  Observer start...
2025-09-04 06:09:26,824 fail2ban.database    [4042]: INFO  Connected to fail2b
an persistent database '/var/lib/fail2ban/fail2ban.sqlite3'
2025-09-04 06:09:26,825 fail2ban.database    [4042]: WARNING New database create
d. Version '4'
2025-09-04 06:21:53,449 fail2ban.transmitter  [4042]: ERROR  Command ['status',
'sshd'] has failed. Received UnknownJailException('sshd')
2025-09-04 06:40:32,834 fail2ban.server      [4042]: INFO  Shutdown in progres
s...
2025-09-04 06:40:32,835 fail2ban.observer    [4042]: INFO  Observer stop ... t
ry to end queue 5 seconds
2025-09-04 06:40:32,858 fail2ban.observer    [4042]: INFO  Observer stopped, 0
events remaining.
2025-09-04 06:40:32,917 fail2ban.server      [4042]: INFO  Stopping all jails
2025-09-04 06:40:32,917 fail2ban.database    [4042]: INFO  Connection to databa
se closed.
2025-09-04 06:40:32,917 fail2ban.server      [4042]: INFO  Exiting Fail2ban
```

Manual Attack



```
[centos@centosstream9 ~]$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group defa
ult qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inetc0 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP
group default qlen 1000
    link/ether 08:00:27:53:e7:0d brd ff:ff:ff:ff:ff:ff
    inet 192.168.0.184/24 brd 192.168.0.255 scope global dynamic noprefixroute
        enp0s3
        valid_lft 6653sec preferred_lft 6653sec
    inetc0 fe80::a00:27ff:fe53:e70c/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
[centos@centosstream9 ~]$
```

```

Command Prompt
Microsoft Windows [Version 10.0.19045.6216]
(c) Microsoft Corporation. All rights reserved.

C:\Users\vboxuser>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

Connection-specific DNS Suffix . :
Link-local IPv6 Address . . . . . : fe80::eaef4:3fac:6a5c:a1c3%8
IPv4 Address . . . . . : 192.168.0.28
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.0.1

C:\Users\vboxuser>

```

```

Command Prompt
Microsoft Windows [Version 10.0.19045.6216]
(c) Microsoft Corporation. All rights reserved.

C:\Users\vboxuser>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

Connection-specific DNS Suffix . :
Link-local IPv6 Address . . . . . : fe80::eaef4:3fac:6a5c:a1c3%8
IPv4 Address . . . . . : 192.168.0.28
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.0.1

C:\Users\vboxuser>ping 192.168.0.184

Pinging 192.168.0.184 with 32 bytes of data:
Reply from 192.168.0.184: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.0.184:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\Users\vboxuser>

```

```

[centos@centosstream9 ~]$ ping 192.168.0.1
PING 192.168.0.1 (192.168.0.1) 56(84) bytes of dat
a.
64 bytes from 192.168.0.1: icmp_seq=1 ttl=64 time=
9.24 ms
64 bytes from 192.168.0.1: icmp_seq=2 ttl=64 time=
9.05 ms
64 bytes from 192.168.0.1: icmp_seq=3 ttl=64 time=
9.27 ms
64 bytes from 192.168.0.1: icmp_seq=4 ttl=64 time=
2.18 ms
64 bytes from 192.168.0.1: icmp_seq=5 ttl=64 time=
2.12 ms

```

```

Command Prompt
reply from 192.168.0.184: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.0.184:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\Users\vboxuser>ssh user1@192.168.0.184 -p 2222
The authenticity of host '[192.168.0.184]:2222' can't be established.
ED25519 key fingerprint is SHA256:CNCMdUz2ade38s3ht4rwso5cuAOStU0z8OTHpmcW8U.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '[192.168.0.184]:2222' (ED25519) to the list of known hosts.
+-----+
LINUXXWINIMAGES.COM
+-----+
User Name: centos
Password: centos (sudo su -)
user1@192.168.0.184's password:
Permission denied, please try again.
user1@192.168.0.184's password:
Permission denied, please try again.
user1@192.168.0.184's password:
Received disconnect from 192.168.0.184 port 2222:2: Too many authentication failures
Disconnected from 192.168.0.184 port 2222

C:\Users\vboxuser>

```

```
[centos@centosstream9 ~]$ sudo fail2ban-client status sshd
Status for the jail: sshd
|- Filter
| |- Currently failed: 1
| |- Total failed: 4
| ` - Journal matches: _SYSTEMD_UNIT=sshd.service
+ _COMM=sshd + _COMM=sshd-session
`- Actions
 |- Currently banned: 1
 |- Total banned: 1
 ` - Banned IP list: 192.168.0.28
[centos@centosstream9 ~]$
```

```
C:\Users\boxuser>ssh user1@192.168.0.184 -p 2222
ssh: connect to host 192.168.0.184 port 2222: Connection timed out
```

Pen Testing using Kali and Tor

```
(kalimainusersns@kali)-[~]
$ proxychains

Usage: proxychains -q -f config_file program_name [arguments]
      -q makes proxychains quiet - this overrides the config setting
      -f allows one to manually specify a configfile to use
      for example : proxychains telnet somehost.com
More help in README file

(kalimainusersns@kali)-[~]
```

```
(kalimainusersns@kali)-[~]
$ sudo apt install tor
Installing:
  tor

Installing dependencies:
  libtorsocks  tor-geoipdb  torsocks

Suggested packages:
  mixmaster  torbrowser-launcher  apparmor-utils  nyx  obfs4proxy

Summary:
  Upgrading: 0, Installing: 4, Removing: 0, Not Upgrading: 943
  Download size: 4,563 kB
  Space needed: 26.6 MB / 8,635 MB available

Continue? [Y/n] yes
Get:2 http://kali.download/kali kali-rolling/main amd64 tor amd64 0.4.8.16-1
```

```
(kalimainusersns@kali)-[~]
$ sudo systemctl enable tor
Synchronizing state of tor.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable tor
Created symlink '/etc/systemd/system/multi-user.target.wants/tor.service' → '/usr/lib/systemd/system/tor.service'.

```

```
(kalimainusersns@kali)-[~]
$ sudo apt install proxychains
Installing:
  proxychains

Installing dependencies:
  libproxychains3

Summary:
  Upgrading: 0, Installing: 2, Removing: 0, Not Upgrading: 943
  Download size: 22.7 kB
  Space needed: 74.8 kB / 8,608 MB available

Continue? [Y/n] y
Get:1 http://http.kali.org/kali kali-rolling/main amd64 libproxychains3 amd64 3.1-9+b2 [13.6 kB]
Get:2 http://kali.download/kali kali-rolling/main amd64 proxychains all 3.1-9 [9,140 B]
Fetched 22.7 kB in 1s (20.0 kB/s)
Selecting previously unselected package libproxychains3:amd64.
(Reading database ... 411997 files and directories currently installed.)
Preparing to unpack .../libproxychains3_3.1-9+b2_amd64.deb ...
Unpacking libproxychains3:amd64 (3.1-9+b2) ...
Selecting previously unselected package proxychains.
Preparing to unpack .../proxychains_3.1-9_all.deb ...
```

```
(kalimainusersns@kali)-[~]
$ sudo nano /etc/proxychains.conf

(kalimainusersns@kali)-[~]
$ sudo cat /etc/proxychains.conf
# proxychains.conf  VER 3.1
#
#      HTTP  SOCKS4  SOCKS5 tunneling proxifier with DNS
```

```
tcp_connect_time_out 8000

# ProxyList format
#   type host port [user pass]
#   (values separated by 'tab' or 'blank')
#
#
# Examples:
#
#   socks5 192.168.67.78 1080 lamere secret
#   http   192.168.89.3 8080 justu hidden
#   socks4 192.168.1.49 1080
#   http   192.168.39.93 8080
#
#
# proxy types: http, socks4, socks5
#   ( auth types supported: "basic"-http "user/pass"-socks )
#
[ProxyList]
# add proxy here ...
# meanwhile
# defaults set to "tor"
socks4 127.0.0.1 9050
```

```
0       60572    26512/tor
(kalimainusersns@kali)-[~]
$ proxychains curl https://check.torproject.org/
[proxychains] config file found: /etc/proxychains.conf
[proxychains] preloading /usr/lib/x86_64-linux-gnu/libproxychains.so.4
[proxychains] DLL init: proxychains-ng 4.17
[proxychains] Strict chain ... 127.0.0.1:9050 ... check.torproject.org:44
3 ... OK
<!doctype html>
<html lang="en_US">
<head>
<meta charset="utf-8" />
<meta name="viewport" content="width=device-width, initial-scale=1.0" />
<title>
  Congratulations. This browser is configured to use Tor.
</title>
<link rel="icon" type="image/x-icon" href="/torcheck/img/tor-not.png" />
<style>
  html { height: 100%; }
```

```
(kalimainusersns@kali)-[~]
$ sudo gunzip /usr/share/wordlists/rockyou.txt.gz
(kalimainusersns@kali)-[~]
```

```
kalimainusersns@kali:-
File Actions Edit View Help
(kalimainusersns@kali)-[~]
$ nano ~/usernames.txt

(kalimainusersns@kali)-[~]
$ cat ~/usernames.txt
root
admin
kali

(kalimainusersns@kali)-[~]
$
```

```
centos@192.168.0.184's password:
(kalimainusersns@kali)-[~]
$ hydra -L usernames.txt -P /usr/share/wordlists/rockyou.txt ssh://192.168.0.184 -s 2222 -t 4

Hydra v9.5 (c) 2023 by van Hauser/THC & David Maciejak - Please do not use in
military or secret service organizations, or for illegal purposes (this is n
on-binding, these *** ignore laws and ethics anyway).

Hydra (https://github.com/vanhauser-thc/thc-hydra) starting at 2025-09-08 02:
29:25
[DATA] max 4 tasks per 1 server, overall 4 tasks, 43033197 login tries (l:3/p
:14344399), ~10758300 tries per task
[DATA] attacking ssh://192.168.0.184:2222/
[STATUS] 12.00 tries/min, 12 tries in 00:01h, 43033185 to do in 59768:19h, 4
active
[ERROR] all children were disabled due to too many connection errors
0 of 1 target completed, 0 valid password found
[INFO] Writing restore file because 2 server scans could not be completed
[ERROR] 1 target was disabled because of too many errors
[ERROR] 1 targets did not complete
Hydra (https://github.com/vanhauser-thc/thc-hydra) finished at 2025-09-08 02:
31:33
(kalimainusersns@kali)-[~]
```

```
[centos@centosstream9 ~]$ sudo tail -f /var/log/secure
Sep 8 02:29:49 centosstream9 unix_chkpwd[3302]: password check
failed for user (root)
Sep 8 02:29:49 centosstream9 sshd[3293]: pam_unix(sshd:auth): a
uthentication failure; logname= uid=0 euid=0 tty=ssh ruser= rhos
t=192.168.0.209 user=root
Sep 8 02:29:49 centosstream9 sshd[3294]: pam_unix(sshd:auth): a
uthentication failure; logname= uid=0 euid=0 tty=ssh ruser= rhos
t=192.168.0.209 user=root
Sep 8 02:29:49 centosstream9 unix_chkpwd[3304]: password check
failed for user (root)
Sep 8 02:29:49 centosstream9 sshd[3296]: pam_unix(sshd:auth): a
uthentication failure; logname= uid=0 euid=0 tty=ssh ruser= rhos
t=192.168.0.209 user=root
Sep 8 02:29:49 centosstream9 unix_chkpwd[3304]: password check
failed for user (root)
Sep 8 02:29:49 centosstream9 sshd[3296]: pam_unix(sshd:auth): a
uthentication failure; logname= uid=0 euid=0 tty=ssh ruser= rhos
t=192.168.0.209 user=root
Sep 8 02:29:51 centosstream9 sshd[3295]: Failed password for in
valid user root from 192.168.0.209 port 44474 ssh2
Sep 8 02:29:51 centosstream9 sshd[3293]: Failed password for in
valid user root from 192.168.0.209 port 44466 ssh2
Sep 8 02:29:51 centosstream9 sshd[3294]: Failed password for in
valid user root from 192.168.0.209 port 44472 ssh2
Sep 8 02:29:51 centosstream9 sshd[3296]: Failed password for in
valid user root from 192.168.0.209 port 44476 ssh2
Sep 8 02:30:22 centosstream9 sudo[3283]: pam_unix(sudo:session)
: session closed for user root
Sep 8 02:30:26 centosstream9 sudo[3328]: centos : TTY=pts/0 ;
PWD=/home/centos ; USER=root ; COMMAND=/bin/tail -f /var/log/sec
ure
Sep 8 02:30:26 centosstream9 sudo[3328]: pam_unix(sudo:session)
: session opened for user root(uid=0) by centos(uid=1000)
^C
```

```
[centos@centosstream9 ~]$ sudo journalctl -u sshd -f
sudo journalctl -u fail2ban -f
Sep 08 02:29:49 centosstream9.linuxvmimages.local sshd[3295]: pa
m_unix(sshd:auth): authentication failure; logname= uid=0 euid=0
tty=ssh ruser= rhost=192.168.0.209 user=root
Sep 08 02:29:49 centosstream9.linuxvmimages.local sshd[3296]: Us
er root from 192.168.0.209 not allowed because not listed in All
owUsers
Sep 08 02:29:49 centosstream9.linuxvmimages.local sshd[3295]: pa
m_unix(sshd:auth): authentication failure; logname= uid=0 euid=0
tty=ssh ruser= rhost=192.168.0.209 user=root
Sep 08 02:29:49 centosstream9.linuxvmimages.local sshd[3296]: Us
er root from 192.168.0.209 not allowed because not listed in All
owUsers
Sep 08 02:29:49 centosstream9.linuxvmimages.local unix_chkpwd[33
02]: password check failed for user (root)
Sep 08 02:29:49 centosstream9.linuxvmimages.local sshd[3293]: pa
m_unix(sshd:auth): authentication failure; logname= uid=0 euid=0
tty=ssh ruser= rhost=192.168.0.209 user=root
Sep 08 02:29:49 centosstream9.linuxvmimages.local sshd[3294]: pa
m_unix(sshd:auth): authentication failure; logname= uid=0 euid=0
tty=ssh ruser= rhost=192.168.0.209 user=root
Sep 08 02:29:49 centosstream9.linuxvmimages.local sshd[3295]: Fa
iled password for invalid user root from 192.168.0.209 port 444
74 ssh2
Sep 08 02:29:51 centosstream9.linuxvmimages.local sshd[3293]: Fa
iled password for invalid user root from 192.168.0.209 port 4446
6 ssh2
Sep 08 02:29:51 centosstream9.linuxvmimages.local sshd[3294]: Fa
iled password for invalid user root from 192.168.0.209 port 4447
2 ssh2
Sep 08 02:29:51 centosstream9.linuxvmimages.local sshd[3295]: Fa
iled password for invalid user root from 192.168.0.209 port 4447
6 ssh2
Sep 08 02:29:51 centosstream9.linuxvmimages.local sshd[3296]: Fa
iled password for invalid user root from 192.168.0.209 port 4447
8 ssh2
```

```
sudo journalctl -u fail2ban -f
Sep 08 02:29:49 centosstream9.linuxvmimages.local sshd[3295]: pa
m_unix(sshd:auth): authentication failure; logname= uid=0 euid=0
tty=ssh ruser= rhost=192.168.0.209 user=root
Sep 08 02:29:49 centosstream9.linuxvmimages.local sshd[3296]: Us
er root from 192.168.0.209 not allowed because not listed in All
owUsers
Sep 08 02:29:49 centosstream9.linuxvmimages.local unix_chkpwd[33
02]: password check failed for user (root)
Sep 08 02:29:49 centosstream9.linuxvmimages.local sshd[3293]: pa
m_unix(sshd:auth): authentication failure; logname= uid=0 euid=0
tty=ssh ruser= rhost=192.168.0.209 user=root
Sep 08 02:29:49 centosstream9.linuxvmimages.local sshd[3294]: pa
m_unix(sshd:auth): authentication failure; logname= uid=0 euid=0
tty=ssh ruser= rhost=192.168.0.209 user=root
Sep 08 02:29:49 centosstream9.linuxvmimages.local sshd[3295]: Fa
iled password for invalid user root from 192.168.0.209 port 4447
4 ssh2
Sep 08 02:29:51 centosstream9.linuxvmimages.local sshd[3293]: Fa
iled password for invalid user root from 192.168.0.209 port 4446
6 ssh2
Sep 08 02:29:51 centosstream9.linuxvmimages.local sshd[3294]: Fa
iled password for invalid user root from 192.168.0.209 port 4447
2 ssh2
Sep 08 02:29:51 centosstream9.linuxvmimages.local sshd[3295]: Fa
iled password for invalid user root from 192.168.0.209 port 4447
6 ssh2
```

```
[centos@centosstream9 ~]$ sudo cat sudo tail /var/log/fail2ban.log
cat: sudo: No such file or directory
cat: tail: No such file or directory
2025-09-04 06:09:26.818 fail2ban.server [4042]: INFO Starting Fail2ban v1.1.0
2025-09-04 06:09:26.818 fail2ban.server [4042]: INFO Observer start...
2025-09-04 06:09:26.824 fail2ban.database [4042]: INFO Connected to fail2ban persistent database '/var/lib/fail2ban/fail2ban.sqlite3'
2025-09-04 06:09:26.825 fail2ban.database [4042]: WARNING New database created. Version '4'
2025-09-04 06:21:53.449 fail2ban.transmitter [4042]: ERROR Command ['status', 'sshd'] has failed. Received UnknownJailException('sshd')
2025-09-04 06:21:53.449 fail2ban.server [4042]: INFO Shutdown in progress...
2025-09-04 06:40:32.835 fail2ban.observer [4042]: INFO Observer stop... try to end queue 5 seconds
2025-09-04 06:40:32.835 fail2ban.observer [4042]: INFO Observer stopped, 0 events remaining.
2025-09-04 06:40:32.837 fail2ban.server [4042]: INFO Stopping all jails
2025-09-04 06:40:32.917 fail2ban.database [4042]: INFO Connecting to database closed.
2025-09-04 06:40:32.917 fail2ban.server [4042]: INFO Exiting Fail2ban
2025-09-04 06:40:33.084 fail2ban.server [4234]: INFO Starting Fail2ban v1.1.0
2025-09-04 06:40:33.085 fail2ban.observer [4234]: INFO Observer start...
2025-09-04 06:40:33.089 fail2ban.database [4234]: INFO Connected to fail2ban persistent database '/var/lib/fail2ban/fail2ban.sqlite3'
2025-09-04 06:40:33.089 fail2ban.jail [4234]: INFO Creating new jail 'sshd'
2025-09-04 06:40:33.101 fail2ban.jail [4234]: INFO Jail 'sshd' uses systemd {}
2025-09-04 06:40:33.101 fail2ban.jail [4234]: INFO Initiated 'systemd' backend
2025-09-04 06:40:33.102 fail2ban.filter [4234]: INFO maxLines: 1
2025-09-04 06:40:33.115 fail2ban.filtersystemd [4234]: INFO [sshd] Added journal match for: '_SYSTEMD_UNIT:sshd'.
service + COMM:sshd + COMM:sshd-session'
2025-09-04 06:40:33.115 fail2ban.filter [4234]: INFO maxRetry: 3
2025-09-04 06:40:33.115 fail2ban.filter [4234]: INFO findtime: 600
2025-09-04 06:40:33.115 fail2ban.actions [4234]: INFO banTime: 3600
```

```

[centos@centosstream9 ~]$ sudo nano /etc/fail2ban/jail.conf
[centos@centosstream9 ~]$ fail2ban-client status
fail2ban version 0.9.30 (2025-09-08)
fail2ban is running
[centos@centosstream9 ~]$ fail2ban-client log
fail2ban/fail2ban.sqlite3
2025-09-06 04:36:36,716 fail2ban.jail [1159]: INFO Connected to fail2ban persistent database '/var/lib/fail2ban/fail2ban.sqlite3'
2025-09-06 04:36:36,737 fail2ban.jail [1159]: INFO Creating new jail 'sshd'
2025-09-06 04:36:36,756 fail2ban.jail [1159]: INFO Jail 'sshd' uses systemd {}
2025-09-06 04:36:36,761 fail2ban.filter [1159]: INFO Initiated 'systemd' backend
2025-09-06 04:36:36,761 fail2ban.filter [1159]: INFO maxLines: 1
2025-09-06 04:36:36,825 fail2ban.filtersystemd [1159]: INFO [sshd] Added journal match for: '_SYSTEMD_UNIT:sshd'
service + _COMM=sshd + _COMM=sshd-session'
2025-09-06 04:36:36,830 fail2ban.filter [1159]: INFO maxRetry: 3
2025-09-06 04:36:36,830 fail2ban.filter [1159]: INFO findtime: 600
2025-09-06 04:36:36,830 fail2ban.actions [1159]: INFO banTime: 3600
2025-09-06 04:36:36,830 fail2ban.filter [1159]: INFO encoding: UTF-8
2025-09-06 04:36:36,832 fail2ban.filtersystemd [1159]: INFO [sshd] Jail is in operation now (process new journal entries)
2025-09-06 04:36:36,836 fail2ban.jail [1159]: INFO Jail 'sshd' started
2025-09-06 04:51:57,125 fail2ban.filter [1159]: INFO [sshd] Found 192.168.0.28 - 2025-09-06 04:51:57
2025-09-06 04:52:04,838 fail2ban.filter [1159]: INFO [sshd] Found 192.168.0.28 - 2025-09-06 04:52:04
2025-09-06 04:52:10,189 fail2ban.filter [1159]: INFO [sshd] Found 192.168.0.28 - 2025-09-06 04:52:09
2025-09-06 04:52:10,578 fail2ban.actions [1159]: NOTICE [sshd] Ban 192.168.0.28
2025-09-06 04:52:11,606 fail2ban.filter [1159]: INFO [sshd] Found 192.168.0.28 - 2025-09-06 04:52:11
2025-09-06 05:52:09,701 fail2ban.actions [1159]: NOTICE [sshd] Unban 192.168.0.28
2025-09-07 02:45:26,812 fail2ban.server [1165]: INFO -----
2025-09-07 02:45:26,820 fail2ban.server [1165]: INFO Starting Fail2ban v1.1.0
2025-09-07 02:45:26,820 fail2ban.observer [1165]: INFO Observer start...
2025-09-07 02:45:26,831 fail2ban.database [1165]: INFO Connected to fail2ban persistent database '/var/lib/fail2ban/fail2ban.sqlite3'
2025-09-07 02:45:26,833 fail2ban.jail [1165]: INFO Creating new jail 'sshd'
2025-09-07 02:45:26,870 fail2ban.jail [1165]: INFO Jail 'sshd' uses systemd {}
2025-09-07 02:45:26,871 fail2ban.jail [1165]: INFO Initiated 'systemd' backend
2025-09-07 02:45:26,873 fail2ban.filter [1165]: INFO maxLines: 1
2025-09-07 02:45:26,925 fail2ban.filtersystemd [1165]: INFO [sshd] Added journal match for: '_SYSTEMD_UNIT:sshd'.

```

```

[centos@centosstream9 ~]$ fail2ban-client log
2025-09-06 02:04:20,440 fail2ban.filter[1183]: INFO Jail is in operation now (process new journal entries)
2025-09-08 02:04:28,454 fail2ban.jail [1183]: INFO [sshd] Jail 'sshd' started
2025-09-08 02:27:57,956 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:27:57
2025-09-08 02:29:49,323 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:49
2025-09-08 02:29:49,528 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:49
2025-09-08 02:29:49,850 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:49
2025-09-08 02:29:49,851 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:49
2025-09-08 02:29:49,854 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:49
2025-09-08 02:29:49,854 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:49
2025-09-08 02:29:49,884 fail2ban.actions [1183]: NOTICE [sshd] Ban 192.168.0.209
2025-09-08 02:29:51,851 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:51
2025-09-08 02:29:51,853 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:51
2025-09-08 02:29:51,854 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:51
2025-09-08 02:29:51,854 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:51
[centos@centosstream9 ~]$ sudo tail -f /var/log/fail2ban.log
2025-09-08 02:29:49,323 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:49
2025-09-08 02:29:49,528 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:49
2025-09-08 02:29:49,850 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:49
2025-09-08 02:29:49,851 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:49
2025-09-08 02:29:49,884 fail2ban.actions [1183]: NOTICE [sshd] Ban 192.168.0.209
2025-09-08 02:29:51,851 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:51
2025-09-08 02:29:51,853 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:51
2025-09-08 02:29:51,854 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:51
2025-09-08 02:29:51,854 fail2ban.filter [1183]: INFO [sshd] Found 192.168.0.209 - 2025-09-08 02:29:51
[centos@centosstream9 ~]$ 

```

Automating Log Analysis

```

[centos@centosstream9 ~]$ sudo nano /home/centos/ssh_attack_report.sh
[centos@centosstream9 ~]$ ./ssh_attack_report.sh
GNU nano 5.6.1
[centos@centosstream9 ~]$ /home/centos/ssh_attack_report.sh
REPORT_DIR="/var/reports"
LOG_FILE="/var/log/secure"
REPORT_FILE="$REPORT_DIR/ssh_attack_report_$(date +%F).txt"
TMP_IP_LIST="/tmp/ssh_failed_ips.txt"

mkdir -p $REPORT_DIR

# Extract all unique IPs with failed SSH logins
# wrong --> grep "Failed password" $LOG_FILE | awk '{print $NF-3}' | sort | uniq > $TMP_IP_LIST
grep "Failed password" $LOG_FILE | awk '{print $NF-3}' | egrep '([0-9]{1,3}\.){3}[0-9]{1,3}' | sort | uniq > $TMP_IP_LIST

echo "SSH Attack Report (All-Time)" > $REPORT_FILE
echo "" >> $REPORT_FILE
echo "Unique attacking IPs:" >> $REPORT_FILE
cat $TMP_IP_LIST >> $REPORT_FILE
echo "" >> $REPORT_FILE

for ip in $(cat $TMP_IP_LIST); do
    attempts=$(grep "$ip" $LOG_FILE | grep "Failed password" | wc -l)
    echo "IP: $ip | Attempts: $attempts" >> $REPORT_FILE
done

echo "" >> $REPORT_FILE
[ Read 27 lines ]

```

```

[centos@centosstream9 ~]$ chmod +x ~/ssh_attack_report.sh
chmod: changing permissions of '/home/centos/ssh_attack_report.sh': Operation not permitted
[centos@centosstream9 ~]$ sudo chmod +x ~/ssh_attack_report.sh
[centos@centosstream9 ~]$ 

```

```

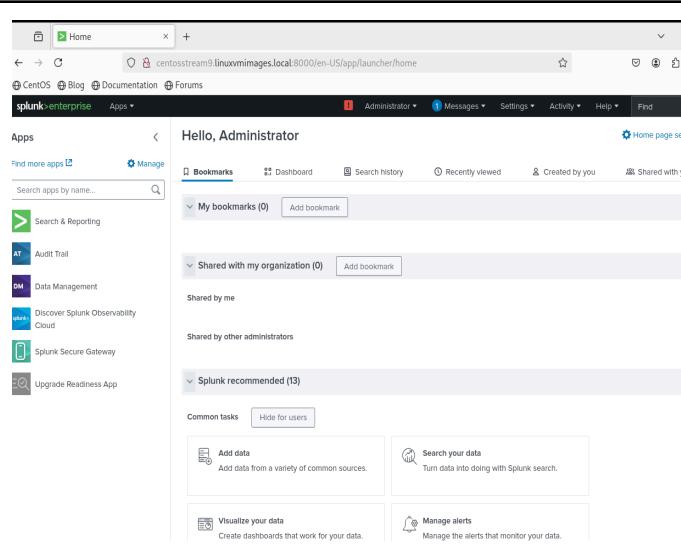
[centos@centosstream9 ~]$ sudo nano ~/ssh_attack_report.sh
[centos@centosstream9 ~]$ sudo ~/ssh_attack_report.sh
[centos@centosstream9 ~]$ cat /var/reports/ssh_attack_report_2025-09-08.txt
SSH Attack Report (All-Time)
-----
Unique attacking IPs:
127.0.0.1
192.168.0.269
192.168.0.28
COMMAND=/bin/grep

IP: 127.0.0.1 | Attempts: 7
IP: 192.168.0.269 | Attempts: 4
IP: 192.168.0.28 | Attempts: 3
IP: COMMAND=/bin/grep | Attempts: 1

Report generated at Mon Sep  8 06:42:24 AM EDT 2025
[centos@centosstream9 ~]$ 

```

Integrating Logs with SIEM Tool

<table border="1"> <tbody> <tr> <td>.tgz</td><td>1635.46 MB</td><td>Download Now</td><td>Copy wget link</td><td>More</td></tr> <tr> <td>.deb</td><td>1290.48 MB</td><td>Download Now</td><td>Copy wget link</td><td>More</td></tr> <tr> <td>.rpm</td><td>1646.48 MB</td><td>Download Now</td><td>Copy wget link</td><td>More</td></tr> </tbody> </table> <p>Release Notes System Requirements</p> <p>Copied the command to Clipboard. Click here to select the entire command.</p> <pre>wget -O splunk-10.0.0-e8eb0c4654f8.x86_64.rpm "https://download.splunk.com/products/splunk/releases/10.0.0/linux/splunk-10.0.0-e8eb0c4654f8.x86_64.rpm"</pre>	.tgz	1635.46 MB	Download Now	Copy wget link	More	.deb	1290.48 MB	Download Now	Copy wget link	More	.rpm	1646.48 MB	Download Now	Copy wget link	More	<pre>[centos@centosstream9 ~]\$ wget -O splunk-10.0.0-e8eb0c4654f8.x86_64.rpm "https://download.splunk.com/products/splunk/releases/10.0.0/linux/splunk-10.0.0-e8eb0c4654f8.x86_64.rpm" --2025-09-08 10:48:23-- https://download.splunk.com/products/splunk/releases/10.0.0/linux/splunk-10.0.0-e8eb0c4654f8.x86_64.rpm Resolving download.splunk.com (download.splunk.com)... 18.66.57.35, 18.66.57.80, 18.66.57.87, ... Connecting to download.splunk.com (download.splunk.com) 18.66.57.35 :443... connected. HTTP request sent, awaiting response... 200 OK Length: 1726454835 (1.6G) [binary/octet-stream] Saving to: 'splunk-10.0.0-e8eb0c4654f8.x86_64.rpm' splunk-10.0.0-e8eb0c 100%[=====] 1.61G 21.1MB/s in 82s 2025-09-08 10:49:47 (20.0 MB/s) - 'splunk-10.0.0-e8eb0c4654f8.x86_64.rpm' saved [1726454835/1726454835]</pre>
.tgz	1635.46 MB	Download Now	Copy wget link	More												
.deb	1290.48 MB	Download Now	Copy wget link	More												
.rpm	1646.48 MB	Download Now	Copy wget link	More												
<pre>splunk. [centos@centosstream9 ~]\$ ls Desktop Music reports Templates Documents Pictures splunk-10.0.0-e8eb0c4654f8.x86_64.rpm Videos Downloads Public ssh_attack_report.sh [centos@centosstream9 ~]\$ sudo rpm -ivh splunk-10.0.0-e8eb0c4654f8.x86_64.rpm warning: splunk-10.0.0-e8eb0c4654f8.x86_64.rpm: Header V4 RSA/SHA256 Signature, key ID b3cd4420: NOKEY ID b3cd4420: NOKEY Verifying...</pre>	<pre>[centos@centosstream9 ~]\$ sudo /opt/splunk/bin/splunk start --accept-license systemctl: /opt/splunk/lib/libcrypto.so.3: version `OPENSSL_3.4.0' not found (required by /usr/lib64/systemd/libsystemd-shared-252.so) This appears to be your first time running this version of Splunk. Splunk software must create an administrator account during startup. Otherwise, you cannot log in. Create credentials for the administrator account. Characters do not appear on the screen when you type in credentials. Please enter an administrator username: admin Password must contain at least: * 8 total printable ASCII character(s). Please enter a new password: Please confirm new password: Error: Please enter a valid password.</pre>															
<pre>Warning: ignoring -extensions option without -extfile Certificate request self-signature ok subject=CN = centosstream9.linuxvmimages.local, O = SplunkUser pDone Waiting for web server at http://127.0.0.1:8000 to be available..... Done If you get stuck, we're here to help. Look for answers here: http://docs.splunk.com The Splunk web interface is at http://centosstream9.linuxvmimages.local:8000</pre>																

The screenshot shows the Splunk Enterprise interface. At the top, it says "Hello, Administrator". Below that is a search bar and a sidebar with "Booksmarks" (0), "Dashboard", "Explore Data", "Monitoring Console", and "Splunk recommended (13)". The main area has sections for "KNOWLEDGE" (Searches, reports, and alerts; Data models; Event types; Tags; Fields; Lookups; User interface; Alert actions; Advanced search; All configurations) and "DATA" (Forwarding and receiving; Indexes; Report acceleration summaries; Virtual indexes; Source types; Ingest actions). A red arrow points to the "DATA" section.

This screenshot shows the "Local inputs" configuration page. It lists various input types with their descriptions and "Add new" buttons. The types include:

- Files & Directories: Index a local file or monitor an entire directory.
- HTTP Event Collector: Receive data over HTTP or HTTPS.
- TCP: Listen on a TCP port for incoming data, e.g. syslog.
- UDP: Listen on a UDP port for incoming data, e.g. syslog.
- Scripts: Run custom scripts to collect or generate more data.
- checkapp
- Systemd Journald Input for Splunk: This is the input that gets data from journald (systemd's logging component) into Splunk.
- Logd Input for the Splunk platform: This input collects data from logd on macOS and sends it to the Splunk platform.

This screenshot shows the "Add Data" wizard at the "Set Source" step. It has a progress bar with "Select Source" (green dot), "Set Source Type" (green dot), "Input Settings" (white dot), "Review" (white dot), and "Done" (white dot). The "Source Type" dropdown is set to "File or Directory". The "File or Directory" field contains "On Windows: c:\apache\apache.error.log or \hostname\apache\apache.error.log. On Unix: /var/log/\hostname\varlog". Below it are "Continuously Monitor" and "Index Once" buttons. There are also "Include list?" and "Exclude list?" fields.

This screenshot shows the "Source Type" configuration page. It displays a list of events with columns for "Time" and "Event". The events are:

- Dec 5 08:34:31 centosstream9 polkitd[727]: Loading rules from directory /etc/polkit-1/rules.d
- Dec 5 08:34:31 centosstream9 polkitd[727]: Loading rules from directory /usr/share/polkit-1/rules.d
- Dec 5 08:34:31 centosstream9 polkitd[727]: Finished loading, compiling and executing 12 rules
- Dec 5 08:34:31 centosstream9 polkitd[727]: Acquired the name org.freedesktop.PolicyKit1 on the system bus
- Dec 5 08:34:33 centosstream9 systemd[1009]: pam_unix(systemd-user:session): session opened for user gdm(uid=42) by (uid=0)
- Dec 5 08:34:33 centosstream9 sshd[397]: pam_unix(pam-ssh/environment:session): session opened for user gdm(uid=42) by (uid=0)
- Dec 5 08:34:34 centosstream9 sshd[1062]: Server listening on 0.0.0.0 port 22.
- Dec 5 08:34:34 centosstream9 sshd[1062]: Server listening on :: port 22.

At the bottom, a command prompt shows: [centos@centosstream9 ~]\$ sudo /opt/splunk/bin/sp

This screenshot shows the "Add Data" wizard at the "Input Settings" step. It has a progress bar with "Select Source" (green dot), "Set Source Type" (green dot), "Input Settings" (green dot), "Review" (white dot), and "Done" (white dot). The "App Context" dropdown is set to "search". The "Host" section shows "Constant value" selected, and the "Host field value" input field contains "centosstream9.linuxvmimages.local".

This screenshot shows the "Add Data" wizard at the "Review" step. It has a progress bar with "Select Source" (green dot), "Set Source Type" (green dot), "Input Settings" (green dot), "Review" (green dot), and "Done" (white dot). The review summary includes:

- Input Type: File Monitor
- Source Path: /var/log/secure
- Continuously Monitor: Yes
- Source Type: linux_secure
- App Context: search
- Host: centosstream9.linuxvmimages.local
- Index: default

splunk enterprise Apps ▾

Administrator ▾ Messages ▾ Settings ▾ Activity ▾ Help ▾ Find ▾

Search & Reporting

New Search

index=main sourcetype=linux_secure "Failed password"

Time range: Last 24 hours ▾

5 events (5/7/25 11:00:00.000 PM to 9/8/25 11:57:11.000 PM) No Event Sampling ▾

Events (5) Patterns Statistics Visualization

Timeline format ▾ - Zoom Out + Zoom to Selection X Deselect 1 hour per column

Format ▾ Show: 20 Per Page ▾ View: List ▾

Selected Fields	All Fields	i	Time	Event
host 1		>	Sep 8 06:16:27 centosstream9 sudo[3318]:	centos : TTY pts/0 ; PWD=/ ; USER=root ; COMMAND=/bin/grep 'Failed password' root /var/log/secure
source 1		>	Sep 8 02:29:51 centosstream9 sshd[3296]:	Failed password for invalid user root from 192.168.0.209 port 44476 ssh2 host centosstream9.linuxvmimages.local source = /var/log/secure sourcetype = linux_secure
sourceType 1		>	Sep 8 02:29:51 centosstream9 sshd[3294]:	Failed password for invalid user root from 192.168.0.209 port 44472 ssh2 host centosstream9.linuxvmimages.local source = /var/log/secure sourcetype = linux_secure
INTERESTING FIELDS		>	Sep 8 02:29:51 centosstream9 sshd[3293]:	Failed password for invalid user root from 192.168.0.209 port 44466 ssh2 host centosstream9.linuxvmimages.local source = /var/log/secure sourcetype = linux_secure
# COMMAND 1		>	Sep 8 02:29:51 centosstream9 sshd[3295]:	Failed password for invalid user root from 192.168.0.209 port 44474 ssh2 host centosstream9.linuxvmimages.local source = /var/log/secure sourcetype = linux_secure
# date_hour 2				
# date_minute 1				
# date_month 1				
# date_second 2				
# date_wday 1				
# date_year 1				
# date_zone 1				