1. Pembuatan User dengan Akses Sudo
   Membuat 1300 user dengan:
   Login password
   SSH public key
   Akses sudo
   Sistem berhasil dibuat sebanyak 1300 user dengan nama `sevima-adm1` hingga `sevima-adm1300`. Setiap user memiliki password masing-masing dan tergabung dalam group sudo sehingga memiliki hak administratif.

```
root@ubuntu:~# id sevima-adm1
uid=1001(sevima-adm1) gid=1001(sevima-adm1) groups=1001(sevima-adm1),27(sudo)
root@ubuntu:~#
```

2. Mengubah Port SSH menjadi 2025
   Port SSH diubah dari default 22 menjadi 2025 untuk meningkatkan keamanan dan mengurangi risiko brute force attack.

```
root@ubuntu:~# ss -tulpn | grep 2025
tcp   LISTEN 0      4096           0.0.0.0:2025      0.0.0.0:*    users:(("sshd",pid=32508,fd=3),("systemd",pid=1,fd=90))
tcp   LISTEN 0      4096              [::]:2025         [::]:*    users:(("sshd",pid=32508,fd=4),("systemd",pid=1,fd=91))
root@ubuntu:~#
```

3. Mengaktifkan Log Aktivitas
   Sistem logging diaktifkan menggunakan auditd dan bash command logging untuk merekam seluruh aktivitas user di server.

```
root@ubuntu:~# apt install auditd -y
systemctl enable --now auditd
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libauparse0t64
Suggested packages:
  audispd-plugins
The following NEW packages will be installed:
  auditd libauparse0t64
0 upgraded, 2 newly installed, 0 to remove and 25 not upgraded.
Need to get 274 kB of archives.
After this operation, 893 kB of additional disk space will be used.
Get:1 http://id.archive.ubuntu.com/ubuntu noble-updates/main amd64 libauparse0t64 amd64 1:3.1.2-2.1build1.1 [58.9 kB]
Get:2 http://id.archive.ubuntu.com/ubuntu noble-updates/main amd64 auditd amd64 1:3.1.2-2.1build1.1 [215 kB]
Fetched 274 kB in 1s (399 kB/s)
Selecting previously unselected package libauparse0t64:amd64.
(Reading database ... 87308 files and directories currently installed.)
Preparing to unpack .../libauparse0t64_1%3a3.1.2-2.1build1.1_amd64.deb ...
Adding 'diversion of /lib/x86_64-linux-gnu/libauparse.so.0 to /lib/x86_64-linux-gnu/libauparse.so.0.usr-is-merged by libauparse0t64'
Adding 'diversion of /lib/x86_64-linux-gnu/libauparse.so.0.0.0 to /lib/x86_64-linux-gnu/libauparse.so.0.0.0.usr-is-merged by libauparse0t
64'
Unpacking libauparse0t64:amd64 (1:3.1.2-2.1build1.1) ...
Selecting previously unselected package auditd.
Preparing to unpack .../auditd_1%3a3.1.2-2.1build1.1_amd64.deb ...
Unpacking auditd (1:3.1.2-2.1build1.1) ...
Setting up libauparse0t64:amd64 (1:3.1.2-2.1build1.1) ...
Setting up auditd (1:3.1.2-2.1build1.1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/auditd.service → /usr/lib/systemd/system/auditd.service.
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu8.6) ...
Scanning processes...
```

```
No VM guests are running outdated hypervisor (qemu) binaries on this host.
Synchronizing state of auditd.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable auditd
root@ubuntu:~# echo 'export PROMPT_COMMAND='\''history -a; logger -t CMD "$(whoami) $(pwd) $(history 1)"'\''' >> /etc/bash.bashrc
root@ubuntu:~# journalctl -xe
   The job identifier is 1769.
Feb 01 06:06:21 ubuntu dbus-daemon[687]: [system] Successfully activated service 'org.freedesktop.UPower'
Feb 01 06:06:21 ubuntu systemd[1]: Started upower.service - Daemon for power management.
   Subject: A start job for unit upower.service has finished successfully
   Defined-By: systemd
   Support: http://www.ubuntu.com/support

   A start job for unit upower.service has finished successfully.

   The job identifier is 1769.
Feb 01 06:06:21 ubuntu fwupd[33459]: 06:06:21.795 FuEngine            failed to add device /sys/devices/pci0000:00/0000:00:01.1/ata1/ho>
Feb 01 06:06:21 ubuntu fwupd[33459]: 06:06:21.836 FuMain              fwupd 1.9.30 ready for requests (locale en_US.UTF-8)
Feb 01 06:06:21 ubuntu dbus-daemon[687]: [system] Successfully activated service 'org.freedesktop.fwupd'
Feb 01 06:06:21 ubuntu systemd[1]: Started fwupd.service - Firmware update daemon.
   Subject: A start job for unit fwupd.service has finished successfully
   Defined-By: systemd
   Support: http://www.ubuntu.com/support

   A start job for unit fwupd.service has finished successfully.

   The job identifier is 1660.
Feb 01 06:06:21 ubuntu systemd[1]: fwupd-refresh.service: Deactivated successfully.
   Subject: Unit succeeded
   Defined-By: systemd
   Support: http://www.ubuntu.com/support

   The unit fwupd-refresh.service has successfully entered the 'dead' state.
Feb 01 06:06:21 ubuntu systemd[1]: Finished fwupd-refresh.service - Refresh fwupd metadata and update motd.
   Subject: A start job for unit fwupd-refresh.service has finished successfully
   Defined-By: systemd
```

4. Konfigurasi Ulimit
   Konfigurasi ulimit dilakukan untuk mengoptimalkan penggunaan resource sistem sesuai kebutuhan server.

```
root@ubuntu:~# nano /etc/security/limits.conf
root@ubuntu:~# ulimit -a
real-time non-blocking time  (microseconds, -R) unlimited
core file size              (blocks, -c) 0
data seg size               (kbytes, -d) unlimited
scheduling priority                 (-e) 0
file size                   (blocks, -f) unlimited
pending signals                     (-i) 7561
max locked memory           (kbytes, -l) 251912
max memory size             (kbytes, -m) unlimited
open files                          (-n) 1024
pipe size                (512 bytes, -p) 8
POSIX message queues         (bytes, -q) 819200
real-time priority                  (-r) 0
stack size                  (kbytes, -s) 8192
cpu time                   (seconds, -t) unlimited
max user processes                  (-u) 7561
virtual memory              (kbytes, -v) unlimited
file locks                          (-x) unlimited
root@ubuntu:~#
```

5. CERTIFICATE AUTHORITY (CA)
   Root Certificate Authority dibuat menggunakan OpenSSL dengan identitas resmi SEVIMA CA.

```
root@ubuntu:~# openssl genrsa -out /root/ca/private/cacert.key 4096
openssl req -x509 -new -nodes \
-key /root/ca/private/cacert.key \
-sha256 -days 3650 \
-out /root/ca/cacert.pem
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [AU]:ID
State or Province Name (full name) [Some-State]:Jakarta
Locality Name (eg, city) []:Jakarta Utara
Organization Name (eg, company) [Internet Widgits Pty Ltd]:PT. Sentra Vidya Utama
Organizational Unit Name (eg, section) []:
Common Name (e.g. server FQDN or YOUR name) []:SEVIMA CA
Email Address []:
root@ubuntu:~#
```

```
root@ubuntu:~/ca# ls -l *.key *.csr *.crt
-rw-r--r-- 1 root root 1558 Feb  1 06:25 barat.crt
-rw-r--r-- 1 root root  993 Feb  1 06:25 barat.csr
-rw------- 1 root root 1704 Feb  1 06:24 barat.key
-rw-r--r-- 1 root root 1558 Feb  1 06:30 timur.crt
-rw-r--r-- 1 root root  993 Feb  1 06:28 timur.csr
-rw------- 1 root root 1704 Feb  1 06:27 timur.key
-rw-r--r-- 1 root root 1558 Feb  1 06:28 utara.crt
-rw-r--r-- 1 root root  993 Feb  1 06:27 utara.csr
-rw------- 1 root root 1704 Feb  1 06:26 utara.key
-rw-r--r-- 1 root root 1558 Feb  1 06:31 www.crt
-rw-r--r-- 1 root root  989 Feb  1 06:31 www.csr
-rw------- 1 root root 1704 Feb  1 06:31 www.key
root@ubuntu:~/ca# ^C
root@ubuntu:~/ca# ls -l /root/ca/cacert.pem /root/ca/private/cacert.key
-rw-r--r-- 1 root root 2045 Feb  1 06:13 /root/ca/cacert.pem
-rw------- 1 root root 3272 Feb  1 06:12 /root/ca/private/cacert.key
root@ubuntu:~/ca#
```

6. Membuat Sertifikat Website
   Apache & Nginx

```
root@ubuntu:~/ca# nano /etc/apache2/ports.conf
root@ubuntu:~/ca# nano /etc/apache2/sites-available/utara.conf
root@ubuntu:~/ca# nano /etc/apache2/sites-available/utara.conf
root@ubuntu:~/ca# mkdir /var/www/utara
echo "Hello World from Utara Site" > /var/www/utara/index.html
a2enmod headers
a2ensite utara
systemctl restart apache2
Enabling module headers.
To activate the new configuration, you need to run:
  systemctl restart apache2
Enabling site utara.
To activate the new configuration, you need to run:
  systemctl reload apache2
root@ubuntu:~/ca# ^C
root@ubuntu:~/ca# systemctl reload apache2
root@ubuntu:~/ca# mkdir /var/www/utara
echo "Hello World from Utara Site" > /var/www/utara/index.html
a2enmod headers
a2ensite utara
systemctl restart apache2
mkdir: cannot create directory ‘/var/www/utara’: File exists
Module headers already enabled
Site utara already enabled
root@ubuntu:~/ca# ss -tulpn | grep apache
tcp   LISTEN 0      511                *:8023            *:*    users:(("apache2",pid=45311,fd=4),("apache2",pid=45310,fd=4),("apache2
",pid=45308,fd=4))
root@ubuntu:~/ca# nano /etc/apache2/sites-available/utara.conf
root@ubuntu:~/ca# curl http://localhost:8023
Hello World from Utara Site
root@ubuntu:~/ca#
```

```
root@ubuntu:~/ca# curl https://barat.sevima.site:4435
Hello World from Bopenssl x509 -in /etc/ssl/barat.crt -noout -issuer -subjectcrt -noout -issuer -subject
issuer=C = ID, ST = Jakarta, L = Jakarta Utara, O = PT. Sentra Vidya Utama, CN = SEVIMA CA
subject=C = ID, ST = Some-State, O = PT. Sentra Vidya Utama, CN = barat.sevima.site
root@ubuntu:~/ca# openssl s_client -connect barat.sevima.site:4435
CONNECTED(00000003)
depth=1 C = ID, ST = Jakarta, L = Jakarta Utara, O = PT. Sentra Vidya Utama, CN = SEVIMA CA
verify return:1
depth=0 C = ID, ST = Some-State, O = PT. Sentra Vidya Utama, CN = barat.sevima.site
verify return:1
---
Certificate chain
 0 s:C = ID, ST = Some-State, O = PT. Sentra Vidya Utama, CN = barat.sevima.site
   i:C = ID, ST = Jakarta, L = Jakarta Utara, O = PT. Sentra Vidya Utama, CN = SEVIMA CA
   a:PKEY: rsaEncryption, 2048 (bit); sigalg: RSA-SHA256
   v:NotBefore: Feb  1 06:25:58 2026 GMT; NotAfter: Feb  1 06:25:58 2027 GMT
---
Server certificate
-----BEGIN CERTIFICATE-----
MIIEUjCCAjoCFAbFqDpye02fRiiN6XH6++bwBlHAMA0GCSqGSIb3DQEBCwUAMGwx
CzAJBgNVBAYTAklEMRAwDgYDVQQIDAdKYWthcnRhMRYwFAYDVQQHDA1KYWthcnRh
IFV0YXJhMR8wHQYDVQQKDBZQVC4gU2VudHJhIFZpZHlhIFV0YW1hMRIwEAYDVQQD
DAlTRVZJTUEgQ0EwHhcNMjYwMjAxMDYyNTU4WhcNMjcwMjAxMDYyNTU4WjBfMQsw
CQYDVQQGEwJJRDETMBEGA1UECAwKU29tZS1TdGF0ZTEfMB0GA1UECgwWUFQuIFNl
bnRyYSBWaWR5YSBVdGFtYTEaMBgGA1UEAwwRYmFyYXQuc2V2aW1hLnNpdGUwggEi
MA0GCSqGSIb3DQEBAQUAA4IBDwAwggEKAoIBAQDJ49ciHnKe0luVwHChMfL5PNUa
TxT0qgj/rz6j2BBdqgKIa0ZR6ncUevpyXXGTwh9a9CMytod58Tu6q0gXfCt1De5C
B55wiYmA/xR9hI9y1YBo6/7wdHgvdZqWvFo4Keb6pRq8u57o8+PKOyEyX33MWLjv
WQfoVmTGcDj/O1cLoC9cKADVCoyyZeUGenL752ojiDKVQohwFQecYkEu8VWeKGcm
NF31BAsSmRdnUf77f4yWelBAXRFVmxWqpKW8voYVSbzgh82miNLj9LnEyGRLGRWU
x5KiGwkkleFLkl4vU0gddQ3FqW8LN0qr38D8z/yGfF72JNv2x0ygfXEC2MqBAgMB
AAEwDQYJKoZIhvcNAQELBQADggIBACmas4pjwdBXvsBzflcH+UkE26SGkFM7ABGU
HDZ+10aO7NRr8rm64lu54NywilFUqakQ2TwJKTOBZURjb2YkKIShN9pOG/PJX/TW
m/zVLICkXCV/EcE4MkobQwJIoq9BOhLl8KRBUMFZkKshSnvx3l2s60wxS/eaWc2A
cw7+Fg9tavxl3cHSP8yT57CBS9eKHUMGb8ukdOMebQuPe7tn83ZjB0vTV9kYoczN
8SHgLTBJcRYioLRv1ApDmWes3jev4aQVXlvbt0Em965GsRNADfd/UiKfDj3QegCg
```

```
Post-Handshake New Session Ticket arrived:
SSL-Session:
    Protocol  : TLSv1.3
    Cipher    : TLS_AES_256_GCM_SHA384
    Session-ID: 8D114DF140FAF0D538956EE457281BDE70C6EB717606204EA04470F96B0847A3
    Session-ID-ctx:
    Resumption PSK: D43FF8BD4220D0A8882A61FB93E213D895A00A43789AC3A87D19698179D31225A2C8243086A4B22B18C1945129C11799
    PSK identity: None
    PSK identity hint: None
    SRP username: None
    TLS session ticket lifetime hint: 300 (seconds)
    TLS session ticket:
    0000 - 53 30 bf 95 62 ac 6b 50-85 0f a0 92 b2 4f 23 fd   S0..b.kP.....O#.
    0010 - 6b 46 ff bf 25 94 9d b3-7c b0 69 91 69 56 27 64   kF..%...|.i.iV'd
    0020 - 14 8a 71 0e 35 fc a6 35-48 e3 58 a1 a6 64 1e c5   ..q.5..5H.X..d..
    0030 - 85 8f bc f8 38 07 a6 0c-fd 09 02 e4 36 33 8c 16   ....8.......63..
    0040 - 3a fb b9 1d 7f 85 4e 0d-08 e5 cb 35 28 09 bc 16   :.....N....5(...
    0050 - 91 23 37 0d 83 96 31 c6-49 91 af 42 c5 7a 0b 51   .#7...1.I..B.z.Q
    0060 - 98 9b cb 6e 65 4f 51 1f-cc 12 9e 61 25 aa 23 80   ...neOQ....a%.#.
    0070 - b0 22 35 2c 6c b8 b1 bc-ad f9 66 c6 d5 58 1f e0   ."5,l.....f..X..
    0080 - 57 72 c5 cb c5 ec 8b f5-f2 9a c2 04 35 d5 b5 c9   Wr.........5...
    0090 - 4e 35 7e 02 82 4a 5d 62-dd 81 e6 44 5b 12 9e 22   N5~..J]b...D[.."
    00a0 - 0b 49 ed 53 d3 ad 59 7d-d0 0f 38 27 cb ae a9 c5   .I.S..Y}..8'....
    00b0 - 40 0e bf 5e e5 90 e4 e0-02 57 77 44 8e 2d 03 ef   @..^.....WwD.-..
    00c0 - 36 3b 64 9d 2c c3 9d b0-9e a3 ae 1f 25 6f e5 4c   6;d.,.......%o.L
    00d0 - 19 bf f7 c1 7d 55 62 03-a2 8d 7e 0f be 76 47 f4   ....}Ub...~..vG.
    00e0 - b4 82 80 a6 86 6c f1 6b-d5 f5 b8 0d a4 ea 56 a7   .....l.k......V.

    Start Time: 1769928867
    Timeout   : 7200 (sec)
    Verify return code: 0 (ok)
    Extended master secret: no
    Max Early Data: 0
---
```

HA Proxy

```
root@ubuntu:~/ca# cat /etc/haproxy/haproxy.cfg
global
        log /dev/log    local0
        log /dev/log    local1 notice
        chroot /var/lib/haproxy
        stats socket /run/haproxy/admin.sock mode 660 level admin
        stats timeout 30s
        user haproxy
        group haproxy
        daemon

        # Default SSL material locations
        ca-base /etc/ssl/certs
        crt-base /etc/ssl/private

        # See: https://ssl-config.mozilla.org/#server=haproxy&server-version=2.0.3&config=intermediate
        ssl-default-bind-ciphers ECDHE-ECDSA-AES128-GCM-SHA256:ECDHE-RSA-AES128-GCM-SHA256:ECDHE-ECDSA-AES256-GCM-SHA384:ECDHE-RSA-AES256
-GCM-SHA384:ECDHE-ECDSA-CHACHA20-POLY1305:ECDHE-RSA-CHACHA20-POLY1305:DHE-RSA-AES128-GCM-SHA256:DHE-RSA-AES256-GCM-SHA384
        ssl-default-bind-ciphersuites TLS_AES_128_GCM_SHA256:TLS_AES_256_GCM_SHA384:TLS_CHACHA20_POLY1305_SHA256
        ssl-default-bind-options ssl-min-ver TLSv1.2 no-tls-tickets

defaults
        log     global
        mode    http
        option  httplog
        option  dontlognull
        timeout connect 5000
        timeout client  50000
        timeout server  50000
        errorfile 400 /etc/haproxy/errors/400.http
        errorfile 403 /etc/haproxy/errors/403.http
        errorfile 408 /etc/haproxy/errors/408.http
        errorfile 500 /etc/haproxy/errors/500.http
        errorfile 502 /etc/haproxy/errors/502.http
        errorfile 503 /etc/haproxy/errors/503.http
        errorfile 504 /etc/haproxy/errors/504.http

frontend sevima_front
    bind *:443 ssl crt /etc/ssl/www.pem
    mode http
    default_backend sevima_back

backend sevima_back
    mode http
    balance roundrobin
    server utara 127.0.0.1:8023 check
    server timur 127.0.0.1:8123 check
```