Laporang Pengerjaan Soal Nomor 3

ID Peserta: 01

Nama: Achmad Alif Nasrulloh

A. Konfigurasi Dasar :

1. Buat user dengan akses sudo, login menggunakan kata sandi dan menggunakan pubkey.

Copy public key ke /etc/skel agar saat pembuatan user sudah otomatis ada file adm.pub.

```
root@semesta-lab-01:~# cp /home/semesta/adm.pub /etc/skel/
root@semesta-lab-01:~# ls /etc/skel/
adm.pub
```

Gunakan bash script looping untuk menambahkan banyak user.

```
root@semesta-lab-01:~# for i in {1..100}; do useradd sevima-adm$i -s /bin
/bash -m; passwd sevima-adm$i <<< "S3m3st4#2025"$'\n'"S3m3st4#2025"; done
New password: Retype new password: passwd: password updated successfully
New password: Retype new password: passwd: password updated successfully
New password: Retype new password: passwd: password updated successfully
```

Verifikasi jumlah user yang dibuat.

```
root@semesta-lab-01:~# cat /etc/passwd | grep sevima-adm* | wc -l
100
root@semesta-lab-01:~#
```

Gunakan bash script looping untuk menambahkan banyak user kedalam group sudo.

```
root@semesta-lab-01:~# for i in {1..100}; do usermod -a -G sudo sevima-adm$i; done
root@semesta-lab-01:~#
```

Verifikasi jumlah user yang masuk kedalam group sudo.

```
root@semesta-lab-01:~# cat /etc/group | grep sudo
sudo:x:27:sevima,sevima-adm1,sevima-adm2,sevima-adm3,sevima-adm4,sevima-adm5,sevima-adm6,sevima-adm7,sevima-adm8,sevima-adm9,sevima-adm10,sevima-adm11,sevima-adm12,sevima-adm13,sevima-
adm14,sevima-adm15,sevima-adm16,sevima-adm17,sevima-adm18,sevima-adm19,sevima-adm20,sevima-adm21,sevima-adm22,sevima-adm23,sevima-adm24,sevima-adm25,sevima-adm26,sevima-adm27,sevima-ad
m28,sevima-adm29,sevima-adm30,sevima-adm31,sevima-adm32,sevima-adm33,sevima-adm34,sevima-adm35,sevima-adm36,sevima-adm37,sevima-adm38,sevima-adm39,sevima-adm40,sevima-adm41,sevima-adm4
2,sevima-adm43,sevima-adm44,sevima-adm45,sevima-adm46,sevima-adm47,sevima-adm48,sevima-adm49,sevima-adm50,sevima-adm51,sevima-adm52,sevima-adm53,sevima-adm54,sevima-adm55,sevima-adm56,
sevima-adm57,sevima-adm58,sevima-adm59,sevima-adm60,sevima-adm61,sevima-adm62,sevima-adm63,sevima-adm64,sevima-adm65,sevima-adm66,sevima-adm67,sevima-adm68,sevima-adm69,sevima-adm70,se
vima-adm71,sevima-adm72,sevima-adm73,sevima-adm74,sevima-adm75,sevima-adm76,sevima-adm77,sevima-adm78,sevima-adm79,sevima-adm80,sevima-adm81,sevima-adm82,sevima-adm83,sevima-adm84,sevi
ma-adm85,sevima-adm86,sevima-adm87,sevima-adm88,sevima-adm89,sevima-adm90,sevima-adm91,sevima-adm92,sevima-adm93,sevima-adm94,sevima-adm95,sevima-adm96,sevima-adm97,sevima-adm98,sevima
-adm99,sevima-adm100
root@semesta-lab-01:~#
```

2. Ubah port ssh menjadi 2025.

Edit file /etc/ssh/sshd_config, dan ubah konfigurasi **PermitRootLogin no**.

```
root@semesta-lab-01:~# cat /etc/ssh/sshd_config | grep 'Port 2025'
Port 2025
root@semesta-lab-01:~#
```

Setelah itu restart service ssh.

```
root@semesta-lab-01:~# systemctl restart ssh
root@semesta-lab-01:~# systemctl daemon-reload
```

Dan allow port 2025/tcp pada ufw.

```
root@semesta-lab-01:~# ufw allow 2025/tcp
Rule added
Rule added (v6)
root@semesta-lab-01:~#
```

3. Aktifkan seluruh log aktivitas.

Edit file /etc/ssh/sshd_config, dan ubah konfigurasi

as

4. Penyesuaian sumber daya.

Edit file /etc/ssh/sshd_config, dan ubah konfigurasi

as

5. Buat LVM dari block sdc dan pastikan dienkripsi.

Gunakan cryptsetup untuk enkripsi block sdc dengan passpharse 123.

```
root@semesta-lab-01:~# cryptsetup luksFormat /dev/sdc
WARNING: Device /dev/sdc already contains a 'crypto_LUKS' superblock signature.

WARNING!
========
This will overwrite data on /dev/sdc irrevocably.

Are you sure? (Type 'yes' in capital letters): YES
Enter passphrase for /dev/sdc:
Verify passphrase:
```

Lalu open disk yang terenkripsi dengan nama lvm2.

```
root@semesta-lab-01:~# cryptsetup luksOpen /dev/sdc lvm2
Enter passphrase for /dev/sdc:
```

Buat physical volume, lalu volume group hackathon-syadm7-web dan logical volume.

```
root@semesta-lab-01:~# pvcreate /dev/mapper/lvm2
  Physical volume "/dev/mapper/lvm2" successfully created.
root@semesta-lab-01:~# vgcreate hackathon-syadm7-web /dev/mapper/lvm2
  Volume group "hackathon-syadm7-web" successfully created
root@semesta-lab-01:~# lvcreate -n data_lv -l 100%FREE hackathon-syadm7-web
  Logical volume "data_lv" created.
```

Verifikasi pembuatan lvm.

```
root@semesta-lab-01:~# lsblk -f
NAME                      FSTYPE      FSVER    LABEL                       UUID                                   FSAVAIL FSUSE% MOUNTPOINTS
sda
├─sda1
├─sda2                    ext4        1.0                                  25942eb5-8be7-432d-9fe4-9af6b9e9a248      1.7G     5% /boot
└─sda3                    LVM2_member LVM2 001                             8TsxeF-IQJm-Kd47-iLH1-W8tY-NbTb-UX9CYp
  └─ubuntu--vg-ubuntu--lv ext4        1.0                                  1a036a05-86e8-4e00-a6fc-ead1bb73fcf9     15.2G    30% /
sdb                       crypto_LUKS 2                                    f3b87333-caf6-4376-8692-19fa0590a39d
└─lvm1                    LVM2_member LVM2 001                             hchqSn-vDd5-i1Tl-rn7g-fCWJ-gAVQ-s1Tyax
  └─hackathon--syadm7-data_lv

sdc                       crypto_LUKS 2                                    b798449e-49ed-4c98-ba41-af57eebf6cd0
└─lvm2                    LVM2_member LVM2 001                             XxB6Cp-eN0u-FCY8-yWug-N68e-8dji-m2dY10
  └─hackathon--syadm7--web-data_lv

sr0                       iso9660     Joliet Extension Ubuntu-Server 24.04.2 LTS amd64 2025-02-16-22-49-22-00
```

6. Konfigurasi NFS agar mount otomatis setelah server restart..

Buat folder /mnt/nfs2 untuk sebagai tempat mounting. Mount menggunakan perintah mount.

```
root@semesta-lab-01:~# mkdir /mnt/nfs2
root@semesta-lab-01:~# mount -t nfs 192.168.99.3:/nfs-semesta7-web /mnt/nfs2
```

Agar konfigurasi persistent, tambahkan output dari isi file /proc/mounts pada bagian nfs kedalam /etc/fstab.

```
root@semesta-lab-01:~# cat /proc/mounts | grep 192.168.99.3
192.168.99.3:/nfs-semesta7 /mnt/nfs1 nfs4 rw,relatime,vers=4.2,rsize=524288,wsize=524288,namlen=255,hard,proto=tcp,timeo=600,retrans=2,sec=sys,clientaddr
=192.168.99.11,local_lock=none,addr=192.168.99.3 0 0
192.168.99.3:/nfs-semesta7-web /mnt/nfs2 nfs4 rw,relatime,vers=4.2,rsize=524288,wsize=524288,namlen=255,hard,proto=tcp,timeo=600,retrans=2,sec=sys,client
addr=192.168.99.11,local_lock=none,addr=192.168.99.3 0 0
root@semesta-lab-01:~#
```

```
root@semesta-lab-01:~# cat /etc/fstab
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# <file system> <mount point>   <type>  <options>       <dump>  <pass>
# / was on /dev/ubuntu-vg/ubuntu-lv during curtin installation
/dev/disk/by-id/dm-uuid-LVM-3OLoHWR73WuNyKTA7xWHgaITySwUKBhr9zwejb9lfUoRwB1x2W2xTEe9VVC1Jt18 / ext4 defaults 0 1
# /boot was on /dev/sda2 during curtin installation
/dev/disk/by-uuid/25942eb5-8be7-432d-9fe4-9af6b9e9a248 /boot ext4 defaults 0 1
/swap.img       none    swap    sw      0       0
192.168.99.3:/nfs-semesta7 /mnt/nfs1 nfs4 rw,relatime,vers=4.2,rsize=524288,wsize=524288,namlen=255,hard,proto=tcp,timeo=600,retrans=2,sec=sys,clientaddr
=192.168.99.11,local_lock=none,addr=192.168.99.3 0 0
192.168.99.3:/nfs-semesta7-web /mnt/nfs2 nfs4 rw,relatime,vers=4.2,rsize=524288,wsize=524288,namlen=255,hard,proto=tcp,timeo=600,retrans=2,sec=sys,client
addr=192.168.99.11,local_lock=none,addr=192.168.99.3 0 0
root@semesta-lab-01:~#
```

7. Buat folder pada NFS yang sudah dikonfigurasi.

Masuk ke folder /mnt/nfs2 dan buat folder dengan mkdir.

```
root@semesta-lab-01:~# cd /mnt/nfs2/
root@semesta-lab-01:/mnt/nfs2# mkdir achmadalifnasrulloh-192.168.99.11
root@semesta-lab-01:/mnt/nfs2# ls
achmadalifnasrulloh-192.168.99.11
root@semesta-lab-01:/mnt/nfs2#
```

```
root@semesta-lab-01:/mnt/nfs2# df -hT
Filesystem                         Type   Size  Used Avail Use% Mounted on
tmpfs                              tmpfs  392M  1.1M  391M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv ext4    24G  7.0G   16G  32% /
tmpfs                              tmpfs  2.0G  4.0K  2.0G   1% /dev/shm
tmpfs                              tmpfs  5.0M     0  5.0M   0% /run/lock
/dev/sda2                          ext4   2.0G  100M  1.7G   6% /boot
tmpfs                              tmpfs  392M   12K  392M   1% /run/user/1000
192.168.99.3:/nfs-semesta7         nfs4    24G  6.4G   16G  29% /mnt/nfs1
tmpfs                              tmpfs  392M   12K  392M   1% /run/user/1102
192.168.99.3:/nfs-semesta7-web     nfs4    24G  6.4G   16G  29% /mnt/nfs2
root@semesta-lab-01:/mnt/nfs2#
```

B. CA :

1. Buat root CA pada folder /root/ca.

Buat folder /root/ca.

```
root@semesta-lab-01:~# mkdir /root/ca
root@semesta-lab-01:~# cd /root/ca/
root@semesta-lab-01:~/ca#
```

2. Buat root CA (cacert.pem dan cacert.key) dengan informasi berikut.

Buat cacert.key dan buat file ca.conf untuk memasukkan informasi terkait CA.

```
root@semesta-lab-01:~/ca# openssl genrsa -out cacert.key
root@semesta-lab-01:~/ca# nano ca.conf
```

Isi dari file ca.conf sebagai berikut.

```
[ req ]
prompt             = no
distinguished_name = dn
x509_extensions    = v3_ca

[ dn ]
C  = ID
ST = Jawa Timur
L  = Surabaya
O  = PT. Sentra Vidya Utama
CN = SEVIMA CA

[ v3_ca ]
keyUsage = critical, keyCertSign
basicConstraints = critical, CA:true
```

Setelah itu generate cacert.pem.

```
root@semesta-lab-01:~/ca# openssl req -x509 -new -key cacert.key -out cacert.pem -days 365 -config ca.conf
root@semesta-lab-01:~/ca# ls
cacert.key  cacert.pem  ca.conf
root@semesta-lab-01:~/ca#
```

Selanjutnya adalah menerbitkan certificate dengan ca yang sudah dibuat. Karena certificate yang dibuat cukup banyak, jadi saya memanfaatkan bash scripting looping lagi untuk generate certificate key, csr, san dan pem.

```
root@semesta-lab-01:~/ca# for i in {www,utara,timur,barat}; do
  # Membuat private key RSA
  openssl genrsa -out $i.sevima.site.key

  # Membuat CSR (Certificate Signing Request)
  openssl req -new -key $i.sevima.site.key -out $i.sevima.site.csr -subj "/C=ID/ST=Jawa Timur/L=Surabaya/O=PT. Sentra Vidya Utama/CN=$i.sevima.site/"

  # Menulis subjectAltName ke file .txt
  echo "subjectAltName = DNS:$i.sevima.site" > $i.sevima.site.txt

  # Membuat sertifikat menggunakan CA
  openssl x509 -req -in $i.sevima.site.csr -CA cacert.pem -CAkey cacert.key -CAcreateserial -out $i.sevima.site.pem -days 365 -sha256 -extfile $i.sevima.site.txt

done
```

Semua certificate sudah dibuat.

```
root@semesta-lab-01:~/ca# ls
barat.sevima.site.csr  barat.sevima.site.txt  cacert.srl            timur.sevima.site.key  utara.sevima.site.csr  utara.sevima.site.txt  www.sevima.site.pem
barat.sevima.site.key  cacert.key             ca.conf               timur.sevima.site.pem  utara.sevima.site.key  www.sevima.site.csr    www.sevima.site.txt
barat.sevima.site.pem  cacert.pem             timur.sevima.site.csr  timur.sevima.site.txt  utara.sevima.site.pem  www.sevima.site.key
root@semesta-lab-01:~/ca#
```

B. Web Server :

A. Install apache dan nginx.

Karena apache dan nginx diinstall di server yang sama, maka harus di bedakan portnya agar tidak konflik.

```
root@semesta-lab-01:~# apt install apache2 nginx -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
apache2 is already the newest version (2.4.58-1ubuntu8.7).
nginx is already the newest version (1.24.0-2ubuntu7.4).
0 upgraded, 0 newly installed, 0 to remove and 89 not upgraded.
root@semesta-lab-01:~#
```

1. Konfigurasi Apache.

Ubah port apache terlebih dahulu dengan edit file /etc/apache2/ports.conf yang awalnya listen 80 ke 8001. Lalu restart servicenya.

```
root@semesta-lab-01:~# cat /etc/apache2/ports.conf | grep 8001
Listen 8001
root@semesta-lab-01:~# systemctl restart apache2
root@semesta-lab-01:~#
```

Lalu edit file html sesuai yang diperintahkan.

```
root@semesta-lab-01:~# echo "Hello World from Utara Site" > /var/www/html/index.html
root@semesta-lab-01:~#
```

```
root@semesta-lab-01:~# cd /etc/apache2/sites-available/
root@semesta-lab-01:/etc/apache2/sites-available# cp 000-default.conf utara.sevima.site.conf
root@semesta-lab-01:/etc/apache2/sites-available#
```

Isi konfigurasi dan jangan lupa restart service.

```
root@semesta-lab-01:/etc/apache2/sites-available# cat utara.sevima.site.conf
<VirtualHost *:8001>
    ServerName utara.sevima.site
    Header set X-Owner-By "Achmad Alif Nasrulloh"
    Header set X-Served-By "apache2"
    DocumentRoot /var/www/html/
    ErrorLog ${APACHE_LOG_DIR}/error-utara.sevima.site.log
    CustomLog ${APACHE_LOG_DIR}/access-utara.sevima.site.log combined
</VirtualHost>
root@semesta-lab-01:/etc/apache2/sites-available# a2enmod headers
Module headers already enabled
root@semesta-lab-01:/etc/apache2/sites-available# a2ensite utara.sevima.site.conf
Site utara.sevima.site already enabled
root@semesta-lab-01:/etc/apache2/sites-available# systemctl restart apache2
root@semesta-lab-01:/etc/apache2/sites-available#
```

Jangan lupa allow port di ufw dan lakukan verifikasi. Untuk verifikasi tambahkan local resolver di file /etc/hosts seperti gambar dibawah ini.

```
root@semesta-lab-01:~# grep -i '192.168.99.11' /etc/hosts
192.168.99.11 www.sevima.site utara.sevima.site timur.sevima.site barat.sevima.site
root@semesta-lab-01:~#
```

Lalu test menggunakan curl.

```
root@semesta-lab-01:~# curl -I http://utara.sevima.site:8001
HTTP/1.1 200 OK
Date: Sat, 19 Jul 2025 06:21:59 GMT
Server: Apache/2.4.58 (Ubuntu)
Last-Modified: Sat, 19 Jul 2025 05:43:43 GMT
ETag: "1c-63a41b9b45153"
Accept-Ranges: bytes
Content-Length: 28
X-Owner-By: Achmad Alif Nasrulloh
X-Served-By: apache2
Content-Type: text/html
```

2. Konfigurasi Nginx.

Ubah port nginx terlebih dahulu dengan edit file /etc/nginx/sites-available/default yang awalnya listen 80 ke 8101. Lalu restart servicenya.

```
root@semesta-lab-01:~# cat /etc/nginx/sites-available/default
server {
        listen 8101 default_server;
        listen [::]:8101 default_server;
        root /var/www/html;
        index index.nginx-debian.html;
        server_name _;
        location / {
                try_files $uri $uri/ =404;
        }
}
root@semesta-lab-01:~#
```

Lalu edit file html sesuai yang diperintahkan.

```
root@semesta-lab-01:~# echo "Hello World from Timur Site" > /var/www/html/index.nginx-debian.html
root@semesta-lab-01:~#
```

Lalu salin konfigurasi default jadi timur.sevima.site di /etc/nginx/sites-enabled dan edit file tersebut.

```
root@semesta-lab-01:~# cd /etc/nginx/sites-enabled/
root@semesta-lab-01:/etc/nginx/sites-enabled# cp default timur.sevima.site
root@semesta-lab-01:/etc/nginx/sites-enabled#
```

Isi konfigurasi dan jangan lupa restart service.

```
root@semesta-lab-01:/etc/nginx/sites-enabled# cat timur.sevima.site
server {
        listen 8101;
        listen [::]:8101;
        root /var/www/html;
        index index.nginx-debian.html;
        server_name timur.sevima.site;
        add_header X-Owner-By "Achmad Alif Nasrulloh";
        add_header X-Served-By "nginx";
        location / {
                try_files $uri $uri/ =404;
        }
}
root@semesta-lab-01:/etc/nginx/sites-enabled# systemctl restart nginx
root@semesta-lab-01:/etc/nginx/sites-enabled#
```

Jangan lupa allow port di ufw dan lakukan verifikasi. Lalu test menggunakan curl.

```
root@semesta-lab-01:~# curl -I http://timur.sevima.site:8101
HTTP/1.1 200 OK
Server: nginx/1.24.0 (Ubuntu)
Date: Sat, 19 Jul 2025 06:23:11 GMT
Content-Type: text/html
Content-Length: 28
Last-Modified: Sat, 19 Jul 2025 06:00:02 GMT
Connection: keep-alive
ETag: "687b3462-1c"
X-Owner-By: Achmad Alif Nasrulloh
X-Served-By: nginx
Accept-Ranges: bytes
```

2. Konfigurasi Https Nginx.

Lalu edit file html sesuai yang diperintahkan.

```
root@semesta-lab-01:~# echo "Hello World from Barat Site" > /var/www/html/barat.sevima.site.html
root@semesta-lab-01:~#
```

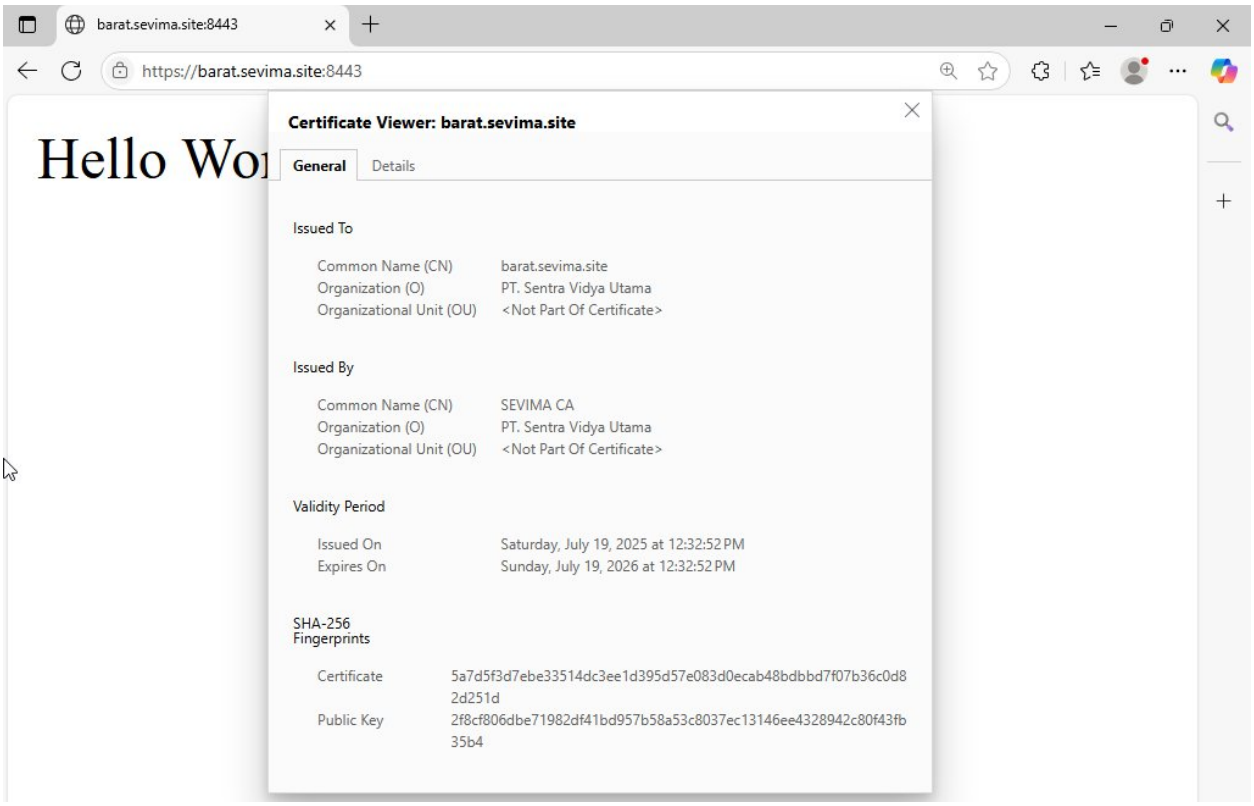
Lalu salin konfigurasi timur.sevima.site jadi barat.sevima.site di /etc/nginx/sites-enabled dan edit file tersebut.

```
root@semesta-lab-01:~# cd /etc/nginx/sites-enabled/
root@semesta-lab-01:/etc/nginx/sites-enabled# cp timur.sevima.site barat.sevima.site
root@semesta-lab-01:/etc/nginx/sites-enabled#
```

Isi konfigurasi dan jangan lupa restart service.

```
root@semesta-lab-01:/etc/nginx/sites-enabled# cat barat.sevima.site
server {
    listen 8443 ssl;
    listen [::]:8443 ssl;

    ssl_certificate /root/ca/barat.sevima.site.pem;
    ssl_certificate_key /root/ca/barat.sevima.site.key;

    root /var/www/html;
    index barat.sevima.site.html;

    server_name barat.sevima.site;

    add_header X-Owner-By "Achmad Alif Nasrulloh";
    add_header X-Served-By "nginx";

    location / {
        try_files $uri $uri/ =404;
    }
}
root@semesta-lab-01:/etc/nginx/sites-enabled# systemctl restart nginx
root@semesta-lab-01:/etc/nginx/sites-enabled#
```

Jangan lupa allow port di ufw dan lakukan verifikasi. Untuk verifikasi pastikan install cacert.pem di browser client dan coba akses domainnya.



D. Loadbalancer Haproxy :

1. Install dan konfigurasi untuk www.sevima.site.

```
root@semesta-lab-01:~# apt install haproxy -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
haproxy is already the newest version (2.8.5-1ubuntu3.3).
0 upgraded, 0 newly installed, 0 to remove and 82 not upgraded.
```

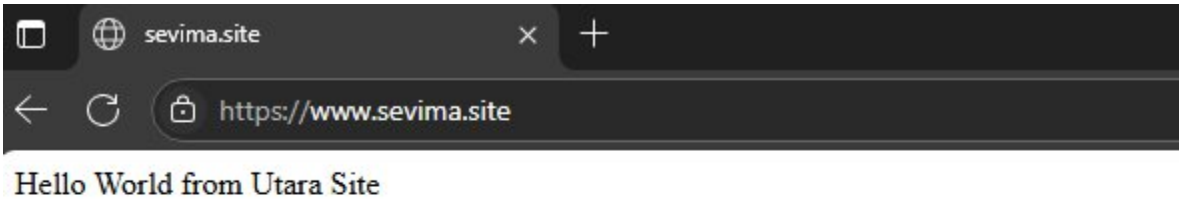
Install haproxy dan tambahkan konfiguasi berikut di /etc/haproxy/haproxy.cfg untuk konfigurasi frontend dan backend http maupun https.

```
frontend http-in
        bind *:80
        default_backend     backend_servers
        option              forwardfor

backend backend_servers
        balance             roundrobin
        server              utara utara.sevima.site:8001 check
        server              timur timur.sevima.site:8101 check


frontend https-in
        bind *:443 ssl crt /etc/haproxy/barat.sevima.site.bundle.pem
        default_backend     backends_servers
        option              forwardfor

backend backends_servers
        balance             roundrobin
        server              utara utara.sevima.site:8001 check
        server              timur timur.sevima.site:8101 check
```

Setelah itu jangan lupa buat bundle certificate dari www.sevima.site.pem dan www.sevima.site.key menjadi www.sevima.site.bundle.pem.

```
root@semesta-lab-01:~# cat /root/ca/www.sevima.site.pem > /etc/haproxy/barat.sevima.site.bundle.pem
root@semesta-lab-01:~# cat /root/ca/www.sevima.site.key >> /etc/haproxy/barat.sevima.site.bundle.pem
root@semesta-lab-01:~#
```

Lalu restart service haproxy dan uji coba dari client, pastikan ketika di refresh tampilannya berubah ubah.




sevima.site
https://www.sevima.site
Hello World from Timur Site