

# TUGAS BESAR CLOUD COMPUTING: DEPLOY WEB DENGAN GOOGLE CLOUD PLATFORM

Nama Kelompok : GGWP

1. Peres Hendri Virgiawan / 1202220421
2. Vincentius Renji Koesnadi / 1202220049

The screenshot shows the Google Cloud Platform console for creating a new VM instance. The 'Machine configuration' tab is active, displaying the 'cloudcomp1' instance. The region is set to 'asia-southeast2 (Jakarta)' and the zone is 'Any'. The machine type is 'E2'. The monthly estimate is \$10.43. The console also shows a table of machine types for common workloads, optimized for cost and flexibility.

Series	Description	vCPUs	Memory	CPU Platform
C4	Consistently high performance	2 - 192	4 - 1,488 GB	Intel Emerald Ra
C4A	Arm-based consistently high performance	1 - 72	2 - 576 GB	Google Axion
C4D	Consistently high performance	2 - 384	3 - 3,072 GB	AMD Turin
N4	Flexible & cost-optimized	2 - 80	4 - 640 GB	Intel Emerald Ra
C3	Consistently high performance	4 - 192	8 - 1,536 GB	Intel Sapphire R
C3D	Consistently high performance	4 - 360	8 - 2,880 GB	AMD Genoa
E2	Low cost, day-to-day computing	0.25 - 32	1 - 128 GB	Intel Broadwell
N2	Balanced price & performance	2 - 128	2 - 864 GB	Intel Cascade La

Langkah awal dari proses membuat Virtual Machine (VM) di Google Cloud Platform (GCP), yaitu konfigurasi mesin. Buka GCP dan buat VM, beri nama dan pilih region kemudian pilih OS ubuntu.

```
valid_lft 3067sec preferred_lft 3067sec
inet6 fe80::4001:aff:feb8:3/64 scope link
valid_lft forever preferred_lft forever
root@cloudcomp1:~# cd /etc/ssh
root@cloudcomp1:~# ls
moduli ssh_config.d ssh_host_ecdsa_key.pub ssh_host_ed25519_key.pub ssh_host_rsa_key.pub sshd_config
ssh_config ssh_host_ecdsa_key ssh_host_ed25519_key ssh_host_rsa_key ssh_import_id sshd_config.d
root@cloudcomp1:~# nano sshd_config
root@cloudcomp1:~# systemctl restart networking
Failed to restart networking.service: Unit networking.service not found.
root@cloudcomp1:~# systemctl restart networking
Unknown command verb 'networking'
root@cloudcomp1:~# systemctl restart ssh
root@cloudcomp1:~# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default 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
    inet6 ::1/128 scope host noprefixroute
        valid_lft forever preferred_lft forever
2: ens4: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1460 qdisc mq state UP group default qlen 1000
    link/ether 42:01:0a:b8:00:03 brd ff:ff:ff:ff:ff:ff
    altname enp0s4
    inet 10.184.0.3/32 metric 100 scope global dynamic ens4
        valid_lft 2708sec preferred_lft 2708sec
    inet6 fe80::4001:aff:feb8:3/64 scope link
    valid_lft forever preferred_lft forever
root@cloudcomp1:~# nano sshd_config
root@cloudcomp1:~# sudo passwd
New password:
Retype new password:
passwd: password updated successfully
root@cloudcomp1:~# systemctl restart ssh
Failed to restart ssh.service: Unit name ssh.service is not valid.
See system logs and 'systemctl status ssh.service' for details.
root@cloudcomp1:~# systemctl restart ssh
root@cloudcomp1:~# nano sshd_config
root@cloudcomp1:~# systemctl restart ssh
root@cloudcomp1:~#
```

Setelah VM berhasil dibuat, kita bisa masuk ke SSH-in-browser. Di sini, jika perlu mengatur akses, kita bisa mengedit file konfigurasi `/etc/ssh/sshd_config`, lalu restart layanan SSH dengan `systemctl restart ssh`. Pengaturan ini berguna jika ingin mengizinkan metode login

tertentu atau mengatur port SSH.



```
GNU nano 7.2 sshd_config
# Configuration for sshd
# See sshd_config(8) for details.

#Authentication:
#PubkeyAuthentication yes
# Expect .ssh/authorized_keys2 to be disregarded by default in future.
#AuthorizedKeysFile .ssh/authorized_keys .ssh/authorized_keys2
#AuthorizedPrincipalsFile none
#AuthorizedKeysCommand none
#AuthorizedKeysCommandUser nobody

# For this to work you will also need host keys in /etc/ssh/ssh_known_hosts
#HostbasedAuthentication no
# Change to yes if you don't trust ~/.ssh/known_hosts for
# HostbasedAuthentication
#IgnoreUserKnownHosts no
# Don't read the user's ~/.rhosts and ~/.shosts files
#IgnoreRhosts yes

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

# Change to yes to enable challenge-response passwords (beware issues with
# some PAM modules and threads)
#KbdInteractiveAuthentication yes

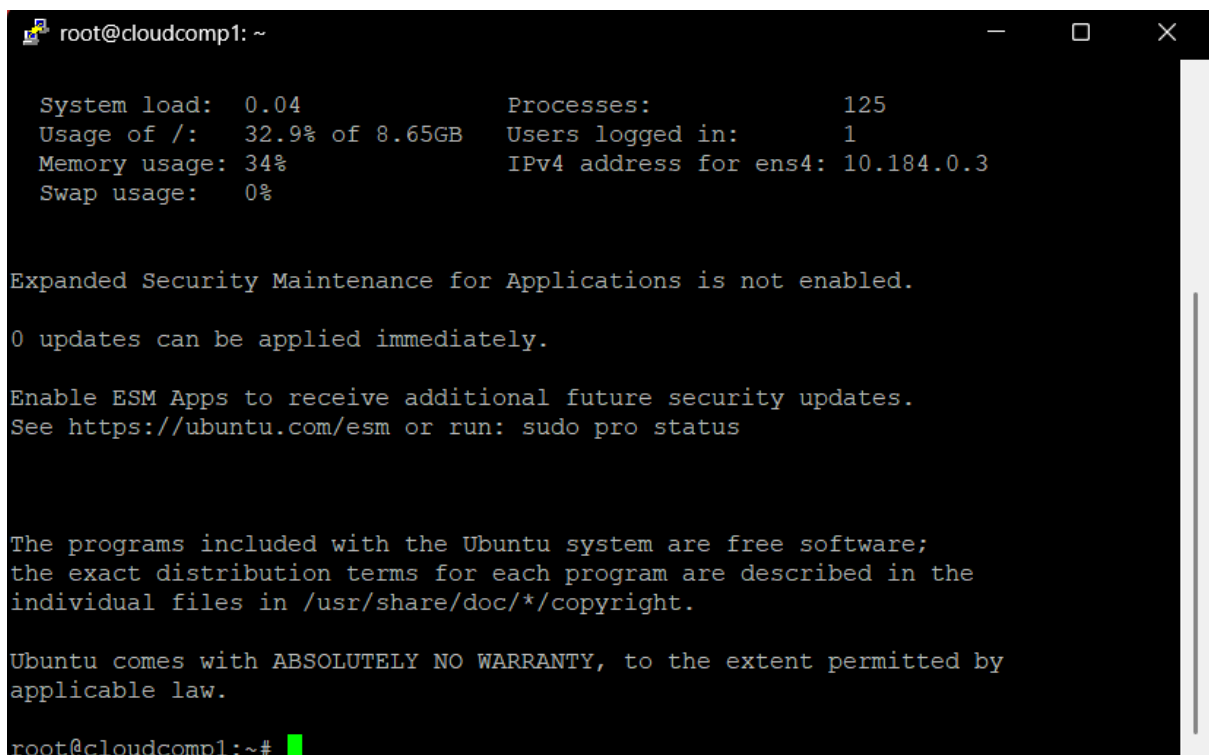
# Kerberos options
#KerberosAuthentication no
#KerberosOrLocalPasswd yes
#KerberosTicketCleanup yes
#KerberosSetAFSToken no

# SSSAPI options
#SSSAPIAuthentication no
#SSSAPICleanupCredentials yes

# Help
# Exit
# Write Out
# Read File
# Where Is
# Replace
# Cut
# Paste
# Execute
# Justify
# Location
# Go To Line
# M-U
# Undo
# M-R
# Redo
# M-A
# Set Mark
# M-C
# Copy
# M-I
# To Bracket
# M-W
# Where Was
# M-P
# Previous
# M-N
# Next
# M-B
# Back
# M-F
# Forward
```

Agar bisa diakses melalui putty maka kita harus setting untuk ssh ya dengan melakukan uncomment pada:

- PermitRootLogin yes
- PasswordAuthentication yes
- ChallengeResponseAuthentication yes



```
root@cloudcomp1: ~
System load: 0.04 Processes: 125
Usage of /: 32.9% of 8.65GB Users logged in: 1
Memory usage: 34% IPv4 address for ens4: 10.184.0.3
Swap usage: 0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

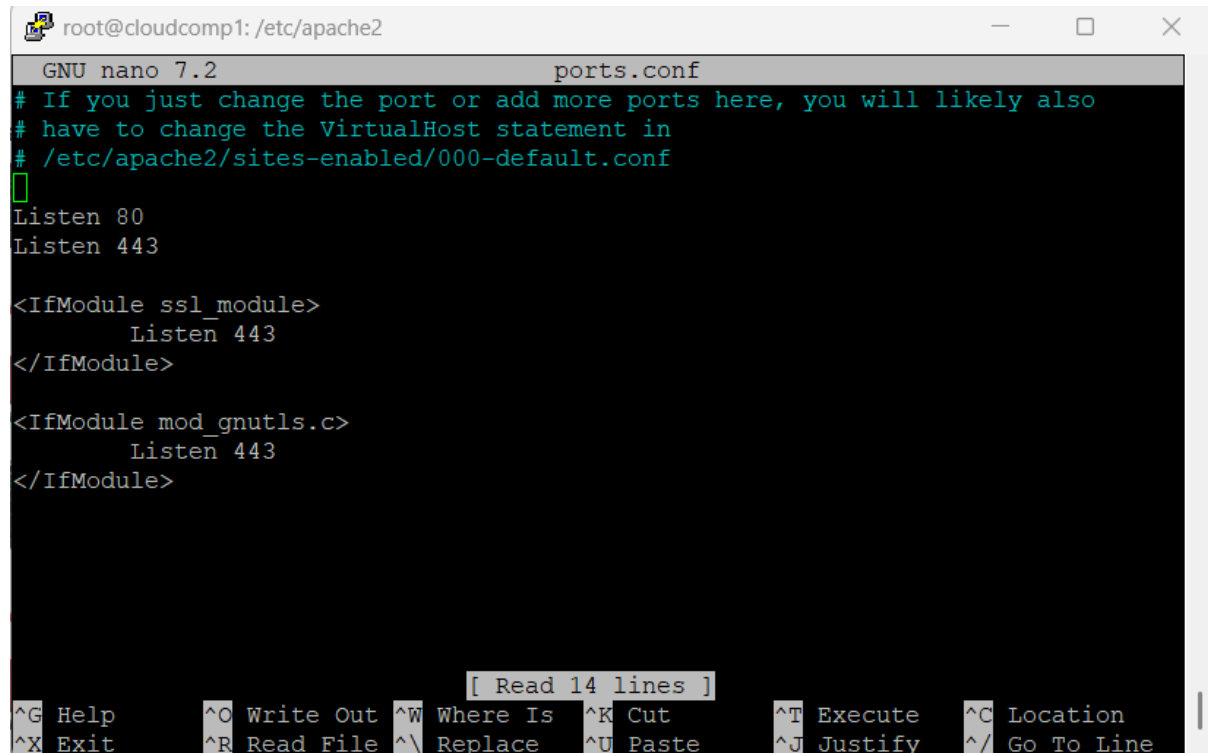
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

root@cloudcomp1:~#
```

Setelah VM GCP berhasil dibuat, kita bisa mengaksesnya melalui terminal SSH, baik via browser console atau aplikasi seperti PuTTY. Jika berhasil login, akan muncul tampilan informasi sistem seperti pada gambar. Lalu di sini kita sudah siap untuk mulai menginstal software seperti web server (Apache, Nginx) dan men-deploy website.

```
root@cloudcomp1:~# apt install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils libapr1t64 libaprutil1-dbd-sqlite3
  libaprutil1-ldap libaprutil1t64 liblua5.4-0 ssl-cert
```

Setelah berhasil masuk ke VM via PuTTY, kita dapat menjalankan perintah apt install apache2 untuk menginstal web server. Apache akan menangani permintaan HTTP dan memungkinkan website diakses melalui IP publik VM.



```
root@cloudcomp1: /etc/apache2
GNU nano 7.2 ports.conf
# If you just change the port or add more ports here, you will likely also
# have to change the VirtualHost statement in
# /etc/apache2/sites-enabled/000-default.conf
[
Listen 80
Listen 443

<IfModule ssl_module>
    Listen 443
</IfModule>

<IfModule mod_gnutls.c>
    Listen 443
</IfModule>

[ Read 14 lines ]
^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify   ^_ Go To Line
```

File ports.conf di Apache digunakan untuk menentukan port mana yang akan digunakan oleh web server. Port 80 digunakan untuk HTTP, sedangkan port 443 untuk HTTPS. Pengaturan ini penting agar website bisa diakses dari browser secara umum.

```
root@cloudcomp1:/etc/apache2# apt install firewalld
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  gir1.2-nm-1.0 ipset libipset13 libnm0 python3-cap-ng python3-firewall
  python3-nftables
The following NEW packages will be installed:
  firewalld gir1.2-nm-1.0 ipset libipset13 libnm0 python3-cap-ng
```

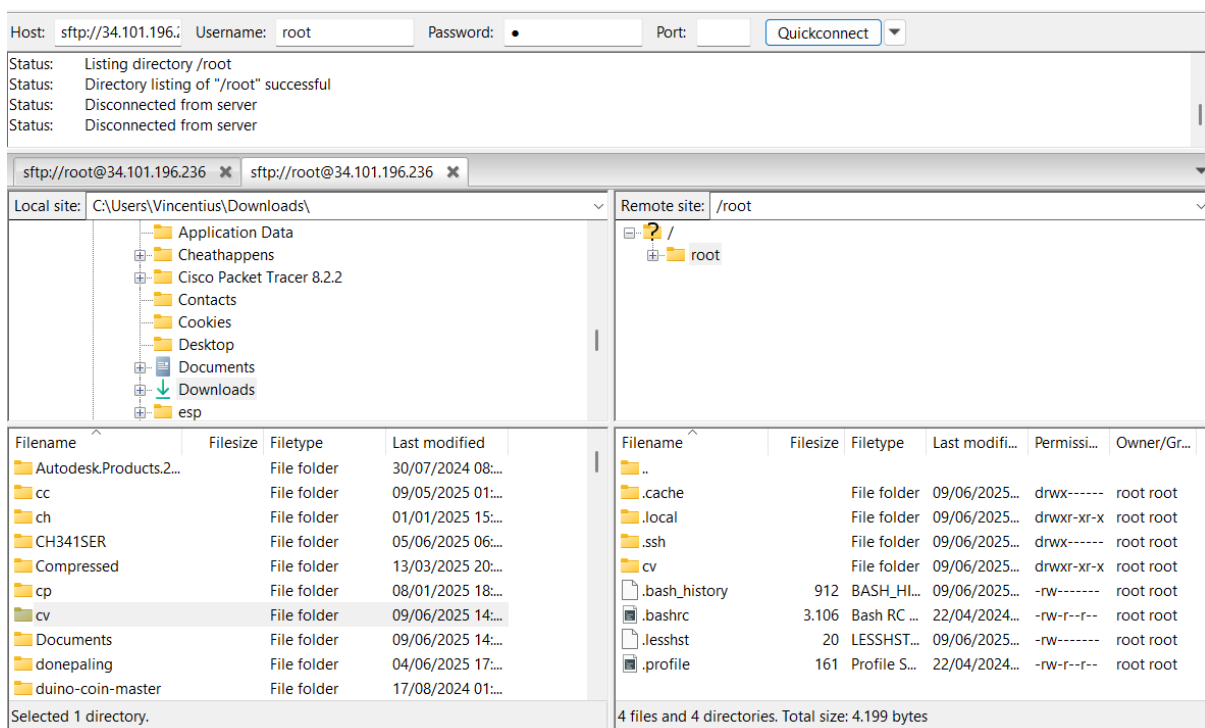
Perintah apt install firewalld digunakan untuk memasang firewall di server. Ini penting untuk mengelola keamanan akses jaringan, misalnya membuka atau menutup port tertentu sesuai kebutuhan server web.

```

root@cloudcomp1:/etc/apache2# firewall-cmd --permanent --add-port=22/tcp
success
root@cloudcomp1:/etc/apache2# firewall-cmd --permanent --add-port=80/tcp
success
root@cloudcomp1:/etc/apache2# firewall-cmd --permanent --add-port=443/tcp
success
root@cloudcomp1:/etc/apache2# firewall-cmd --reload
success
root@cloudcomp1:/etc/apache2# firewall-cmd --list-port
22/tcp 80/tcp 443/tcp

```

Setelah firewalld terinstal, port 22 (SSH), 80 (HTTP), dan 443 (HTTPS) dibuka secara permanen menggunakan firewall-cmd, lalu konfigurasi direload agar langsung aktif. Ini memastikan server web dan SSH dapat diakses dari luar jaringan.



Selanjutnya, memindahkan file code website menggunakan Filezila dan mengirimkan ke SFTP IP kita yaitu 34.101.196.236

```

root@cloudcomp1:~# cp -r cv /var/www
root@cloudcomp1:~# cd /var/www
root@cloudcomp1:/var/www# ls
cv  html

```

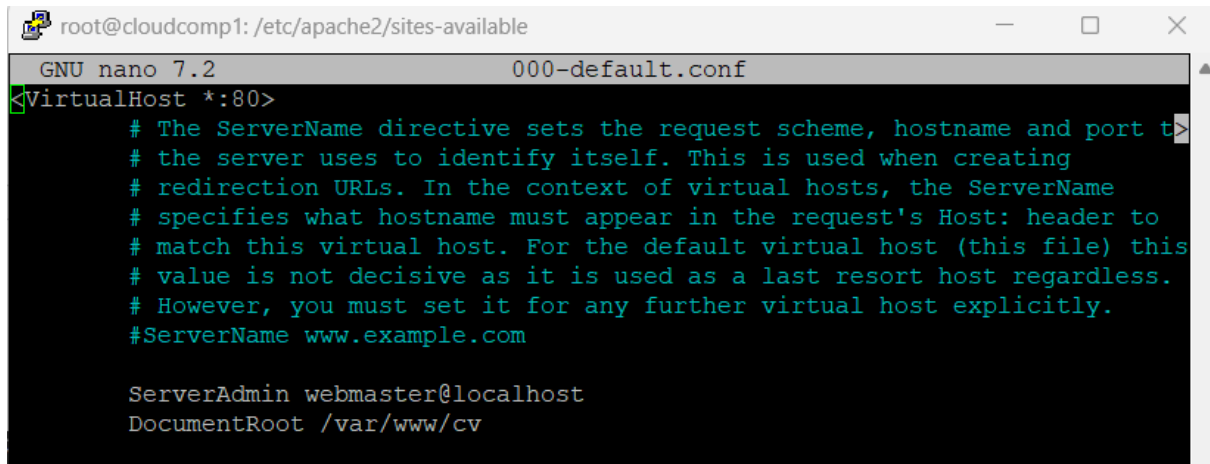
Copy folder cv yang berada di root dan langsung pindahkan ke /var/www

```

root@cloudcomp1:~# cd /etc/apache2
root@cloudcomp1:/etc/apache2# ls
apache2.conf  conf-enabled  magic          mods-enabled  sites-available
conf-available  envvars      mods-available  ports.conf    sites-enabled
root@cloudcomp1:/etc/apache2# cd sites-available/
root@cloudcomp1:/etc/apache2/sites-available# ls
000-default.conf  default-ssl.conf
root@cloudcomp1:/etc/apache2/sites-available# nano 000-default.conf

```

Setelah itu edit pada bagian 000-default.conf



```

GNU nano 7.2 000-default.conf
<VirtualHost *:80>
    # The ServerName directive sets the request scheme, hostname and port to
    # the server uses to identify itself. This is used when creating
    # redirection URLs. In the context of virtual hosts, the ServerName
    # specifies what hostname must appear in the request's Host: header to
    # match this virtual host. For the default virtual host (this file) this
    # value is not decisive as it is used as a last resort host regardless.
    # However, you must set it for any further virtual host explicitly.
    #ServerName www.example.com

    ServerAdmin webmaster@localhost
    DocumentRoot /var/www/cv

```

Edit bagian DocumentRoot menjadi /var/www/cv, setelah itu ketik systemctl restart apache2

Dan pada bagian browser ketikan IP eksternal yang berada di GCP

