

Old Dominion University
CYSE 301 Cyber Techniques and Operations

Assignment #7
Make Your Own VPN Server

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Task A

The screenshot shows the Google Cloud console welcome page for a new project named "My First Project". The user is identified as Trey KIRK. The page features a "You're in Free Trial" notification indicating that 0 out of \$300 credits have been used, with a trial end date of July 18, 2024. It also displays the project ID "phonic-arcana-420722" and provides links to "Add people to your project", "Set up budget alerts", and "Review product spend". A prominent blue button labeled "ACTIVATE FULL ACCOUNT" is visible. On the right, there is a promotional banner for the Gemini 1.5 Pro Experimental model, with a "Try Gemini" button. Below the main content, a section titled "Recommended based on your interest in General" offers pre-built solution templates such as "Deploy a three-tier web app", "Deploy load balanced managed VMs", and "Create a data warehouse with BigQuery". The browser's address bar shows the URL "console.cloud.google.com/welcome/new?project=phonic-arcana-420722".

The screenshot displays the "Budgets & alerts" page in the Google Cloud console. The left sidebar contains navigation options for Billing, Cost management, and Cost optimization. The main content area shows a table of budgets, with one budget named "VPN" listed. The table has columns for Budget name, Budget period, Budget type, Applies to, Trigger alerts at, and Spend and budget amount. A notification at the bottom of the page states "VPN has been created". On the right side, there is a "Recommended for you" section with links to "Create a Google Cloud budget", "Create, edit, or delete budgets and budget alerts", and "Understanding your Google Cloud costs". The browser's address bar shows the URL "console.cloud.google.com/billing/01F70E-F3787E-5E2306/budgets?organizationId=1032465061447&project=phonic-arcana-420722".

In the screenshots, I created a google cloud platform account and created a budget for the assignment.

Google Cloud My First Project Search (/) for resources, docs, products, and more Search

← Create an instance EQUIVALENT CODE

New VM instance
Create a single VM instance from scratch

New VM instance from template
Create a single VM instance from an existing template

New VM instance from machine image
Create a single VM instance from an existing machine image

Marketplace
Deploy a ready-to-go solution onto a VM Instance

Name * vpn-301-tkirk008

MANAGE TAGS AND LABELS

Region * us-central1 (Iowa) Zone * us-central1-c

Region is permanent Zone is permanent

Machine configuration

General purpose Compute optimized Memory optimized Storage optimized **NEW** GPUs

Machine types for common workloads, optimized for cost and flexibility

Series	Description	vCPUs	Memory	Platform
<input type="radio"/> N4	Flexible & cost-optimized	2 - 80	4 - 640 GB	Intel Emerald Rapids
<input type="radio"/> C3	Consistently high performance	4 - 176	8 - 1,408 GB	Intel Sapphire Rapids
<input type="radio"/> C3D	Consistently high performance	4 - 360	8 - 2,880 GB	AMD Genoa
<input checked="" type="radio"/> E2	Low cost, day-to-day computing	0.25 - 32	1 - 128 GB	Based on availability
<input type="radio"/> N2	Balanced price & performance	2 - 128	2 - 864 GB	Intel Cascade and Ice Lake
<input type="radio"/> N2D	Balanced price & performance	2 - 224	2 - 896 GB	AMD EPYC

Monthly estimate
\$25.46
That's about \$0.03 hourly

Pay for what you use: no upfront costs and per second billing

Item	Monthly estimate
2 vCPU + 4 GB memory	\$24.46
10 GB balanced persistent disk	\$1.00
Total	\$25.46

[Compute Engine pricing](#)

[^ LESS](#)

CREATE CANCEL EQUIVALENT CODE



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Advanced options

Networking
Hostname and network interfaces

Network tags vpn

Hostname

Set a custom hostname for this instance or leave it default. Choice is permanent

IP forwarding

Enable

Network performance configuration

Network interface card

Network bandwidth

Enable per VM Tier_1 networking performance
Maximum outbound network bandwidth: 2Gbps
VM to Public IP: 2Gbps

Monthly estimate
\$25.46
That's about \$0.03 hourly

Pay for what you use: no upfront costs and per second billing

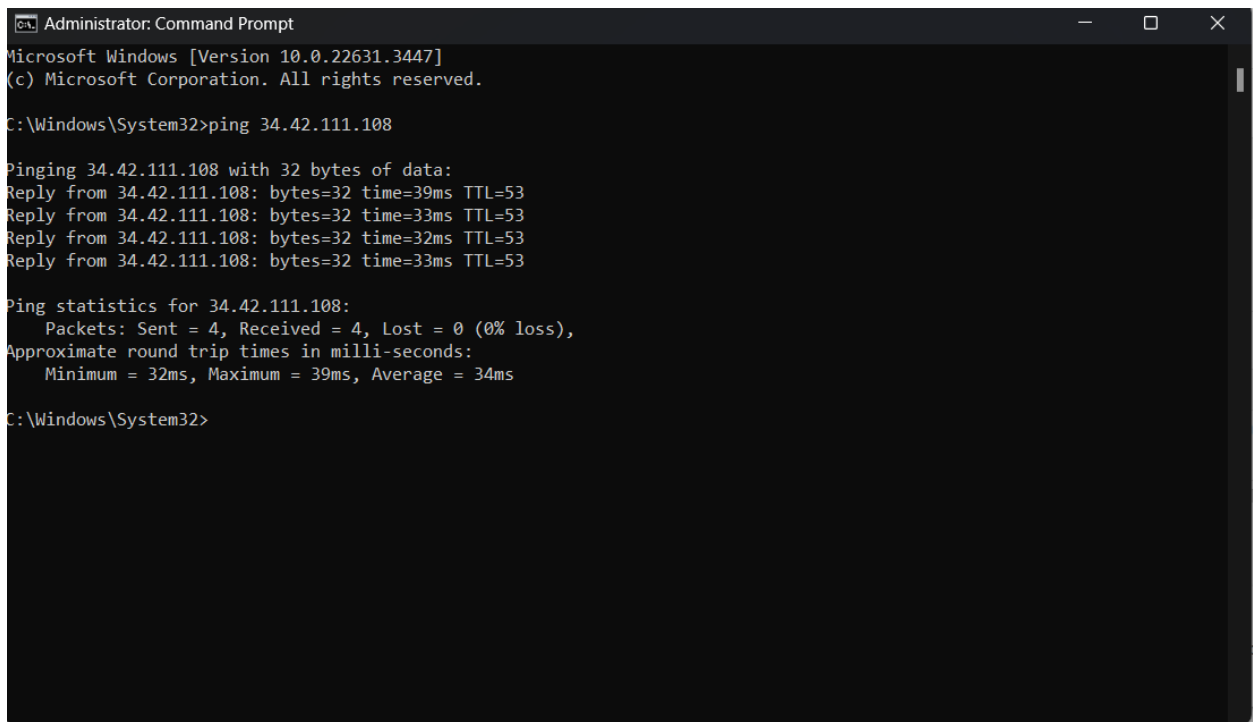
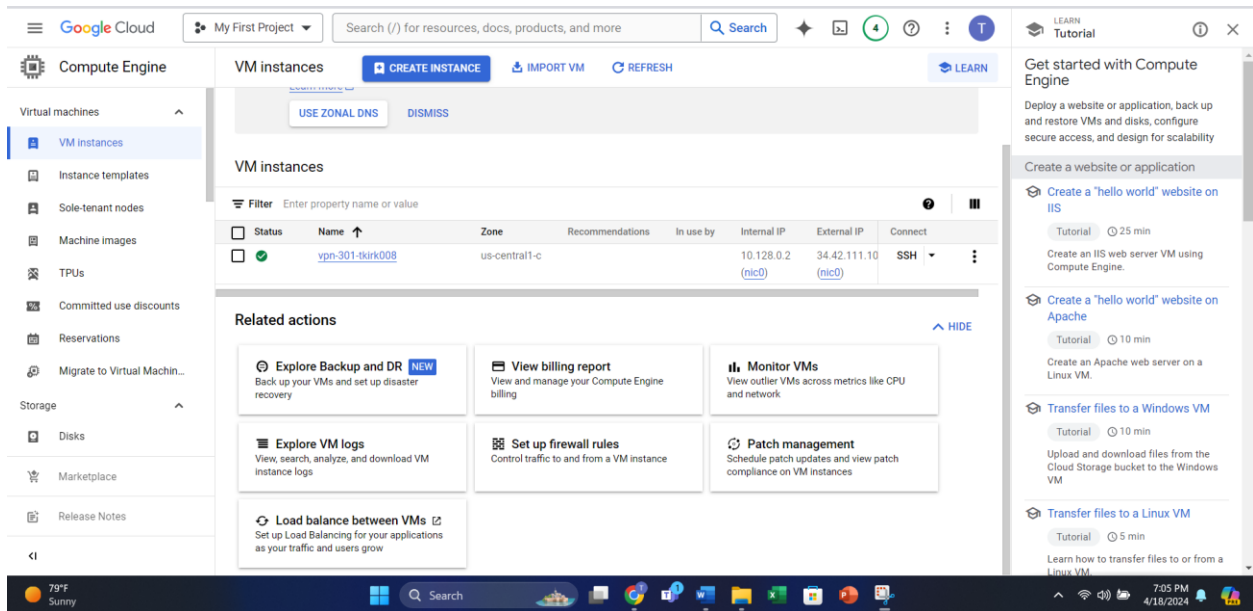
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[^ LESS](#)

CREATE CANCEL EQUIVALENT CODE





In the screenshots, I configured a vpn through the GCP and tested my connectivity to it through the command line interface. My external IP address is 34.42.111.108.


```
ssh.cloud.google.com/v2/ssh/projects/phonic-arcana-420722/zones/us-central1-c/instances/vpn-301-tkirk008?authuser=0&hl=en_US&pr...
ssh.cloud.google.com/v2/ssh/projects/phonic-arcana-420722/zones/us-central1-c/instances/vpn-301-tkirk008?authuser=0&h...
SSH-in-browser
UPLOAD FILE
DOWNLOAD FILE

* /etc/openvpn/server/easy-rsa/pki/issued/tkirk008_v2.crt

Notice
-----
Inline file created:
* /etc/openvpn/server/easy-rsa/pki/inline/tkirk008_v2.inline

No Easy-RSA 'vars' configuration file exists!

Using SSL:
* openssl OpenSSL 3.0.11 19 Sep 2023 (Library: OpenSSL 3.0.11 19 Sep 2023)
Using configuration from /etc/openvpn/server/easy-rsa/pki/openssl-easyrsa.cnf

Notice
-----
An updated CRL has been created:
* /etc/openvpn/server/easy-rsa/pki/crl.pem

2024-04-18 23:58:07 DEPRECATED OPTION: The option --secret is deprecated.
2024-04-18 23:58:07 WARNING: Using --genkey --secret filename is DEPRECATED. Use --genkey secret filename inst
ead.
Created symlink /etc/systemd/system/multi-user.target.wants/openvpn-iptables.service -> /etc/systemd/system/open
vpn-iptables.service.
Created symlink /etc/systemd/system/multi-user.target.wants/openvpn-server@server.service -> /lib/systemd/system
/openvpn-server@.service.

Finished!

The client configuration is available in: /root/tkirk008_v2.ovpn
New clients can be added by running this script again.
tkirk008@vpn-301-tkirk008:~/openvpn-install$ sudo cp /root/tkirk008_v2 .
cp: cannot stat '/root/tkirk008_v2': No such file or directory
tkirk008@vpn-301-tkirk008:~/openvpn-install$ sudo cp /root/tkirk008_v2.ovpn .
tkirk008@vpn-301-tkirk008:~/openvpn-install$ sudo chmod 666 tkirk008_v2
chmod: cannot access 'tkirk008_v2': No such file or directory
tkirk008@vpn-301-tkirk008:~/openvpn-install$ sudo chmod 666 tkirk008_v2.ovpn
tkirk008@vpn-301-tkirk008:~/openvpn-install$
```

In the screenshots, I configured the server and made a downloadable file for the open VPN application to read.

Google Cloud My First Project Search (/) for resources, docs, products, and more

Network Security

Firewall policies

CREATE FIREWALL POLICY CREATE FIREWALL RULE

REFRESH CONFIGURE LOGS DELETE

Filter Enter property name or value

Name	Type	Targets	Filters	Protocols / ports	Action	Priority	Network
<u>allow-vpn-traffic</u>	Ingress	vpn	IP ranges:	udp:8888	Allow	1000	default
<u>default-allow-icmp</u>	Ingress	Apply to all	IP ranges:	icmp	Allow	65534	default
<u>default-allow-internal</u>	Ingress	Apply to all	IP ranges:	tcp:0-65535 udp:0-65535 icmp	Allow	65534	default
<u>default-allow-rdp</u>	Ingress	Apply to all	IP ranges:	tcp:3389	Allow	65534	default
<u>default-allow-ssh</u>	Ingress	Apply to all	IP ranges:	tcp:22	Allow	65534	default

Network firewall policies

Firewall policies let you group several firewall rules so that you can update them all at once, effectively controlled by Identity and Access Management (IAM) roles. [Learn more](#)

Successfully created firewall rule "allow-vpn-traffic".

Recommended for you

- Cloud Next Generation Firewall overview
- Types of firewall policies
- Create a global network firewall policy
- Configure intrusion prevention service

In the screenshot, I configured a firewall for the server.





Imported Profile

Profile Name

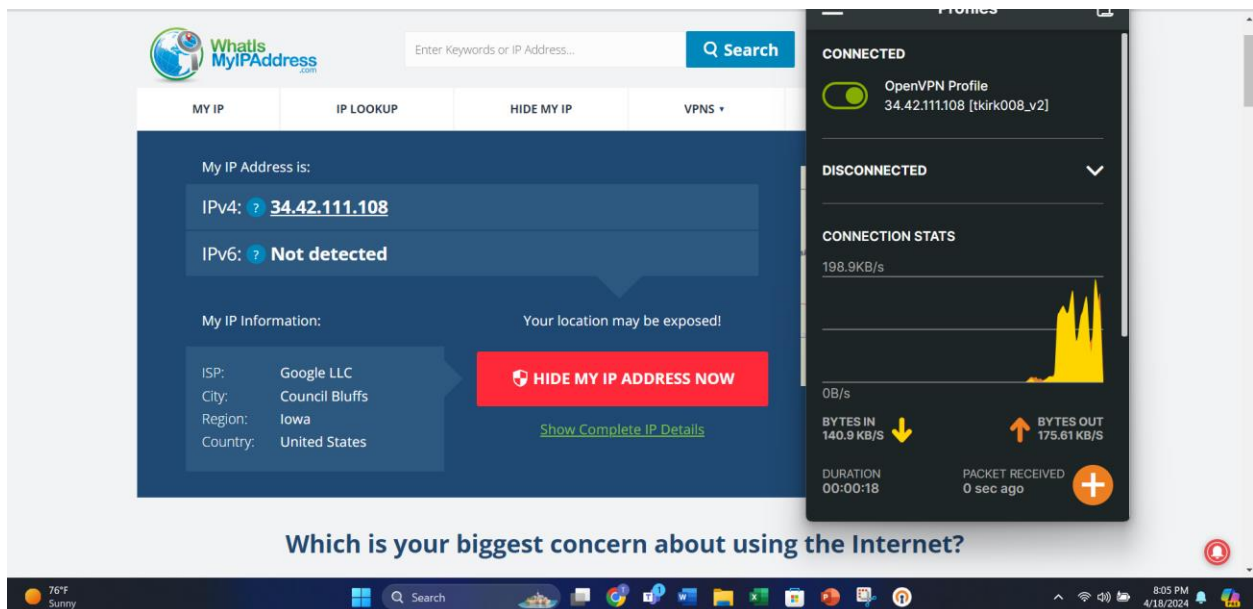
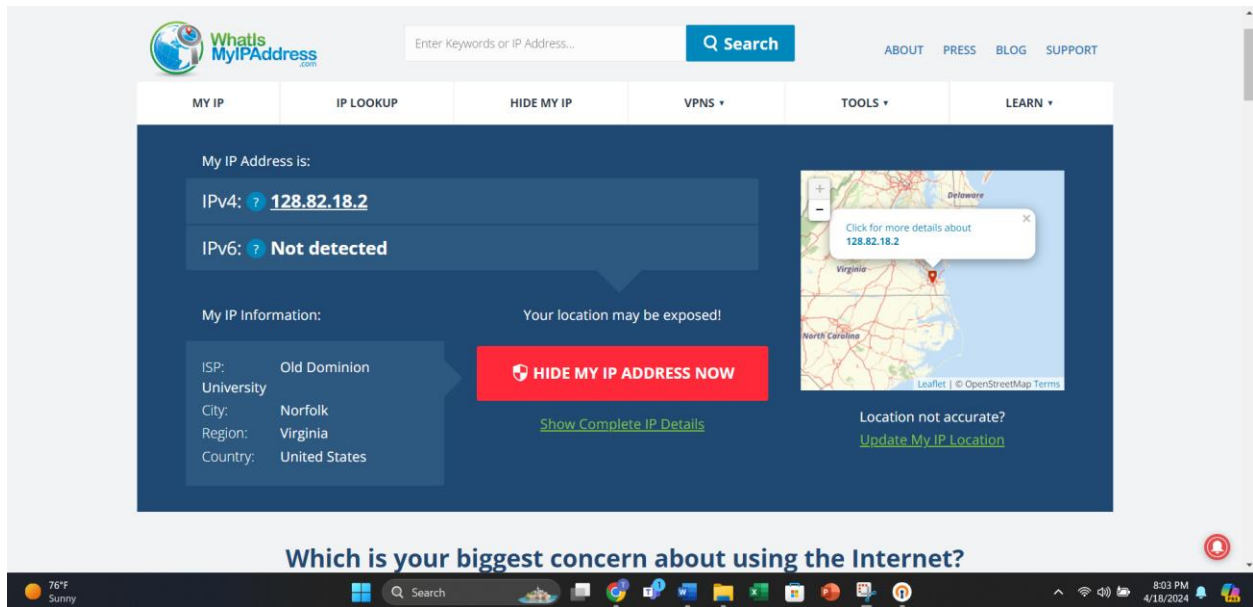
34.42.111.108 [tkirk008_v2]

Server Hostname (locked)

34.42.111.108

PROFILES

CONNECT



In the screenshots, I tested the firewall connectivity with my original public IP address being 128.82.18.2 which then was changed to the external public IP address of 34.42.111.108 from the VPN server.

