

Reverse Proxy

- protects a web site
- load balancing

User A User B User C



Reverse Proxy



LAN

Reverse Proxy

- protects a web site
- load balancing
- caching

User A User B User C



Internet

Caching



NGINX

Reverse Proxy

Web Server A

Web Server B

LAN

Web Server A

Web Server B

LAN

Reverse Proxy

- protects a web site
- load balancing
- caching
- handles SSL encryption

User A User B User C



Internet

Nginx

https://

Reverse Proxy

https://

Web Server A

Web Server B

LAN



Reverse Proxy

- protects a web site
- load balancing
- caching
- handles SSL encryption

User A User B User C



Internet

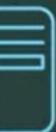


NGINX

Reverse Proxy



Web Server A



Web Server B

LAN



Client

Web

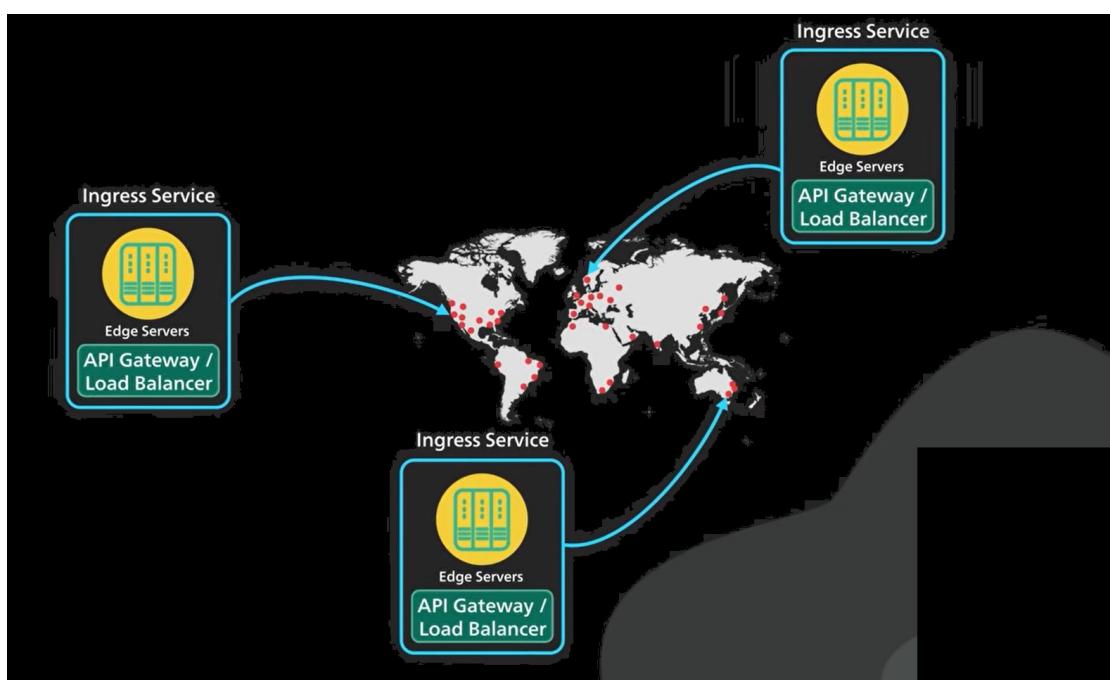
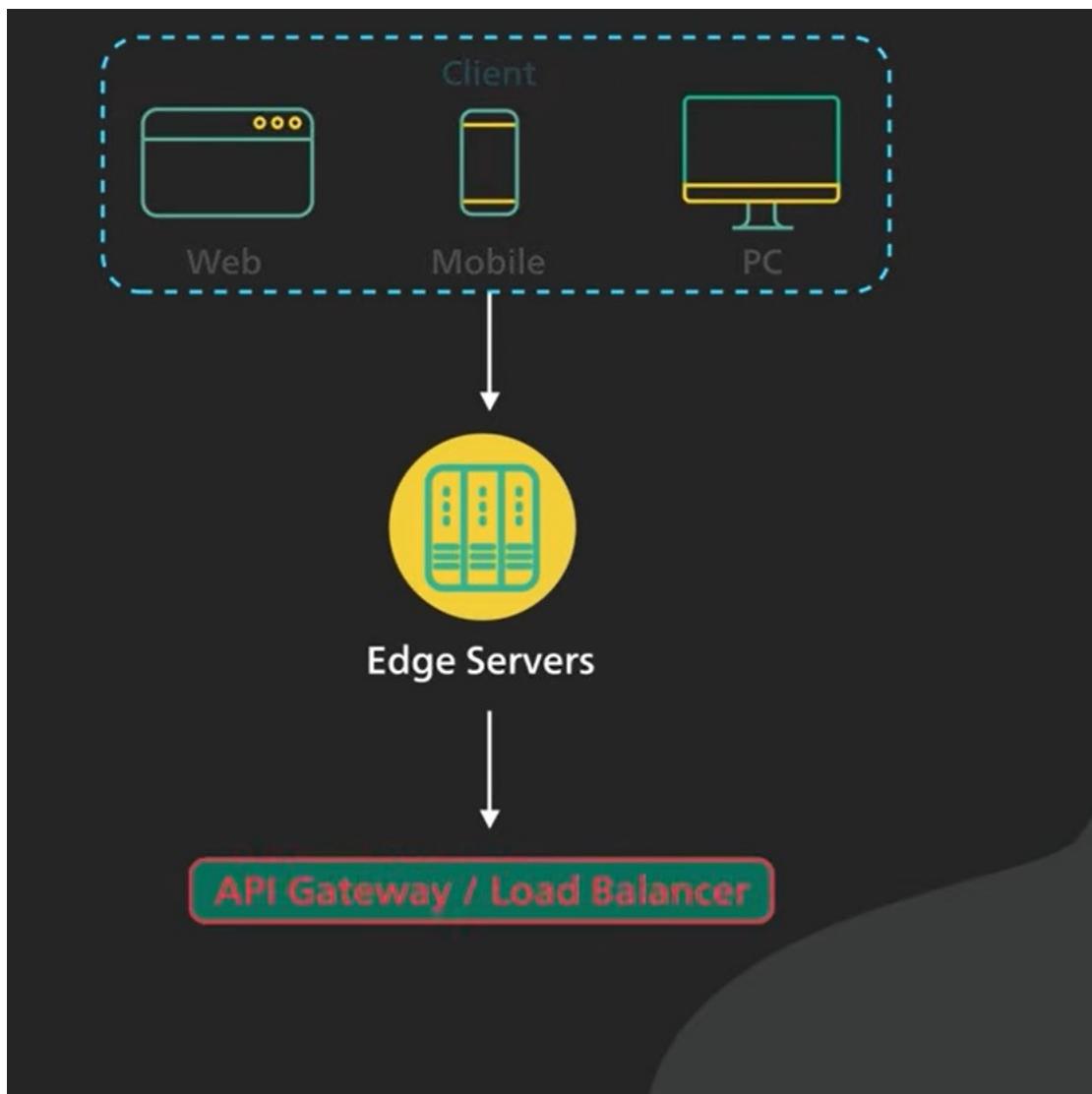
Mobile

PC

Edge Servers

API Gateway / Load Balancer





Practicals

Set up EC2 instance name as Forward_proxy on AWS

The screenshot shows the AWS EC2 Dashboard. On the left, a sidebar menu includes options like Dashboard, Instances, Images, Elastic Block Store, Network & Security, and more. The main area displays 'Resources' for the United States (N. Virginia) Region, showing 0 instances (running), 0 Auto Scaling Groups, 0 Capacity Reservations, 0 Dedicated Hosts, 0 Elastic IPs, 0 Instances, 1 Key pair, 0 Load balancers, 0 Placement groups, 3 Security groups, and 0 Snapshots, Volumes, and Volumes. Below this is a 'Launch instance' section with a 'Launch instance' button and a note about launching in the United States (N. Virginia) Region. To the right is a 'Service health' section with a green status indicator ('This service is operating normally') and a 'Zones' table showing availability zones (us-east-1a, us-east-1b, us-east-1c, us-east-1d, us-east-1e) and their Zone IDs (use1-az4, use1-az6, use1-az1, use1-az2, use1-az3). On the far right is an 'EC2 cost' section with a bar chart showing costs over time, with a total cost of \$0.

The screenshot shows the 'Launch an instance' wizard. Step 1: Name and tags. It asks for a name (e.g., My Web Server) and provides an 'Add additional tags' button. Step 2: Application and OS Images (Amazon Machine Image). It lists available AMIs and allows searching or browsing more. Step 3: Instance type. It shows the selected t3.micro instance type with details: Family: t3, 2 vCPU, 1 GB Memory, Current generation: true. It also lists other options like All generations and Compare instance types. A note at the bottom states 'Additional costs apply for AMIs with pre-installed software'. On the right, there's a 'Summary' section with fields for Number of instances (set to 1), Software Image (AMI), Virtual server type (instance type) t3.micro, Firewall (security group), and Storage (volumes). Buttons include 'Cancel', 'Launch instance' (highlighted in orange), and 'Preview code'. A message at the top says 'It seems like you may be new to launching instances in EC2. Take a walkthrough to learn about EC2, how to launch instances and about best practices'.

Screenshot of the AWS EC2 Launch Instance wizard. The left sidebar shows tabs for 'Launch an instance | EC2' and 'iam-veerema/forward-and-rev'. The main content area is titled 'Launch an instance' under 'Instances'.

- Instance type:** t2.micro (selected). Details: Family: t2, 1 vCPU, 1 GiB Memory, Current generation: true, On-Demand Windows base pricing: 0.0162 USD per Hour, On-Demand Ubuntu Pro base pricing: 0.0114 USD per Hour, On-Demand SUSE base pricing: 0.0116 USD per Hour, On-Demand RHEL base pricing: 0.026 USD per Hour, On-Demand Linux base pricing: 0.0116 USD per Hour. A note says 'Additional costs apply for AMIs with pre-installed software'.
- Key pair (login):** Key pair name is required. A dropdown menu shows 'Select' and a button to 'Create new key pair'.
- Network settings:** Network is set to 'vpc-0bb30d1e90899fb7b'. Subnet is set to 'No preference'. Auto-assign public IP is enabled. Firewall (security groups) shows 'Create security group' selected.
- Summary:** Shows 1 instance. Software Image (AMI): Canonical, Ubuntu, 24.04, amd64. Virtual server type: t2.micro. Storage: 1 volume(s) - 8 GiB.
- Buttons:** 'Cancel', 'Launch instance' (highlighted in orange), and 'Preview code'.

Key-Value-pair

Create key pair

Key pair name
Key pairs allow you to connect to your instance securely.

The name can include up to 255 ASCII characters. It can't include leading or trailing spaces.

Key pair type
 RSA
RSA encrypted private and public key pair
 ED25519
ED25519 encrypted private and public key pair

Private key file format
 .pem
For use with OpenSSH
 .ppk
For use with PuTTY

Warning: When prompted, store the private key in a secure and accessible location on your computer. You will need it later to connect to your instance. [Learn more](#)

Buttons: 'Cancel' and 'Create key pair' (highlighted in orange).

The screenshot shows the AWS EC2 'Launch an instance' wizard. On the left, there's a sidebar with 'EC2 > Instances > Launch an instance'. The main area has tabs for 'Subnet' (selected), 'Info', 'Auto-assign public IP', 'Enable', and 'Firewall (security groups)'. Under 'Firewall (security groups)', it says 'We'll create a new security group called "launch-wizard-3" with the following rules:' and lists three rules: 'Allow SSH traffic from Anywhere (0.0.0.0/0)', 'Allow HTTPS traffic from the internet (To set up an endpoint, for example when creating a web server)', and 'Allow HTTP traffic from the internet (To set up an endpoint, for example when creating a web server)'. A note below says 'Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.' On the right, the 'Summary' section shows: Software Image (AMI) - Canonical, Ubuntu, 24.04, amd64; Virtual server type (instance type) - t2.micro; Firewall (security group) - New security group; Storage (volumes) - 1 volume(s) - 8 GiB. At the bottom right are 'Cancel', 'Launch instance', and 'Preview code' buttons.

The screenshot shows the 'Launch an instance' progress bar at 80%. The progress bar has two segments: 'Launching instance' and 'Launch initiation'. Below the progress bar, there's a 'Details' section with the message: 'Please wait while we launch your instance. Do not close your browser while this is loading.'

```
Oct 15 12:49:54 on console
Mac-Studio ~ % cd Downloads/
Mac-Studio ~ /Downloads %
```

cp public IP

Instance summary for i-0a7b38ec5e58a6ec8 (forward-proxy)

- Public IP4 address:** 54.91.210.90 | [open address](#)
- Private IP4 address (IPV4 only):** ip-172-31-27-83.ec2.internal
- Private IP DNS name (IPV4 only):** ip-172-31-27-83.ec2.internal
- Instance type:** t2.micro
- VPC ID:** vpc-0bb30d1e90899fb7b
- Subnet ID:** subnet-0a5aeef6f253decbb
- Instance ARN:** arn:aws:ec2:us-east-1:766957561917:instance/i-0a7b38ec5e58a6ec8
- Elastic IP addresses:** 172.31.27.83
- AWS Compute Optimizer finding:** Opt-in to AWS Compute Optimizer for recommendations.
- Auto Scaling Group name:** -
- Managed:** false

```

Mac-Studio [~/Downloads] ssh -i proxy-key-value.pem ubuntu@54.91.210.90
he authenticity of host '54.91.210.90 (54.91.210.90)' can't be established.
D25519 key fingerprint is SHA256:3Z16MbopGh2qangDXIeExnl0jfDPqp3HAGKBQvI97uc.
his key is not known by any other names.
re you sure you want to continue connecting (yes/no/[fingerprint])? yes
arning: Permanently added '54.91.210.90' (ED25519) to the list of known hosts.
@@@@@@@WARNING: UNPROTECTED PRIVATE KEY FILE! @
@@@permissions 0644 for 'proxy-key-value.pem' are too open.
t is required that your private key files are NOT accessible by others.
his private key will be ignored.
oad key "proxy-key-value.pem": bad permissions
ubuntu@54.91.210.90: Permission denied (publickey).

Mac-Studio [~/Downloads] chmod 400 proxy-key-value.pem
Mac-Studio [~/Downloads] ssh -i proxy-key-value.pem ubuntu@54.91.210.90

```

```
* Documentation: https://help.ubuntu.com
* Management: https://landscape.canonical.com
* Support: https://ubuntu.com/pro

System information as of Wed Oct 15 11:27:38 UTC 2025

System load: 0.42           Processes:      112
Usage of /: 25.6% of 6.71GB  Users logged in: 0
Memory usage: 22%          IPv4 address for enX0: 172.31.27.83
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 list of available updates is more than a week old.
To check for new updates run: sudo apt update

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.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-27-83:~$
```

@ this instance install Forward Proxy Server

```
ubuntu@ip-172-31-27-83:~$ sudo apt update
[et:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
[et:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
[et:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
[et:4 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
[et:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
% [5 Packages 5578 kB/15.0 MB 37%] [4 InRelease 76.4 kB/126 kB 61%]
```

install Squid

```
ubuntu@ip-172-31-27-83:~$ sudo apt install squid
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
libdbi-perl libecap3 libltdl7 libtdb1 squid-common squid-langpack ssl-cert
Suggested packages:
  libclone-perl libmldb-m perl libnet-daemon-perl libsql-statement-perl squidclient squid-cgi squid-purge resolvconf smbclient winbind
The following NEW packages will be installed:
  libdbi-perl libecap3 libltdl7 libtdb1 squid squid-common squid-langpack ssl-cert
0 upgraded, 8 newly installed, 0 to remove and 53 not upgraded.
Need to get 3973 kB of archives.
After this operation, 16.0 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
[et:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/main amd64 libecap3 amd64 1.0.1-3.4ubuntu2 [17.0 kB]
[et:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/main amd64 libltdl7 amd64 2.4.7-7build1 [40.3 kB]
[et:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/main amd64 libtdb1 amd64 1.4.10-7build1 [46.8 kB]
[et:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/main amd64 squid-langpack all 20220130-1 [175 kB]
[et:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/main amd64 squid-common all 6.13-0ubuntu0.24.04.2 [213 kB]
[et:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble/main amd64 libdbi-perl amd64 1.643-4build3 [721 kB]
[et:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble/main amd64 ssl-cert all 1.1.2ubuntu1 [17.8 kB]
[et:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/main amd64 squid amd64 6.13-0ubuntu0.24.04.2 [2743 kB]
4% [8 squid 64.9 kB/2743 kB 2%]
```

```
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-27-83:~$
```

```
ubuntu@ip-172-31-27-83:~$ sudo ls /etc/squid/squid.conf
/etc/squid/squid.conf
ubuntu@ip-172-31-27-83:~$
```

```
ubuntu@ip-172-31-27-83:~$ sudo vim /etc/squid/squid.conf
```

The screenshot shows a terminal window titled "Term2" with the command "ubuntu@ip-172-31-27-83:~\$ sudo vim /etc/squid/squid.conf". The Vim editor is displaying the Squid configuration file. The file starts with a welcome message for version 6.1. It provides documentation for the Squid configuration file, including links to the official website and a FAQ. It also discusses the use of the "include" directive to include other files and the nesting of includes. The configuration file ends with a footer indicating it has 9391 lines and was last modified on October 15, 2016, at 4:59 PM.

```
WELCOME TO SQUID 6.1
-----
#
# This is the documentation for the Squid configuration file.
# This documentation can also be found online at:
#   http://www.squid-cache.org/Doc/config/
#
# You may wish to look at the Squid home page and wiki for the
# FAQ and other documentation:
#   http://www.squid-cache.org/
#   https://wiki.squid-cache.org/SquidFaq
#   https://wiki.squid-cache.org/ConfigExamples
#
# This documentation shows what the defaults for various directives
# happen to be. If you don't need to change the default, you should
# leave the line out of your squid.conf in most cases.
#
# In some cases "none" refers to no default setting at all,
# while in other cases it refers to the value of the option
# - the comments for that keyword indicate if this is the case.
#
# Configuration options can be included using the "include" directive.
# Include takes a list of files to include. Quoting and wildcards are
# supported.
#
# For example,
# include /path/to/include/file/squid.acl.config
#
# Includes can be nested up to a hard-coded depth of 16 levels.
# This arbitrary restriction is to prevent recursive include references
# from causing Squid entering an infinite loop whilst trying to load
# configuration files.
#
# Values with byte units
"/etc/squid/squid.conf" 9391L, 3531558
```

```
# iTerm2 Shell Edit View Session Scripts Profiles Toolbar Window Help
ubuntu@ip-172-31-27-83: ~
# Units accepted by Squid are:
#   bytes - byte
#     KB - Kilobyte (2^10, 1'024 bytes)
#     MB - Megabyte (2^20, 1'048'576 bytes)
#     GB - Gigabyte (2^30, 1'073'741'824 bytes)
# Squid does not yet support KiB, MiB, and GiB unit names.

# Values with time units
# Time-related directives marked with either "time-units" or
# "time-units-small" accept a time unit. The supported time units are:
#   nanosecond (time-units-small only)
#   microsecond (time-units-small only)
#   millisecond
#   second
#   minute
#   hour
#   day
#   week
#   fortnight
#   month - 30 days
#   year - 31557790080 milliseconds (just over 365 days)
#   decade

# Values with spaces, quotes, and other special characters
# Squid supports directive parameters with spaces, quotes, and other
# special characters. Surround such parameters with "double quotes". Use
# the configuration_includes_quoted_values directive to enable or
# disable that support.

# Squid supports reading configuration option parameters from external
# files using the syntax:
#   parameters(">/path/filename")
# For example:
#
```

backup this File

```
ubuntu@ip-172-31-27-83:~$ sudo cp /etc/squid/squid.conf /etc/squid/squid.conf.original
ubuntu@ip-172-31-27-83:~$
```

Empty the file

```
ubuntu@ip-172-31-27-83:~$ sudo mv /etc/squid/squid.conf /dev/null
ubuntu@ip-172-31-27-83:~$ sudo vim /etc/squid/squid.conf
```

```
# iTerm2 Shell Edit View Session Scripts Profiles Toolbar Window Help
ubuntu@ip-172-31-27-83: ~
"/etc/squid/squid.conf" [New]
^[ 0,0-1 All
```

<https://github.com/Siddhartha082/Forward-Reverse-Proxy--using-NGNIX-on-AWS/blob/main/forward-proxy/squid.conf>

Forward-Reverse-Proxy/forward... You will never forget Forward... | +

github.com/Siddhartha082/Forward-Reverse-Proxy/blob/main/forward-proxy/squid.conf

Siddhartha082 / Forward-Reverse-Proxy

Code Issues Pull requests Actions Wiki Security Insights Settings

main Forward-Reverse-Proxy / forward-proxy / squid.conf

Siddhartha082 Forward-Reverse-Proxy

Code Blame 44 lines (34 loc) - 1.36 KB

```

1  # Squid Forward Proxy Configuration
2  http_port 8080
3
4  # Recommended minimum configuration:
5  acl SSL_ports port 443
6  acl Safe_ports port 80      # http
7  acl Safe_ports port 21      # ftp
8  acl Safe_ports port 443    # https
9  acl Safe_ports port 70      # gopher
10 acl Safe_ports port 210     # wais
11 acl Safe_ports port 1025-65535 # unregistered ports
12 acl Safe_ports port 280     # http-gmt
13 acl Safe_ports port 488     # gss-http
14 acl Safe_ports port 591     # filemaker
15 acl Safe_ports port 777     # multiling http
16
17 acl CONNECT method CONNECT
18
19 # Deny requests to certain unsafe ports
20 http_access deny !Safe_ports
21
22 # Deny CONNECT to other than secure SSL ports
23 http_access deny CONNECT !SSL_ports

```

Type here to search

ubuntu@ip-172-31-27-83: ~

/etc/squid/squid.conf [New]

```

# Recommended minimum configuration:
acl Safe_ports port 210      # wais
acl Safe_ports port 1025-65535 # unregistered ports
acl Safe_ports port 280      # http-gmt
acl Safe_ports port 488      # gss-http
acl Safe_ports port 591      # filemaker
acl Safe_ports port 777      # multiling http

acl CONNECT method CONNECT

# Deny requests to certain unsafe ports
http_access deny !Safe_ports

# Deny CONNECT to other than secure SSL ports
http_access deny CONNECT !SSL_ports

# Only allow cachemgr access from localhost
http_access allow localhost manager
http_access deny manager

# DEMO: Block specific websites to show proxy filtering capability
acl blocked_sites dstdomain .facebook.com .twitter.com .instagram.com
http_access deny blocked_sites

# Allow access from all (DEMO ONLY - NOT FOR PRODUCTION)
http_access allow all

# And finally deny all other access to this proxy
http_access deny all

# Logging - use stdio instead of daemon to avoid pipe issues
access_log stdio:/var/log/squid/access.log squid
cache_log /var/log/squid/cache.log

# Cache directory
coredump_dir /var/spool/squid

```

Check the Config in Squid

```
ubuntu@ip-172-31-27-83:~$ sudo vim /etc/squid/squid.conf
ubuntu@ip-172-31-27-83:~$ sudo squid -k parse
2025/10/15 11:36:00| Processing Configuration File: /etc/squid/squid.conf (depth 0)
2025/10/15 11:36:00| Processing: http_port 8080
2025/10/15 11:36:00| Processing: acl SSL_ports port 443
2025/10/15 11:36:00| Processing: acl Safe_ports port 80      # http
2025/10/15 11:36:00| Processing: acl Safe_ports port 21      # ftp
2025/10/15 11:36:00| Processing: acl Safe_ports port 443      # https
2025/10/15 11:36:00| Processing: acl Safe_ports port 70      # gopher
2025/10/15 11:36:00| Processing: acl Safe_ports port 210     # wais
2025/10/15 11:36:00| Processing: acl Safe_ports port 1025-65535 # unregistered ports
2025/10/15 11:36:00| Processing: acl Safe_ports port 280     # http-mgmt
2025/10/15 11:36:00| Processing: acl Safe_ports port 488     # gss-http
2025/10/15 11:36:00| Processing: acl Safe_ports port 591     # filemaker
2025/10/15 11:36:00| Processing: acl Safe_ports port 777     # multiling http
2025/10/15 11:36:00| Processing: acl CONNECT method CONNECT
2025/10/15 11:36:00| Processing: http_access deny !Safe_ports
2025/10/15 11:36:00| Processing: http_access deny CONNECT !SSL_ports
2025/10/15 11:36:00| Processing: http_access allow localhost manager
2025/10/15 11:36:00| Processing: http_access deny manager
2025/10/15 11:36:00| Processing: acl blocked_sites dstdomain .facebook.com .twitter.com .instagram.com
2025/10/15 11:36:00| Processing: http_access deny blocked_sites
2025/10/15 11:36:00| Processing: http_access allow all
2025/10/15 11:36:00| Processing: http_access deny all
2025/10/15 11:36:00| Processing: access_log stdio:/var/log/squid/access.log squid
2025/10/15 11:36:00| Processing: cache_log /var/log/squid/cache.log
2025/10/15 11:36:00| Processing: coredump_dir /var/spool/squid
```

Restart Squid

```
ubuntu@ip-172-31-27-83:~$ sudo systemctl restart squid
sudo systemctl enable squid
```

```
[...]
Synchronizing state of squid.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable squid
ubuntu@ip-172-31-27-83:~$ sudo systemctl status squid
● squid.service - Squid Web Proxy Server
   Loaded: loaded (/usr/lib/systemd/system/squid.service; enabled; preset: enabled)
   Active: active (running) since Wed 2025-10-15 11:36:55 UTC; 8s ago
     Docs: man:squid(8)
 Main PID: 2005 (squid)
    Tasks: 3 (limit: 1121)
   Memory: 17.6M (peak: 18.0M)
    CPU: 136ms
   CGroup: /system.slice/squid.service
           ├─2005 /usr/sbin/squid --foreground -sYC
           ├─2008 "(squid-1)" --kid squid-1 --foreground -sYC
           └─2009 "(pinger)"

Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Using Least Load store dir selection
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Set Current Directory to /var/spool/squid
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Finished loading MIME types and icons.
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: HTCP Disabled.
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Pinger socket opened on FD 13
Oct 15 11:36:55 ip-172-31-27-83 systemd[1]: Started squid.service - Squid Web Proxy Server.
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Squid plugin modules loaded: 0
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Adaptation support is off.
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Accepting HTTP Socket connections at conn3 local=[::]:8080 remote=[::] FD 11 flags=9
                                                listening port: 8080
Oct 15 11:36:56 ip-172-31-27-83 squid[2008]: storeLateRelease: released 0 objects
ubuntu@ip-172-31-27-83:~$
```

Squid is up + Running

```
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Using Least Load store dir selection
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Set Current Directory to /var/spool/squid
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Finished loading MIME types and icons.
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: HTTP Disabled.
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Pinger socket opened on FD 13
Oct 15 11:36:55 ip-172-31-27-83 systemd[1]: Started squid.service - Squid Web Proxy Server.
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Squid plugin modules loaded: 0
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Adaptation support is off.
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Accepting HTTP Socket connections at conn3 local=[::]:8080 remote=[::] FD 11 flags=9
          listening port: 8080
Oct 15 11:36:56 ip-172-31-27-83 squid[2008]: storeLateRelease: released 0 objects
ubuntu@ip-172-31-27-83: ~ $ sudo systemctl status squid
● squid.service - Squid Web Proxy Server
   Loaded: loaded (/usr/lib/systemd/system/squid.service; enabled; preset: enabled)
   Active: active (running) since Wed 2025-10-15 11:36:55 UTC; 28s ago
     Docs: man:squid(8)
 Main PID: 2005 (squid)
   Tasks: 3 (limit: 1121)
  Memory: 17.6M (peak: 18.0M)
    CPU: 138ms
   CGroup: /system.slice/squid.service
           ├─2005 /usr/sbin/squid --foreground -sYC
           ├─2008 "(squid-1)" --kid squid-1 --foreground -sYC
           └─2009 "(pinger)"

Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Using Least Load store dir selection
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Set Current Directory to /var/spool/squid
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Finished loading MIME types and icons.
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: HTTP Disabled.
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Pinger socket opened on FD 13
Oct 15 11:36:55 ip-172-31-27-83 systemd[1]: Started squid.service - Squid Web Proxy Server.
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Squid plugin modules loaded: 0
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Adaptation support is off.
Oct 15 11:36:55 ip-172-31-27-83 squid[2008]: Accepting HTTP Socket connections at conn3 local=[::]:8080 remote=[::] FD 11 flags=9
          listening port: 8080
Oct 15 11:36:56 ip-172-31-27-83 squid[2008]: storeLateRelease: released 0 objects
ubuntu@ip-172-31-27-83: ~ $
```

now Verify whether FP is configured according to the requirement

Running Website

```
ubuntu@ip-172-31-27-83: ~ $ curl -x http://localhost:8080 google.com
<HTML><HEAD><meta http-equiv="content-type" content="text/html; charset=utf-8">
<TITLE>301 Moved</TITLE></HEAD><BODY>
<H1>301 Moved</H1>
The document has moved
<A href="http://www.google.com/">here</A>.
</BODY></HTML>
ubuntu@ip-172-31-27-83: ~ $ curl -x http://localhost:8080 example.com
<!DOCTYPE html><html lang="en"><head><title>Example Domain</title><meta name="viewport" content="width=device-width, initial-scale=1"><style>body{background:#eee; width:60vw; margin:15vh auto; font-family:system-ui,sans-serif}h1{font-size:1.5em}div{opacity:0.8}a:link,a:visited{color:#348}</style><body><h1>Example Domain</h1><p>This domain is for use in documentation examples without needing permission. Avoid use in operations.<p><a href="https://iana.org/domains/example">Learn more</a></div></body></html>
ubuntu@ip-172-31-27-83: ~ $ curl -x http://localhost:8080 facebook
```

Blocked Website

```
ubuntu@ip-172-31-27-83:~$ curl -x http://localhost:8080 facebook.com
```

```
body
:lang(fa) { direction: rtl; font-size: 100%; font-family: Tahoma, Roya, sans-serif; float: right; }
:lang(he) { direction: rtl; }

-->/style>
</head><body id=ERR_ACCESS_DENIED>
<div id="titles">
<h1>ERROR</h1>
<h2>The requested URL could not be retrieved</h2>
</div>
<br>

<div id="content">
<p>The following error was encountered while trying to retrieve the URL: <a href="http://facebook.com/">http://facebook.com/</a></p>

<blockquote id="error">
<p><b>Access Denied.</b></p>
</blockquote>

<p>Access control configuration prevents your request from being allowed at this time. Please contact your service provider if you feel this is incorrect.</p>
</p>

<p>Your cache administrator is <a href="mailto:webmaster?subject=CacheErrorInfo%20-%20ERR_ACCESS_DENIED&body=CacheHost%3A920ip-172-31-27-83%0D%0AErrPage%3A920ERR_ACCESS_DENIED%0D%0AErr%3A920%5Bnone%5D%0D%0ATime Stamp%3A920Wed, 15 Oct 2025%2013:38:41%20GMT%0D%0A%0D%0AClient IP%3A920%3A93A1%0D%0A%0D%0AProxy%3A920%0D%0ARequest%3A920%0D%0AGET%2F%20%2F%20HTTP%2F1.%0D%0AHost%3A920facebook.com%0D%0AUser-Agent%3A920curl%2F8.5.0%0D%0AAccept%3A920%2F%20%0D%0AProxy-Connection%3A920%0D%0AContent-Type%3A920text/html%0D%0AContent-Language%3A920en%0D%0AContent-Encoding%3A920gzip%0D%0AContent-Security-Policy%3A920script-src 'self' %0D%0AContent-Type%3A920text/html%0D%0AContent-Language%3A920en%0D%0AContent-Encoding%3A920gzip%0D%0AContent-Security-Policy%3A920script-src 'self'">webmaster</a>.</p>
<br>
</div>

<br>
<div id="footer">
<p>Generated Wed, 15 Oct 2025 11:38:41 GMT by ip-172-31-27-83 (squid/6.13)</p>
<l-- ERR_ACCESS_DENIED -->
</div>
</body></html>
ubuntu@ip-172-31-27-83:~$
```

#Twitter.com

```

body
:lang(fa) { direction: rtl; font-size: 100%; font-family: Tahoma, Roya, sans-serif; float: right; }
:lang(hc) { direction: rtl; }
--></style>
</head><body id=ERR_ACCESS_DENIED>
<div id=titles>
<h1>ERROR</h1>
<h2>The requested URL could not be retrieved</h2>
</div>
<hr>
<div id=content>
<p>The following error was encountered while trying to retrieve the URL: <a href="http://twitter.com/">http://twitter.com/</a></p>
<blockquote id=error>
<p><b>Access Denied.</b></p>
</blockquote>
<p>Access control configuration prevents your request from being allowed at this time. Please contact your service provider if you feel this is incorrect.</p>
<br>
<p>Your cache administrator is <a href="mailto:webmaster?subject=CacheErrorInfo&X20-%20ERR_ACCESS_DENIED&amp;body=CacheHost%3A%20ip-172-31-27-83%0D%0AErrPage%3A%20ERR_ACCESS_DENIED%0D%0AErr%3A%20%5Bnone%5D%0D%0ATimeStamp%3A%20Wed,%2015%20Oct%202025%2011%3A39%3A05%20GMT%0D%0AHost%3A%20twitter.com%0D%0AUUser-Agent%3A%20curl%2F8.5.0%0D%0AAccept%3A%20%2F%0D%0AProxy-Connection%3A%20KeepAlive%0D%0A%0D%0A%0D%0A">webmaster</a>.</p>
<br>
</div>
<hr>
<div id=footer>
<p>Generated Wed, 15 Oct 2025 11:39:05 GMT by ip-172-31-27-83 (squid/6.13)</p>
<!-- ERR_ACCESS_DENIED -->
</div>
</body></html>
ubuntu@ip-172-31-27-83: $ curl -x http://localhost:8080 twitter.com

```

Reverse -Proxy

The screenshot shows the AWS EC2 Instances page with a search bar and navigation links. A modal window titled "Launch an instance" is open, prompting the user to learn about EC2 best practices. The "Name and tags" section has "reverse-proxy" entered. The "Application and OS Images (Amazon Machine Image)" section shows various AMI options, with "Amazon Linux 2023 kernel-6.1 AMI" selected. The "Summary" section shows 1 instance being launched with the selected AMI and t3.micro server type. The "Launch instance" button is highlighted.

EC2 > Instances > Launch an instance

Browse more AMIs.

Search our full catalog including 1000s of application and OS images

Recent AMIs: Amazon Linux, macOS, Ubuntu, Windows, Red Hat, SUSE Linux, Debian

Quick Start

Amazon Machine Image (AMI)

Ubuntu Server 24.04 LTS (HVM), SSD Volume Type

Ubuntu Server 24.04 LTS (HVM), SSD Volume Type

Virtualization: hvm ENA enabled: true Root device type: ebs

Instance type: t2.micro

All generations

Compare instance types

Additional costs apply for AMIs with pre-installed software

Key pair (login): # t2-micro

CloudShell Feedback

Summary

Number of instances: 1

Software Image (AMI): Amazon Linux 2023 AMI 2023.9.2...read more

Virtual server type (instance type): t2.micro

Firewall (security group): New security group

Storage (volumes): 1 volume(s) - 8 GiB

Cancel Launch instance Preview code

EC2 > Instances > Launch an instance

Ubuntu Server 24.04 LTS (HVM),EBS General Purpose (SSD) Volume Type. Support available from Canonical (<http://www.ubuntu.com/cloud/services>).

Canonical, Ubuntu, 24.04, amd64 noble image

Architecture: 64-bit (x86) AMI ID: ami-0560c520857e5138f Publish Date: 2025-08-21 Username: ubuntu Verified provider

Instance type: t2.micro

All generations

Compare instance types

Additional costs apply for AMIs with pre-installed software

Key pair (login): proxy-key-value Create new key pair

Network settings

Network: vpc-0b30d1e90899fb7b Subnet: Info

Summary

Number of instances: 1

Software Image (AMI): Canonical, Ubuntu, 24.04, amd6...read more

Virtual server type (instance type): t2.micro

Firewall (security group): New security group

Storage (volumes): 1 volume(s) - 8 GiB

Cancel Launch instance Preview code

The screenshots show the AWS EC2 instance creation process and the resulting instance details.

Screenshot 1: Launching an EC2 Instance

This screenshot shows the "Launch an instance" wizard. The "Firewall (security groups)" step is active, showing options to "Create security group" or "Select existing security group". A note says: "We'll create a new security group called 'launch-wizard-4' with the following rules:"

- Allow SSH traffic from Anywhere (0.0.0.0/0)
- Allow HTTPS traffic from the internet To set up an endpoint, for example when creating a web server
- Allow HTTP traffic from the internet To set up an endpoint, for example when creating a web server

A note below states: "Rules of source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only."

The "Configure storage" step shows a 1x 8 GiB gp3 volume selected as the root volume, with 3000 IOPS and Not encrypted.

Screenshot 2: Launch Instances Progress

This screenshot shows the progress of launching an instance. It is at 33% completion, with the message: "Please wait while we launch your instance. Do not close your browser while this is loading."

Screenshot 3: Instance Details

This screenshot shows the "Instance summary for i-008af75e86a2baf52 (reverse-proxy)" page. Key details include:

- Public IPv4 address:** 54.237.196.139
- Instance state:** Running
- Private IP DNS name (IPv4 only):** ip-172-31-31-19.ec2.internal
- Instance type:** t2.micro
- VPC ID:** vpc-0bb30d1e90899fb7b
- Subnet ID:** subnet-0a5aeef6f253decbb
- Instance ARN:** arn:aws:ec2:us-east-1:766957561917:instance/i-008af75e86a2baf52
- Platform details:** Linux/UNIX

The terminal window at the bottom shows the command: `ssh -i proxy-key-value.pem ubuntu@54.237.196.139`. The response indicates the host's fingerprint and asks for confirmation to proceed.

```

iTerm2 Shell Edit View Session Scripts Profiles Toolkit Window Help
ubuntu@ip-172-31-31-19: ~
Warning: Permanently added '54.237.196.139' (ED25519) to the list of known hosts.
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.14.0-1011-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Wed Oct 15 11:43:29 UTC 2025

System load: 0.64 Processes: 113
Usage of /: 25.6% of 6.71GB Users logged in: 0
Memory usage: 22% IPv4 address for enX0: 172.31.31.19
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 list of available updates is more than a week old.
To check for new updates run: sudo apt update

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.

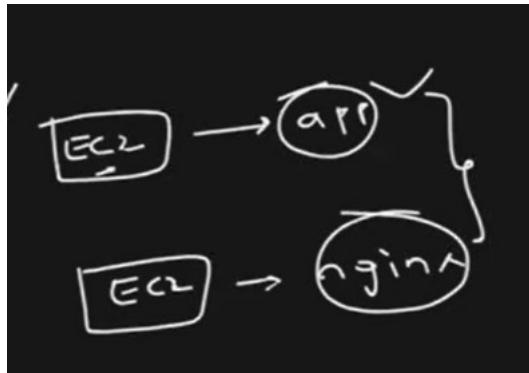
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <commands>".
See "man sudo_root" for details.

ubuntu@ip-172-31-31-19: $ █

```

#now Run Application as a service



Backend - run Python app with Virtual Env

```

ubuntu@ip-172-31-31-19:~$ mkdir backend
ubuntu@ip-172-31-31-19:~$ cd backend/
ubuntu@ip-172-31-31-19:~/backend$ sudo apt update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu noble-security InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
43 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@ip-172-31-31-19:~/backend$ █

```

ubuntu@ip-172-31-31-19:~/backend\$ sudo apt-get install -y python3-pip python3-venv

```

Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
python3-pip is already the newest version (24.0+dfsg-1ubuntu1.3).
python3-venv is already the newest version (3.12.3-0ubuntu2).
0 upgraded, 0 newly installed, 0 to remove and 43 not upgraded.
ubuntu@ip-172-31-31-19:~/backend$ █

```

Virtual Env

```
ubuntu@ip-172-31-31-19:~/backend$ python3 -m venv venv
ubuntu@ip-172-31-31-19:~/backend$ source venv/bin/activate
(venv) ubuntu@ip-172-31-31-19:~/backend$ pwd
/home/ubuntu/backend
(venv) ubuntu@ip-172-31-31-19:~/backend$ ls
venv
(venv) ubuntu@ip-172-31-31-19:~/backend$ █
```

install Flask + Gunicorn - dependencies

```
(venv) ubuntu@ip-172-31-31-19:~/backend$ pip install flask gunicorn
Collecting Flask
  Using cached Flask-3.1.2-py3-none-any.whl.metadata (3.2 kB)
Collecting gunicorn
  Using cached gunicorn-23.0.0-py3-none-any.whl.metadata (4.4 kB)
Collecting blinker>=1.9.0 (from Flask)
  Using cached blinker-1.9.0-py3-none-any.whl.metadata (1.6 kB)
Collecting click>=8.1.3 (from Flask)
  Using cached click-8.3.0-py3-none-any.whl.metadata (2.6 kB)
Collecting itsdangerous>=2.2.0 (from flask)
  Using cached itsdangerous-2.2.0-py3-none-any.whl.metadata (1.9 kB)
Collecting jinja2>=3.1.2 (from flask)
  Using cached jinja2-3.1.6-py3-none-any.whl.metadata (2.9 kB)
Collecting markupsafe>=2.1.1 (from flask)
  Using cached markupsafe-3.0.3-cp312-cp312-manylinux2014_x86_64_manylinux_2_17_x86_64_manylinux_2_28_x86_64.whl.metadata (2.7 kB)
Collecting werkzeug>=3.1.0 (from flask)
  Using cached werkzeug-3.1.3-py3-none-any.whl.metadata (3.7 kB)
Collecting packaging (from gunicorn)
  Using cached packaging-25.0-py3-none-any.whl.metadata (3.3 kB)
Using cached flask-3.1.2-py3-none-any.whl (103 kB)
Using cached gunicorn-23.0.0-py3-none-any.whl (85 kB)
Using cached blinker-1.9.0-py3-none-any.whl (8.5 kB)
Using cached click-8.3.0-py3-none-any.whl (107 kB)
Using cached itsdangerous-2.2.0-py3-none-any.whl (16 kB)
Using cached jinja2-3.1.6-py3-none-any.whl (134 kB)
Using cached markupsafe-3.0.3-cp312-cp312-manylinux2014_x86_64_manylinux_2_17_x86_64_manylinux_2_28_x86_64.whl (22 kB)
(venv) ubuntu@ip-172-31-31-19:~/backend$ ls
venv
(venv) ubuntu@ip-172-31-31-19:~/backend$ vim app.py█
```

```
from flask import Flask, jsonify

app = Flask(__name__)

@app.route('/')
def home():
    return jsonify({
        'message': 'Hello from Backend Server!',
        'server': 'Backend Server',
        'ip': 'This is the actual server handling the request'
    })

if __name__ == '__main__':
    app.run(host='0.0.0.0', port=5000)~
```

```
(venv) ubuntu@ip-172-31-31-19:~/backend$ CURRENT_DIR=$(pwd)
(venv) ubuntu@ip-172-31-31-19:~/backend$ cat <<EOT | sudo tee /etc/systemd/system/backend.service
[Unit]
Description=Backend Server
After=network.target

[Service]
User=ubuntu
WorkingDirectory=$CURRENT_DIR
Environment="PATH=$CURRENT_DIR/venv/bin"
ExecStart=$CURRENT_DIR/venv/bin/gunicorn --bind 0.0.0.0:5000 app:app
Restart=always

[Install]
WantedBy=multi-user.target
EOT
```

```
[Unit]
Description=Backend Server
After=network.target

[Service]
User=ubuntu
WorkingDirectory=/home/ubuntu/backend
Environment="PATH=/home/ubuntu/backend/venv/bin"
ExecStart=/home/ubuntu/backend/venv/bin/gunicorn --bind 0.0.0.0:5000 app:app
Restart=always

[Install]
WantedBy=multi-user.target
(venv) ubuntu@ip-172-31-31-19:~/backend$ 
```

```
[venv] ubuntu@ip-172-31-31-19:~/backend$ sudo systemctl daemon-reload
sudo systemctl enable backend
sudo systemctl start backend
[venv] ubuntu@ip-172-31-31-19:~/backend$ 
```

```
(venv) ubuntu@ip-172-31-31-19:~/backend$ sudo systemctl status backend
● backend.service - Backend Server
   Loaded: loaded (/etc/systemd/system/backend.service; enabled; preset: enabled)
   Active: active (running) since Wed 2025-10-15 11:57:42 UTC; 33s ago
     Main PID: 4887 (gunicorn)
        Tasks: 2 (limit: 1121)
       Memory: 27.4M (peak: 27.7M)
          CPU: 195ms
        CGroup: /system.slice/backend.service
                └─4887 /home/ubuntu/backend/venv/bin/python3 /home/ubuntu/backend/venv/bin/gunicorn --bind 0.0.0.0:5000 app:app
                  ├─4888 /home/ubuntu/backend/venv/bin/python3 /home/ubuntu/backend/venv/bin/gunicorn --bind 0.0.0.0:5000 app:app

Oct 15 11:57:42 ip-172-31-31-19 systemd[1]: Started backend.service - Backend Server.
Oct 15 11:57:42 ip-172-31-31-19 gunicorn[4887]: [2025-10-15 11:57:42 +0000] [4887] [INFO] Starting gunicorn 23.0.0
Oct 15 11:57:42 ip-172-31-31-19 gunicorn[4887]: [2025-10-15 11:57:42 +0000] [4887] [INFO] Listening at: http://0.0.0.0:5000 (4887)
Oct 15 11:57:42 ip-172-31-31-19 gunicorn[4887]: [2025-10-15 11:57:42 +0000] [4887] [INFO] Using worker: sync
Oct 15 11:57:42 ip-172-31-31-19 gunicorn[4888]: [2025-10-15 11:57:42 +0000] [4888] [INFO] Booting worker with pid: 4888
(venv) ubuntu@ip-172-31-31-19:~/backend$ 
```

```
# install NGNIX
```

```
iTerm2 Shell Edit View Session Scripts Profiles Toolkit Window Help
ubuntu@ip-172-31-31-19:~/backend
Wed 15 Oct 5:29PM
(venv) ubuntu@ip-172-31-31-19:~/backend$ sudo apt install nginx
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  nginx-common
Suggested packages:
  fcgiwrap nginx-doc ssl-cert
The following NEW packages will be installed:
  nginx nginx-common
0 upgraded, 2 newly installed, 0 to remove and 43 not upgraded.
Need to get 564 kB of archives.
After this operation, 1596 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 nginx-common all 1.24.0-2ubuntu7.5 [43.4 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 nginx amd64 1.24.0-2ubuntu7.5 [520 kB]
Fetched 564 kB in 0s (17.8 MB/s)
Preconfiguring packages ...
Selecting previously unselected package nginx-common.
(Reading database ... 79175 files and directories currently installed.)
Preparing to unpack .../nginx-common_1.24.0-2ubuntu7.5_all.deb ...
Unpacking nginx-common (1.24.0-2ubuntu7.5) ...
Selecting previously unselected package nginx.
Preparing to unpack .../nginx_1.24.0-2ubuntu7.5_amd64.deb ...
Unpacking nginx (1.24.0-2ubuntu7.5) ...
Setting up nginx-common (1.24.0-2ubuntu7.5) ...
Created symlink /etc/systemd/system/multi-user.target.wants/nginx.service → /usr/lib/systemd/system/nginx.service.
Setting up nginx (1.24.0-2ubuntu7.5) ...
 * Upgrading binary nginx
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for ufw (0.36.2-6) ...
Scanning processes...
[ OK ]
Scanning processes... [OK]

Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for ufw (0.36.2-6) ...
Scanning processes...
Scanning candidates...
Scanning linux images...

Running kernel seems to be up-to-date.

Restarting services...

Service restarts being deferred:
/etc/needrestart/restart.d/dbus.service
systemctl restart getty@tty1.service
systemctl restart networkd-dispatcher.service
systemctl restart serial-getty@ttyS0.service
systemctl restart systemd-logind.service
systemctl restart unattended-upgrades.service

No containers need to be restarted.

User sessions running outdated binaries:
ubuntu @ session #1: sshd[1039,1151]
ubuntu @ user manager service: systemd[1046]

No VM guests are running outdated hypervisor (qemu) binaries on this host.

# Nginx file is created now update - reversee-proxy configuration
```

```
(venv) ubuntu@ip-172-31-31-19:~/backend$ cat <<EOT | sudo tee /etc/nginx/sites-available/reverse-proxy
server {
    listen 80;
    server_name _;

    location / {
        proxy_pass http://YOUR_BACKEND_IP:5000; # Replace with your backend server's private IP
        proxy_set_header Host \$host;
        proxy_set_header X-Real-IP \$remote_addr;
        proxy_set_header X-Forwarded-For \$proxy_add_x_forwarded_for;
        proxy_set_header X-Forwarded-Proto \$scheme;
    }
}
EOT
server {
    listen 80;
    server_name _;

    location / {
        proxy_pass http://YOUR_BACKEND_IP:5000; # Replace with your backend server's private IP
        proxy_set_header Host \$host;
        proxy_set_header X-Real-IP \$remote_addr;
        proxy_set_header X-Forwarded-For \$proxy_add_x_forwarded_for;
        proxy_set_header X-Forwarded-Proto \$scheme;
    }
}
```

```
venv) ubuntu@ip-172-31-31-19:~/backend$ sudo vim /etc/nginx/sites-available/reverse-proxy
```

```
# Change to local host
server {
    listen 80;
    server_name _;

    location / {
        proxy_pass http://YOUR_BACKEND_IP:5000; # Replace with your backend server's private IP
        proxy_set_header Host \$host;
        proxy_set_header X-Real-IP \$remote_addr;
        proxy_set_header X-Forwarded-For \$proxy_add_x_forwarded_for;
        proxy_set_header X-Forwarded-Proto \$scheme;
    }
}

server {
    listen 80;
    server_name _;

    location / {
        proxy_pass http://localhost:5000; # Replace with your backend server's private IP
        proxy_set_header Host \$host;
        proxy_set_header X-Real-IP \$remote_addr;
        proxy_set_header X-Forwarded-For \$proxy_add_x_forwarded_for;
        proxy_set_header X-Forwarded-Proto \$scheme;
    }
}
```

```
# Any Request send to Ngnix on port 80 will automatically forward to the Backend
```

```
(venv) ubuntu@ip-172-31-31-19:~/backend$ sudo ln -s /etc/nginx/sites-available/reverse-proxy /etc/nginx/sites-enabled/
sudo rm /etc/nginx/sites-enabled/default
(venv) ubuntu@ip-172-31-31-19:~/backend$
```

```
# Restart Ngnix config
```

```
(venv) ubuntu@ip-172-31-31-19:~/backend$ sudo systemctl restart nginx
(venv) ubuntu@ip-172-31-31-19:~/backend$
```

```
(venv) ubuntu@ip-172-31-31-19:~/backend$ sudo systemctl status nginx
● nginx.service - A high performance web server and a reverse proxy server
   Loaded: loaded (/usr/lib/systemd/system/nginx.service; enabled; preset: enabled)
   Active: active (running) since Wed 2025-10-15 12:02:01 UTC; 10s ago
     Docs: man:nginx(8)
 Process: 5243 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_process on; (code=exited, status=0/SUCCESS)
 Process: 5247 ExecStart=/usr/sbin/nginx -g daemon on; master_process on; (code=exited, status=0/SUCCESS)
 Main PID: 5248 (nginx)
   Tasks: 2 (limit: 1121)
  Memory: 1.9M (peak: 2.0M)
    CPU: 12ms
   CGroup: /system.slice/nginx.service
           └─5248 "nginx: master process /usr/sbin/nginx -g daemon on; master_process on;"
             ├─5249 "nginx: worker process"
Oct 15 12:02:01 ip-172-31-31-19 systemd[1]: Starting nginx.service - A high performance web server and a reverse proxy server...
Oct 15 12:02:01 ip-172-31-31-19 systemd[1]: Started nginx.service - A high performance web server and a reverse proxy server.
(venv) ubuntu@ip-172-31-31-19:~/backend$
```

```
(venv) ubuntu@ip-172-31-31-19:~/backend$ curl localhost:80/
{"ip": "This is the actual server handling the request", "message": "Hello from Backend Server!", "server": "Backend Server"}
(venv) ubuntu@ip-172-31-31-19:~/backend$
```

```
(venv) ubuntu@ip-172-31-31-19:~/backend$ cat app.py
from flask import Flask, jsonify

app = Flask(__name__)

@app.route('/')
def home():
    return jsonify({
        'message': 'Hello from Backend Server!',
        'server': 'Backend Server',
        'ip': 'This is the actual server handling the request'
    })

if __name__ == '__main__':
    app.run(host='0.0.0.0', port=5000)
(venv) ubuntu@ip-172-31-31-19:~/backend$
```