

TASK-5

BY
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Nginx-Based Load Balancer

- A company runs a web application serving a high number of users. To ensure high availability (HA) and load balancing, they want to deploy multiple web servers behind an Nginx-based load balancer. The goal is to:
 - Distribute traffic evenly across servers
 - Ensure failover if one server goes down
 - Implement session persistence (sticky sessions)

```
network:
  version: 2
  renderer: networkd
  ethernet:
    enp0s3:
      dhcp4: no
      addresses:
        - 192.168.1.100/24
      routes:
        - to: default
          via: 192.168.1.1
      nameservers:
        addresses:
          - 8.8.8.8
          - 8.8.4.4
```

```
root@mahendraredy:~# sudo netplan apply
root@mahendraredy:~#
```

```
# server_name_in_redirect off;

include /etc/nginx/mime.types;
default_type application/octet-stream;

##
# SSL Settings
##

ssl_protocols TLSv1 TLSv1.1 TLSv1.2 TLSv1.3; # Dropping SSLv3, ref: P00DLE
ssl_prefer_server_ciphers on;




##
# Logging Settings
##



access_log /var/log/nginx/access.log;



##
# Gzip Settings
##


root@mahendrareddy:~# systemctl restart nginx
root@mahendrareddy:~# 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 Tue 2025-03-25 13:44:12 UTC; 11s ago
     Docs: man:nginx(8)
   Process: 1238 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_process on; (code=exited, status=0/SUCCESS)
   Process: 1240 ExecStart=/usr/sbin/nginx -g daemon on; master_process on; (code=exited, status=0/SUCCESS)
   Main PID: 1241 (nginx)
    Tasks: 2 (limit: 2276)
   Memory: 1.7M (peak: 2.4M)
      CPU: 13ms
   CGroup: /system.slice/nginx.service
           └─1241 "nginx: master process /usr/sbin/nginx -g daemon on; master_process on;"
             └─1242 "nginx: worker process"

Mar 25 13:44:12 mahendrareddy systemd[1]: Starting nginx.service - A high performance web server and a reverse proxy server...
Mar 25 13:44:12 mahendrareddy systemd[1]: Started nginx.service - A high performance web server and a reverse proxy server.
root@mahendrareddy:~# sudo nginx -t
Command 'sudo' not found, did you mean:
  command 'sudo' from deb sudo (1.9.14p2-1ubuntu1)
  command 'sudo' from deb sudo-ldap (1.9.14p2-1ubuntu1)
Try: apt install <deb name>
root@mahendrareddy:~# sudo nginx -t
nginx: the configuration file /etc/nginx/nginx.conf syntax is ok
nginx: configuration file /etc/nginx/nginx.conf test is successful
root@mahendrareddy:~# systemctl restart nginx
root@mahendrareddy:~#
```



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GNU nano 7.2 /etc/nginx/nginx.conf

```
user www-data;
worker_processes auto;
pid /run/nginx.pid;
error_log /var/log/nginx/error.log;
include /etc/nginx/modules-enabled/*.conf;

events {
    worker_connections 768;
    # multi_accept on;
}

http {
    upstream backend {
        ip_hash;
        server 192.168.1.101;
        server 192.168.1.102;
        server 192.168.1.103;
    }
    server {
        listen 80;
        server_name 192.168.1.100;
        location / {
            proxy_pass http://backend;
            proxy_set_header Host $host;
            proxy_set_header X-Real-IP $remote_addr;
            proxy_set_header X-Forwarded-For $proxy_add_x_forwarded_for;
        }
    }
    ##
    # Basic Settings
    ##

    sendfile on;
    tcp_nopush on;
    types_hash_max_size 2048;
    # server_tokens off;

    # server_names_hash_bucket_size 64;
    # server_name_in_redirect off;

    include /etc/nginx/mime.types;
    default_type application/octet-stream;

    ##
    # SSL Settings
    ##
```

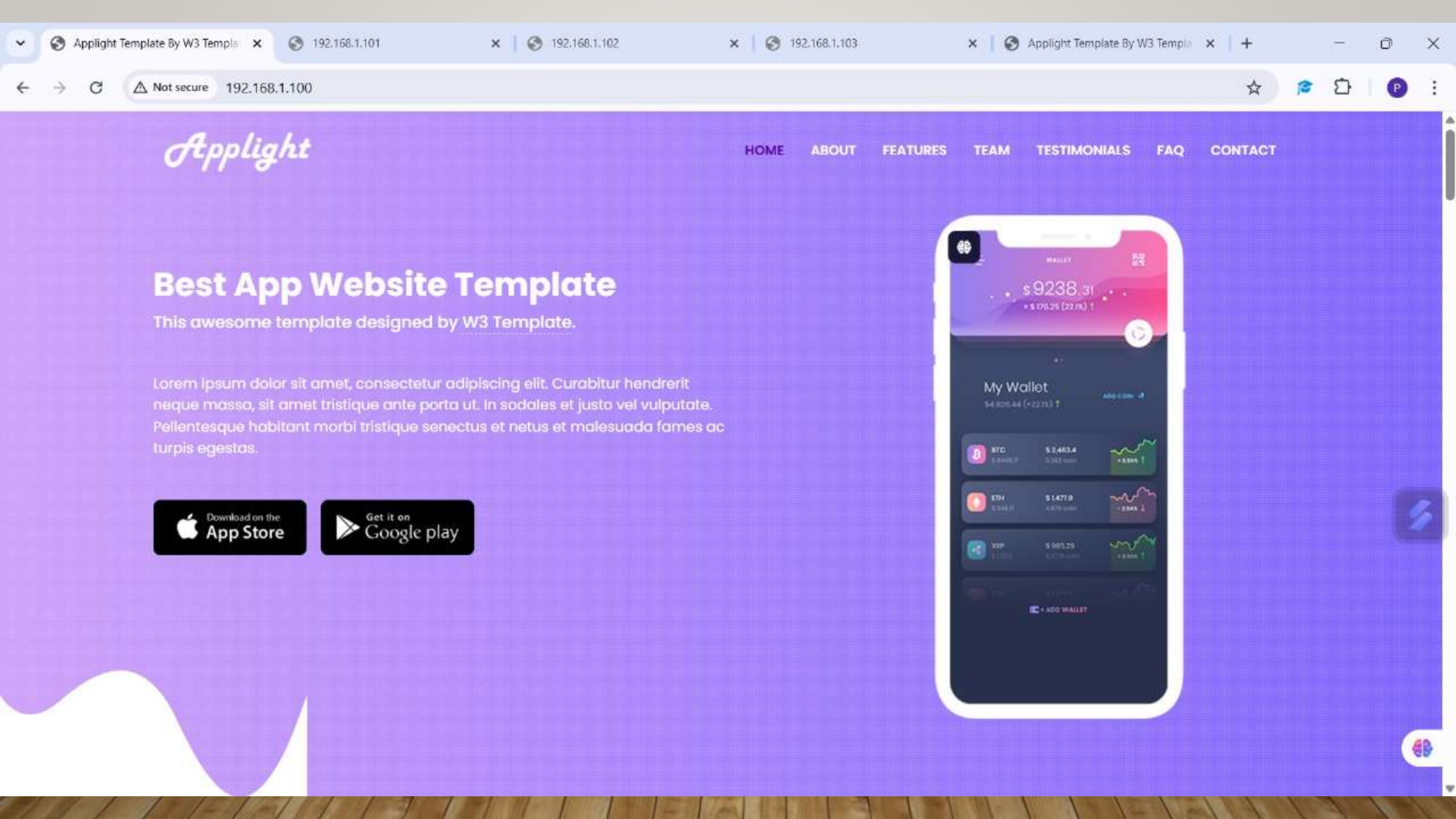
[Read 98 lines]

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^X Exit	^R Read File	^_ Replace	^U Paste	^J Justify	^_ Go To Line	M-E Redo	M-G Copy	^O Where Was	M-W Next



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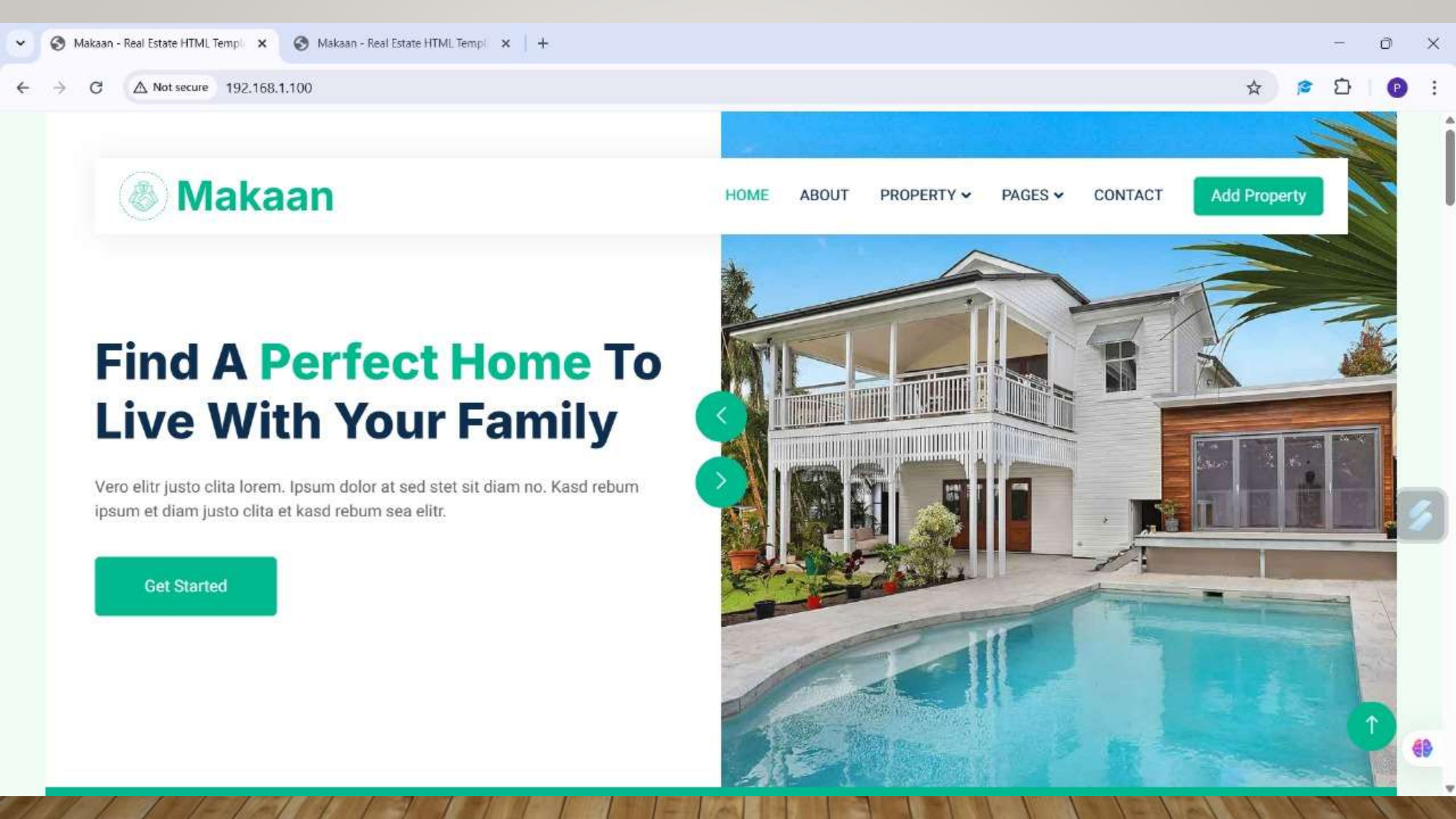
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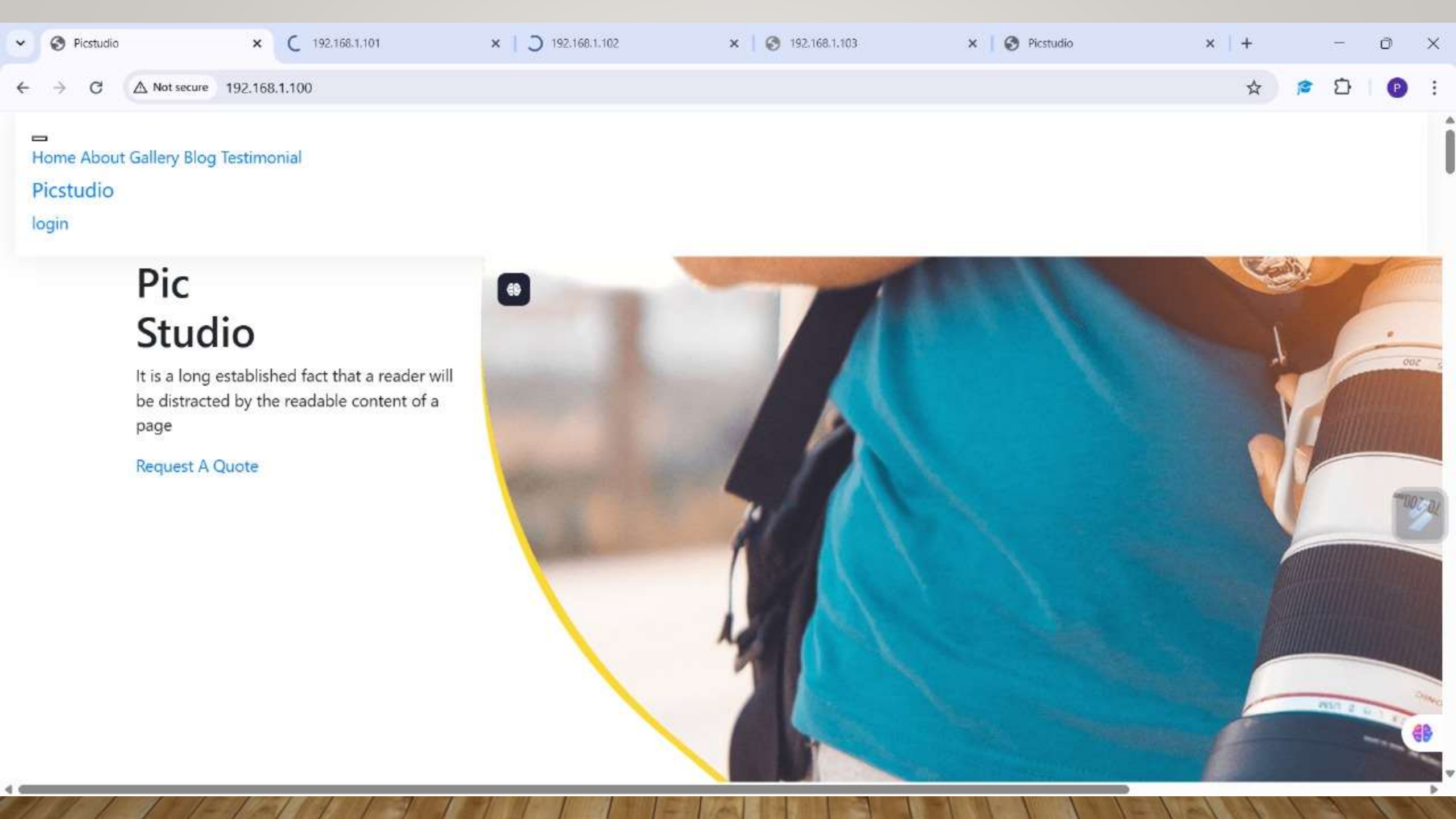
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Get Started





HA PROXY-Based Load Balancer

- A company runs a web application serving a high number of users. To ensure high availability (HA) and load balancing, they want to deploy multiple web servers behind an HAProxy-based load balancer. The goal is to:
 - Distribute traffic evenly across servers
 - Ensure failover if one server goes down
 - Implement session persistence (sticky sessions)

```
root@mahendraredy:~# systemctl status haproxy
• haproxy.service - HAProxy Load Balancer
  Loaded: loaded (/usr/lib/systemd/system/haproxy.service; enabled; preset: enabled)
  Active: active (running) since Fri 2025-03-28 09:54:47 UTC; 4min 42s ago
    Docs: man:haproxy(1)
          file:/usr/share/doc/haproxy/configuration.txt.gz
  Main PID: 754 (haproxy)
    Status: "Ready."
     Tasks: 2 (limit: 2276)
  Memory: 44.1M (peak: 44.3M)
     CPU: 560ms
  CGroup: /system.slice/haproxy.service
          └─754 /usr/sbin/haproxy -Ws -f /etc/haproxy/haproxy.cfg -p /run/haproxy.pid -S /run/haproxy-master.sock
            └─794 /usr/sbin/haproxy -Ws -f /etc/haproxy/haproxy.cfg -p /run/haproxy.pid -S /run/haproxy-master.sock

Mar 28 09:54:50 mahendraredy haproxy[794]: backend backend_servers has no server available!
Mar 28 09:57:54 mahendraredy haproxy[794]: [WARNING] (794) : Server backend_servers/web1 is UP, reason: Layer7 check passed, code: 200, check duration: 1ms. >
Mar 28 09:57:54 mahendraredy haproxy[794]: Server backend_servers/web1 is UP, reason: Layer7 check passed, code: 200, check duration: 1ms. 1 active and 0 back>
Mar 28 09:57:54 mahendraredy haproxy[794]: Server backend_servers/web1 is UP, reason: Layer7 check passed, code: 200, check duration: 1ms. 1 active and 0 back>
Mar 28 09:57:57 mahendraredy haproxy[794]: [WARNING] (794) : Server backend_servers/web2 is UP, reason: Layer7 check passed, code: 200, check duration: 1ms. >
Mar 28 09:57:57 mahendraredy haproxy[794]: Server backend_servers/web2 is UP, reason: Layer7 check passed, code: 200, check duration: 1ms. 2 active and 0 back>
Mar 28 09:57:57 mahendraredy haproxy[794]: Server backend_servers/web2 is UP, reason: Layer7 check passed, code: 200, check duration: 1ms. 2 active and 0 back>
Mar 28 09:57:59 mahendraredy haproxy[794]: [WARNING] (794) : Server backend_servers/web3 is UP, reason: Layer7 check passed, code: 200, check duration: 2ms. >
Mar 28 09:57:59 mahendraredy haproxy[794]: Server backend_servers/web3 is UP, reason: Layer7 check passed, code: 200, check duration: 2ms. 3 active and 0 back>
Mar 28 09:57:59 mahendraredy haproxy[794]: Server backend_servers/web3 is UP, reason: Layer7 check passed, code: 200, check duration: 2ms. 3 active and 0 back>
lines 1-24/24 (END)
```



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```
GNU nano 7.2 /etc/haproxy/haproxy.cfg
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-ECDS
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 http_front
  bind *:80
  mode http
  default_backend backend_servers

backend backend_servers
  mode http
  balance roundrobin
  option httpchk GET /
  cookie SERVERID insert indirect nocache
  server web1 192.168.1.101:80 check cookie s1
  server web2 192.168.1.102:80 check cookie s2
  server web3 192.168.1.103:80 check cookie s3

^G Help      ^O Write Out  ^W Where Is   ^K Cut        ^T Execute    ^C Location   M-U Undo     M-A Set Mark  M-I To Bracket M-Q Previous
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```



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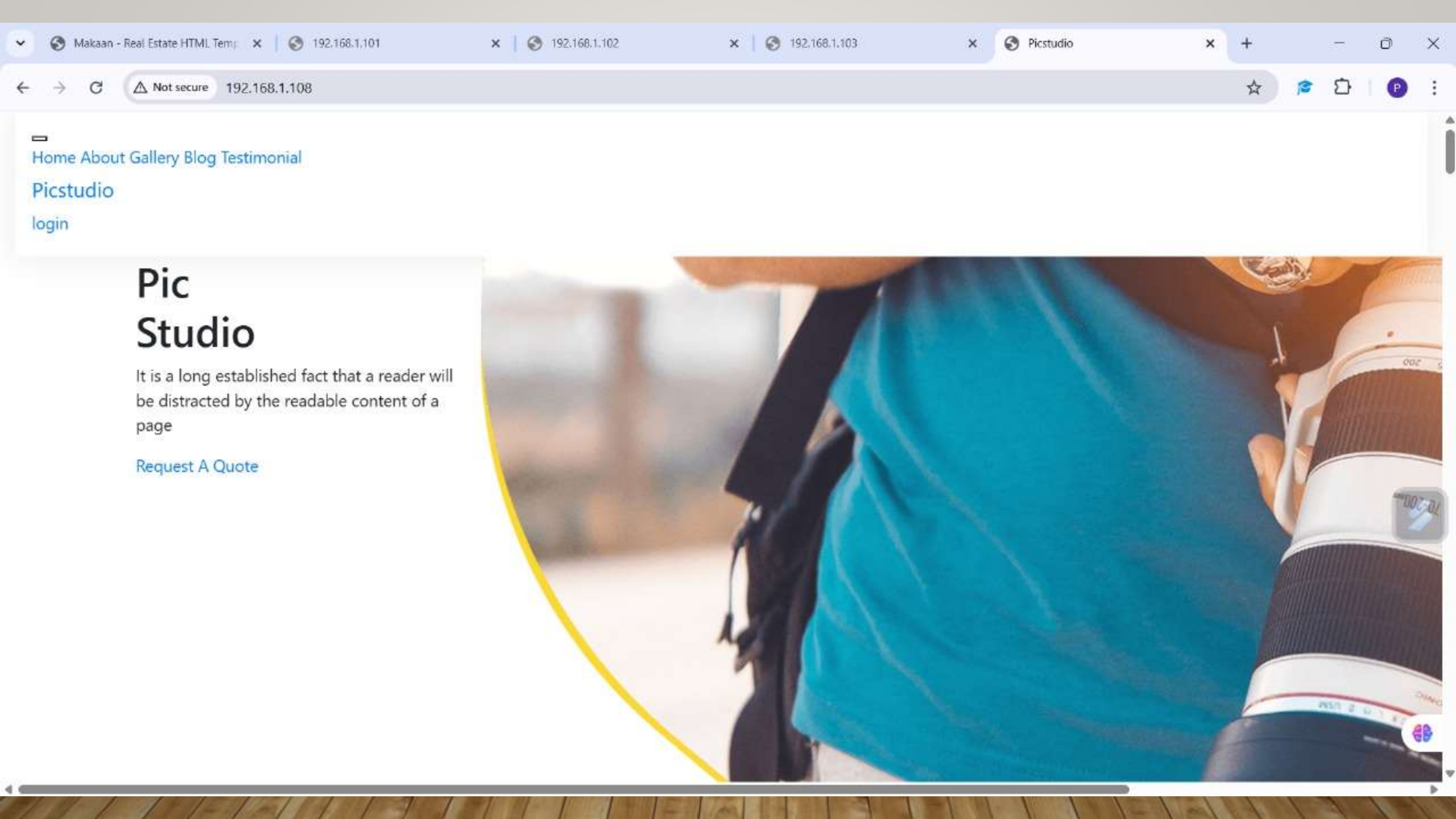
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