

LAPORAN SISTEM OPERASI

PROGRES 4 MINGGU 14 (EMPAT BELAS)

Disusun untuk memenuhi tugas pada Mata Kuliah Sistem Operasi

Dosen Pengampu:

Ferdi Cahyadi, S. Kom., M.Cs



Disusun oleh:

Amira Azza Nuuradiba (2401020001)

Zafira Khairunnisa (2401020006)

Rashika Kasih Putri (240120017)

Nurul Syafika (2401020025)

**PROGRAM STUDI TEKNIK INFORMATIKA
FAKULTAS TEKNIK & TEKNOLOGI KEMARITIMAN
UNIVERSITAS MARITIM RAJA ALI HAJI**

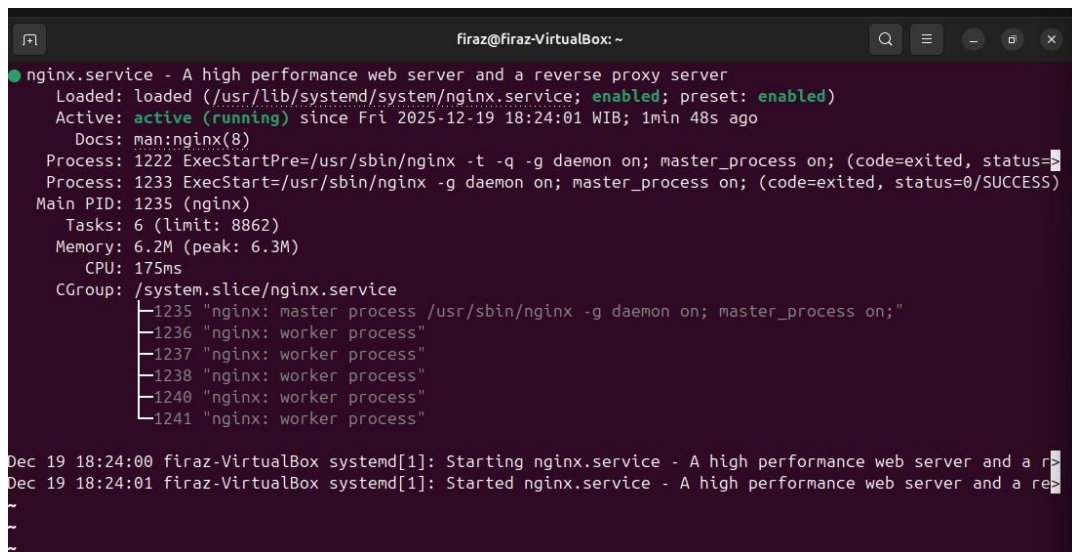
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PROGRES MINGGUAN

Pada minggu ke-14, dilakukan tahap pengujian terhadap web server Nginx yang telah dikonfigurasi pada minggu sebelumnya. Pengujian ini bertujuan untuk memastikan bahwa layanan web dapat berjalan dengan baik, aman, dan stabil, meliputi pengujian akses HTTP, HTTPS, firewall, serta pengujian beban ringan (load test kecil).

1. Pengujian status web server

- a) Cek nginx berjalan atau tidak, command: **sudo systemctl status nginx**

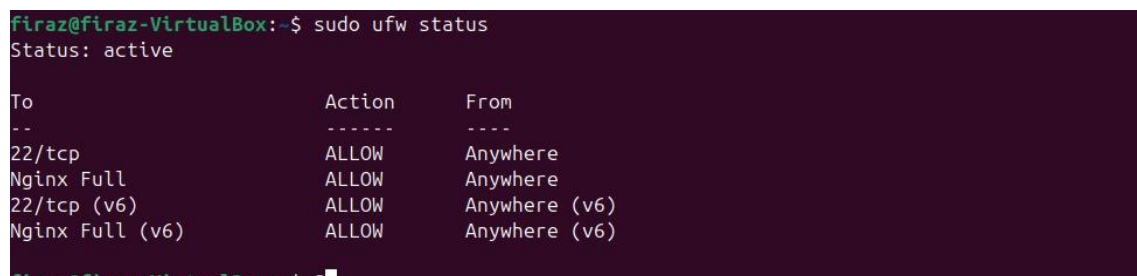


```
firaz@firaz-VirtualBox: ~  
● nginx.service - A high performance web server and a reverse proxy server  
   Loaded: loaded (/usr/lib/systemd/system/nginx.service; enabled; preset: enabled)  
   Active: active (running) since Fri 2025-12-19 18:24:01 WIB; 1min 48s ago  
     Docs: man:nginx(8)  
  Process: 1222 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_process on; (code=exited, status=0/SUCCESS)  
  Process: 1233 ExecStart=/usr/sbin/nginx -g daemon on; master_process on; (code=exited, status=0/SUCCESS)  
 Main PID: 1235 (nginx)  
    Tasks: 6 (limit: 8862)  
  Memory: 6.2M (peak: 6.3M)  
     CPU: 175ms  
   CGroup: /system.slice/nginx.service  
           └─1235 "nginx: master process /usr/sbin/nginx -g daemon on; master_process on;"  
             └─1236 "nginx: worker process"  
               └─1237 "nginx: worker process"  
                 └─1238 "nginx: worker process"  
                   └─1240 "nginx: worker process"  
                     └─1241 "nginx: worker process"  
  
Dec 19 18:24:00 firaz-VirtualBox systemd[1]: Starting nginx.service - A high performance web server and a reverse proxy server:  
Dec 19 18:24:01 firaz-VirtualBox systemd[1]: Started nginx.service - A high performance web server and a reverse proxy server:  
~  
~  
~
```

Terlihat bahwa status active (running) yang artinya nginx berjalan

- b) Untuk pengujian akses http dan https sudah dilakukan di minggu sebelumnya

2. Pengujian firewall (UFW)



```
firaz@firaz-VirtualBox:~$ sudo ufw status  
Status: active  
  
To Action From  
--  
22/tcp ALLOW Anywhere  
Nginx Full ALLOW Anywhere  
22/tcp (v6) ALLOW Anywhere (v6)  
Nginx Full (v6) ALLOW Anywhere (v6)
```

Pengujian firewall dilakukan untuk memastikan sistem keamanan berjalan dengan baik. Firewall berada dalam kondisi aktif dan hanya membuka port yang diperlukan untuk layanan web dan akses administrasi. Pada gambar terlihat bahwa status ufw udah **active**

3. Pengujian Virtual Host Menggunakan Protokol HTTPS (SSL Self-Signed).

```
firaz@firaz-VirtualBox:~$ curl -k -H "Host: myweb.local" https://myweb.local

Caution: You are using the Snap version of curl.
Due to Snap's sandbox nature, this version has some limitations.
For example, it may not be able to access hidden folders in your home directory
or other restricted areas of the os.

Which means you may encounter errors when using snap curl to download and execute some script.
For those cases, you might want to use the native curl package.
For details, see: https://github.com/boukendesho/curl-snap/issues/1

To stop seeing this message, run the following command:
$ curl.snap-acked

<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>MyWeb.local - Nginx + HTTPS</title>
  <link rel="stylesheet" href="/css/style.css">
</head>
<body>

  <header class="hero">
    <h1>Welcome to MyWeb.local</h1>
  </header>

  <section class="content">
    <h2>Server Information</h2>
    <ul>
      <li><strong>Server:</strong> Nginx</li>
      <li><strong>SSL:</strong> Self-Signed Certificate</li>
      <li><strong>Operating System:</strong> Ubuntu Server</li>
      <li><strong>Domain:</strong> myweb.local</li>
    </ul>
  </section>

  <footer>
    <p>© 2025 MyWeb.local – Web Server Linux Demo</p>
  </footer>

</body>
</html>
```

Pengujian virtual host menggunakan protokol HTTPS dilakukan untuk memastikan penerapan SSL pada web server Nginx. Website dapat diakses melalui domain myweb.local menggunakan koneksi aman. Sertifikat SSL yang digunakan bersifat self-signed sehingga browser menampilkan peringatan keamanan, namun akses tetap berhasil sesuai perancangan sistem.

4. Pengujian Virtual Host Menggunakan Protokol HTTP.

```
firaz@firaz-VirtualBox:~$ curl -H "Host: myweb.local" http://myweb.local

Caution: You are using the Snap version of curl.
Due to Snap's sandbox nature, this version has some limitations.
For example, it may not be able to access hidden folders in your home directory
or other restricted areas of the os.

Which means you may encounter errors when using snap curl to download and execute some script.
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      <li><strong>Operating System:</strong> Ubuntu Server</li>
      <li><strong>Domain:</strong> myweb.local</li>
    </ul>
  </section>

  <footer>
    <p>© 2025 MyWeb.local – Web Server Linux Demo</p>
  </footer>

</body>
</html>
```

Pengujian virtual host dilakukan dengan mengakses domain lokal myweb.local melalui protokol HTTP menggunakan browser. Hasil pengujian menunjukkan bahwa domain berhasil mengarah ke direktori website yang telah dikonfigurasi pada web server Nginx dan menampilkan halaman web dengan baik.

5. Pengujian load test kecil

```
firaz@firaz-VirtualBox:~$ ab -n 100 -c 10 https://myweb.local/
This is ApacheBench, Version 2.3 <$Revision: 1903618 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking myweb.local (be patient).....done


Server Software:      nginx/1.24.0
Server Hostname:      myweb.local
Server Port:          443
SSL/TLS Protocol:     TLSv1.3,TLS_AES_256_GCM_SHA384,2048,256
Server Temp Key:      X25519 253 bits
TLS Server Name:      myweb.local

Document Path:        /
Document Length:      722 bytes

Concurrency Level:    10
Time taken for tests:  0.234 seconds
Complete requests:    100
Failed requests:       0
Total transferred:    96400 bytes
HTML transferred:     72200 bytes
Requests per second:  426.90 [#/sec] (mean)
Time per request:     23.424 [ms] (mean)
Time per request:     2.342 [ms] (mean, across all concurrent requests)
Transfer rate:        401.89 [Kbytes/sec] received

Connection Times (ms)
              min   mean[+/-sd] median   max
Connect:        3    13   3.9      13     29
Processing:      1     8   4.1       8     23
Waiting:         0     6   4.6       5     23
Total:          5    22   5.9      22     39

Percentage of the requests served within a certain time (ms)
 50%    22
 66%    23
 75%    24
 80%    25
 90%    28
 95%    34
 98%    36
 99%    39
100%    39 (longest request)
```

Pengujian load test kecil dilakukan menggunakan Apache Benchmark untuk mengetahui kemampuan server dalam menangani beberapa permintaan secara bersamaan. Pengujian dilakukan dengan total 100 request dan 10 koneksi secara bersamaan. Hasil pengujian menunjukkan bahwa seluruh request dapat diproses tanpa error, sehingga server dinyatakan stabil untuk penggunaan dasar.

Kesimpulan: Hasil pengujian menunjukkan bahwa seluruh request berhasil diproses tanpa kegagalan (failed requests = 0), sehingga server dinyatakan stabil untuk penggunaan dasar.

6. Pengujian Log

Pengujian log dilakukan sebagai pengujian tambahan untuk memastikan sistem berjalan dengan baik.

```
firaz@firaz-VirtualBox: $ sudo tail /var/log/nginx/access.log
127.0.0.1 - - [19/Dec/2025:19:13:18 +0700] "GET / HTTP/1.0" 200 722 "-" "ApacheBench/2.3"
127.0.0.1 - - [19/Dec/2025:19:13:18 +0700] "GET / HTTP/1.0" 200 722 "-" "ApacheBench/2.3"
127.0.0.1 - - [19/Dec/2025:19:13:18 +0700] "GET / HTTP/1.0" 200 722 "-" "ApacheBench/2.3"
127.0.0.1 - - [19/Dec/2025:19:13:18 +0700] "GET / HTTP/1.0" 200 722 "-" "ApacheBench/2.3"
127.0.0.1 - - [19/Dec/2025:19:13:18 +0700] "GET / HTTP/1.0" 200 722 "-" "ApacheBench/2.3"
127.0.0.1 - - [19/Dec/2025:19:13:18 +0700] "GET / HTTP/1.0" 200 722 "-" "ApacheBench/2.3"
127.0.0.1 - - [19/Dec/2025:19:13:18 +0700] "GET / HTTP/1.0" 200 722 "-" "ApacheBench/2.3"
127.0.0.1 - - [19/Dec/2025:19:31:00 +0700] "GET / HTTP/1.1" 304 0 "-" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:145.0) Gecko/20100101 Firefox/145.0"
127.0.0.1 - - [19/Dec/2025:19:31:15 +0700] "GET / HTTP/1.1" 304 0 "-" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:145.0) Gecko/20100101 Firefox/145.0"
127.0.0.1 - - [19/Dec/2025:19:31:15 +0700] "GET /css/style.css HTTP/1.1" 304 0 "http://myweb.local/" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:145.0) Gecko/20100101 Firefox/145.0"
```

Pengujian log akses dilakukan untuk memastikan bahwa setiap aktivitas permintaan ke server tercatat dengan baik. Berdasarkan hasil pengujian, permintaan dari pengujian load test menggunakan Apache Benchmark serta akses melalui browser berhasil tercatat pada file access log Nginx. Hal ini menunjukkan bahwa mekanisme pencatatan log berjalan dengan normal.

DOKUMENTASI

Pengerjaan tanggal 18 Desember 2025

