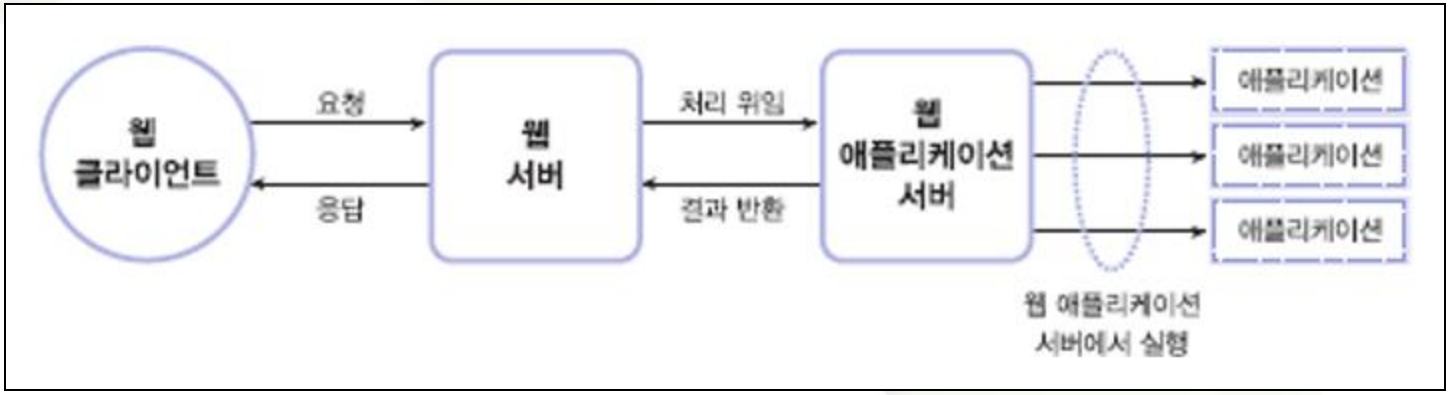
WSGI (Web Server Gateway Interface)

- 웹 서버와 웹 애플리케이션 연동 인터페이스를 위한 파이썬 프레임워크



- 아키텍처 구성 요소
  - » 웹 서버 : Apache httpd 또는 nginx와 같은 웹 서버 프로그램
  - » 웹 애플리케이션 서버 : uwsgi, gunicorn과 같은 WAS 서버 프로그램
  - » 애플리케이션 : 장고 프레임워크를 사용해서 개발한 파이썬 프로그램
  - » WSGI 미들웨어
    - › WSGI 서버와 애플리케이션 사이를 연결
    - › 서버의 관점에서는 애플리케이션으로, 애플리케이션의 관점에서는 서버로 행동

Apache 웹 서버

- 오픈 소스 소프트웨어 그룹인 아파치 소프트웨어 재단에서 만드는 웹 서버 프로그램으로 프로그램명은 httpd
- 팀 버너스 리가 만든 웹 서버 프로그램인 "NCSA HTTPd"를 기반으로 개발
- 운영 중인 웹사이트의 50% 이상이 사용할 정도로 인기 있는 웹 서버
- 거의 모든 리눅스 배포판이 Apache 웹 서버 지원
- mod_wsgi 확장 모듈
  - » Apache는 추가 모듈을 만들고 동적 로딩 방식으로 기능 확장
  - » mod_wsgi는 파이썬 웹 애플리케이션을 실행할 수 있는 확장 모듈 중 하나
  - » 파이썬 웹 애플리케이션 규격인 WSGI 구현

httpd 설치

```
[ssac@centos-server ~]$
[ssac@centos-server ~]$ sudo yum install -y httpd
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
 * base: mirror.kakao.com
 * extras: mirror.kakao.com
 * updates: mirror.kakao.com
Resolving Dependencies
--> Running transaction check
---> Package httpd.x86_64 0:2.4.6-97.el7.centos will be installed
--> Processing Dependency: httpd-tools = 2.4.6-97.el7.centos for package: httpd-2.4.
6-97.el7.centos.x86_64
--> Processing Dependency: /etc/mime.types for package: httpd-2.4.6-97.el7.centos.x8
6_64
--> Running transaction check
---> Package httpd-tools.x86_64 0:2.4.6-97.el7.centos will be installed
---> Package mailcap.noarch 0:2.1.41-2.el7 will be installed
--> Finished Dependency Resolution
```

```
[ssac@centos-server ~]$
[ssac@centos-server ~]$ sudo httpd -V
AH00558: httpd: Could not reliably determine the server's fully qualified domain nam
e, using 192.168.56.100. Set the 'ServerName' directive globally to suppress this me
ssage
Server version: Apache/2.4.6 (CentOS)
Server built:   Nov 16 2020 16:18:20
Server's Module Magic Number: 20120211:24
```

httpd-devel 설치

```
(ssac) [ssac@centos-server ~]$
(ssac) [ssac@centos-server ~]$ sudo yum install -y httpd-devel
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
 * base: mirror.kakao.com
 * extras: mirror.kakao.com
 * updates: mirror.kakao.com
Resolving Dependencies
--> Running transaction check
---> Package httpd-devel.x86_64 0:2.4.6-97.el7.centos will be installed
```

방화벽 설정

```
[ssac@centos-server ~]$ sudo firewall-cmd --permanent --zone=public --add-service=http
success
[ssac@centos-server ~]$ sudo firewall-cmd --permanent --zone=public --add-service=https
success
[ssac@centos-server ~]$
```

```
[ssac@centos-server ~]$
[ssac@centos-server ~]$ sudo firewall-cmd --permanent --zone=public --list-service
dhcpv6-client http https ssh
[ssac@centos-server ~]$
[ssac@centos-server ~]$ sudo systemctl restart firewalld
[ssac@centos-server ~]$
[ssac@centos-server ~]$ sudo systemctl status firewalld
● firewalld.service - firewalld - dynamic firewall daemon
   Loaded: loaded (/usr/lib/systemd/system/firewalld.service; enabled; vendor preset: e
nabled)
   Active: active (running) since 화 2021-02-16 20:14:36 KST; 8s ago
     Docs: man:firewalld(1)
 Main PID: 2150 (firewalld)
   CGroup: /system.slice/firewalld.service
           └─2150 /usr/bin/python2 -Es /usr/sbin/firewalld --nofork --nopid

 2월  16 20:14:36 centos-server systemd[1]: Stopped firewalld - dynamic firewall d...n.
 2월  16 20:14:36 centos-server systemd[1]: Starting firewalld - dynamic firewall .....
 2월  16 20:14:36 centos-server systemd[1]: Started firewalld - dynamic firewall d...n.
 2월  16 20:14:36 centos-server firewalld[2150]: WARNING: AllowZoneDrifting is enab....
Hint: Some lines were ellipsized, use -l to show in full.
[ssac@centos-server ~]$
```

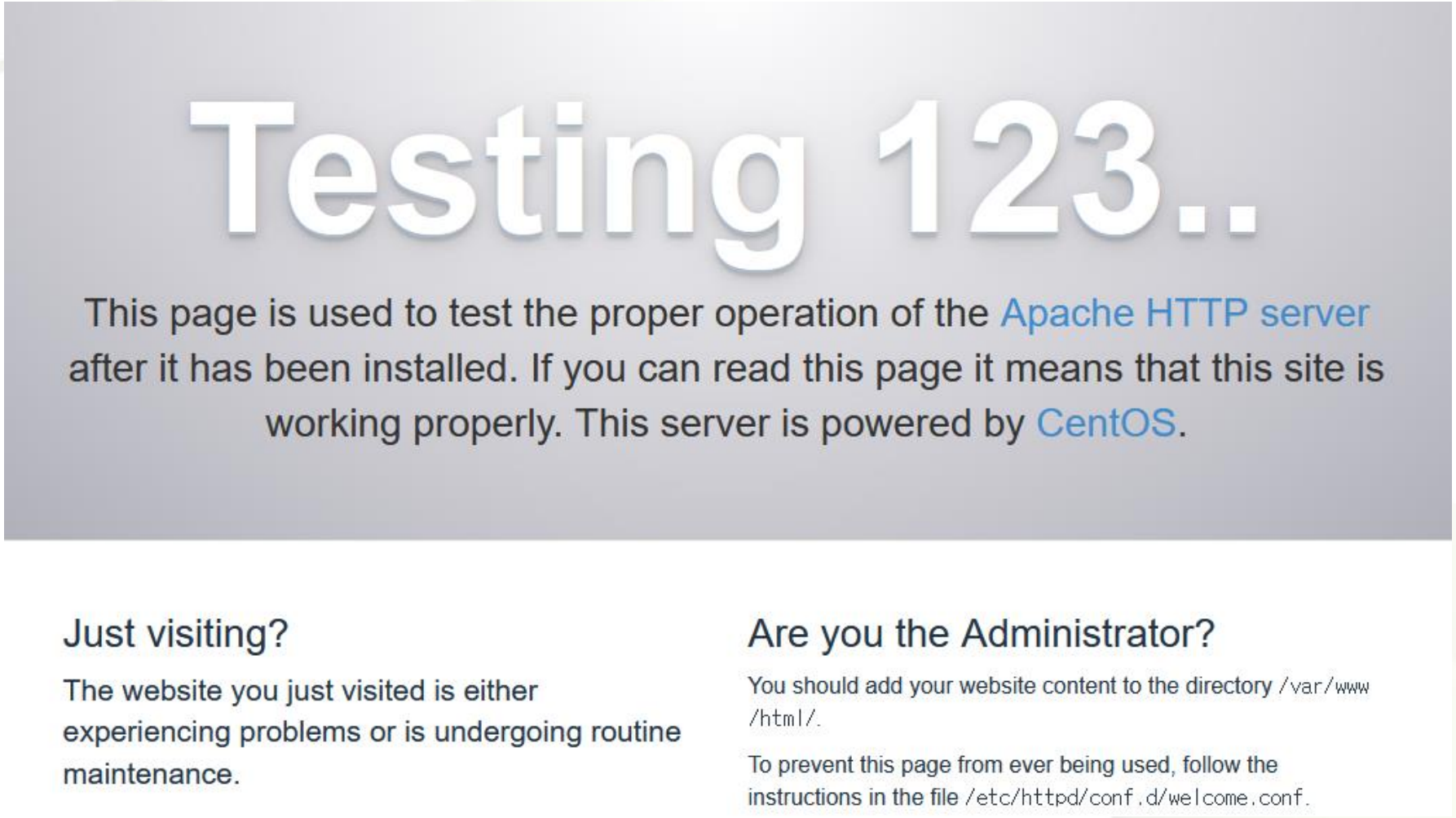
httpd service 시작

```
[ssac@centos-server ~]$
[ssac@centos-server ~]$ sudo systemctl start httpd
[ssac@centos-server ~]$
[ssac@centos-server ~]$ sudo systemctl status httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; vendor preset: disa
bled)
   Active: active (running) since 화  2021-02-16 20:16:54 KST; 7s ago
     Docs: man:httpd(8)
           man:apachectl(8)
 Main PID: 2252 (httpd)
   Status: "Processing requests..."
   CGroup: /system.slice/httpd.service
           ├─2252 /usr/sbin/httpd -DFOREGROUND
           ├─2253 /usr/sbin/httpd -DFOREGROUND
           ├─2254 /usr/sbin/httpd -DFOREGROUND
           ├─2255 /usr/sbin/httpd -DFOREGROUND
           ├─2256 /usr/sbin/httpd -DFOREGROUND
           └─2257 /usr/sbin/httpd -DFOREGROUND

 2월  16 20:16:54 centos-server systemd[1]: Starting The Apache HTTP Server...
 2월  16 20:16:54 centos-server httpd[2252]: AH00558: httpd: Could not reliably de...ge
 2월  16 20:16:54 centos-server systemd[1]: Started The Apache HTTP Server.
Hint: Some lines were ellipsized, use -l to show in full.
[ssac@centos-server ~]$
```

httpd 서비스 실행 확인

- 브라우저에서 http://192.168.56.100 요청



mod_wsgi 설치

```
(ssac) [ssac@centos-server ~]$
(ssac) [ssac@centos-server ~]$ pip install mod_wsgi
Collecting mod_wsgi
  Using cached mod_wsgi-4.7.1.tar.gz (498 kB)
Building wheels for collected packages: mod-wsgi
  Building wheel for mod-wsgi (setup.py) ... done
  Created wheel for mod-wsgi: filename=mod_wsgi-4.7.1-cp37-cp37m-linux_x86_64.whl size=
662077 sha256=a5da85270c6b685bc13438d31d1607645d574370fa94ec157b05aa4fa02ff118
  Stored in directory: /home/ssac/.cache/pip/wheels/c3/b2/93/f173e3207d97ada7d56f5516cf
1cdff34b38111e41d4a0bad0
Successfully built mod-wsgi
Installing collected packages: mod-wsgi
Successfully installed mod-wsgi-4.7.1
(ssac) [ssac@centos-server ~]$
```

mod_wsgi-express 서버 실행

- 방화벽 설정

```
(ssac) [ssac@centos-server ~]$ sudo firewall-cmd --permanent --zone=public --add-port=8
000/tcp
[sudo] ssac의 암호 :
success
```

```
(ssac) [ssac@centos-server ~]$
(ssac) [ssac@centos-server ~]$ sudo systemctl restart firewalld
(ssac) [ssac@centos-server ~]$
```

- 서버 실행

```
(ssac) [ssac@centos-server ~]$
(ssac) [ssac@centos-server ~]$ mod_wsgi-express start-server
Server URL          : http://localhost:8000/
Server Root         : /tmp/mod_wsgi-localhost:8000:1000
Server Conf         : /tmp/mod_wsgi-localhost:8000:1000/httpd.conf
Error Log File      : /tmp/mod_wsgi-localhost:8000:1000/error_log (warn)
Request Capacity    : 5 (1 process * 5 threads)
Request Timeout     : 60 (seconds)
Startup Timeout     : 15 (seconds)
Queue Backlog       : 100 (connections)
Queue Timeout       : 45 (seconds)
Server Capacity     : 20 (event/worker), 20 (prefork)
Server Backlog      : 500 (connections)
Locale Setting      : ko_KR.UTF-8
```

mod_wsgi-express 서버 실행

- 서버 실행 확인 → http://192.168.56.100:8000