오픈소스 SW 개발도구 활용

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1. 기본적으로 아파치를 사용하기 위하여 아파치 설치 그리고 이미지 파일을 활용하기 위하여 wget함수를 사용하려 하였지만 안되어서 추가적으로 설치하여 활용하였습니다.

```
qkrtlsdn981225@psw:~$ sudo apt install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom www-browser
The following NEW packages will be installed:
  apache2
0 upgraded, 1 newly installed, 0 to remove and 8 not upgraded.
Need to get 275 kB of archives.
After this operation, 638 kB of additional disk space will be used.
Get:1 http://deb.debian.org/debian bullseye/main amd64 apache2 amd64 2.4.54-1~de
b11ul [275 kB]
Fetched 275 kB in 0s (1302 kB/s)
Selecting previously unselected package apache2.
(Reading database ... 58715 files and directories currently installed.)
Preparing to unpack .../apache2_2.4.54-1~deb11ul_amd64.deb ...
Unpacking apache2 (2.4.54-1~deb11ul) ...
Setting up apache2 (2.4.54-1~deb11ul) ...
apache-htcacheclean.service is a disabled or a static unit not running, not star
ting it.
Processing triggers for man-db (2.9.4-2) ...
```

```
qkrtlsdn981225@psw:/var/www/html$ sudo apt install wget
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
wget is already the newest version (1.21-1+deb11ul).
0 upgraded, 0 newly installed, 0 to remove and 8 not upgraded.
```

2. wget함수를 이용하여 필요한 사진의 이미지 주소를 복사하여 저장합니다.

```
qkrtlsdn981225@psw:/var/www/html$ sudo wget https://www.hallym.ac.kr/.resources/hallym_univ_theme/hallym/ko/img/abouthallym/symbol-ui-mark.png
--2022-09-27 09:57:08--  https://www.hallym.ac.kr/.resources/hallym_univ_theme/hallym/ko/img/abouthallym/symbol-ui-mark.png
Resolving www.hallym.ac.kr (www.hallym.ac.kr)... 210.115.225.177
Connecting to www.hallym.ac.kr (www.hallym.ac.kr)|210.115.225.177|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 11077 (11K) [image/png]
Saving to: 'symbol-ui-mark.png'

symbol-ui-mark.png          100%[===================================================================================================>]  10.82K  --.-KB/s    in 0s

2022-09-27 09:57:08 (94.6 MB/s) - 'symbol-ui-mark.png' saved [11077/11077]

qkrtlsdn981225@psw:/var/www/html$ sudo wget https://www.rd.com/wp-content/uploads/2021/01/GettyImages-1175550351.jpg
--2022-09-27 09:57:21--  https://www.rd.com/wp-content/uploads/2021/01/GettyImages-1175550351.jpg
Resolving www.rd.com (www.rd.com)... 172.64.149.115, 104.18.38.141, 2606:4700:4400::ac40:9573, ...
Connecting to www.rd.com (www.rd.com)|172.64.149.115|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 256170 (250K) [image/jpeg]
Saving to: 'GettyImages-1175550351.jpg'

GettyImages-1175550351.jpg  100%[===================================================================================================>] 250.17K  --.-KB/s    in 0.004s

2022-09-27 09:57:21 (56.9 MB/s) - 'GettyImages-1175550351.jpg' saved [256170/256170]
```

```
qkrtlsdn981225@psw:/var/www/html$ ls
GettyImages-1175550351.jpg  'images?q=tbn:ANd9GcQIsPpqzQ-tBEVdo4-g5FdjutF8w3t0h9TTvA'   index.html   symbol-ui-mark.png
```

3. 본인소개서 내용을 작성하여 html문서안에 저장을 한다.

```html
<html>
<head>
<title>Self Introduction </title>
</head>
<body>
<p>Hello, My Name Park sin woo. I'm a 17th grade student of big data attending <strong>Hallym University</strong></p>
<a href="www.hallym.ac.kr"><img src="symbol-ui-mark.png"></a>
<p>Click on the picture above to go to the school's website.</p>
<img height="100" width="100" src="GettyImages-1175550351.jpg">
</body>
</html>
```

4. 연결될 주소로 이동하여 자신이 만든 코드와 html의 문서가 똑같이 나오는지 확인한다.
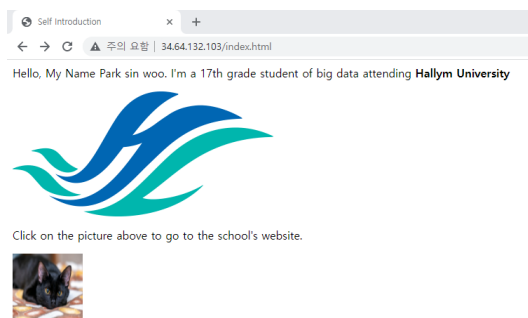
5. 기본적인 도커의 패키지를 설치를 한다.

```
Selecting previously unselected package docker-compose-plugin.
Preparing to unpack .../06-docker-compose-plugin_2.10.2-debian-bullseye_amd64.de
b ...
Unpacking docker-compose-plugin (2.10.2-debian-bullseye) ...
Selecting previously unselected package docker-scan-plugin.
Preparing to unpack .../07-docker-scan-plugin_0.17.0~debian-bullseye_amd64.deb .
..
Unpacking docker-scan-plugin (0.17.0~debian-bullseye) ...
Selecting previously unselected package libcurl3-gnutls:amd64.
Preparing to unpack .../08-libcurl3-gnutls_7.74.0-1.3+deb11u3_amd64.deb ...
Unpacking libcurl3-gnutls:amd64 (7.74.0-1.3+deb11u3) ...
Selecting previously unselected package liberror-perl.
Preparing to unpack .../09-liberror-perl_0.17029-1_all.deb ...
Unpacking liberror-perl (0.17029-1) ...
Selecting previously unselected package git-man.
Preparing to unpack .../10-git-man_1%3a2.30.2-1_all.deb ...
Unpacking git-man (1:2.30.2-1) ...
Selecting previously unselected package git.
Preparing to unpack .../11-git_1%3a2.30.2-1_amd64.deb ...
Unpacking git (1:2.30.2-1) ...
Selecting previously unselected package libltdl7:amd64.
Preparing to unpack .../12-libltdl7_2.4.6-15_amd64.deb ...
Unpacking libltdl7:amd64 (2.4.6-15) ...
Selecting previously unselected package libslirp0:amd64.
Preparing to unpack .../13-libslirp0_4.4.0-1+deb11u2_amd64.deb ...
Unpacking libslirp0:amd64 (4.4.0-1+deb11u2) ...
Selecting previously unselected package patch.
Preparing to unpack .../14-patch_2.7.6-7_amd64.deb ...
Unpacking patch (2.7.6-7) ...
Selecting previously unselected package slirp4netns.
Preparing to unpack .../15-slirp4netns_1.0.1-2_amd64.deb ...
Unpacking slirp4netns (1.0.1-2) ...
Setting up docker-scan-plugin (0.17.0~debian-bullseye) ...
Setting up libcurl3-gnutls:amd64 (7.74.0-1.3+deb11u3) ...
Setting up liberror-perl (0.17029-1) ...
Setting up dbus-user-session (1.12.20-2) ...
Setting up containerd.io (1.6.8-1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/containerd.service →
 /lib/systemd/system/containerd.service.
Setting up patch (2.7.6-7) ...
Setting up docker-compose-plugin (2.10.2~debian-bullseye) ...
Setting up libltdl7:amd64 (2.4.6-15) ...
Setting up docker-ce-cli (5:20.10.18-3-0~debian-bullseye) ...
Setting up libslirp0:amd64 (4.4.0-1+deb11u2) ...
Setting up pigz (2.6-1) ...
Setting up git-man (1:2.30.2-1) ...
Setting up docker-ce-rootless-extras (5:20.10.18-3-0~debian-bullseye) ...
Setting up slirp4netns (1.0.1-2) ...
Setting up docker-ce (5:20.10.18-3-0~debian-bullseye) ...
Created symlink /etc/systemd/system/multi-user.target.wants/docker.service → /li
b/systemd/system/docker.service.
Created symlink /etc/systemd/system/sockets.target.wants/docker.socket → /lib/sy
stemd/system/docker.socket.
Setting up git (1:2.30.2-1) ...
Processing triggers for man-db (2.9.4-2) ...
Processing triggers for libc-bin (2.31-13+deb11u4) ...
qkrtlsdn981225@psw:~$ sudo docker ps
CONTAINER ID   IMAGE    COMMAND   CREATED    STATUS    PORTS     NAMES
qkrtlsdn981225@psw:~$ whoami
qkrtlsdn981225
qkrtlsdn981225@psw:~$ sudo docker images
REPOSITORY   TAG    IMAGE ID    CREATED    SIZE
qkrtlsdn981225@psw:~$
```

```
qkrtlsdn981225@psw:~$ sudo apt-get install \
    ca-certificates \
    curl \
    gnupg \
    lsb-release
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
ca-certificates is already the newest version (20210119).
ca-certificates set to manually installed.
curl is already the newest version (7.74.0-1.3+deb11u3).
gnupg is already the newest version (2.2.27-2+deb11u2).
gnupg set to manually installed.
lsb-release is already the newest version (11.1.0).
lsb-release set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 9 not upgraded.
```

6. 도커를 설치한 후 apache를 사용하기 위해 필요한 htttpd image를 다운로드 한다. 그 후 image를 run 시킨후 웹페이지에 제대로 연결이 되었는지 확인한다.

```
qkrtlsdn981225@psw:/$ docker search httpd
NAME                              DESCRIPTION                                      STARS   OFFICIAL   AUTOMATED
httpd                             The Apache HTTP Server Project                   4174    [OK]
centos/httpd-24-centos7           Platform for running Apache httpd 2.4 or bui…    44
centos/httpd                                                                       35                 [OK]
hypoport/httpd-cgi                httpd-cgi                                        2
clearlinux/httpd                  httpd HyperText Transfer Protocol (HTTP) ser…    2
solsson/httpd-openidc             mod_auth_openidc on official httpd image, ve…    2                  [OK]
jonathanheilmann/httpd-alpine-rewrite   httpd:alpine with enabled mod_rewrite     1                  [OK]
dockerpinata/httpd                                                                 1
public1/httpd                     httpd:latest                                     1                  [OK]
inanimate/httpd-ssl               A play container with httpd, ssl enabled, an…    1                  [OK]
dariko/httpd-rproxy-ldap          Apache httpd reverse proxy with LDAP authent…    1                  [OK]
centos/httpd-24-centos8                                                            1
manageiq/httpd                    Container with httpd, built on CentOS for Ma…    1                  [OK]
lead4good/httpd-fpm               httpd server which connects via fcgi proxy h…    1                  [OK]
nnasaki/httpd-ssi                 SSI enabled Apache 2.4 on Alpine Linux           1
patrickha/httpd-err                                                               0
manageiq/httpd_configmap_generator  Httpd Configmap Generator                     0                  [OK]
manasip/httpd                                                                      0
amd64/httpd                       The Apache HTTP Server Project                   0
httpdocker/kubia                                                                  0
httpdss/archerysec                ArcherySec repository                            0                  [OK]
paketobuildpacks/httpd                                                             0
19022021/httpd-connection_test    This httpd image will test the connectivity …    0
sandeep1988/httpd-new             httpd-new                                        0
e2eteam/httpd                                                                      0
qkrtlsdn981225@psw:/$ docker pull httpd
Using default tag: latest
latest: Pulling from library/httpd
31b3f1ad4cel: Already exists
f29089ecfcbf: Pull complete
a9fcd580ef1c: Pull complete
a19138bf3164: Pull complete
5bfb2ce98078: Pull complete
Digest: sha256:71e882df50adc606c57e46e5deb3c933288e2c7775472a639326d9e4e40a47c2
Status: Downloaded newer image for httpd:latest
docker.io/library/httpd:latest
```


Apache2 Debian Default Page

It works!

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Debian systems. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at /var/www/html/index.html) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

Configuration Overview

Debian's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Debian tools. The configuration system is **fully documented in /usr/share/doc/apache2/README.Debian.gz**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manual** if the apache2-doc package was installed on this server.

The configuration layout for an Apache2 web server installation on Debian systems is as follows:

```
/etc/apache2/
|-- apache2.conf
|       `-- ports.conf
|-- mods-enabled
|       |-- *.load
|       `-- *.conf
|-- conf-enabled
|       `-- *.conf
|-- sites-enabled
        `-- *.conf
```

- apache2.conf is the main configuration file. It puts the pieces together by including all remaining configuration files when starting up the web server.
- ports.conf is always included from the main configuration file. It is used to determine the listening ports for incoming connections, and this file can be customized anytime.
- Configuration files in the mods-enabled/, conf-enabled/ and sites-enabled/ directories contain particular configuration snippets which manage modules, global configuration fragments, or virtual host configurations, respectively.
- They are activated by symlinking available configuration files from their respective *-available/ counterparts. These should be managed by using our helpers a2enmod, a2dismod, a2ensite, a2dissite, and a2enconf, a2disconf. See their respective man pages for detailed information.
- The binary is called apache2. Due to the use of environment variables, in the default configuration, apache2 needs to be started/stopped with /etc/init.d/apache2 or apache2ctl. **Calling /usr/bin/apache2 directly will not work** with the default configuration.

Document Roots

7. exec명령을 통하여 컨테이너 내부에 접속한 후 내부에 있는 index.html파일의 위치를 확인한다.

```
qkrtlsdn981225@psw:/var/www/html$ docker exec -it 90 bash
root@90ecd9bbb523:/usr/local/apache2# ls
bin  build  cgi-bin  conf  error  htdocs  icons  include  logs  modules
root@90ecd9bbb523:/usr/local/apache2# cd htdocs
root@90ecd9bbb523:/usr/local/apache2/htdocs# ls
index.html
```

8. **실행되어 있는 컨테이너의 Name을 알아낸 후**

```
qkrtlsdn981225@psw:/var/www/html$ sudo docker ps
CONTAINER ID   IMAGE    COMMAND              CREATED        STATUS         PORTS                 NAMES
90ecd9bbb523   httpd    "httpd-foreground"   3 minutes ago  Up 3 minutes   0.0.0.0:80->80/tcp    funny_tereshkova
```

9. **기존에 만들어 놓았던 var/www/html/index.html을 컨테이너 내부의 index.html파일에 cp 명령어를 통하여 복사하여 붙여넣기를 해줍니다.**

```
qkrtlsdn981225@psw:/var/www/html$ sudo docker cp index.html funny_tereshkova:/usr/local/apache2/htdocs/index.html
```

10. **마지막으로 연결된 포트에 같은 내용의 문서가 저장되어 있는지 체크합니다.**

← → C ▲ 주의 요함 | 34.64.132.103

Hello, My Name Park sin woo. I'm a 17th grade student of big data attending **Hallym University**

Click on the picture above to go to the school's website.