MCHMS Myanmar Cultural Heritage Management System

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Ver. 2.0

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1. 홈페이지 운영

1.1 관리자의 역할

- 회원가입한 사용자는 관리자가 승인을 해야만 로그인할 수 있다.

- 관리자는 회원들이 로그인 할 수 있는 권한을 부여한다.

- 권한 수준은 총 3가지가 있으며, 각 값에 따라 접근권한이 다르다. (1=관리자 권한, 2=일반 회원, 3=가입 대기 상황)

1.2 관리자로 로그인

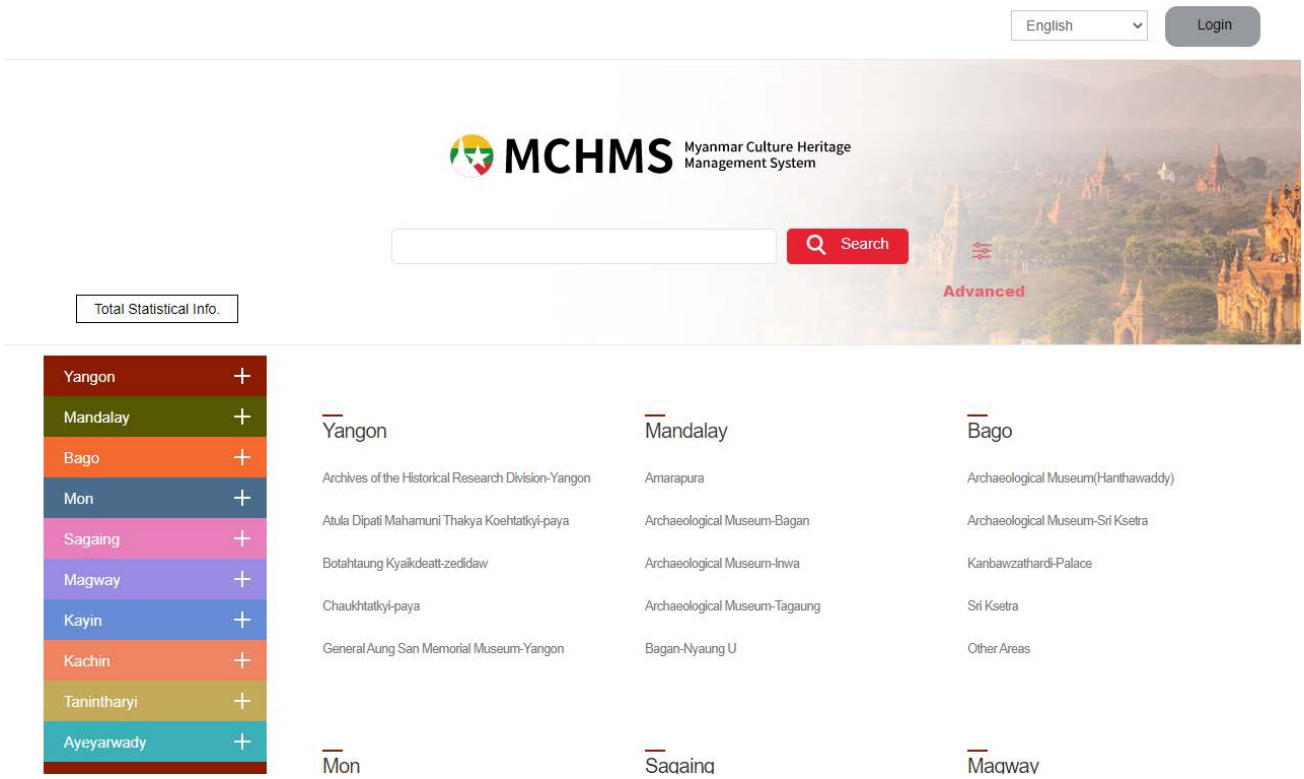


그림 1 MCHMS 메인 페이지

관리자는 우측 상단의 로그인 버튼을 클릭해 로그인 페이지로 접속한다

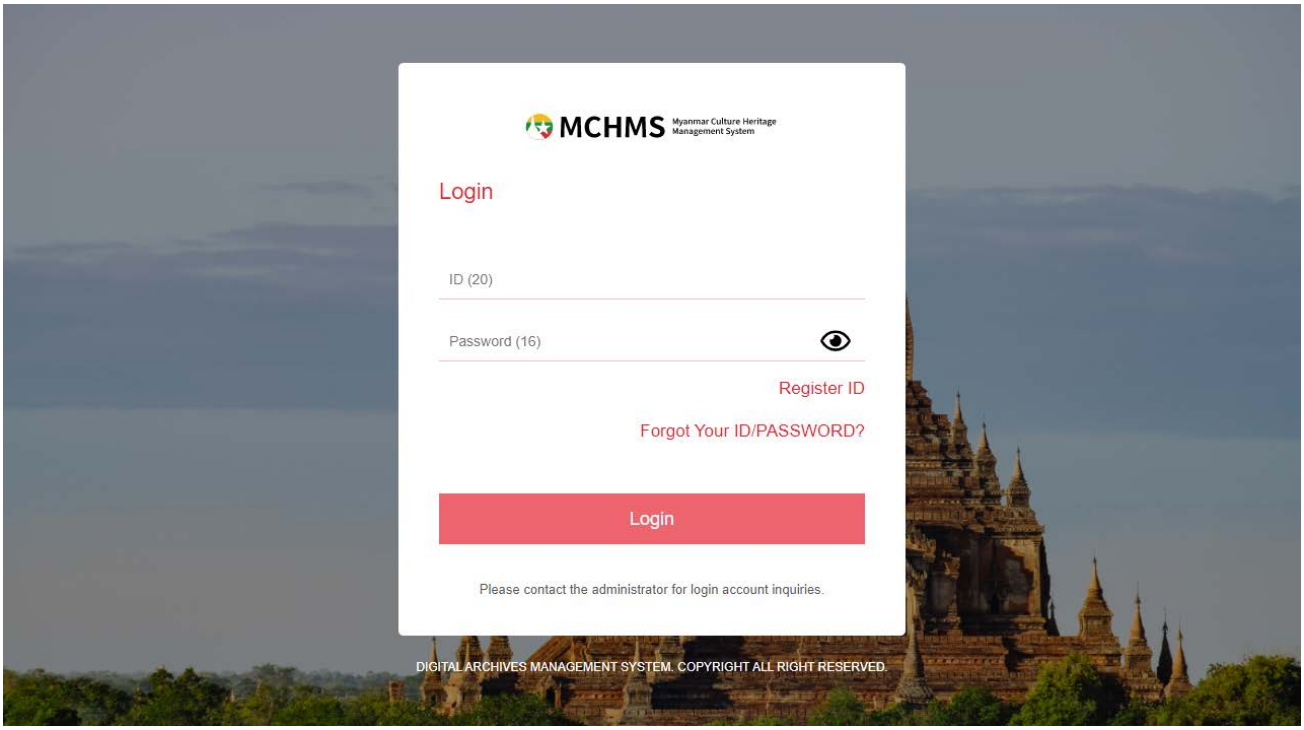


그림 2 MCHMS 로그인 페이지

관리자 ID와 패스워드를 입력하여 로그인한다.

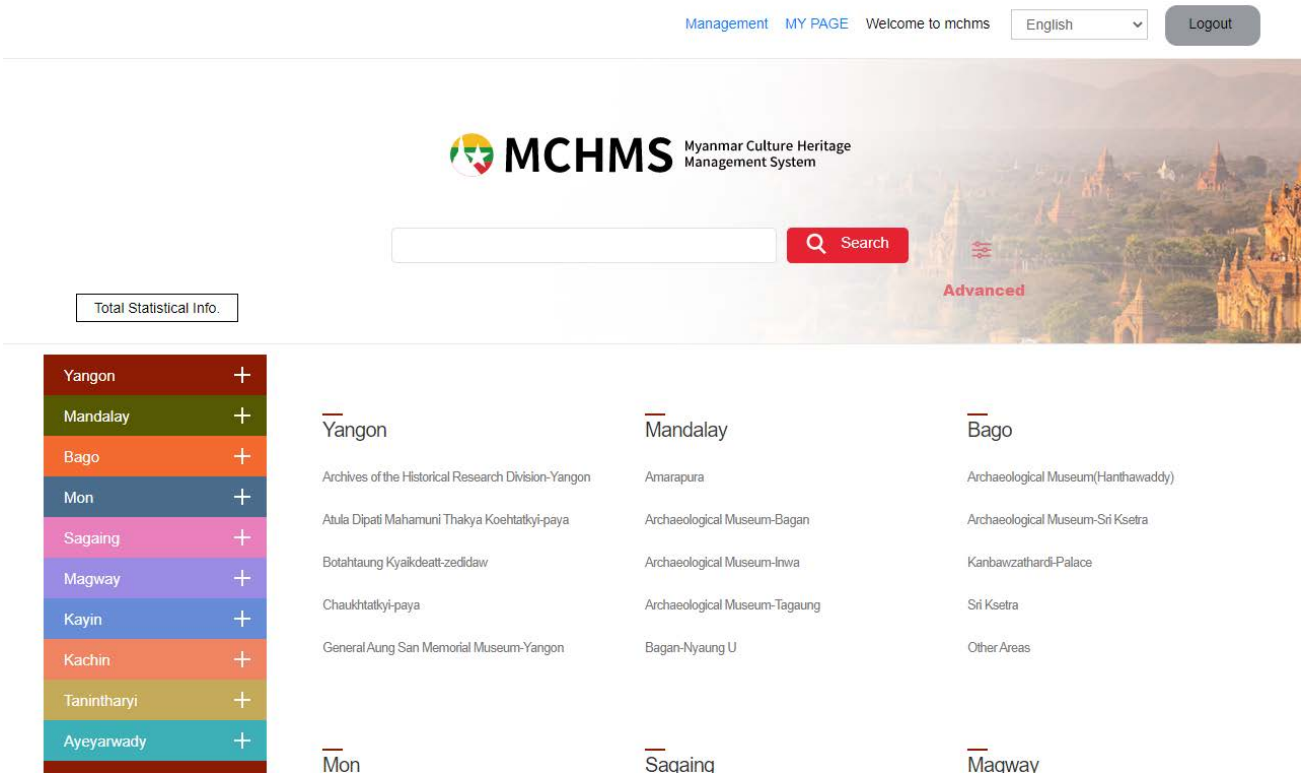


그림 3 MCHMS 관리자 로그인 시 메인 페이지

관리자로 로그인을 한 경우 최상단에 Management 버튼이 생긴다.

1.3 관리자 기능

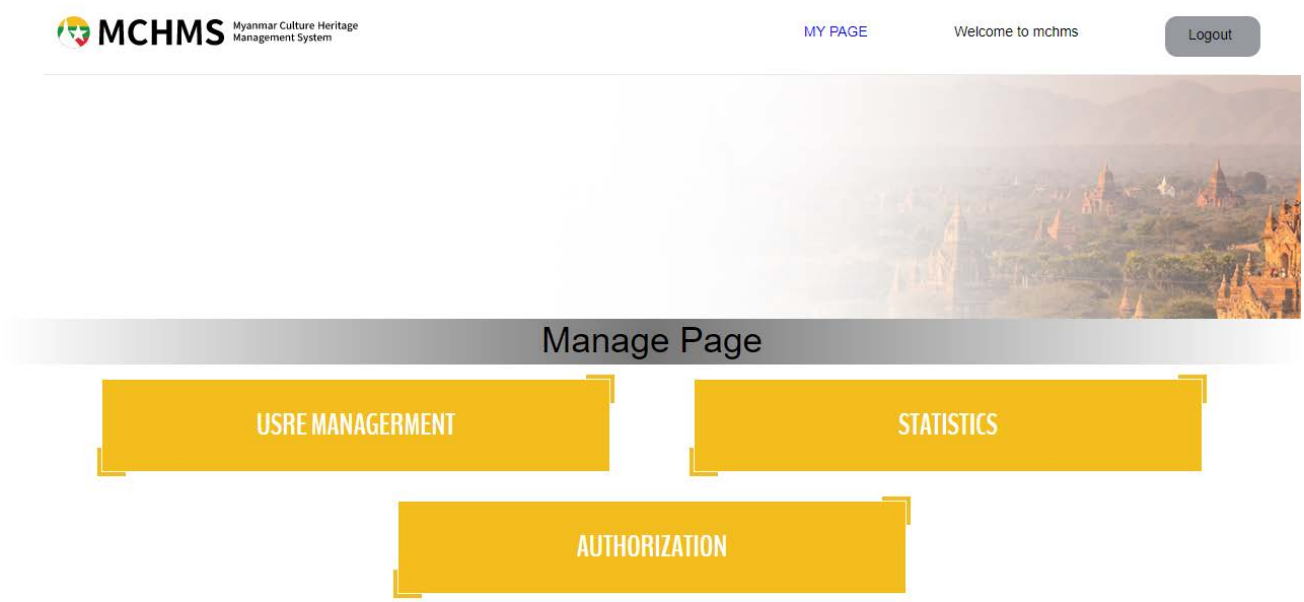


그림 4 MCHMS 관리자 페이지

관리자 페이지에서는 3가지 기능을 제공한다. 각 기능은 이하와 같다.

1. 사용자 관리 : 사용자 목록을 확인하고 밴할 수 있다.
2. 사용자 인증 : 가입 대기중인 사용자를 승인할 수 있다.
3. 전체 통계 : 업로드된 자료의 전체 통계를 확인할 수 있다.

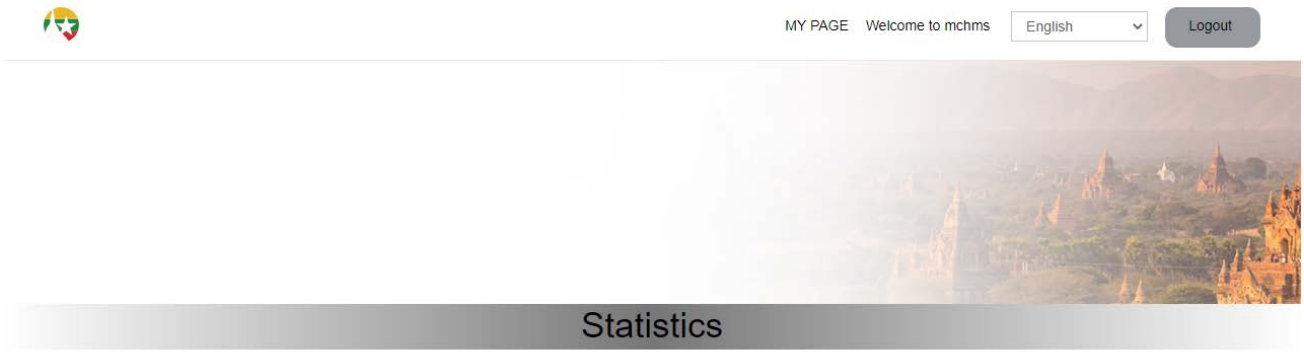
1.3.1 사용자 인증



그림 5 MCHMS 사용자 인증 페이지

사용자 인증 페이지에서는 사용자의 ID와 닉네임, 이름 목록을 보여주며, Approve 버튼을 통해 가입 대기 중인 사용자를 승인시킬 수 있다.

1.3.2 전체 통계



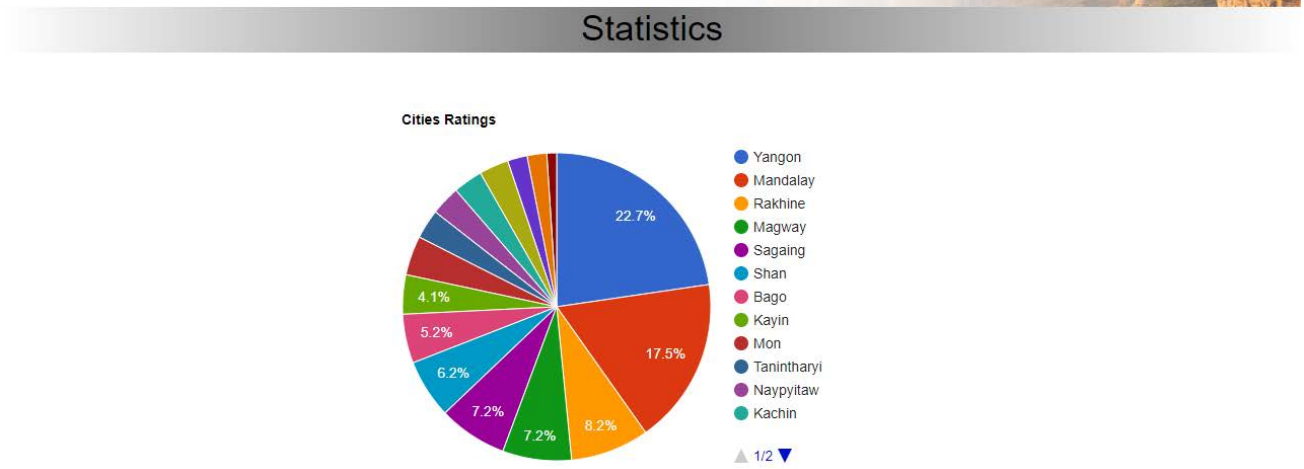


그림 6 MCHMS 전체 통계 페이지

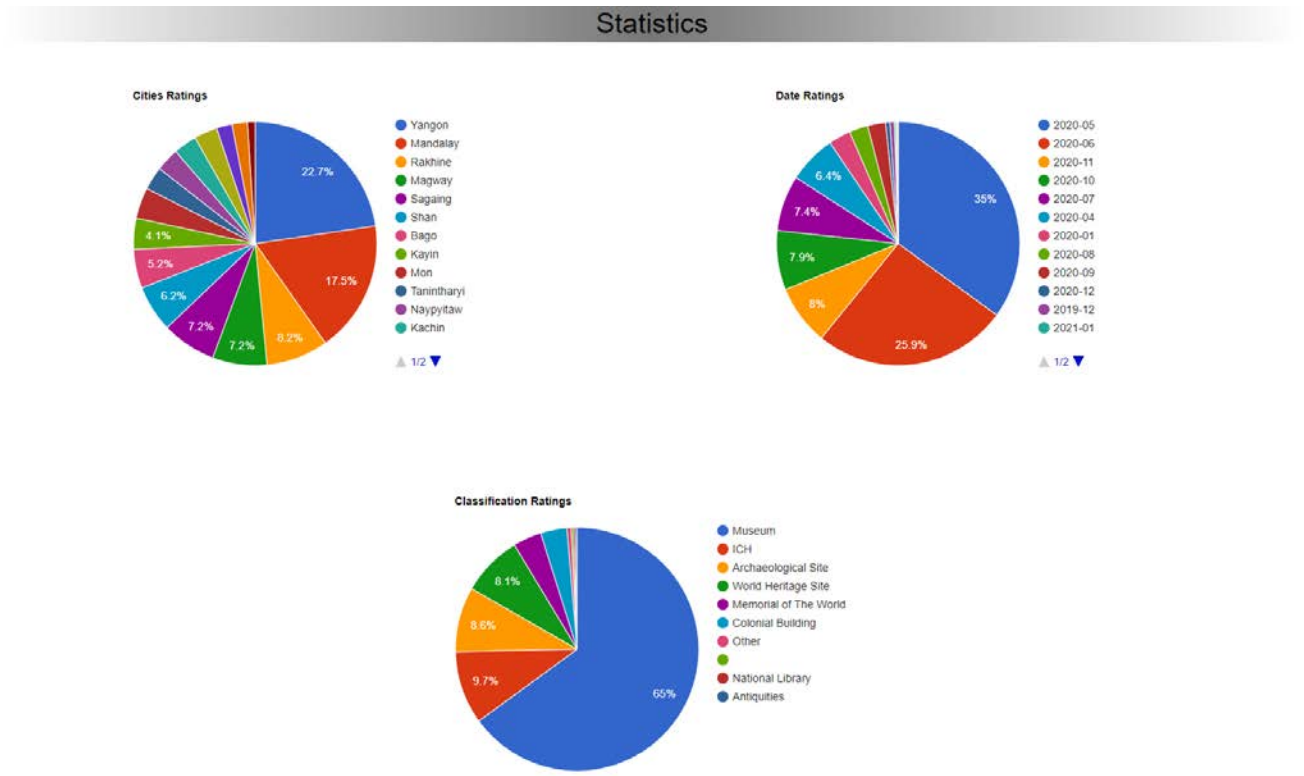


그림 7 MCHMS 통계 페이지 – 통계 차트

통계 페이지에서는 도시별 통계, 날짜별 통계, 종류별 통계를 확인할 수 있다.

2. AWS 관리 및 유지보수

2.1 AWS에 로그인하기

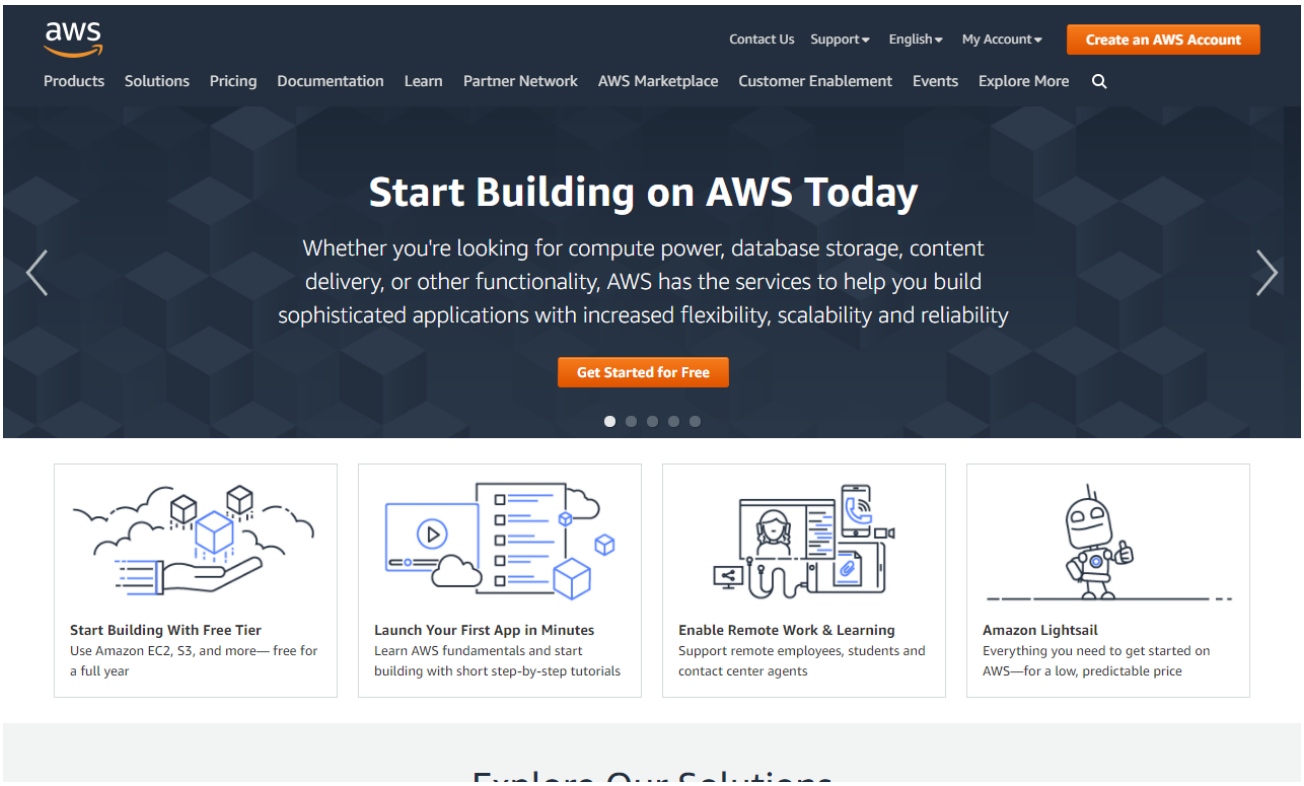


그림 8 Amazon AWS 홈페이지

AWS 홈페이지에 접속한다 (https://aws.amazon.com/)

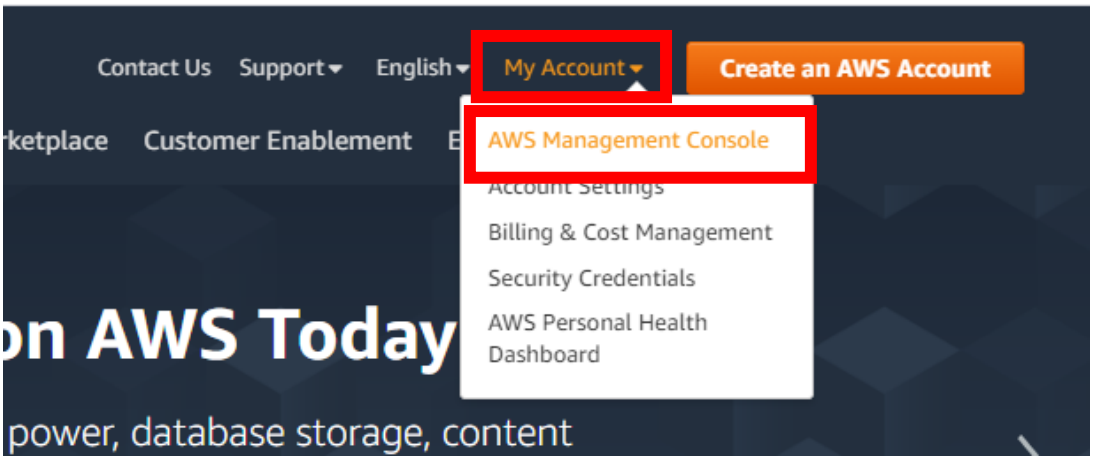


그림 9 AWS Management Console 접근방법

상단의 My Account에 마우스를 올려놓으면 나오는 창에서 AWS Management Console을 클릭한다.

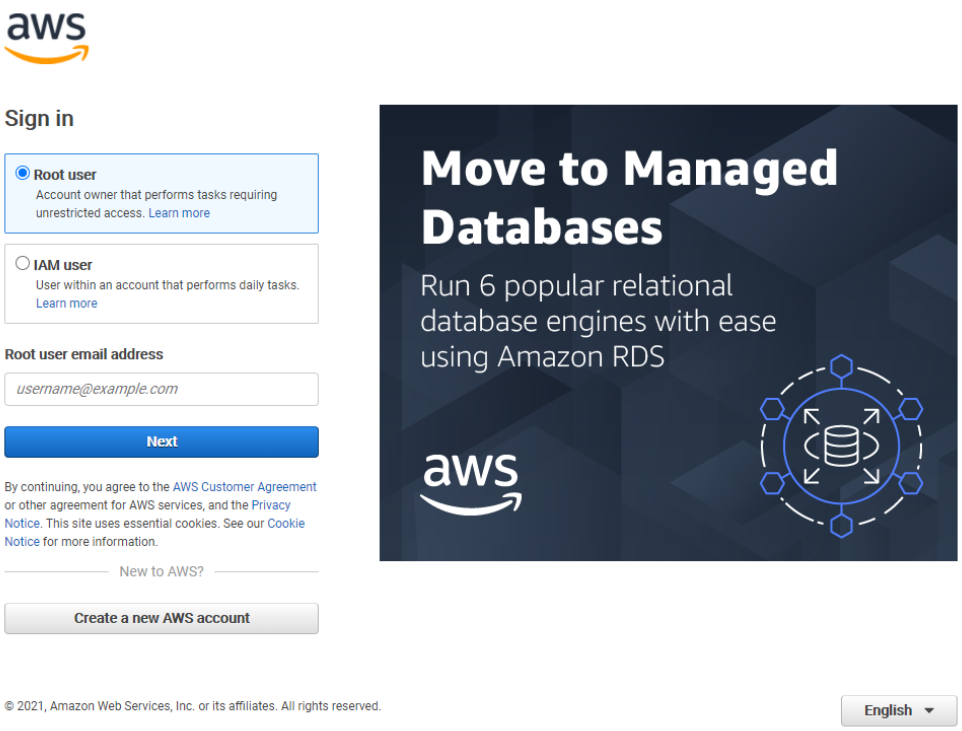


그림 10 Amazon AWS 로그인 과정 1 – 이메일 입력

로그인 페이지의 Root user email address란에 이메일을 입력하고 Next를 누른다.

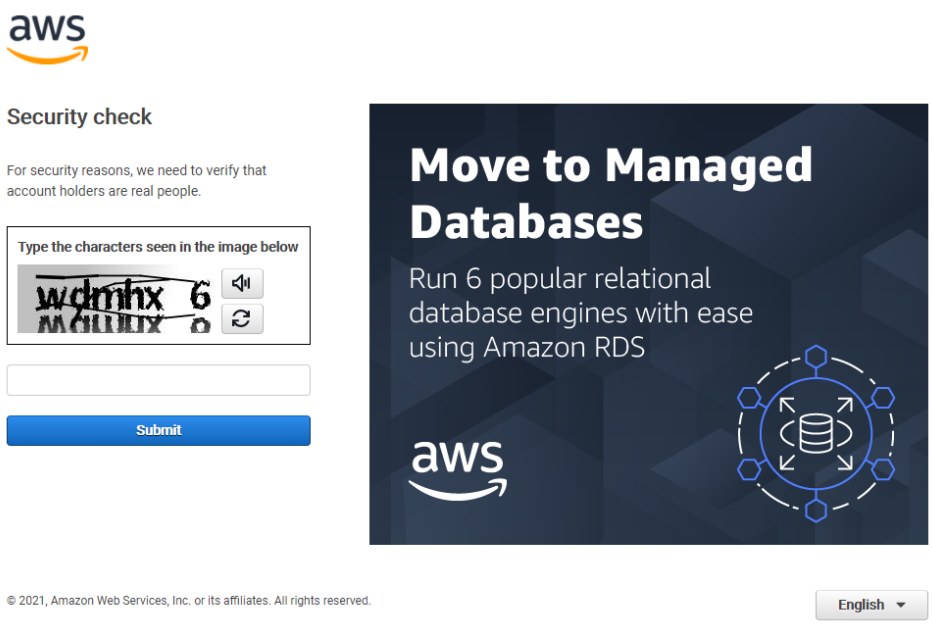


그림 11 Amazon AWS 로그인 과정 2 – Captcha 입력

화면에 나오는 Captcha 코드를 똑같이 기입하고 Submit을 누른다.

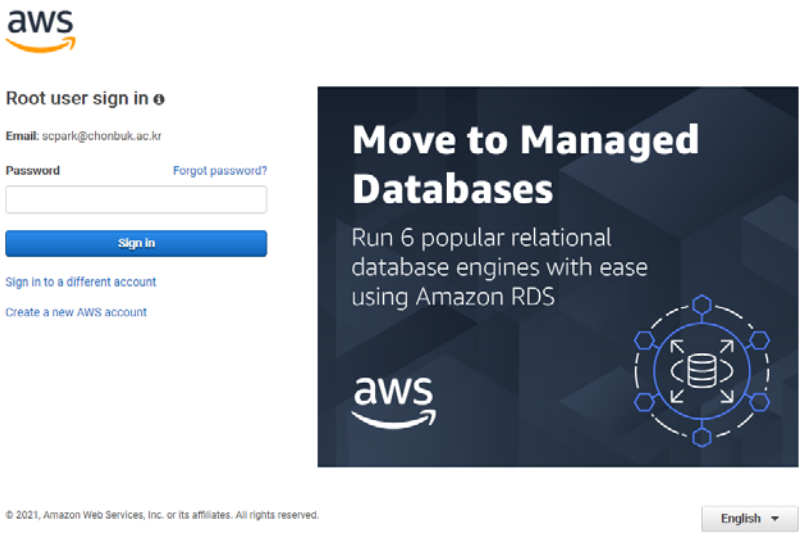


그림 12 Amazon AWS 로그인 과정 3 – 비밀번호 입력

Password란에 비밀번호를 입력하고 Sign in을 클릭한다.

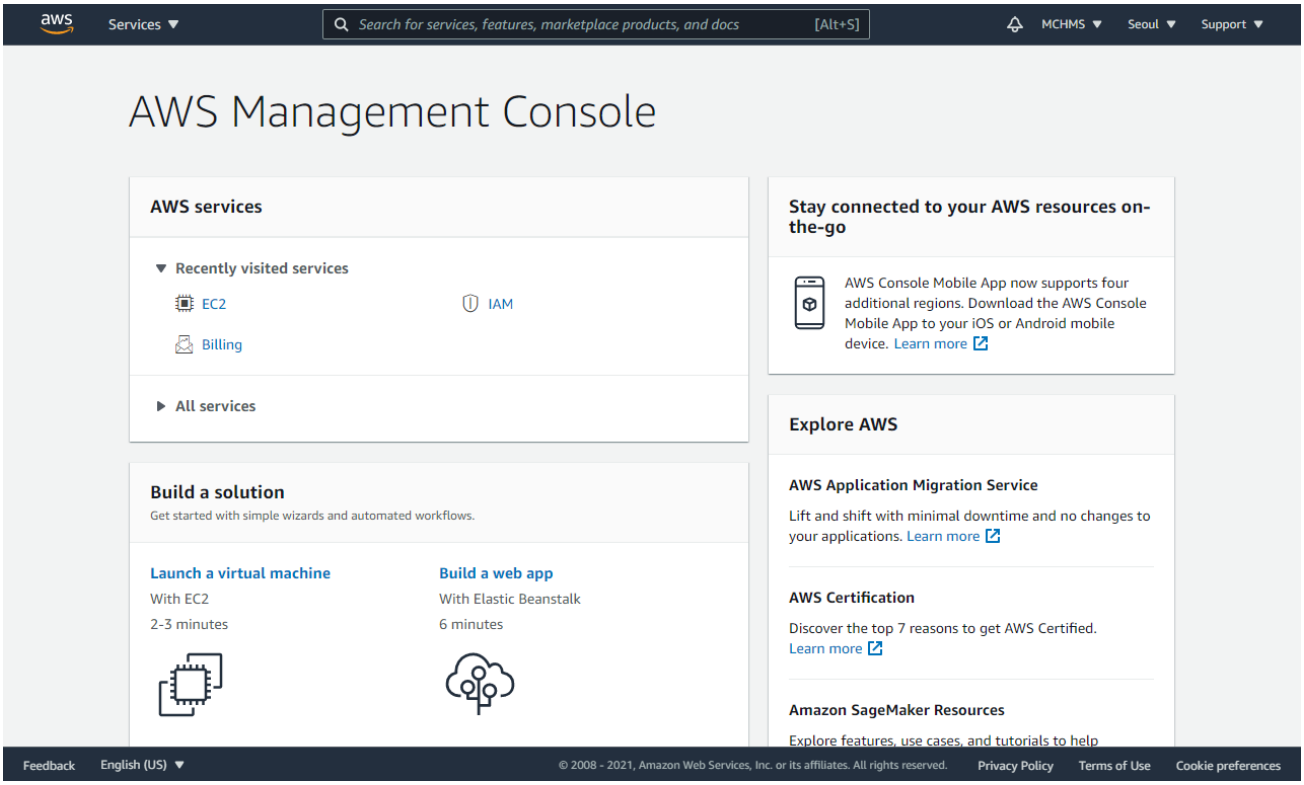


그림 13 Amazon AWS 관리 콘솔

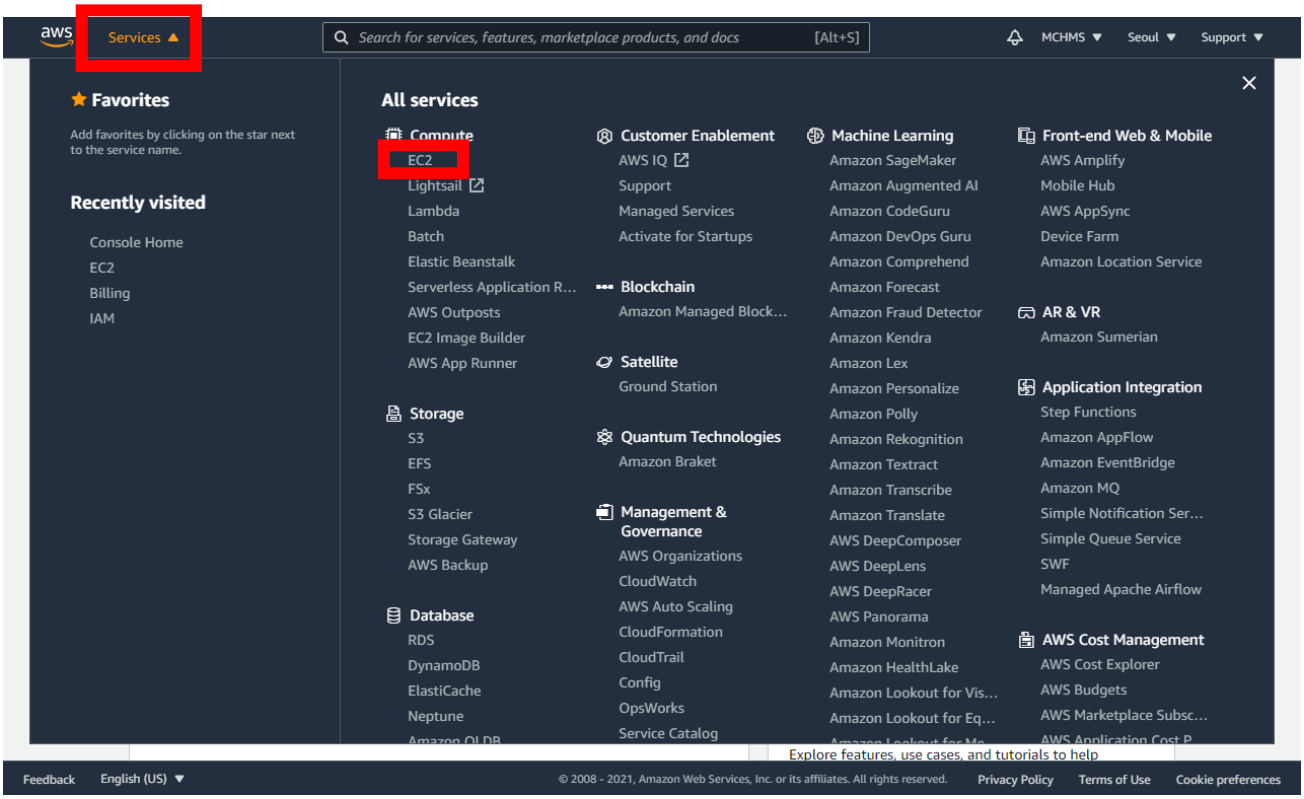


그림 14 Amazon AWS EC2 콘솔 접근 방법

EC2 콘솔에 접근하기 위해서는 좌측 상단의 Services를 클릭한 후 All services – Compute – EC2를 클릭한

다.

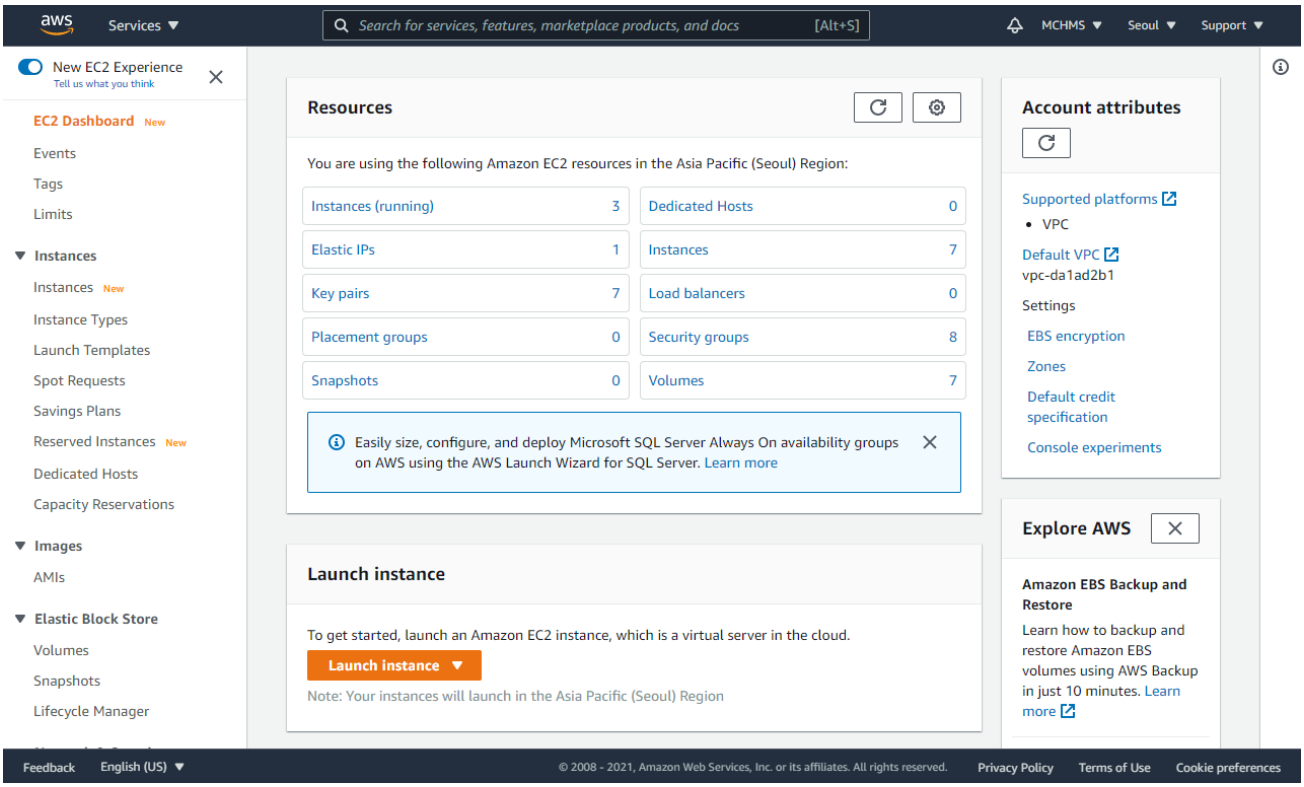


그림 15 Amazon AWS EC2 대시보드

2.2 인스턴스 종료, 시작, 재시작 방법

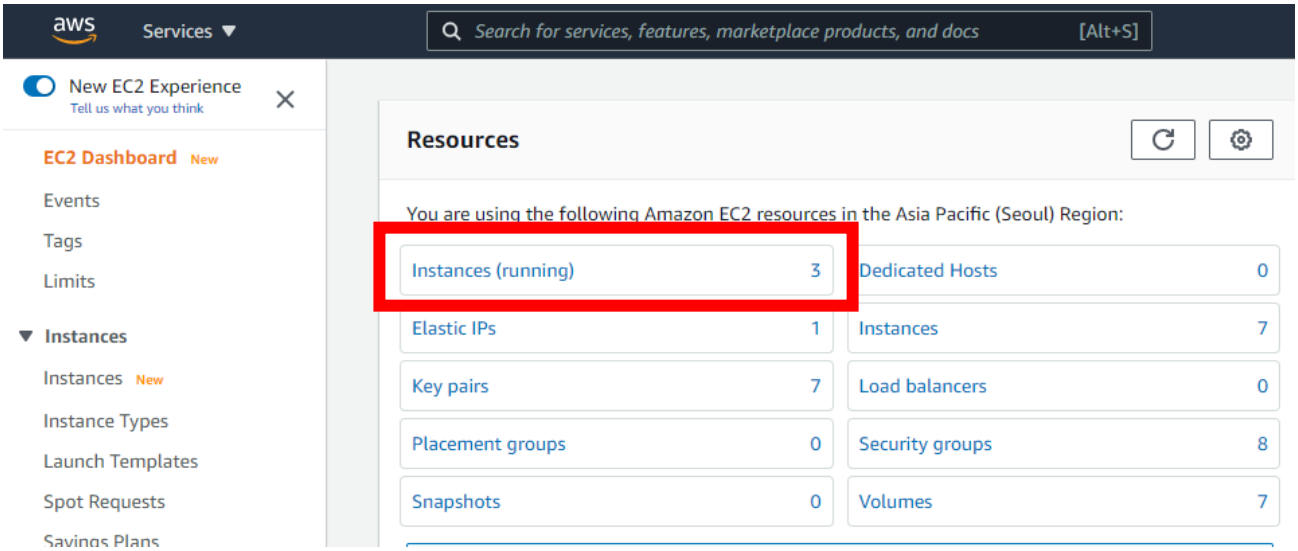


그림 16 Amazon AWS EC2 현재 실행중인 인스턴스 확인

먼저 EC2 대시보드 중앙의 Instances (running)을 클릭하여 실행중인 인스턴스 목록으로 들어간다.

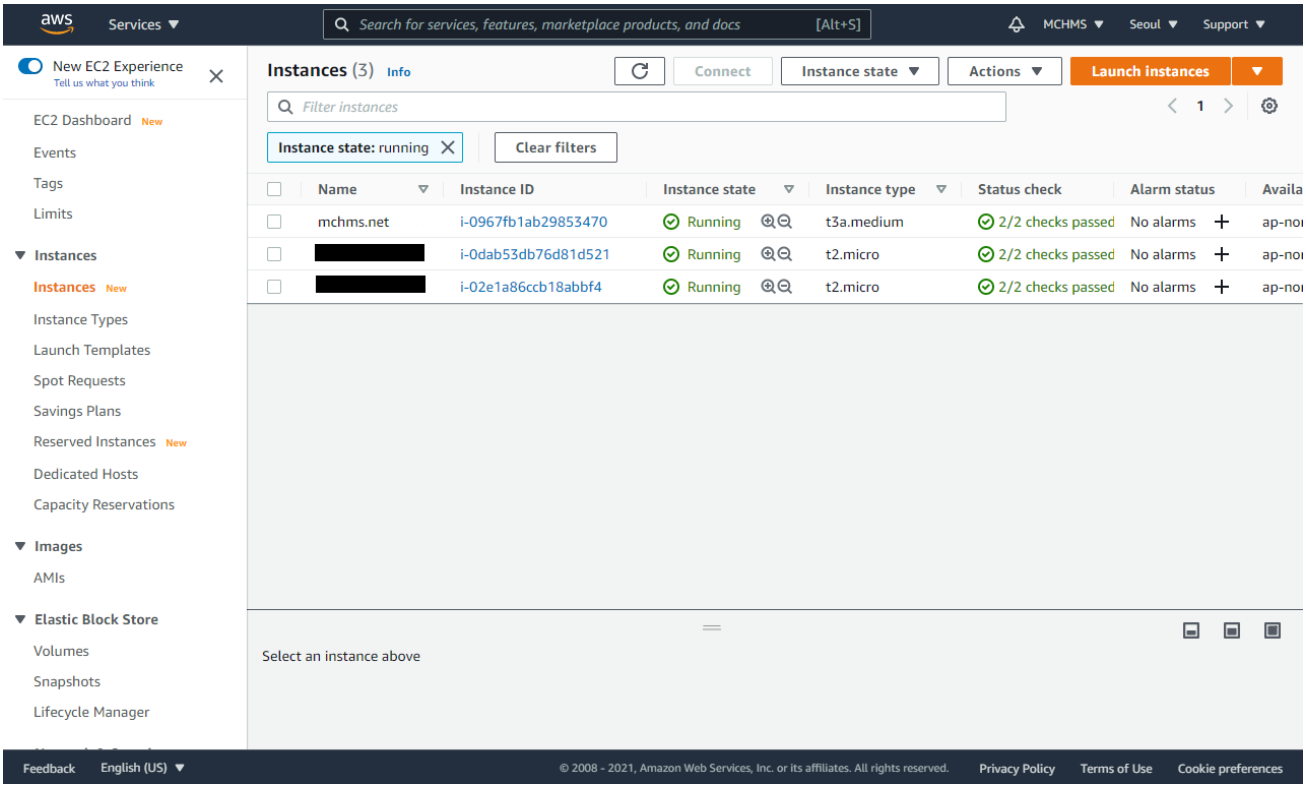


그림 17 Amazon AWS EC2 현재 실행중인 인스턴스 목록

현재 실행중인 인스턴스 중에서 접속하려는 인스턴스를 우클릭하면 아래와 같은 창이 뜬다.

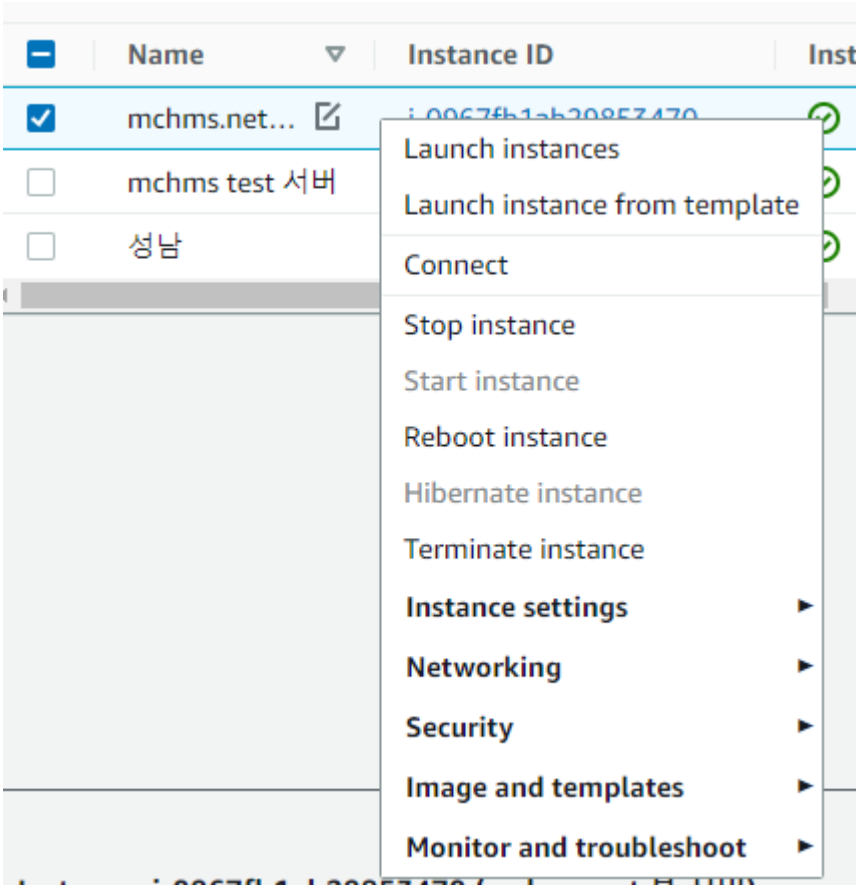


그림 18 인스턴스 우클릭 시

인스턴스를 정지시키려면 Stop instance를, 시작하려면 Start instance를, 재시작하려면 Reboot instance를 눌러준다. Terminate instance는 인스턴스를 삭제하는 버튼이므로 누르지 않도록 주의한다.

2.3 인바운드 규칙 편집

인바운드 규칙을 설정하여 특정 IP를 차단하거나 특정 IP만 접근을 허용시킬 수 있다,.

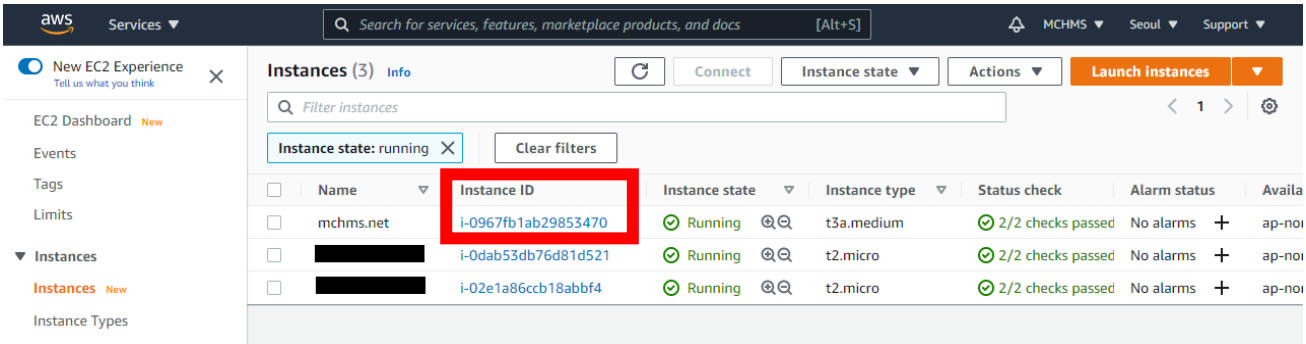


그림 19 인스턴스 상세 페이지 접근 방법

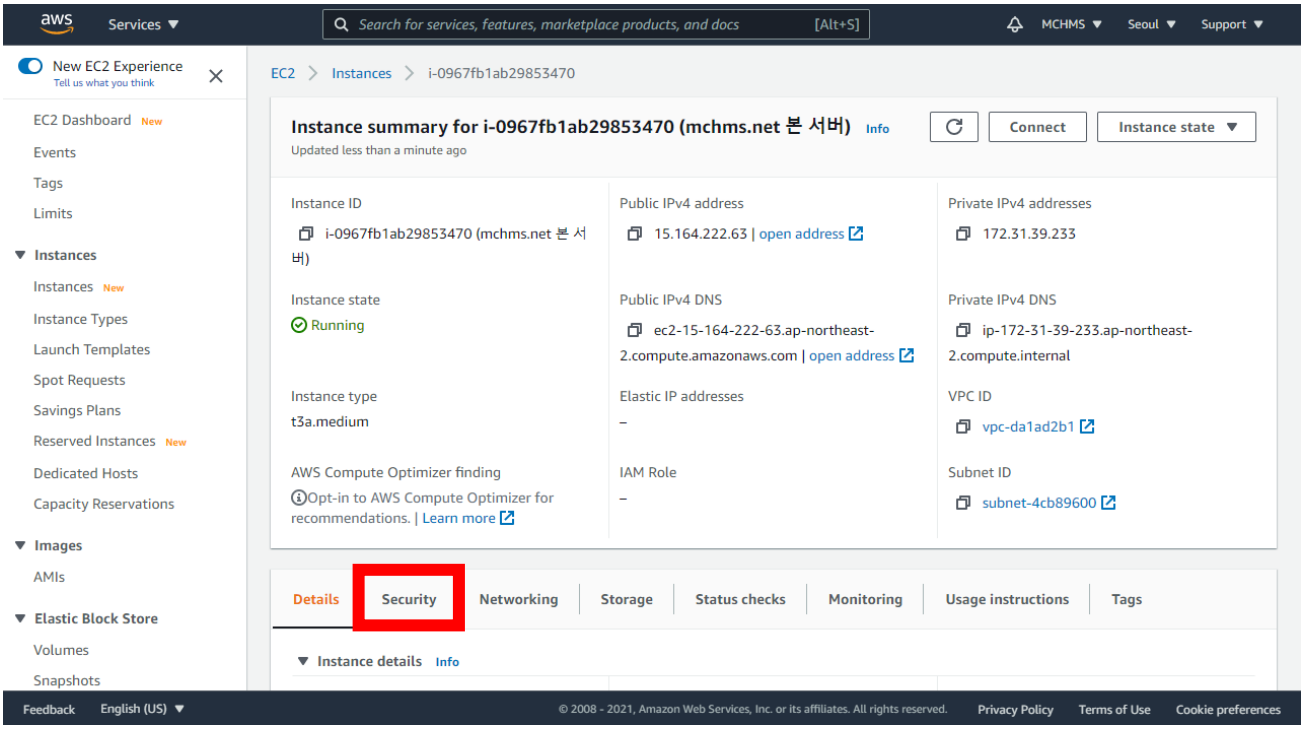


그림 20 Amazon AWS EC2 인스턴스 상세 페이지

인스턴스 목록에서 Instance ID를 클릭해 해당 인스턴스의 상세 페이지에 접근한다. 그리고 아래의 Security 탭을 클릭한다.

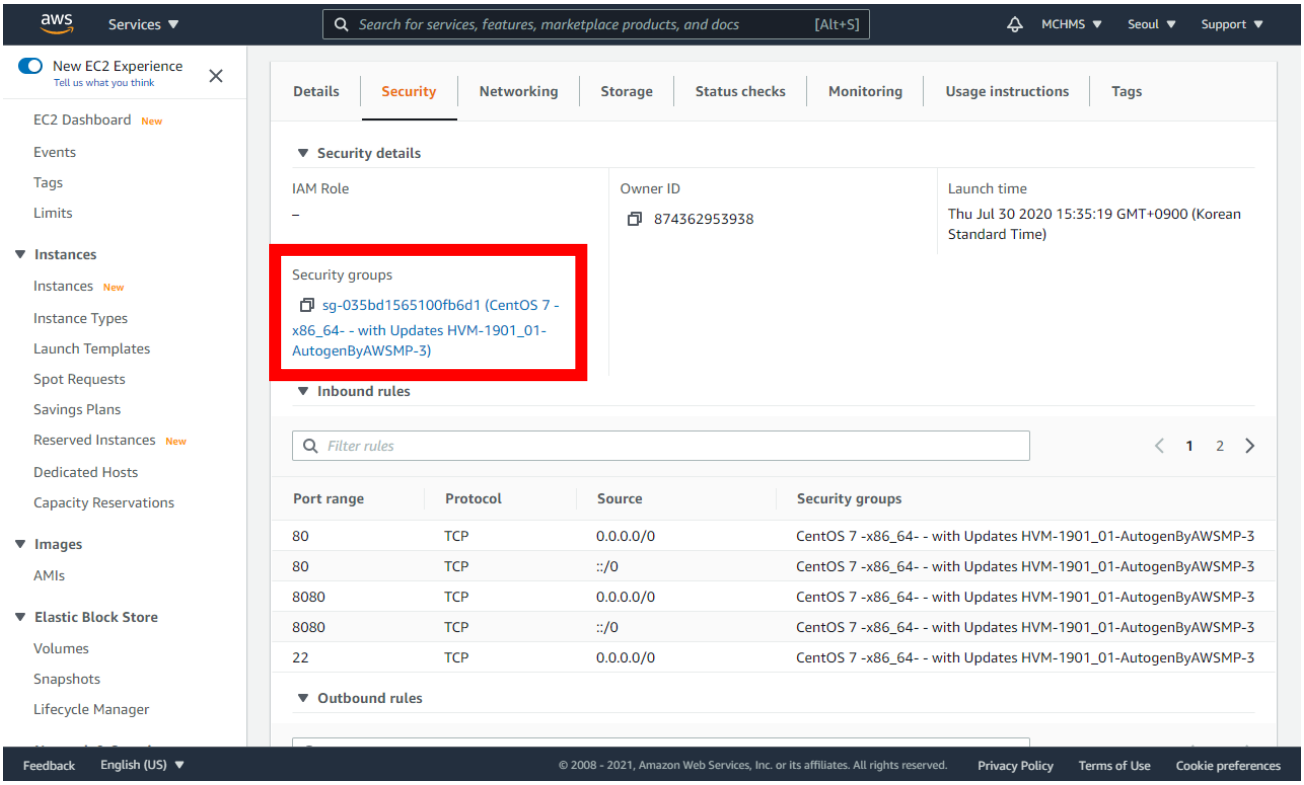


그림 21 Amazon AWS EC2 인스턴스 상세 페이지 – Security

그러면 현재 사용하고 있는 Security groups와 Inbound rules, Outbound rules 등을 확인할 수 있다. 규칙을 수정하기 위해서는 Security groups 항목의 바로 아래에 있는 그룹명을 클릭해준다.

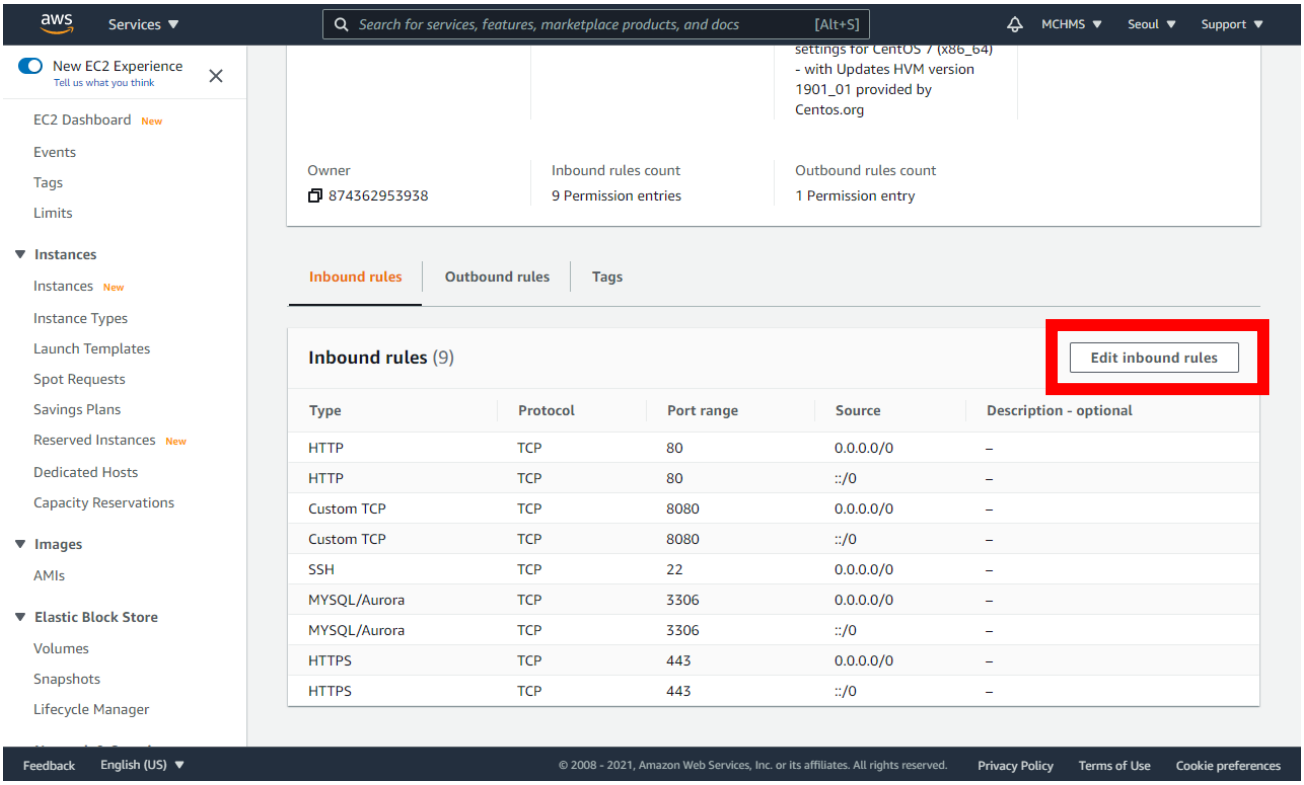


그림 22 Amazon AWS EC2 Security Groups 페이지

아래로 스크롤 해서 Edit inbound rules를 클릭한다.

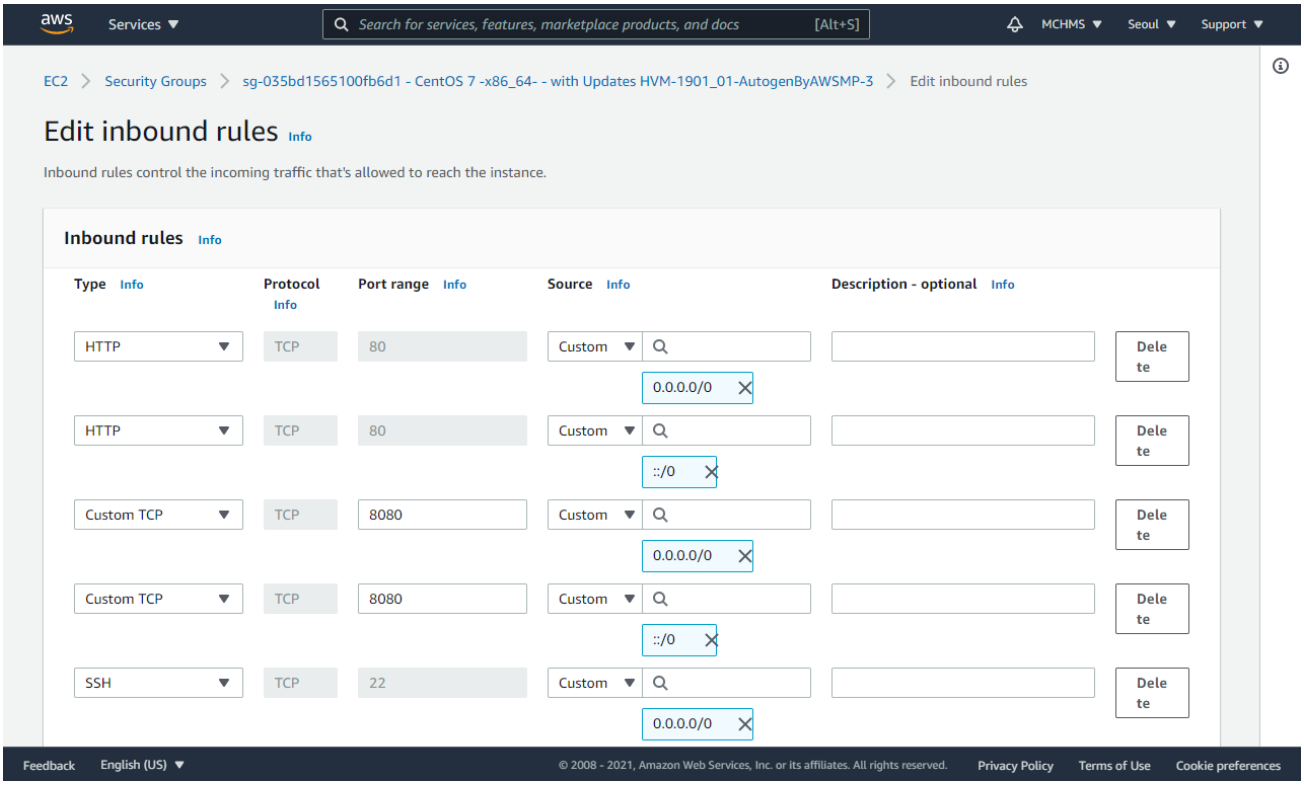


그림 23 Amazon AWS EC2 Security Groups 수정 페이지

해당 페이지에는 Type, 프로토콜, 포트번호, Source, 설명 컬럼이 있다. 위의 값을 수정하여 접속을 허용할 수 있으며, 추가한 IP에 한해서 Inbound를 허용한다. HTTP(80번 포트)와 HTTPS(443) 포트의 경우 모두 접근 가능하게 0.0.0.0/0(IPv4), :/0(IPv6)이 허용되어있다.

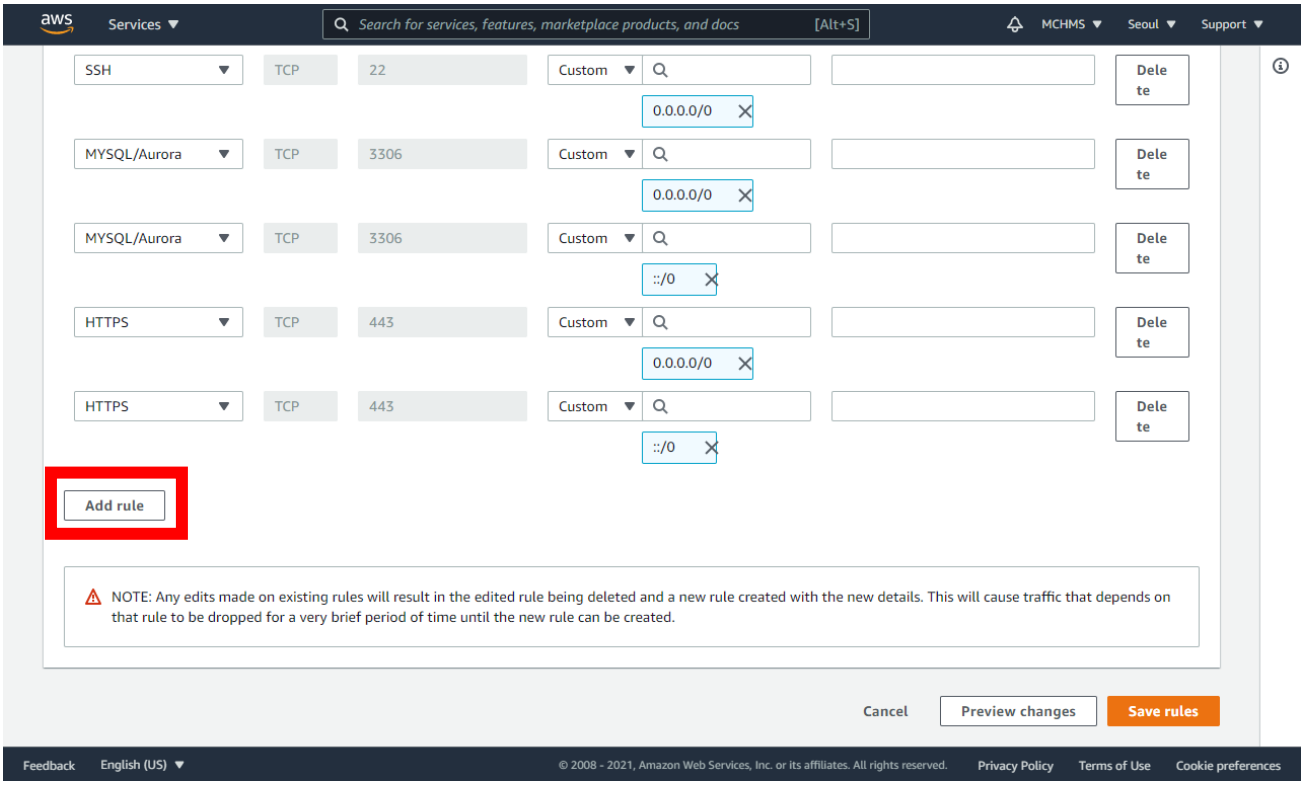


그림 24 Inbound rule 추가 과정 1

SSH는 일부 내부 인원만 접속 가능하게 하는 것이 보안에 좋기 때문에 SSH에 특정 IP만 추가하는 과정을 설명한다. rule을 추가하려면 좌측 하단의 Add rule을 클릭한다.

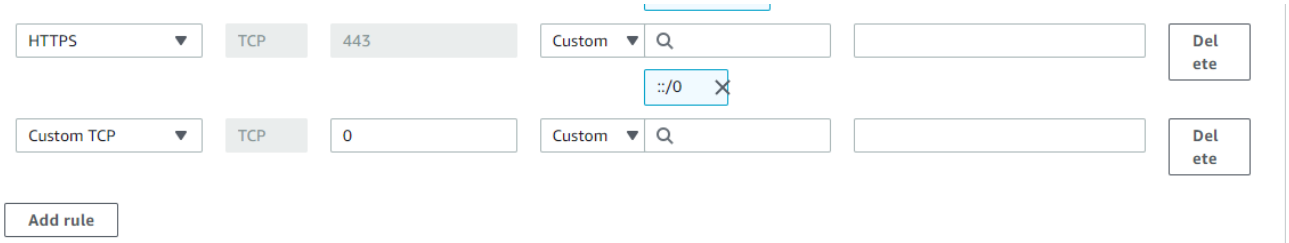


그림 25 Inbound rule 추가 과정 2 – Add role 클릭 시

Add role을 클릭하면 목록 맨 아래에 Custom TCP가 추가된다.

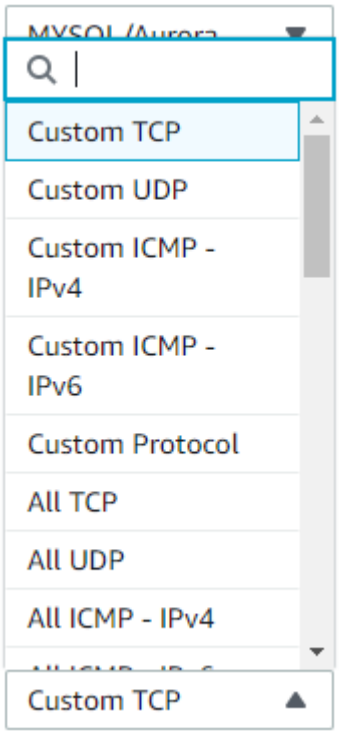


그림 26 Inbound rule 추가 과정 3 – Type 항목의 Custom TCP 클릭 시

Custom TCP를 클릭하면 선택할 수 있는 프로토콜 목록이 뜬다. SSH를 검색하거나 아니면 찾아서 클릭해 준다.

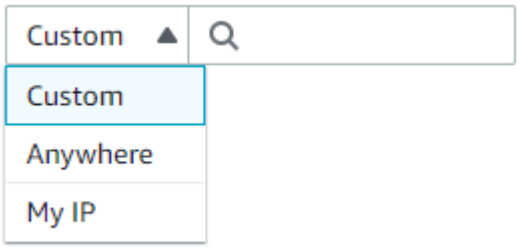


그림 27 Inbound rule 추가 과정 4 – Source 항목의 Custom 클릭 시

Source의 Custom을 클릭할 경우 Custom, Anywhere와 My IP가 뜨는데 Anywhere을 선핵하면 0.0.0.0/0과 ::/0이 자동으로 기입된다. My IP를 선택할 경우 현재 자신이 접속하고 있는 컴퓨터의 IP가 자동으로 기입된다. 수동으로 설정하고 싶다면 Custom을 사용한다.

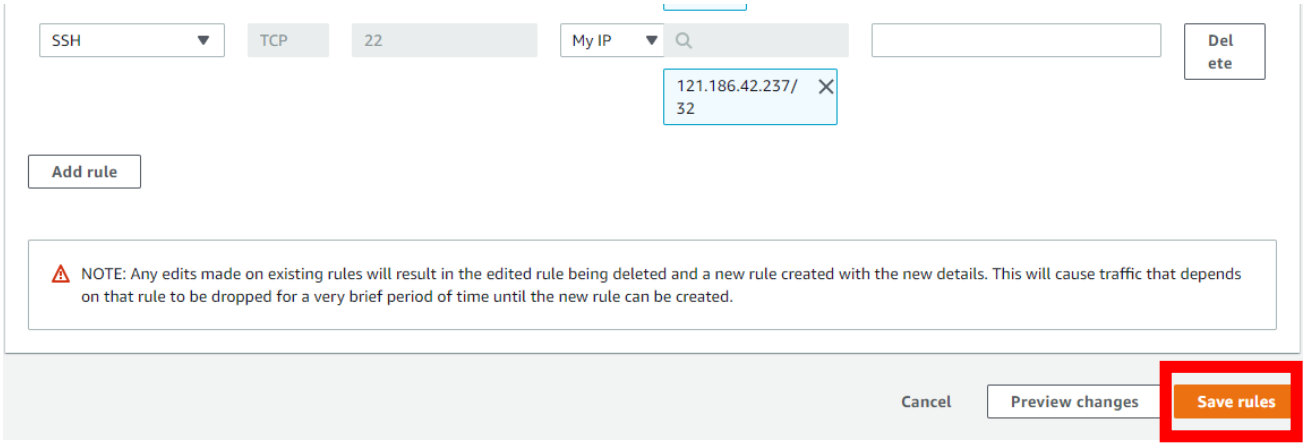


그림 28 Inbound rule 추가 과정 4 – 기입 완료 후 확인

설정을 끝마쳤다면 다시 한번 확인한다. 위 예시는 SSH(TCP, Port 22)에 My IP를 허용하는 rule이다. 알맞게 기입했다면 우측 아래의 Save rules를 클릭하여 저장한다.

2.4 인스턴스 용량 확장 방법

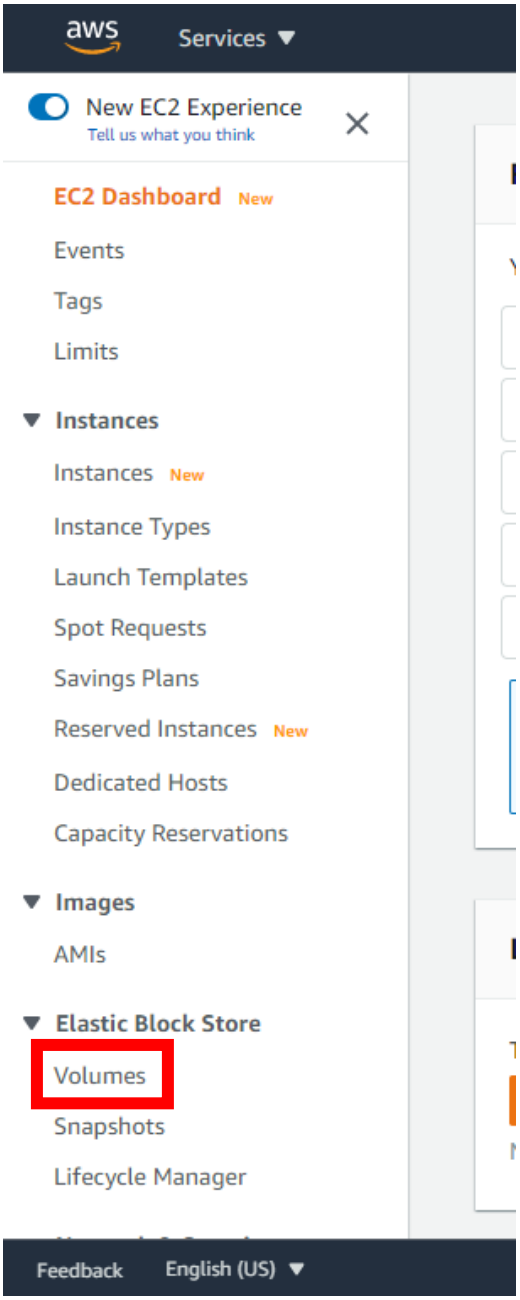


그림 29 Amazon AWS EC2에서 EBS Volume 수정 페이지 접속 방법

EC2 인스턴스의 용량을 수정(확장)하기 위해 EBS(Elastic Block Store)의 Volumes 탭에 들어간다.

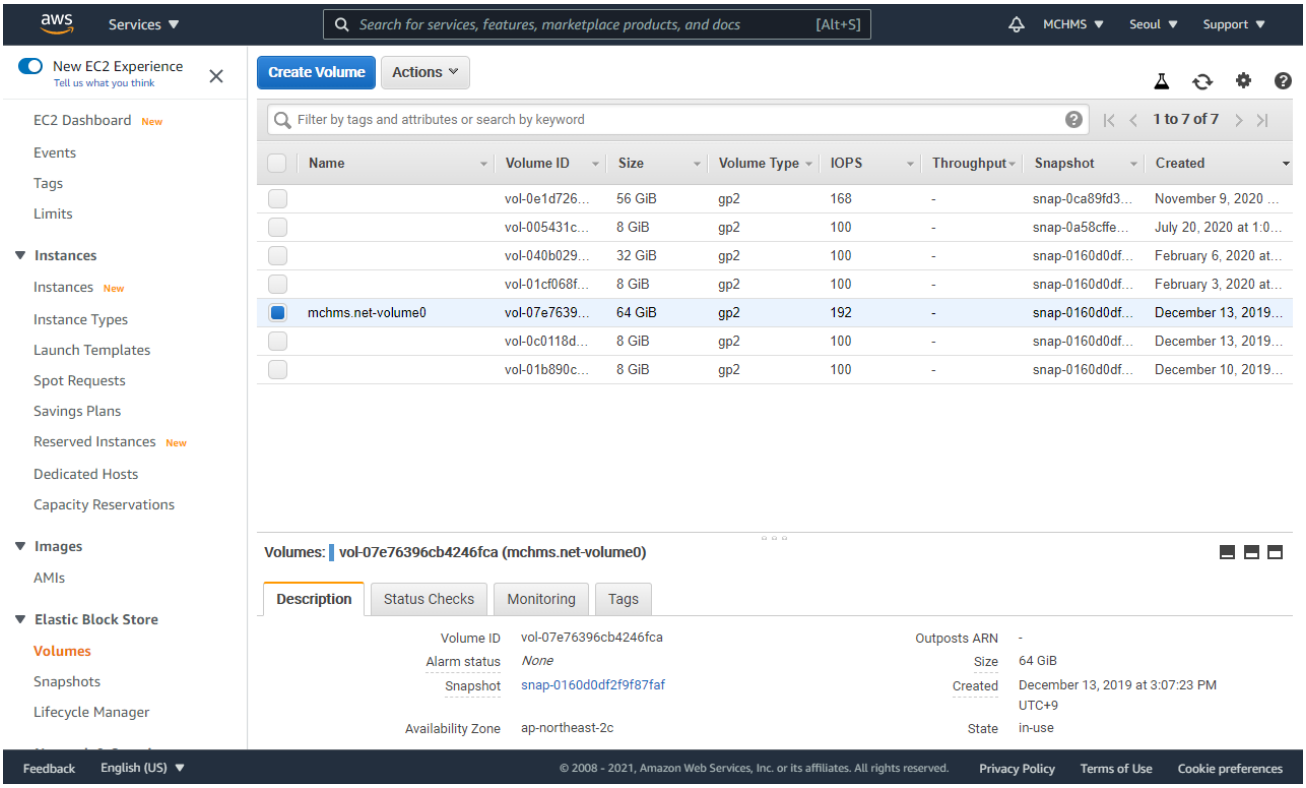


그림 30 Amazon AWS EC2 EBS Volumes 페이지

Volumes 페이지로 접속하면 위와 같은 EBS Volume 목록이 나온다. 그중 수정하려는 볼륨을 찾아 우클릭 한다.

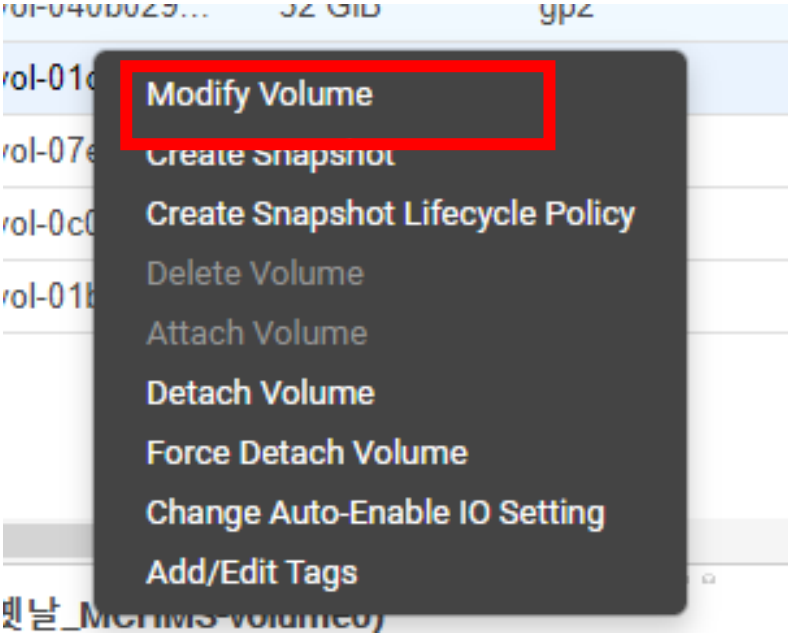


그림 31 Amazon AWS EC2 Volume 우클릭 시 나오는 창

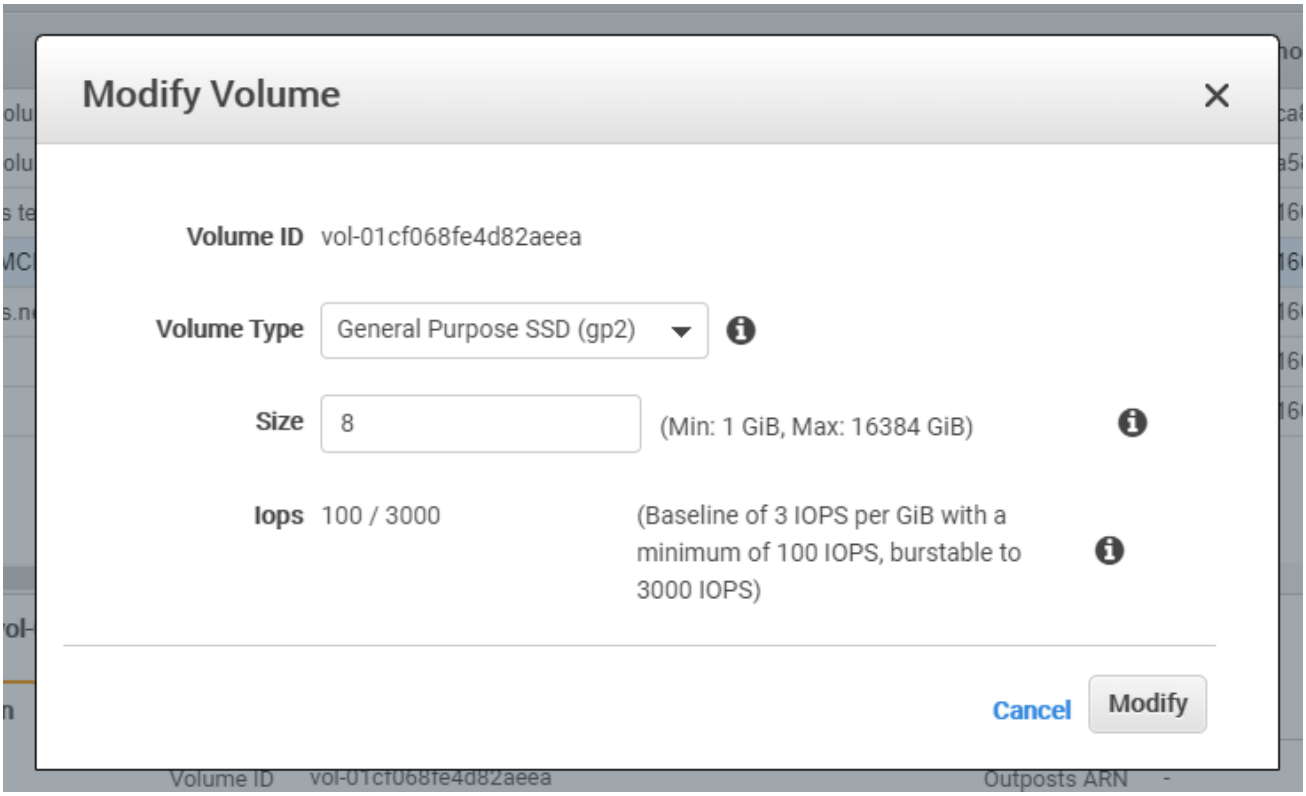


그림 32 Modify Volume 모달창

이후 Modify Volume을 누르면 모달창이 나오는데 여기서 볼륨의 크기를 확대할 수 있다. 한번 확대한 용량은 축소가 불가능하다.

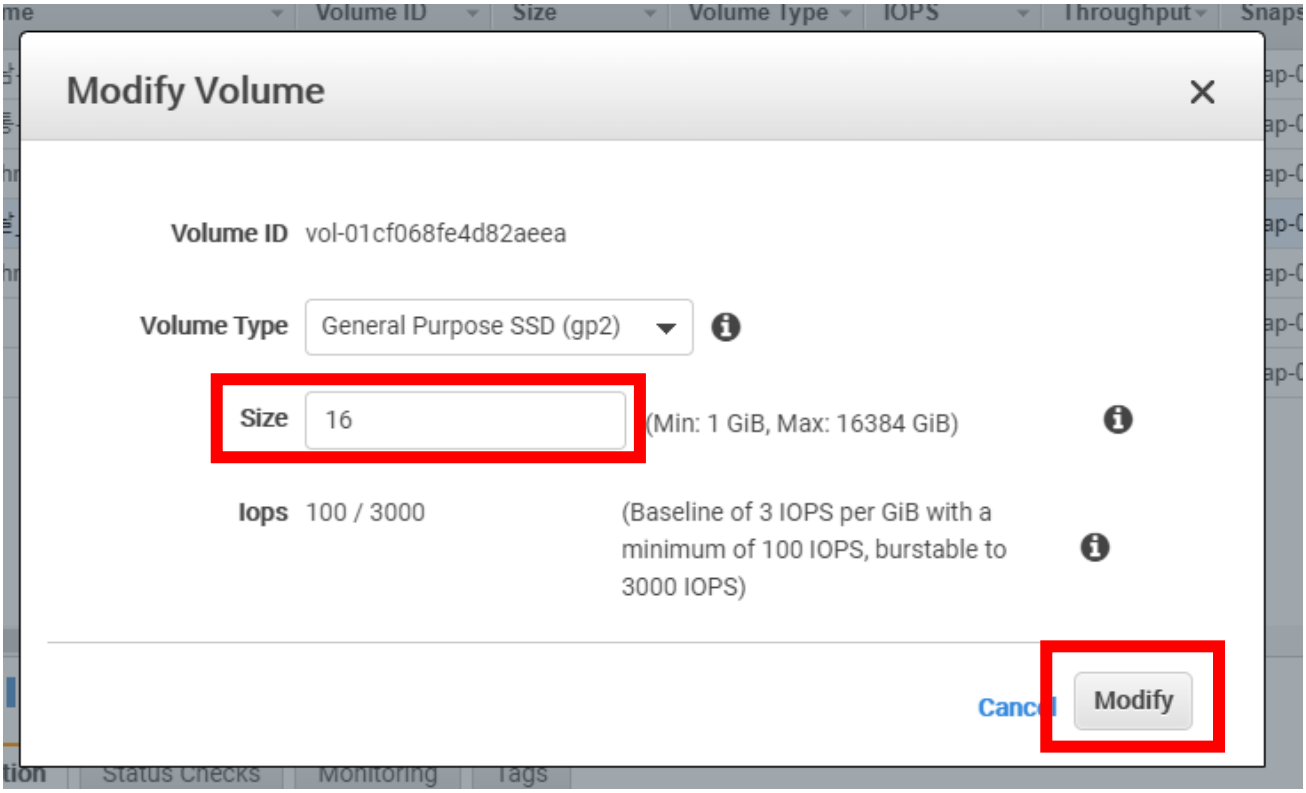


그림 33 인스턴스 용량 확장 과정 1 – Size 변경

원하는 볼륨 사이즈를 기입한 후 Modify 버튼을 누른다.

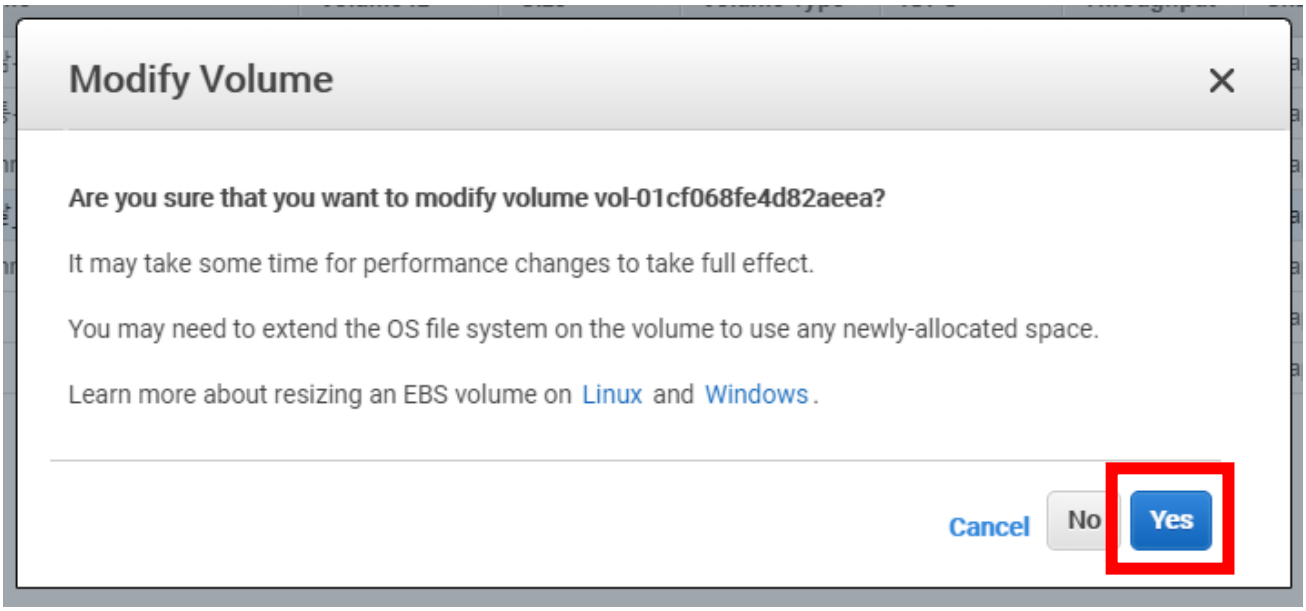


그림 34 인스턴스 용량 확장 과정 2 – Alert창

Yes를 눌러준다.

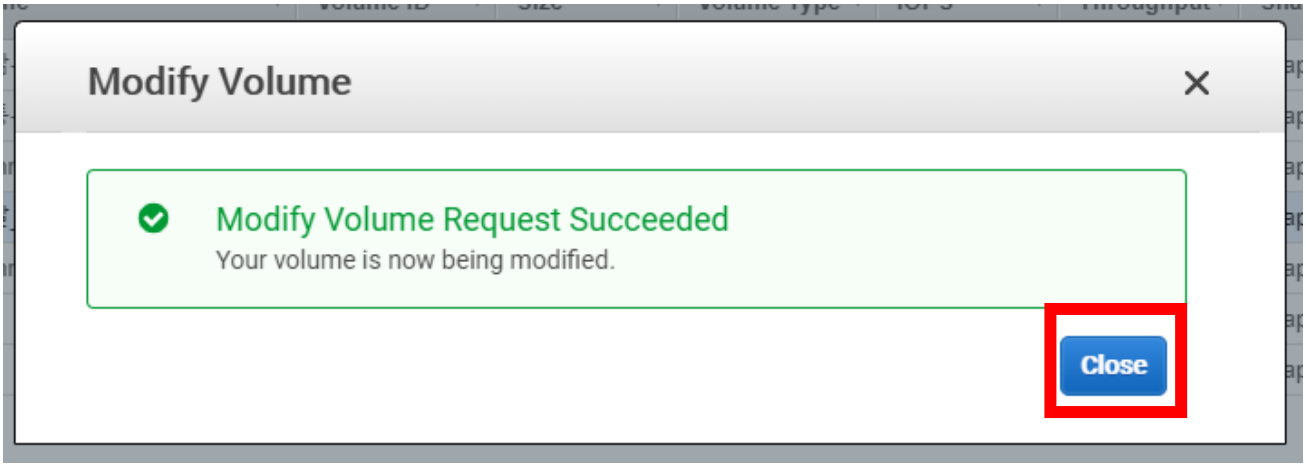


그림 35 인스턴스 용량 확장 과정 3 – 성공 메시지

Close를 눌러준다

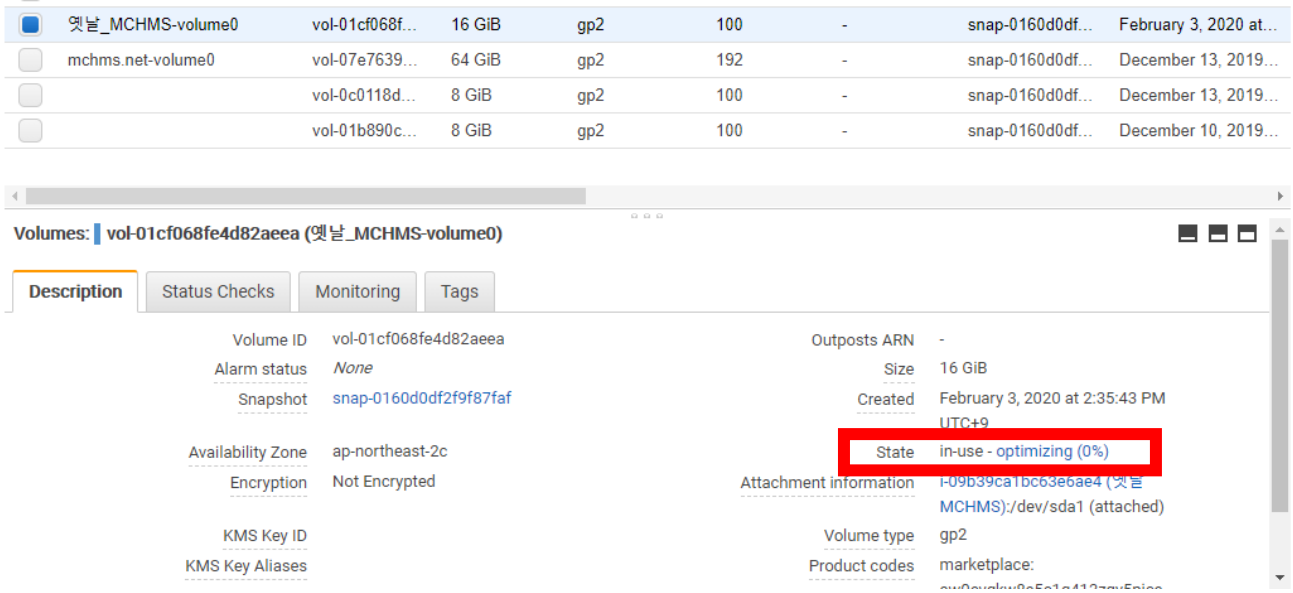


그림 36 인스턴스 용량 확장 과정 4 – 볼륨 용량 확장 중

볼륨을 눌러 아래를 확인해 보면 State 항목이 in-used -optimizing (0%)으로 변경된 것을 확인할 수 있다. 완료될 때까지 기다린다. 항목이 완료되면 인스턴스를 SSH로 접속하고 수퍼유저 계정으로 로그인한다.

```
[root@ip-172-31-37-141 ~]# lsblk
NAME    MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda    202:0    0  16G  0 disk
└─xvda1 202:1    0   8G  0 part /
[root@ip-172-31-37-141 ~]#
```

그림 37 lsblk 명령어 실행

ssh에 lsblk 명령어를 실행해서 현재 인스턴스의 블록 장치를 확인한다.

xvda(이름이 다를 수 있음)는 물리적인 디스크 볼륨 크기, xvda1은 현재 사용할 수 있는 논리적인 파티션의 블록 크기이다. 서로 용량이 다른 것을 확인할 수 있다.

```
[root@ip-172-31-37-141 ~]# growpart /dev/xvda 1
CHANGED: partition=1 start=2048 old: size=16775168 end=16777216 new: size=33552351 end=33554399
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]# lsblk
NAME    MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda    202:0    0  16G  0 disk
└─xvda1 202:1    0  16G  0 part /
[root@ip-172-31-37-141 ~]#
```

그림 38 growpart 명령어 실행

growpart /dev/xvda 1 명령어를 실행하여 xvda1 파티션 블록 크기를 최대로 확장시켜준다. 이후 lsblk를 다시 실행시켜보면 xvda1의 블록 크기가 16GB로 늘어난 것을 확인할 수 있다.

```
[root@ip-172-31-37-141 ~]# df -lh
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        472M     0  472M   0% /dev
tmpfs           493M     0  493M   0% /dev/shm
tmpfs           493M   13M  480M   3% /run
tmpfs           493M     0  493M   0% /sys/fs/cgroup
/dev/xvda1      8.0G  3.1G  5.0G  39% /
tmpfs            99M     0   99M   0% /run/user/0
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]# xfs_growfs -d /
meta-data=/dev/xvda1             isize=512    agcount=4, agsize=524224 blks
         =                       sectsz=512   attr=2, projid32bit=1
         =                       crc=1        finobt=0 spinodes=0
data     =                       bsize=4096   blocks=2096896, imaxpct=25
         =                       sunit=0      swidth=0 blks
naming   =version 2              bsize=4096   ascii-ci=0 ftype=1
log      =internal               bsize=4096   blocks=2560, version=2
         =                       sectsz=512   sunit=0 blks, lazy-count=1
realtime =none                   extsz=4096   blocks=0, rtextents=0
data blocks changed from 2096896 to 4194043
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]# df -lh
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        472M     0  472M   0% /dev
tmpfs           493M     0  493M   0% /dev/shm
tmpfs           493M   13M  480M   3% /run
tmpfs           493M     0  493M   0% /sys/fs/cgroup
/dev/xvda1       16G  3.1G   13G  20% /
tmpfs            99M     0   99M   0% /run/user/0
[root@ip-172-31-37-141 ~]#
```

그림 39 xfs_growfs 명령어 실행

하지만 아직 루트 파티션이 확장된 것은 아니다. df -lh 명령어를 싱행하여 확인하면 마운트된 루트 파티션의 용량이 8GB로 되어있는 것을 확인할 수 있다. 루트 파티션의 용량을 확장하기 위해서는 xfs_growfs

명령어를 실행하여야 한다.

예시 로그

```
[root@ip-172-31-37-141 ~]# fdisk -l

Disk /dev/xvda: 17.2 GB, 17179869184 bytes, 33554432 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x000b956b

   Device Boot      Start         End      Blocks   Id  System
/dev/xvda1   *        2048    16777215     8387584   83  Linux
[root@ip-172-31-37-141 ~]# clear
[root@ip-172-31-37-141 ~]# blkls
-bash: blkls: command not found
[root@ip-172-31-37-141 ~]# lsblk
NAME    MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda    202:0    0  16G  0 disk
└─xvda1 202:1    0   8G  0 part /
[root@ip-172-31-37-141 ~]# clear
[root@ip-172-31-37-141 ~]# lsblk
NAME    MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda    202:0    0  16G  0 disk
└─xvda1 202:1    0   8G  0 part /
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]# growpart /dev/xvda 1
CHANGED: partition=1 start=2048 old: size=16775168 end=16777216 new: size=33552351
end=33554399
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]# lsblk
NAME    MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
```

```
xvda      202:0    0   16G  0 disk
 └─xvda1 202:1    0   16G  0 part /
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]# df -lh
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        472M     0  472M   0% /dev
tmpfs           493M     0  493M   0% /dev/shm
tmpfs           493M   13M  480M   3% /run
tmpfs           493M     0  493M   0% /sys/fs/cgroup
/dev/xvda1      8.0G  3.1G  5.0G  39% /
tmpfs            99M     0   99M   0% /run/user/0
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]# xfs_growfs -d /
meta-data=/dev/xvda1             isize=512    agcount=4, agsize=524224 blks
         =                       sectsz=512   attr=2, projid32bit=1
         =                       crc=1        finobt=0 spinodes=0
data     =                       bsize=4096   blocks=2096896, imaxpct=25
         =                       sunit=0      swidth=0 blks
naming   =version 2              bsize=4096   ascii-ci=0 ftype=1
log      =internal               bsize=4096   blocks=2560, version=2
         =                       sectsz=512   sunit=0 blks, lazy-count=1
realtime =none                   extsz=4096   blocks=0, rtextents=0
data blocks changed from 2096896 to 4194043
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]# df -lh
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        472M     0  472M   0% /dev
tmpfs           493M     0  493M   0% /dev/shm
tmpfs           493M   13M  480M   3% /run
tmpfs           493M     0  493M   0% /sys/fs/cgroup
/dev/xvda1       16G  3.1G   13G  20% /
tmpfs            99M     0   99M   0% /run/user/0
[root@ip-172-31-37-141 ~]#
```

3. 시스템 관리

3.1 SSH 접속 방법

3.2 홈페이지 편집 방법

3.3 데이터베이스 백업 및 복구 방법

3.4 phpMyAdmin으로 직접 사용자 승인하기

(1) mchms.net/phpmyadmin에 들어가서 MCHMS->User 테이블을 클릭한다

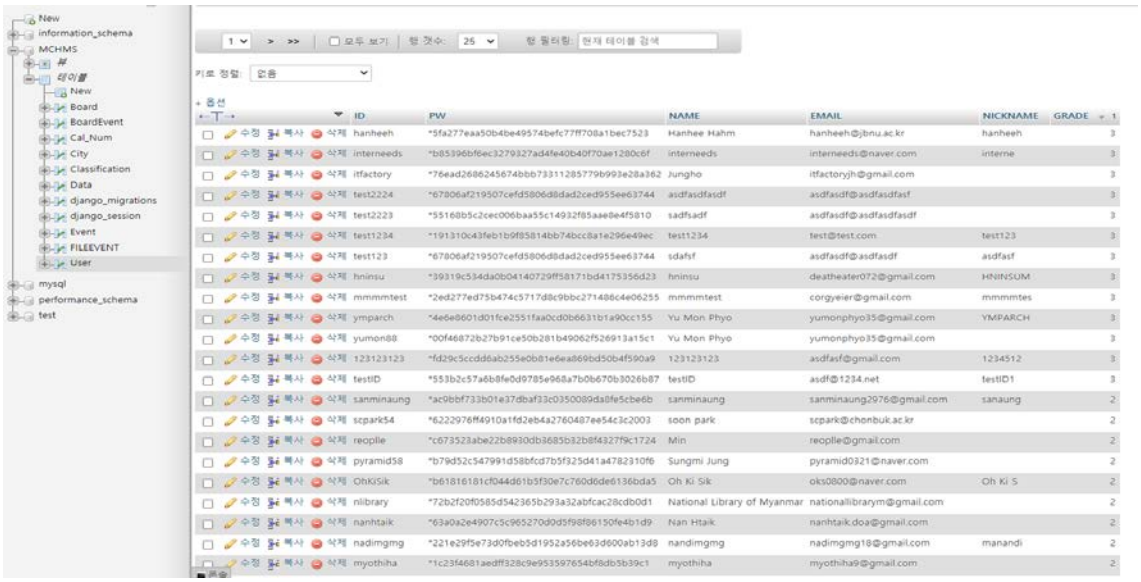


그림 40

(2) 해당하는 행의 GRADE를 '더블클릭' 후 값을 권한을 변경할 수 있다.

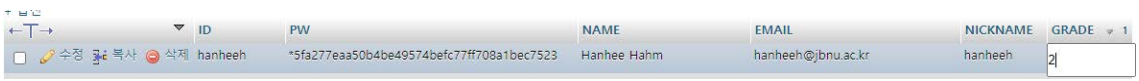


그림 41

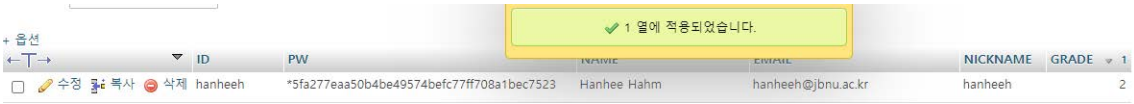


그림 42

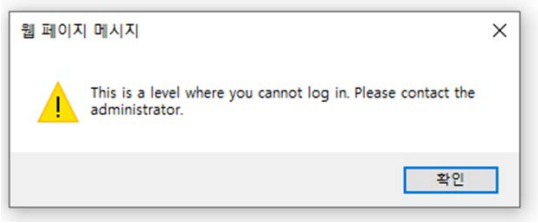


그림 43

GRADE가 3이면 로그인 불가



그림 44

GRADE가 2나 1이면 로그인 가능

4. 시스템 설명

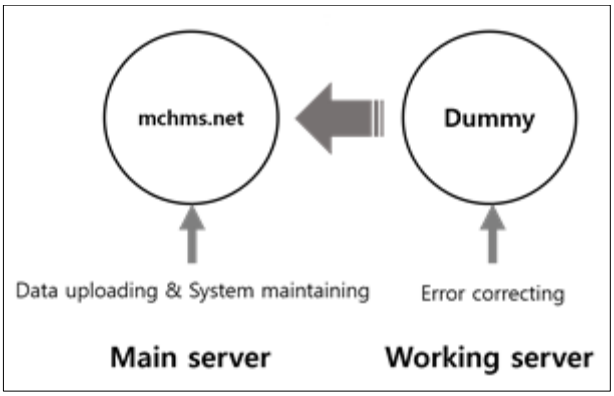


그림1. 현재 운영 중 시스템

Pic 1. Showing the current working system

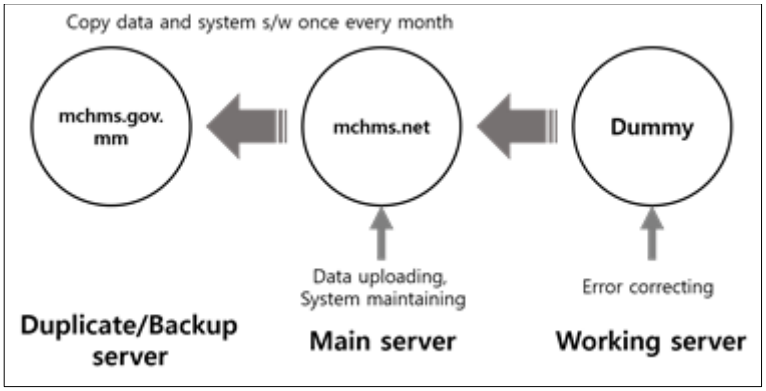


그림2. 2+1 시스템

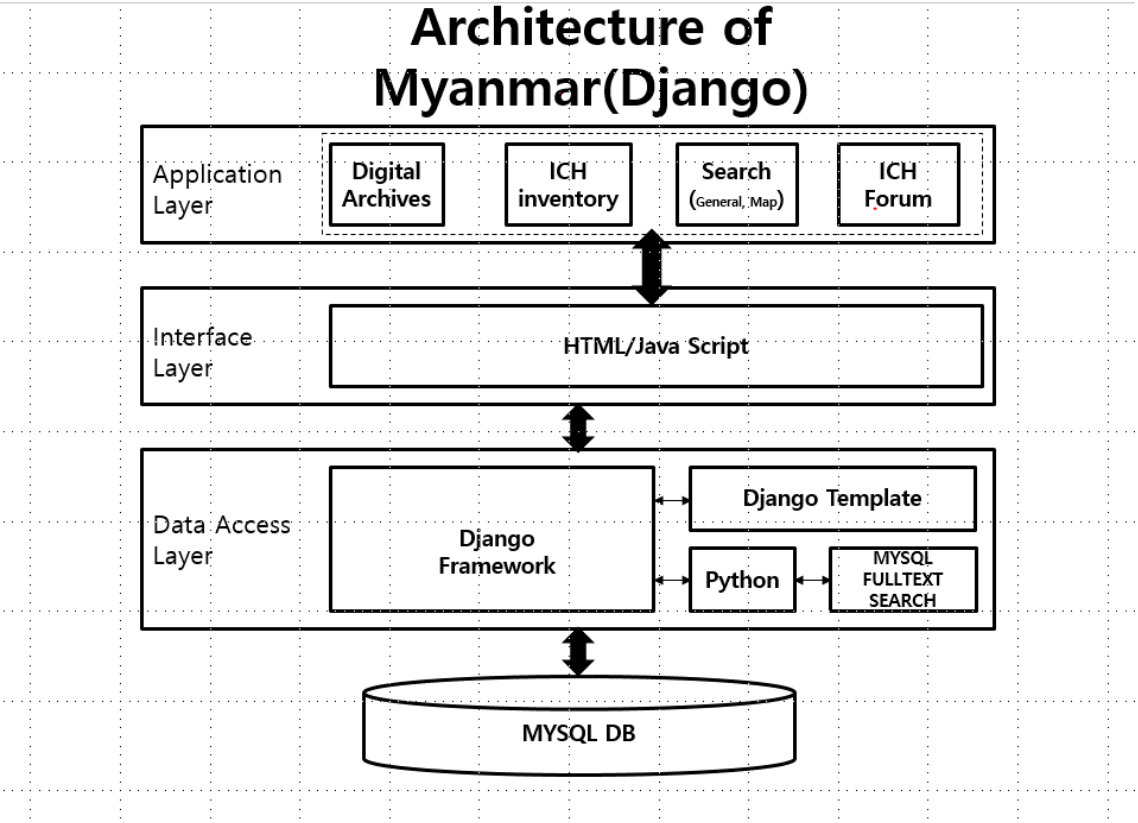
Pic 2. Showing the 2+1 시스템

현재 mchms.net, mchms.gov.mm 2개 사이트와 mchms.net 테스트용 서버 하나를 운영하고 있으며, mchms.net는 Spring과 Django Framework 서버가 공존해있고 mchms.gov.mm에는 Spring Framework 서버로 개발되었다.

mchms.gov.mm에서는 로그인 및 글을 쓸 수 있는 기능이 없고 읽기만 가능하다. 실제 데이터는 mchms.net에 업로드되며 한 달에 한 번씩 mchms.net에 올라간 데이터를 mchms.gov.mm에 포팅하게 된다.

Django는 MVT의 구조를 가지고 있다. MVC와 유사하며 Model, View, Template로 구성되어 있다. Model은 데이터, View는 비즈니스 로직, Template는 응답할 페이지를 의미한다.

Mchms.net의 구조는 그림과 같다.



HTTP 요청이 들어오면 URLs(urls.py)에서 알맞은 위치의 View(views.py)에 연결해 준다. 이 View에서는 DB와 연동이 된 Model(models.py)에서 데이터를 읽거나 불러오게 된다. 이 데이터와 Template(.html)을 연결하여 HTTP Response를 하게 된다.

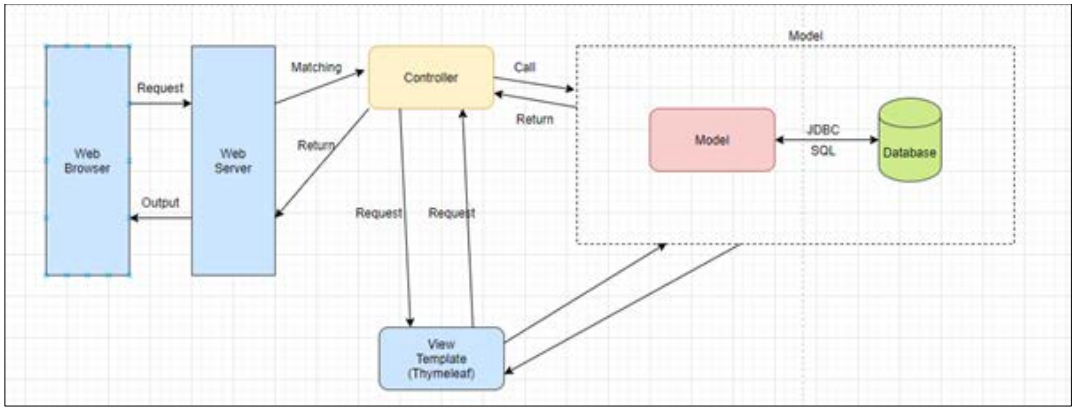
mchms.gov.mm은 기본적으로 Controller, Service Template로 이루어져 있다.

Controller에서는 시스템을 통제하고 데이터를 변형하는 일을 한다.

Service는 DB에 있는 데이터들을 삽입, 삭제, 변형 등의 일을 한다.

Controller와 Service는 JAVA로 되어있다.

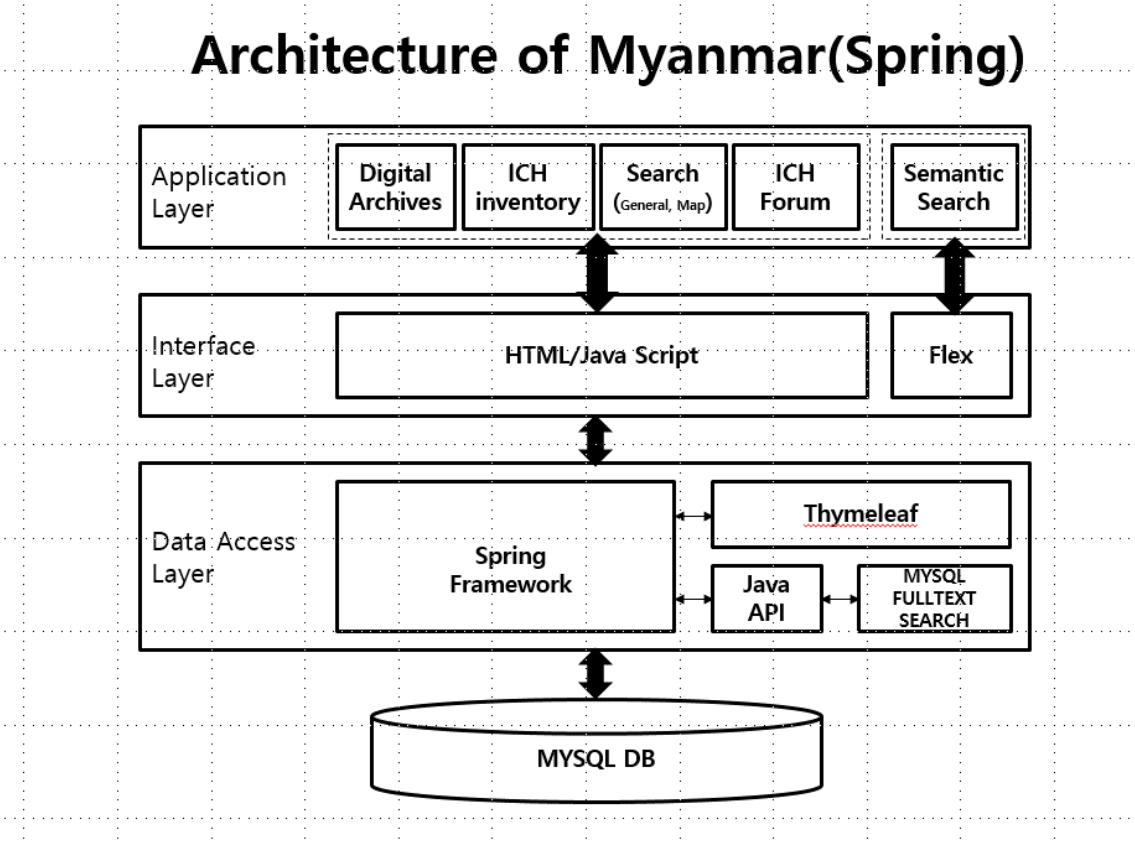
Template는 실제 브라우저에서 보여지는 일을 담당한다. Thymeleaf로 되어있고,



사용자가 URL request을 하면 이 request을 처리할 수 있는 Controller를 찾아서 request을 전달한다. 이 request를 받은 Controller는 Service를 호출하여 DB에 접근하게 된다. DB에서 데이터를 가져와 Controller에 넘겨주면 Controller에서는 받은 데이터를 가공 처리하여 Template로 넘겨주게 된다.

3. 개발자 매뉴얼

(1) 시스템 구조



A. Service에는 DB에 접근하여 데이터를 가져올 수 있는 기능이 있다. Table 별로 나뉘어 있다.

B. Templates에는 페이지별로 나뉘어 있다. Html 파일이 있으며, View에서 경로를 지정하여 Template를 호출할 수 있다.

1) Base는 모든 페이지에 들어 있는 부분으로 검색 창, 로그인 창과 도시의 목록들을 보여준다.

2) Login은 Register와 연결되어 있다. 아이디와 비밀번호를 이용하여 로그인을 하거나 회원가입을 할 수 있다.

3) Register는 회원가입을 하는 페이지로 ID, PW, Name, Email을 이용하여 아이디를 등록할 수 있다.

4) Main는 Search와 연결되어 있다. 어느 도시의 글들을 볼 수 있다.

5) Search는 Base에서 검색된 결과를 보거나, 지역을 선택했을 때 지역과 관련된 자료들을 볼 수 있다. Advanced를 선택하면 더 자세하게 검색 할 수 있다. Title, Remark, Registrant, Registration date, Serial Number의 내용들을 and, or, not으로 조합하여 검색할 수 있다. 또 자료들의 등록된 좌표를 이용하여 지도에 나타나 지역별로 확인 할 수 있고, Serial, Region, Classification, Title, Registration date를 눌렀을 때

오름차순, 내림차순으로 정렬된다.

6) View는 입력된 자료들을 표시해준다.

7) Write는 자료를 입력할 수 있다. Classification으로 "자료의 성격"을 분류하고 Serial Number는 자료의 등록 정보를 나타낸다. Visibility를 통해 공개의 여부를 결정할 수 있다.

8) Modify는 입력된 자료를 수정할 수 있다.

C. Django - 에러의 위치를 알고 싶을 때에는 TELNET 클라이언트에 접속하여 vi (혹은 cat) /var/log/httpd/error_log에서 확인할 수 있다. vi home/centos/public_html/MCHMS/MCHMS/setting.py의 DEBUG = True로 변경하면 홈페이지에서도 에러를 확인 할 수 있다.

Spring - ₩src₩main₩resources₩logback.groovy에 써있는 위치에 로그가 나타나게 된다. 이 위치에서 로그를 확인 후 에러를 수정하면 된다.

```
logFileRootPath = '/install/log/MCHMS/'
```

```
"""
Django settings for MCHMS project.

Generated by 'django-admin startproject' using Django 3.0.

For more information on this file, see
https://docs.djangoproject.com/en/3.0/topics/settings/

For the full list of settings and their values, see
https://docs.djangoproject.com/en/3.0/ref/settings/
"""

import os

# Build paths inside the project like this: os.path.join(BASE_DIR, ...)
BASE_DIR = os.path.dirname(os.path.dirname(os.path.abspath(__file__)))


# Quick-start development settings - unsuitable for production
# See https://docs.djangoproject.com/en/3.0/howto/deployment/checklist/

# SECURITY WARNING: keep the secret key used in production secret!
SECRET_KEY =

# SECURITY WARNING: don't run with debug turned on in production!
DEBUG = True

ALLOWED_HOSTS = ['*']
```

D. 현재 MCHMS는 크게 세가지 서버로 나누어져 있는데 미얀마의 로컬 서버에서 동작하고 있는 mchms.gov.mm, aws 서버에서 동작하고 있는 mchms.net, 그리고 테스트용으로 더미 서버에서 사용하고 있는 54.180.30.69가 있다.

IP = 15.164.222.63

ID = ****

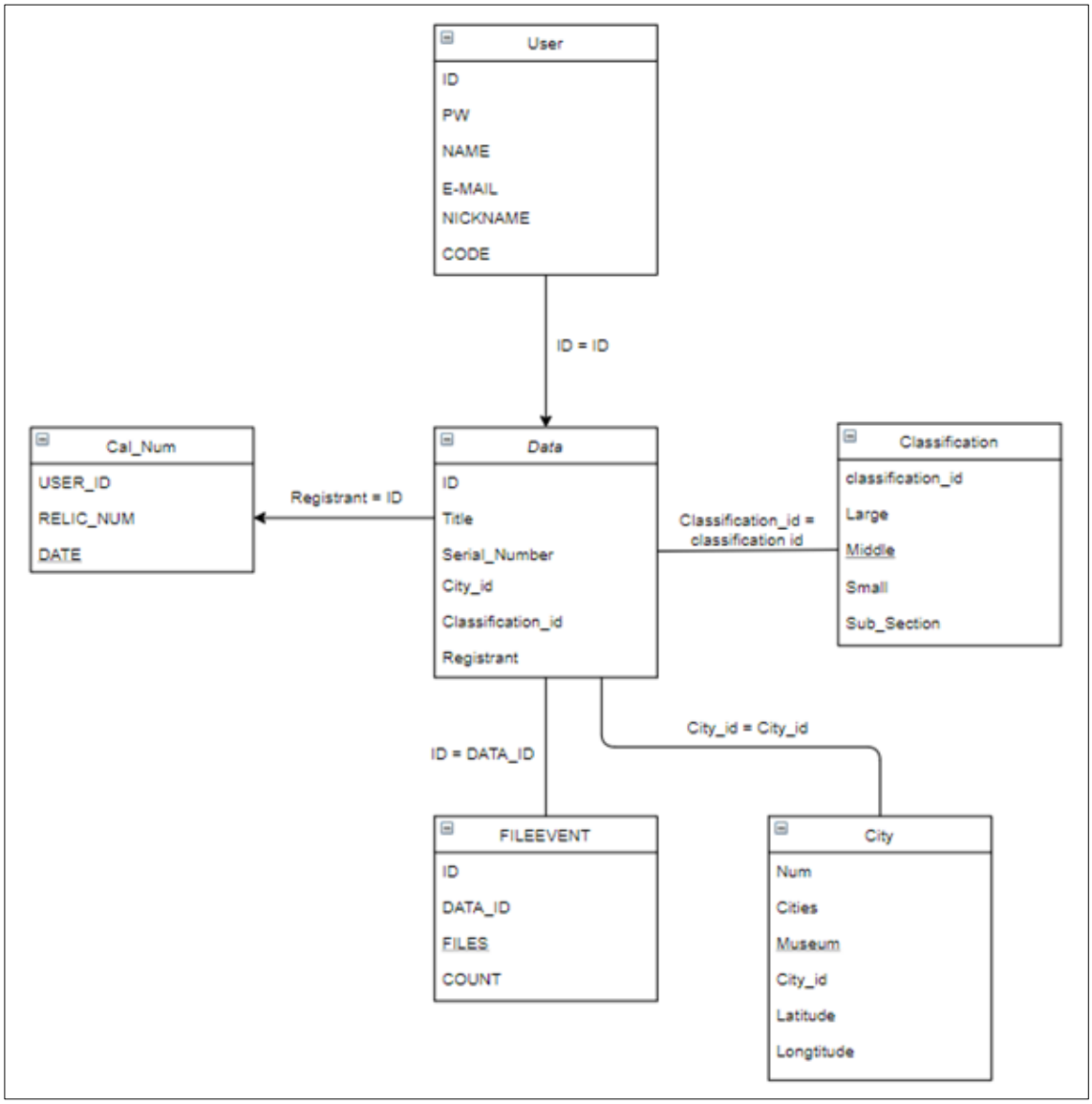
PW = **********

Database

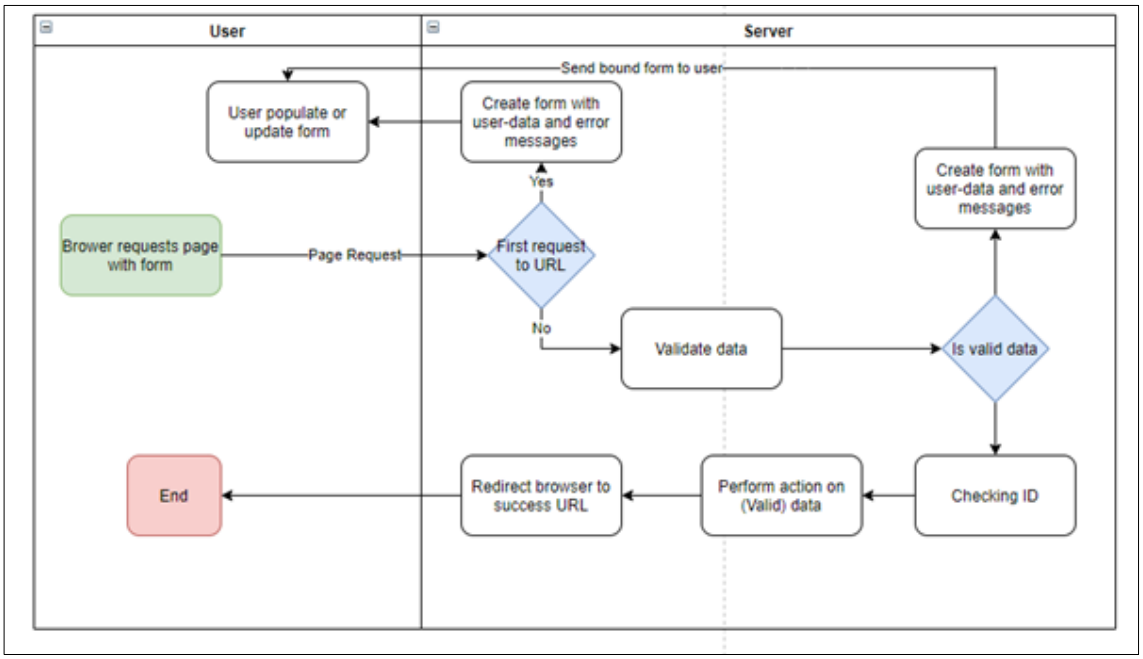
ID = ****

PW = *******

E. DB 구조도


User
ID
PW
NAME
E-MAIL
NICKNAME
CODE
ID = ID
Cal_Num
USER_ID
RELIC_NUM
DATE
Registrant = ID
Data
ID
Title
Serial_Number
City_id
Classification_id
Registrant
Classification_id = classification id
Classification
classification_id
Large
Middle
Small
Sub_Section
City_id = City_id
ID = DATA_ID
FILEEVENT
ID
DATA_ID
FILES
COUNT
City
Num
Cities
Museum
City_id
Latitude
Longtitude

F. DFD

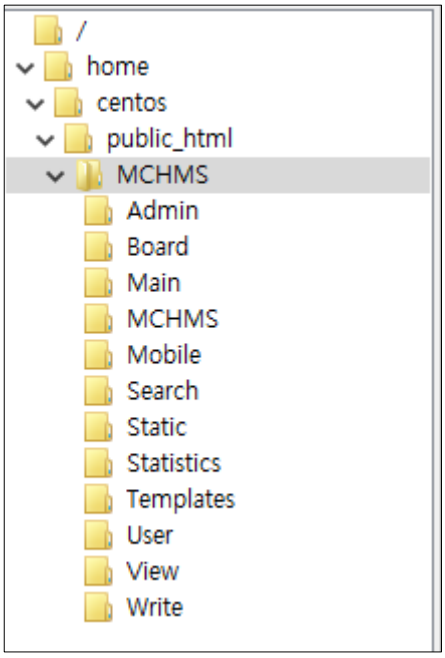

User
Server
Send bound form to user
User populate or update form
Create form with user-data and error messages
Yes
Create form with user-data and error messages
Brower requests page with form
Page Request
First request to URL
No
Validate data
Is valid data
End
Redirect browser to success URL
Perform action on (Valid) data
Checking ID

4. 페이지 수정하는 법

위에 있는 서버 정보로 접속 한 뒤, /home/centos/public_html/MCHMS/MCHMS/urls.py에 들어가게 된다. 각 폴더에는 urls.py라는 폴더가 있다. Django 구조에서 말한 것처럼 HTTP요청이 들어오면 urls.py에서 이 요청을 처리하게 된다.

이 urls.py에서 해당 url과 같은 이름의 변수를 사용한 path를 찾을 수 있다.(path('MCHMSLogin/', views.MCHMSLogin),) path 함수 왼쪽의 인자는 url이고 오른쪽 인자는 view의 함수 이름이다. Urls.py의 폴더 안에 views.py라는 파일이 있다.

이 파일 안에 MCHMSLogin이라는 함수를 찾으면 된다. 이 함수에서 데이터와 Template을 불러와 HTTP Response를 하게 되면 화면에 로그인 창이 나타나게 되는 것이다.



(1) 디자인 수정이 필요한 경우

- 템플릿의 기본 위치는 /home/centos/public_html/MCHMS/Templates/ 이다. 이 안에서 위에서 말한 것처럼 Template을 찾아 뒤 디자인 수정을 하면 된다.

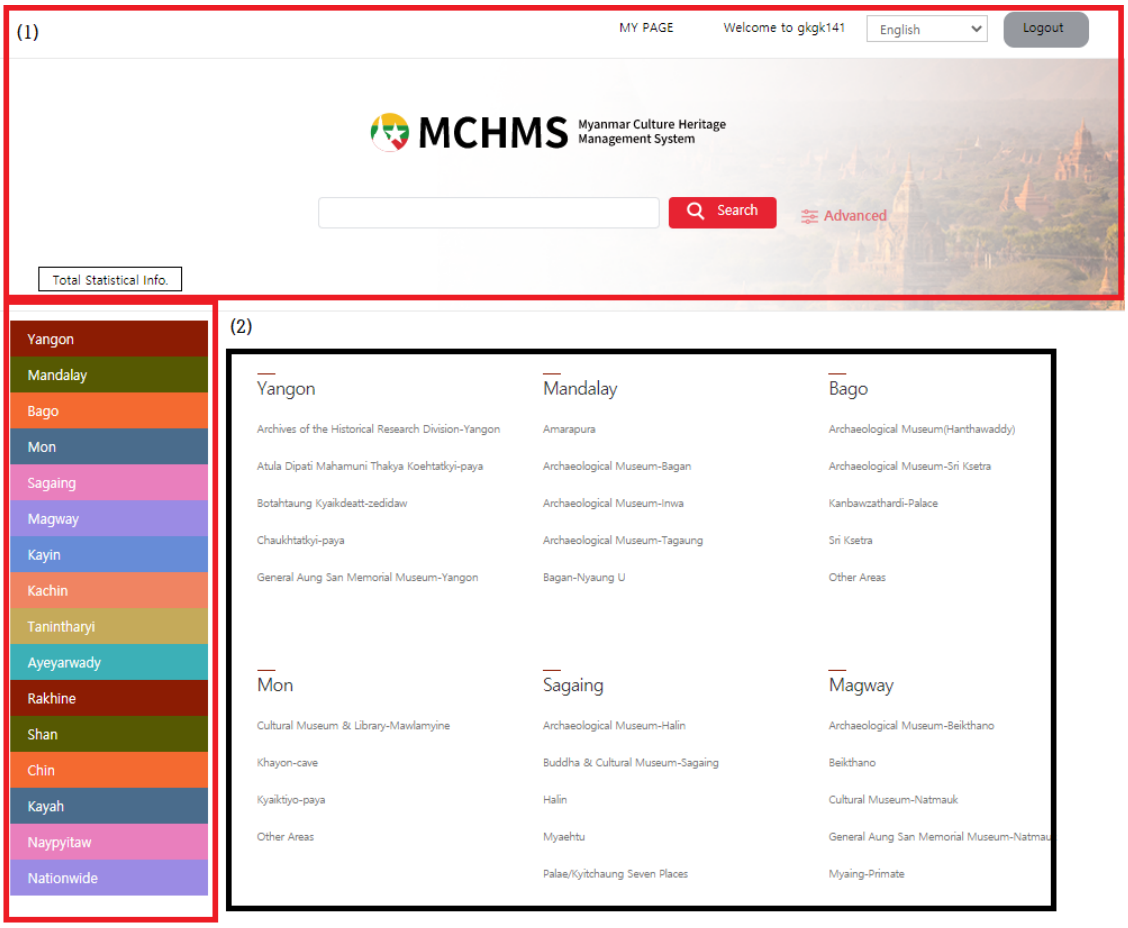
(2) Back-end 부분 수정이 필요한 경우

- Back-end 부분은 View.py 에서 수정하면 된다. Django는 Python을 기반으로 되어있어 Python 으로 수정을 하면 된다.

1, 2번이 완료된 후 아파치 재시작을 하지 않으면 변경 사항들이 제대로 적용되지 않는다. 쉘에서 systemctl restart httpd 를 입력하여 아파치를 재시작해 주도록 한다.

5. 각 페이지 수정위치 및 세부내용(Front)

1) Main Page



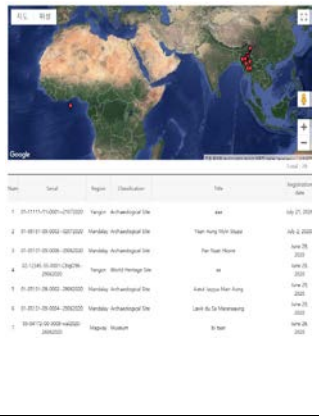
총 2개의 html로 구성되어있다.

(1) - Template_Base.html에서 수정이 가능하며 메뉴바와 검색창을 담당한다.

- MCHMSWrite, MCHMSModify와 Template_Base.html을 같이 사용한다.

(2) - Main/Main.html에서 수정이 가능하며 각 도시와 세부도시를 보여준다.

2) Search

		
MCHMSLargeSearch	MCHMSSearch	MCHMSSearch_process

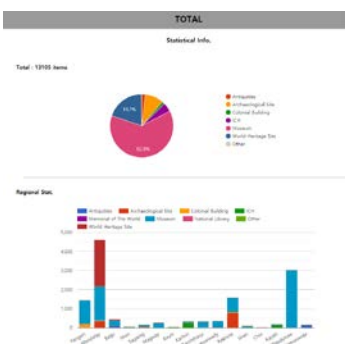
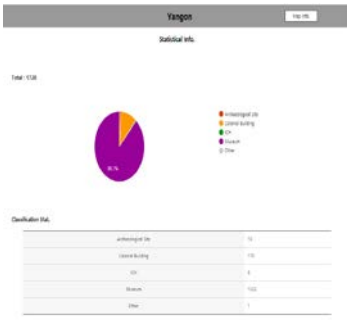
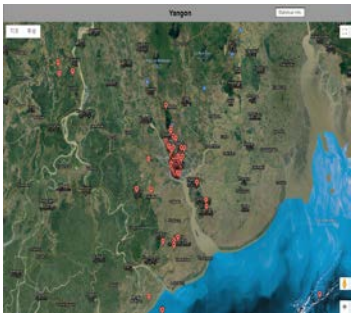
Search/MCHMSSearch.html이라는 똑같은 소스를 사용하지만 접근방법에 따라 다르다.

(1) - MCHMSLargeSearch은 왼쪽 menu에서 Classification 선택시 나오는 결과 화면이다.

(2) - MCHMSSearch은 Search를 하거나 1)-2의 세부도시명을 클릭시 나오는 결과 화면이다.

(3) - MCHMSSearch_process은 Advanced를 통해 나오는 화면이다.

3) Statistics

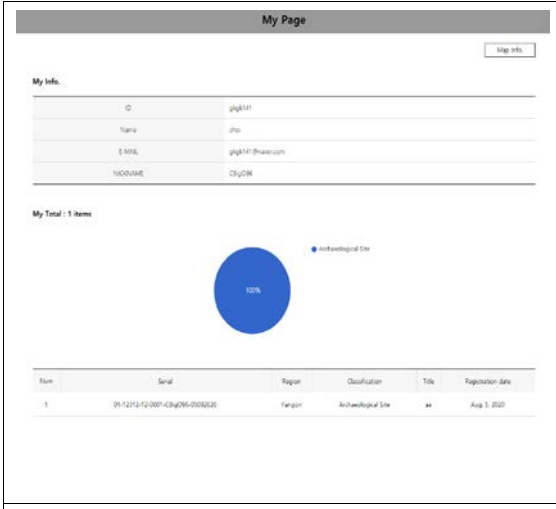
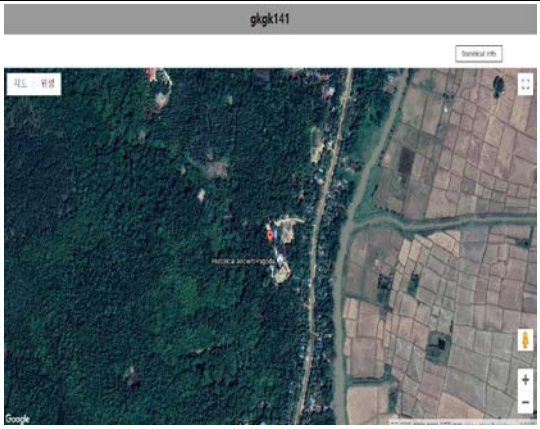
		
all_Statistics	Statistics	Statistics_Map

(1) - Statistics/all_Statistics에서 수정 가능하며 전체 정보와 각 도시별 저장된 값을 보여준다.

(2) - Statistics/Statistics에서 수정 가능하며 도시별 정보와 결과 값을 보여준다.

(3) - Statistics/Statistics_Map에서 수정 가능하며 위치를 지도에서 보여준다.

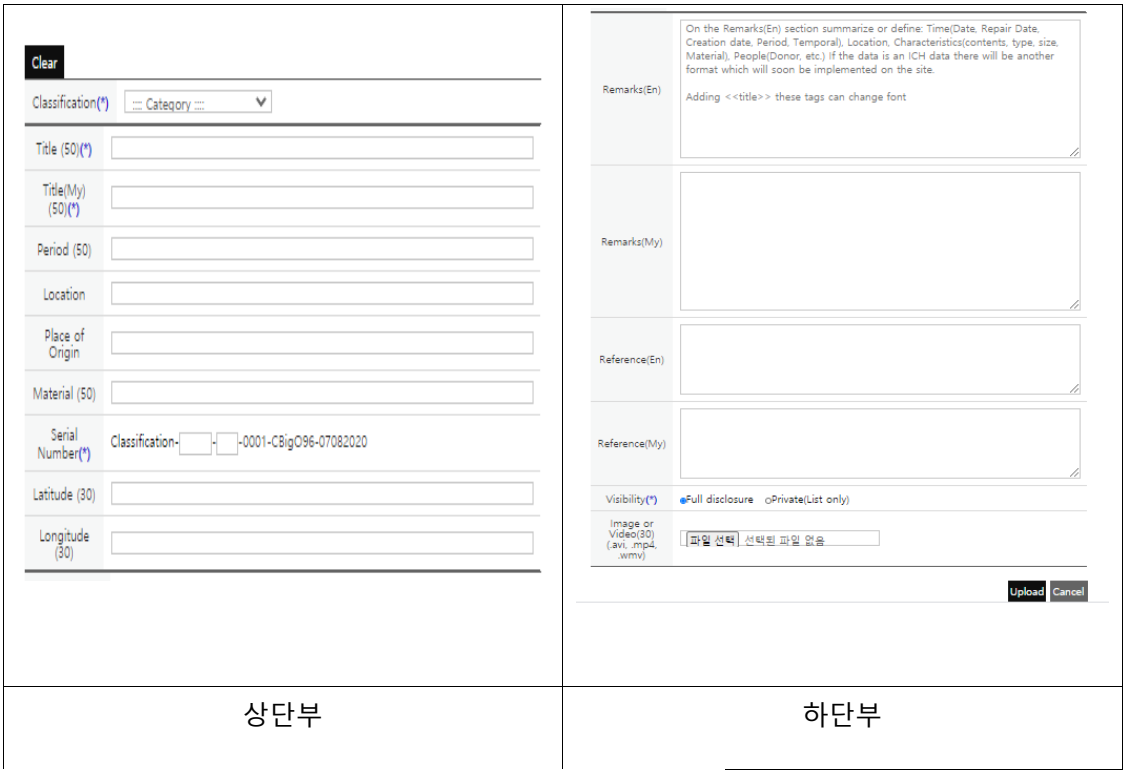
4) Mypage

	
Mypage	Contents_User

(1) - Mypage/Mypage에서 수정 가능하며 사용자의 정보와 올린 Data의 결과를 보여준다.

(2) - Contents_User에서 수정 가능하며 사용자의 정보를 Map으로 보여준다.

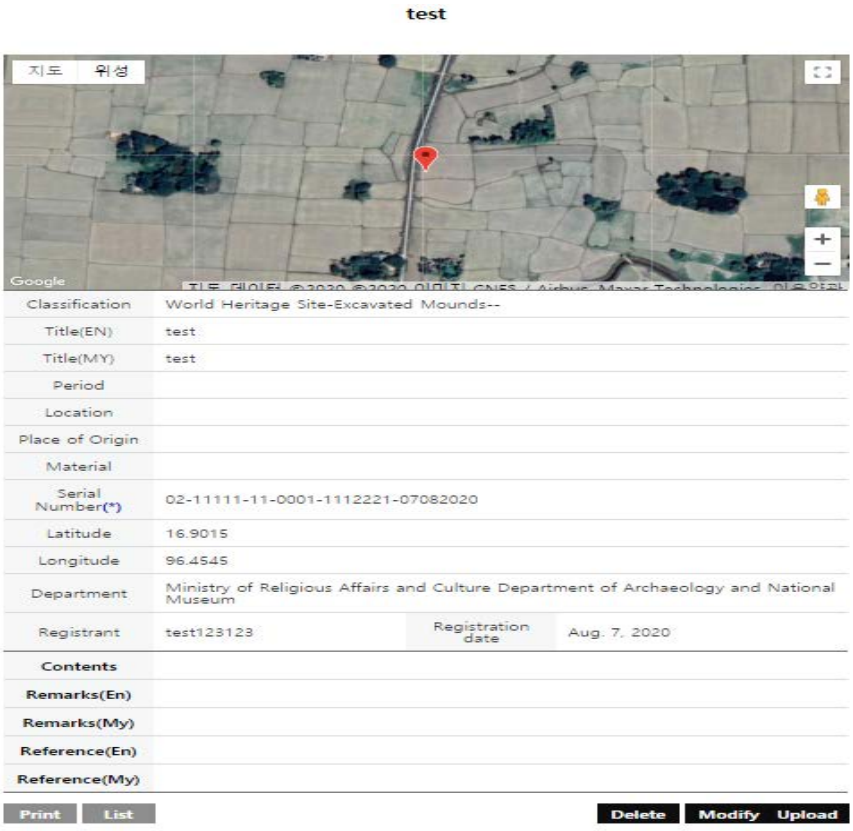
5) Upload



상단부	하단부

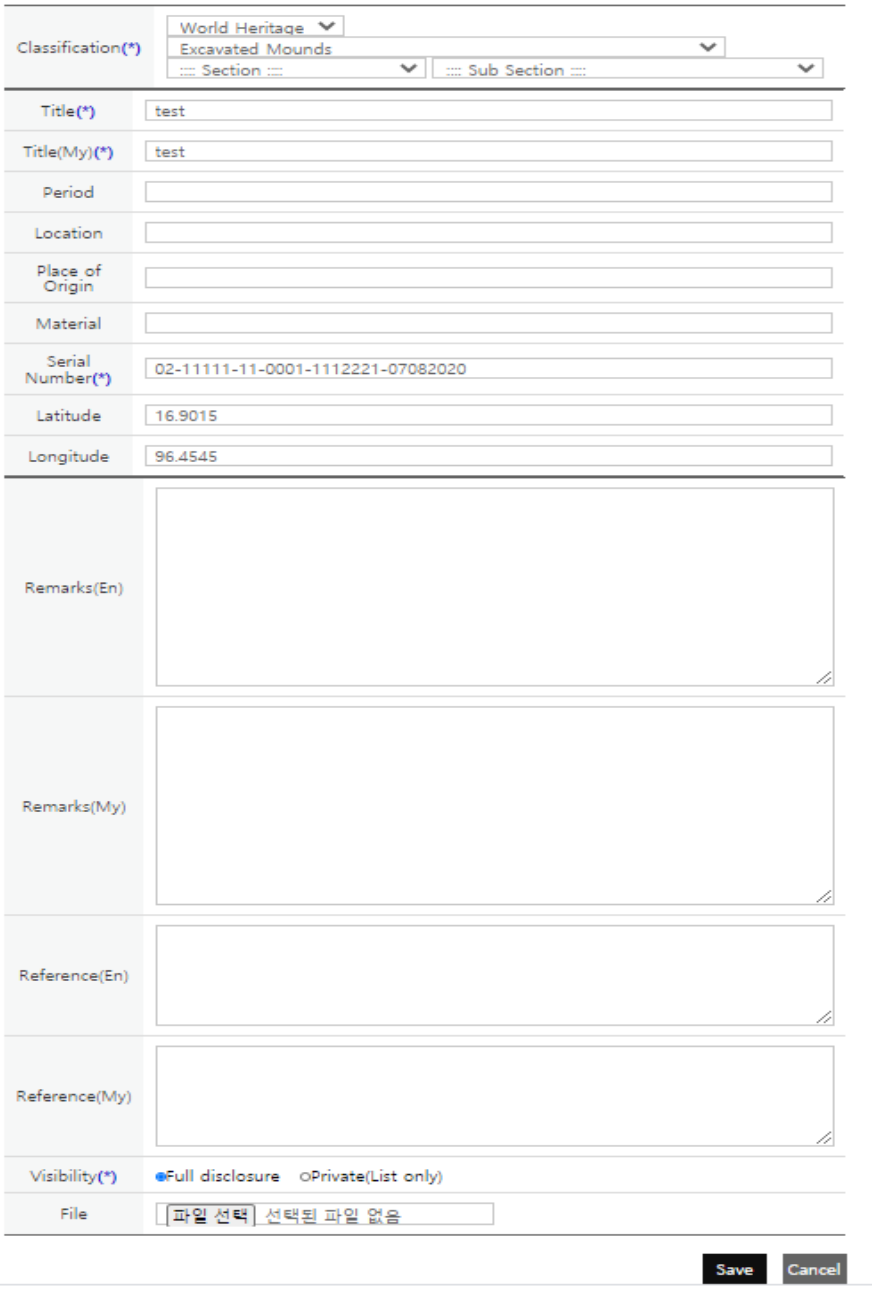
- Write/MCHMSWrite.html에서 수정이 가능하다. Data을 넣는 Page이다.

6) View



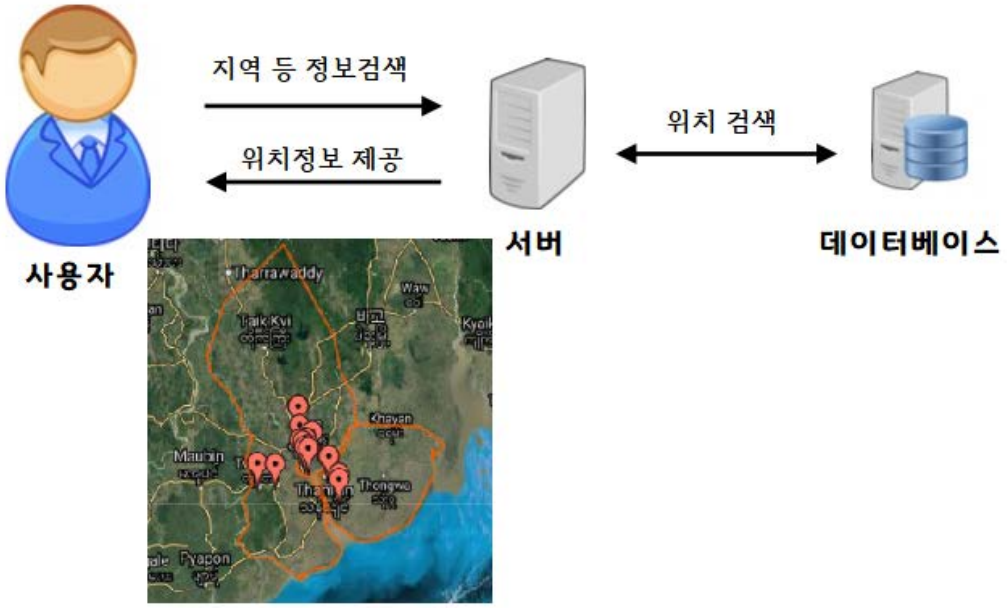
- View/MCHMSView.html에서 수정이 가능하다. Data에 있는 정보를 보여준다.

7) Modify



- View/MCHMSModify.html에서 수정이 가능하다. 작성자가 upload한 Data를 수정할 수 있다.

6. 지도검색 원리



현재 MCHMS는 Google지도 API를 받아와서 사용하고 있습니다. 사용자가 지역과 같은 정보를 검색할 경우, 서버는 이를 받아들이고 데이터베이스에서 정보를 검색합니다. 서버는 검색된 데이터를 지도위에 마커로 표시합니다.

데이터베이스에 저장된 정보는 Latitude, Longitude와 같은 위치정보와 이름과 제작일시와 같은 Data 정보를 가지고 있으며, 지도에 있는 좌표를 클릭할 경우 해당 하는 Data의 정보를 확인할 수 있다.

5. Website operation

3.5 Roles of Administrators

- A user who has registered as a member can log in only after the administrator approves it.

- The administrator grants members the right to log in.

- There are a total of 3 permission levels, and access rights are different according to each value. (1=Administrator rights, 2=General member, 3=Standby status)

3.6 Administrator long in

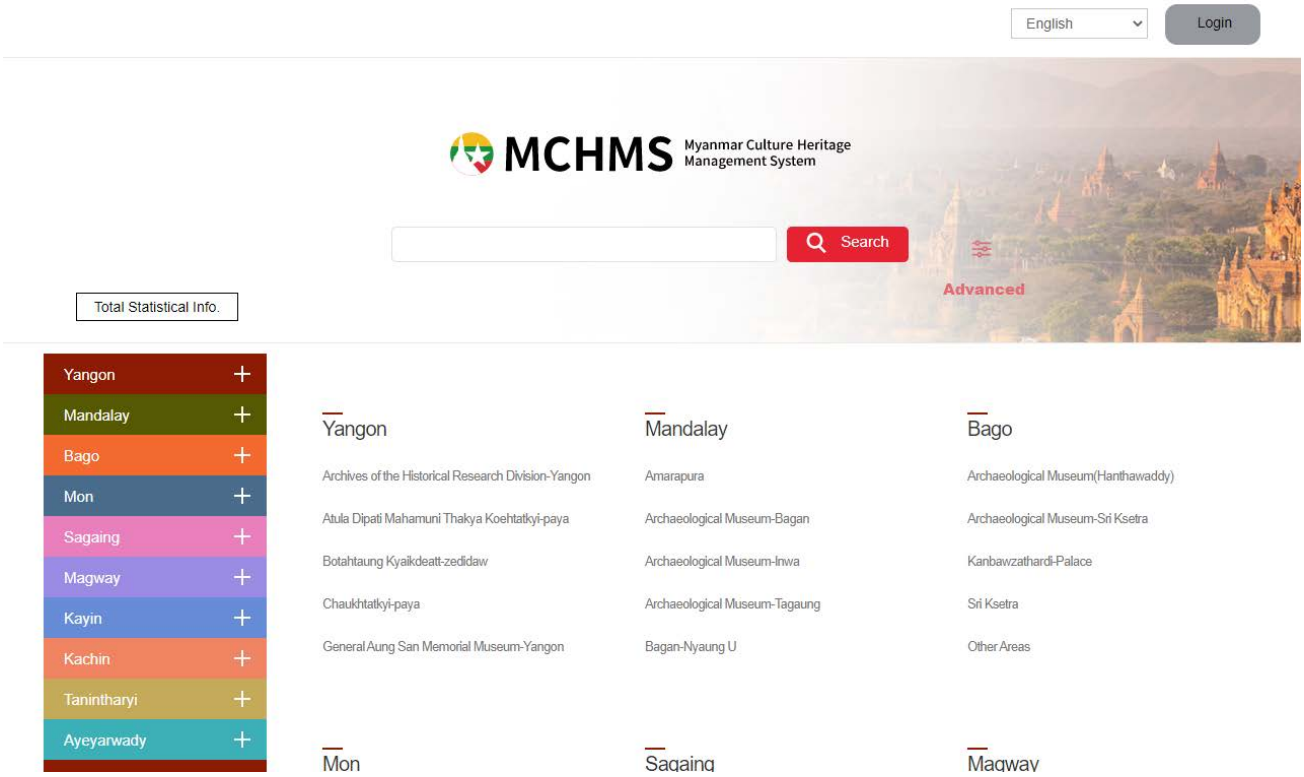


Figure 1. MCHMS main page

The administrator clicks the login button in the upper right corner to access the login page

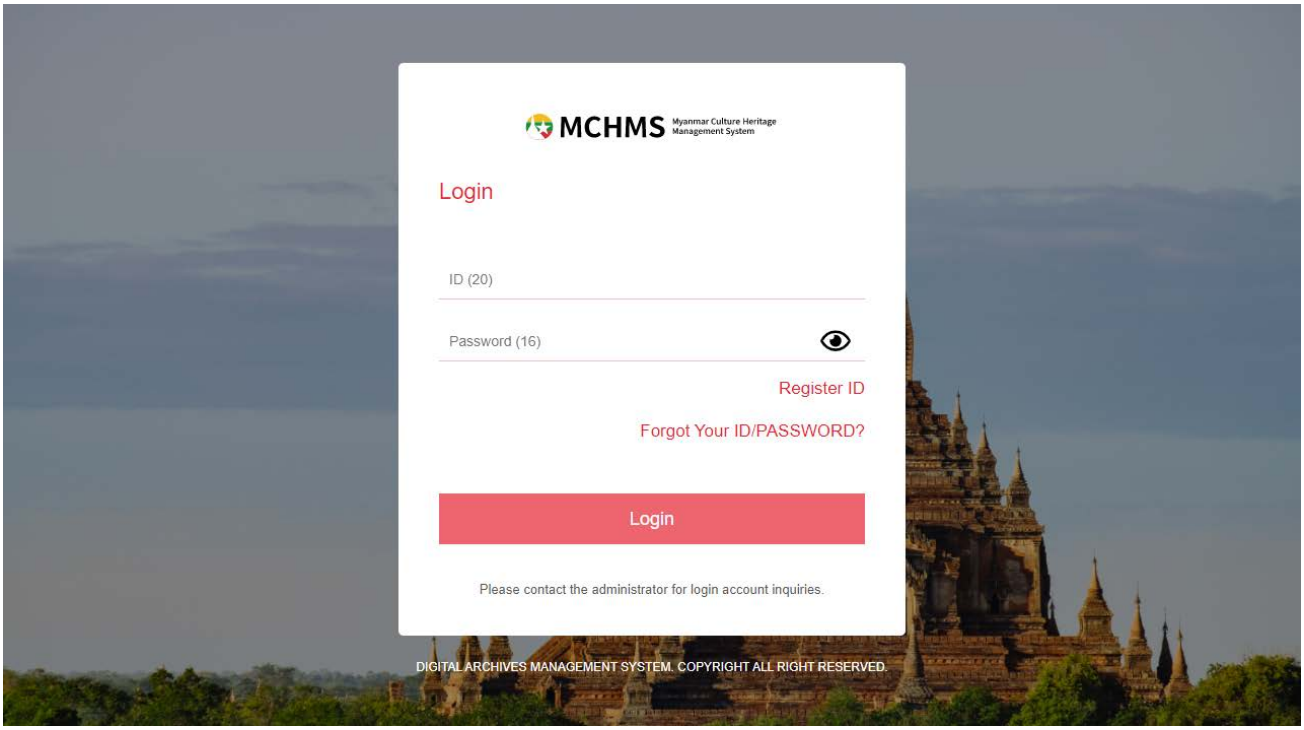


Figure.2 MCHMS Login page

Enter the administrator ID and password to log in

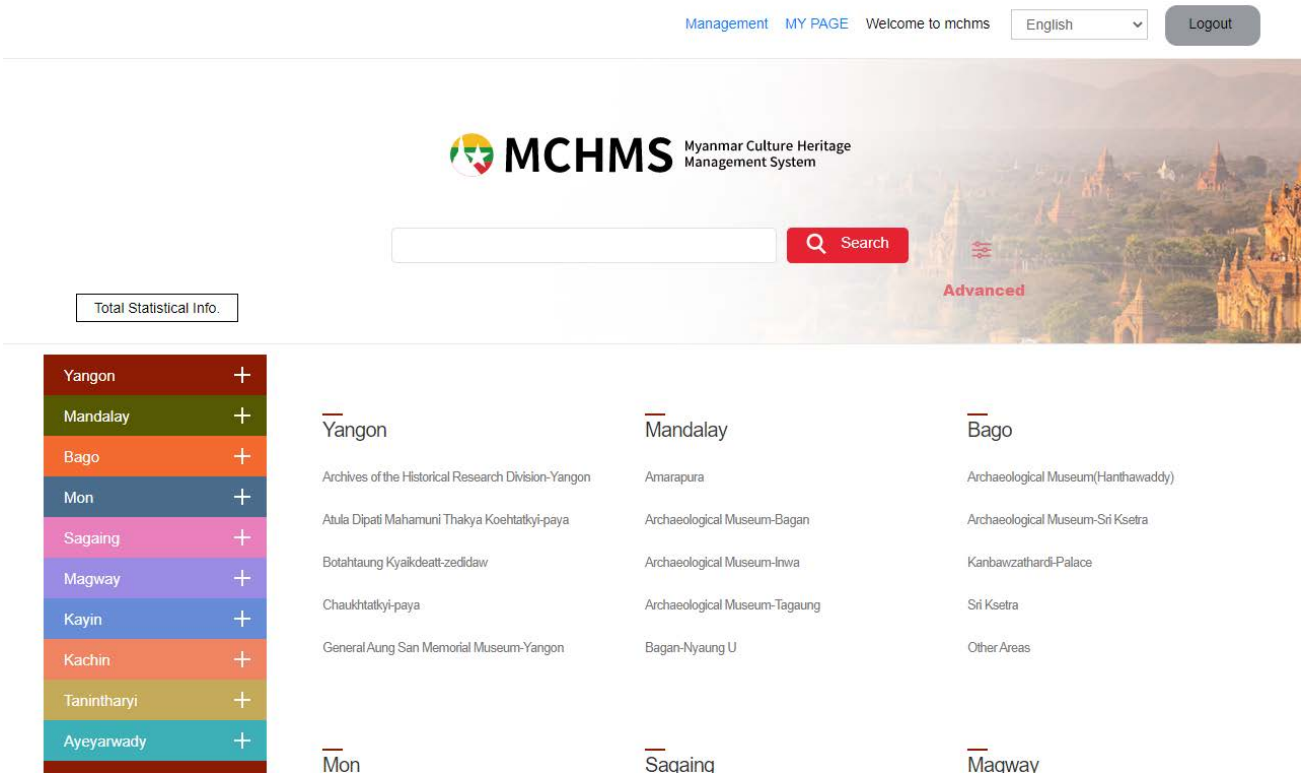


Figure 3. MCHMS admin login main page

Log in as administrator, the Management button appears at the top.

3.7 Administrator functions

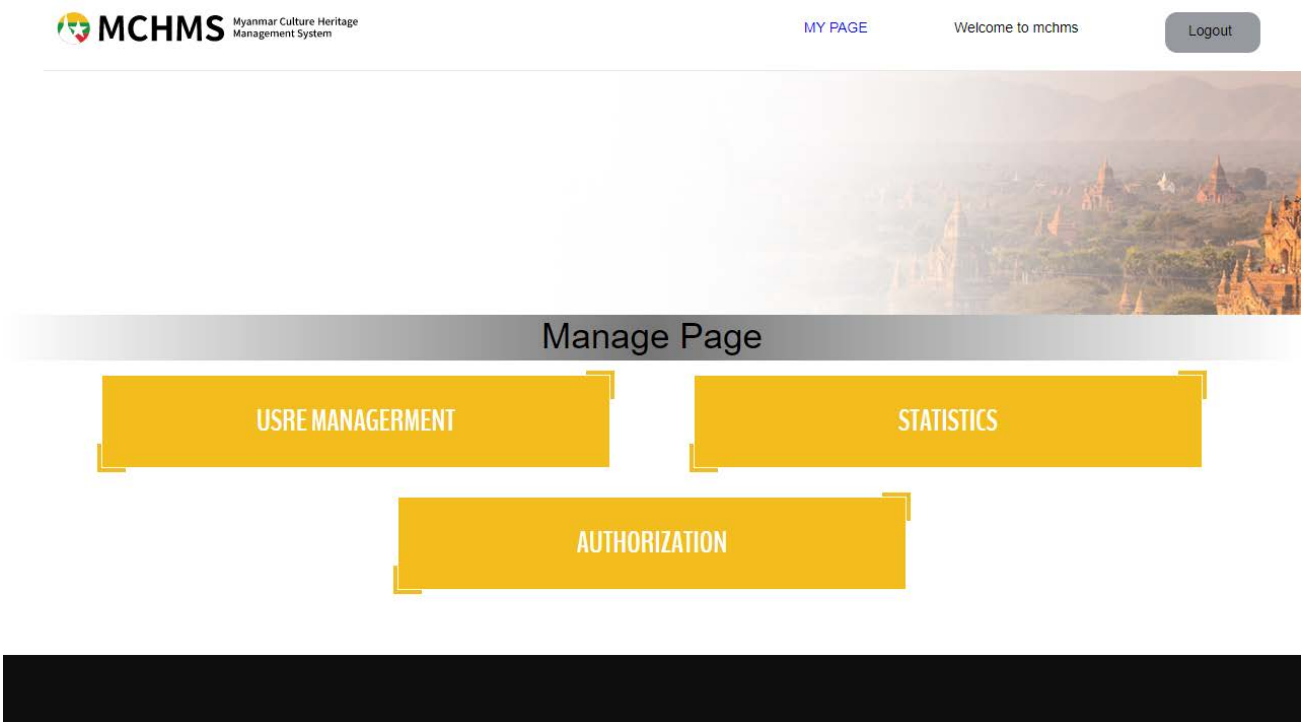


Figure 4. MCHMS Administrator page

The admin page provides three functions. Each function is as follows.

4. User Management : Administrator can check the list of users and band them.
5. User authorization : Administrator can approve users waiting to join.
6. Statistics : Administrator can check the overall statistics of the uploaded data.

3.7.1 User management

(미구현)

3.7.2 User Authentication



Figure 5. MCHMS user authentication page

The user authentication page shows the user's ID, nickname, and name list, and administrators can approve the user waiting to join through the approve button

3.7.3 Statistics

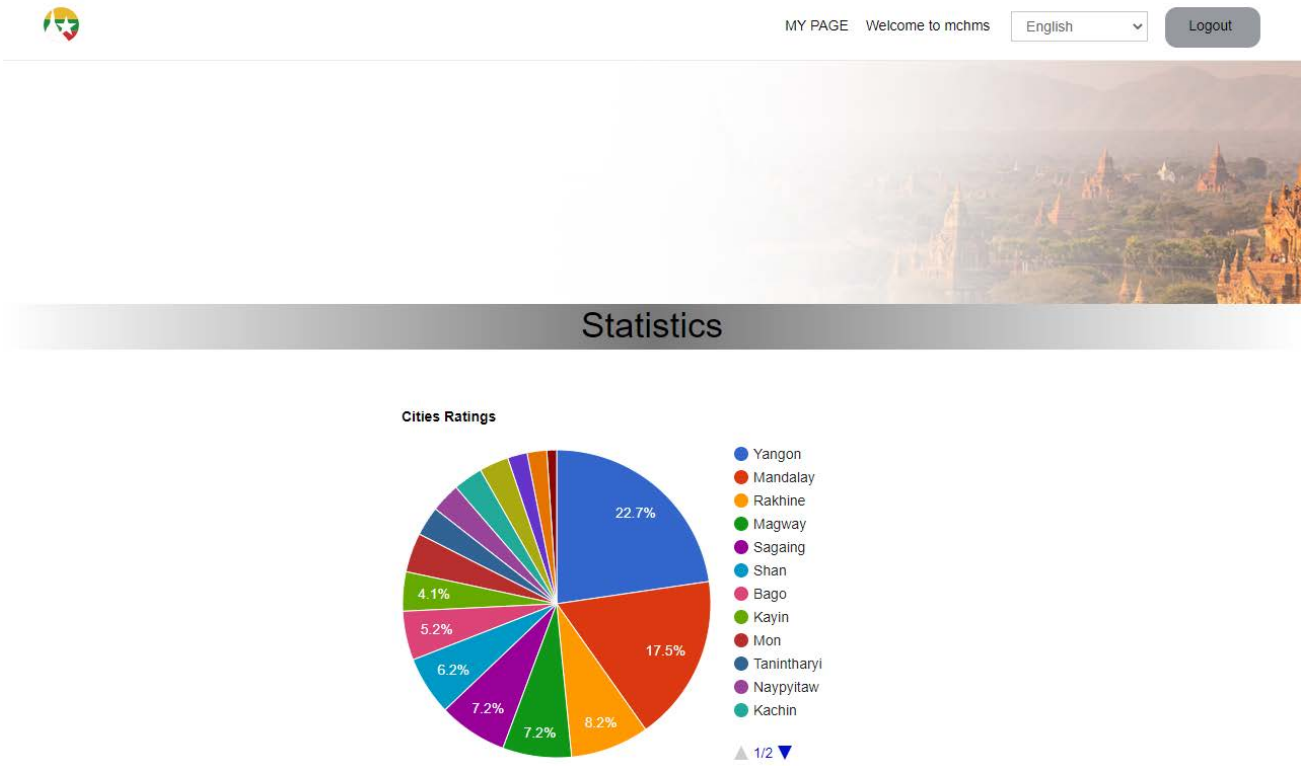


Figure 6. MCHMS overall statistics page

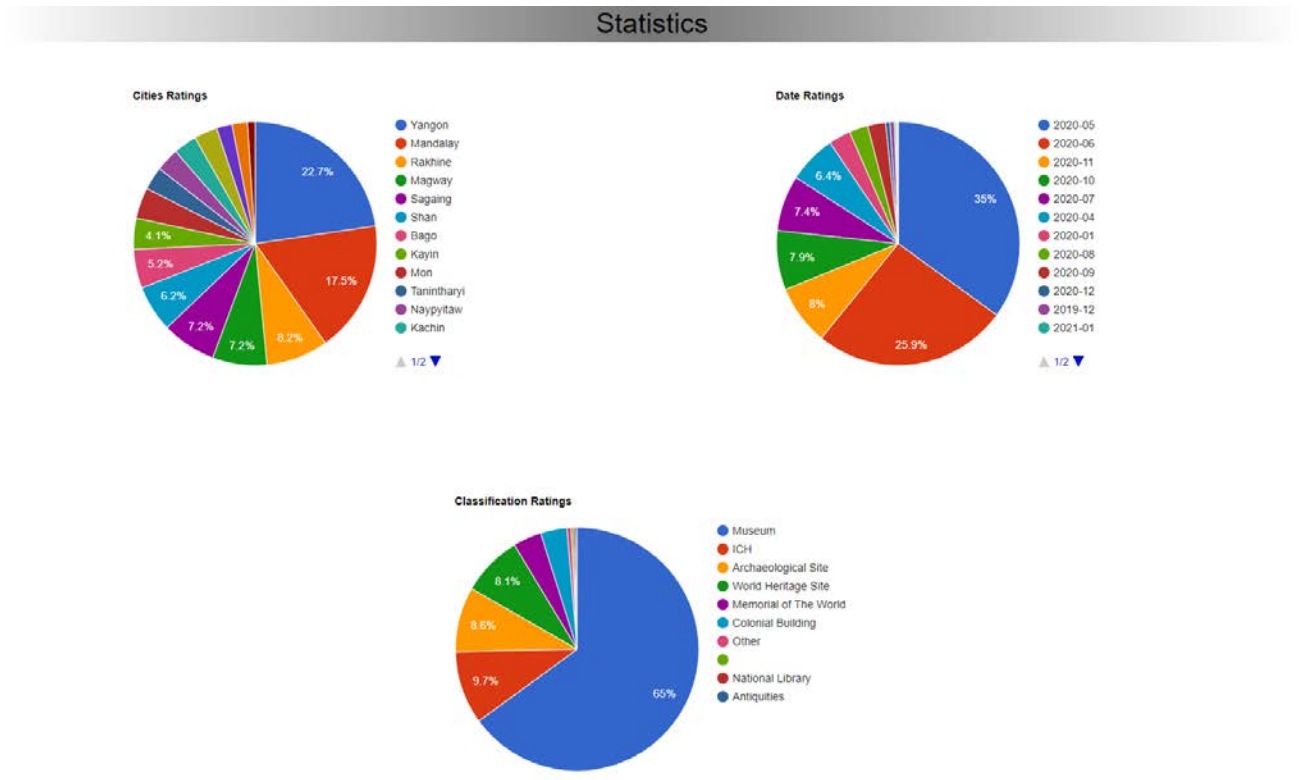


Figure 7. MCHMS Statistics page / Chart

6. AWS Management and Matintenance

4.1 Sign in to AWS



Figure 13. Amazon AWS Homepage Access the AWS website

Access the AWS sebsite (https://aws.amazon.com/)

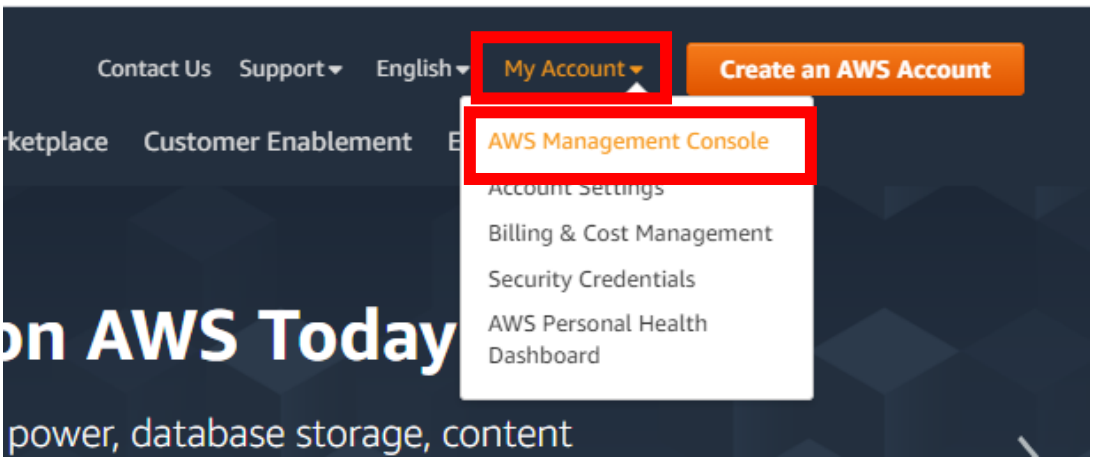


Figure 14. AWS Management Console Approach

In the window that appears when you hover your mouse over My Account at the top, click AWS

Management Console.

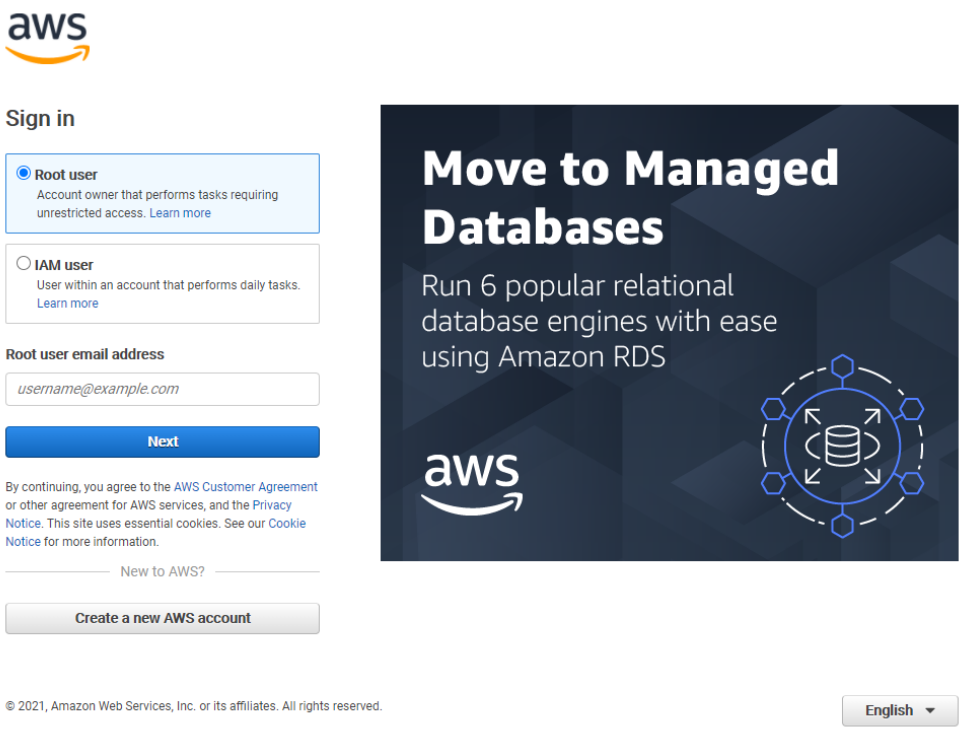


Figure 45. Amazon AWS Login Process 1 – Enter Email

Enter your email address in the Root user email address field on the login page and click Next.

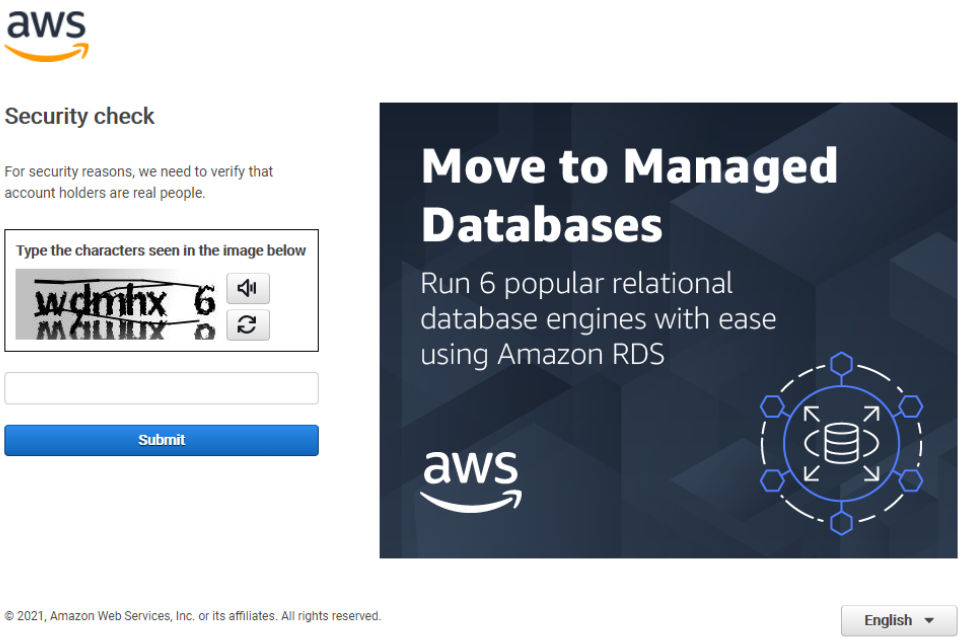


Figure 16. Amazon AWS Login Process 2 – Enter Captcha

Enter the same Captcha code that appears on the screen and click Submit.

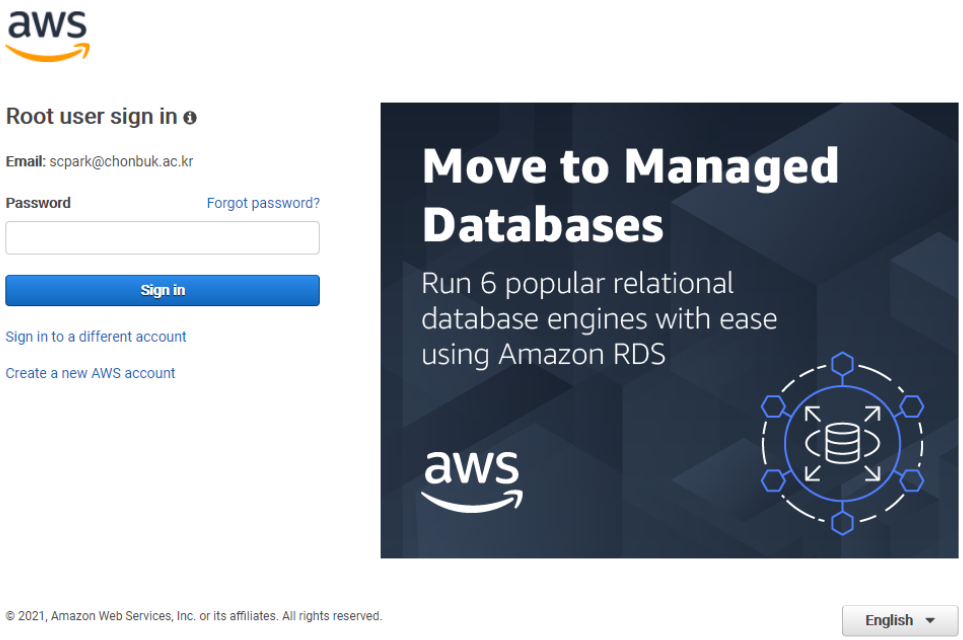


Figure 17. Amazon AWS Login Process 3 – Enter Password

Enter your password in the Password field and click Sign in.

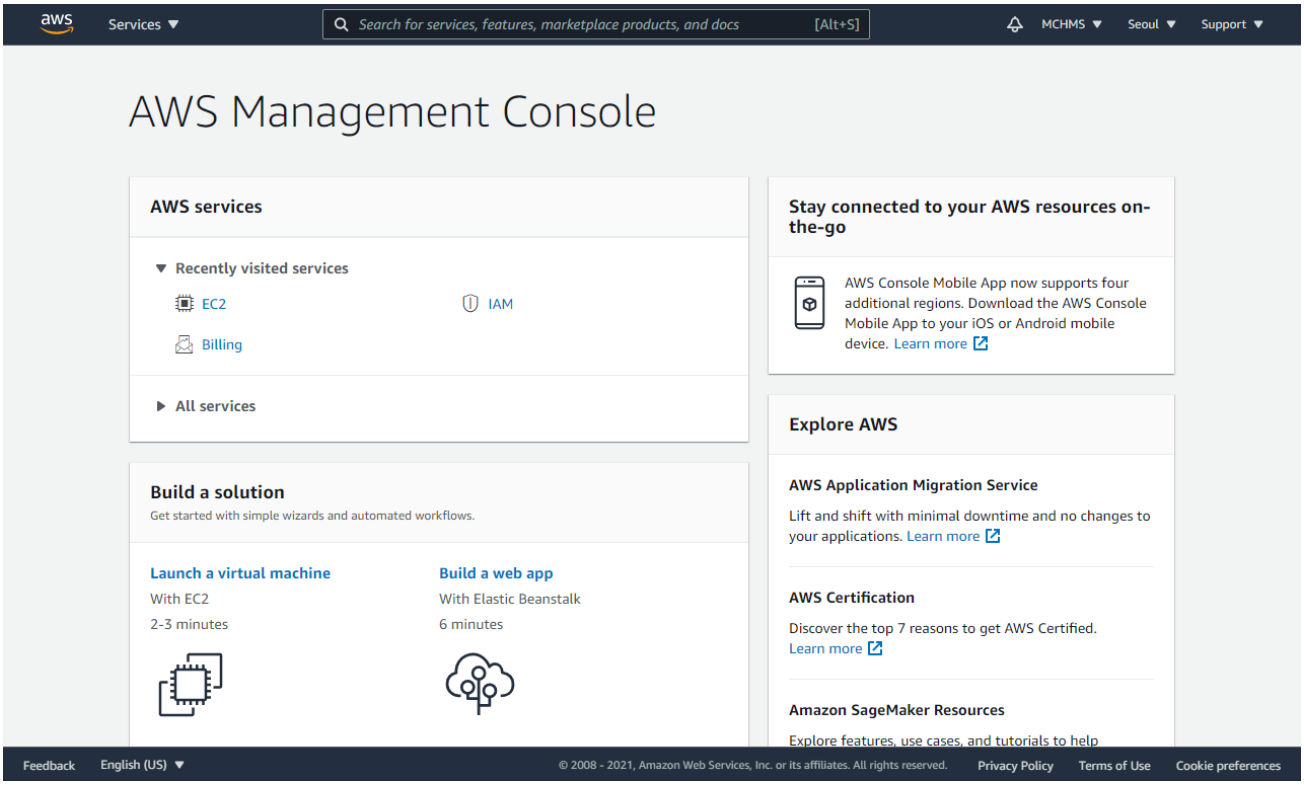


Figure 18 Amazon AWS Management Console

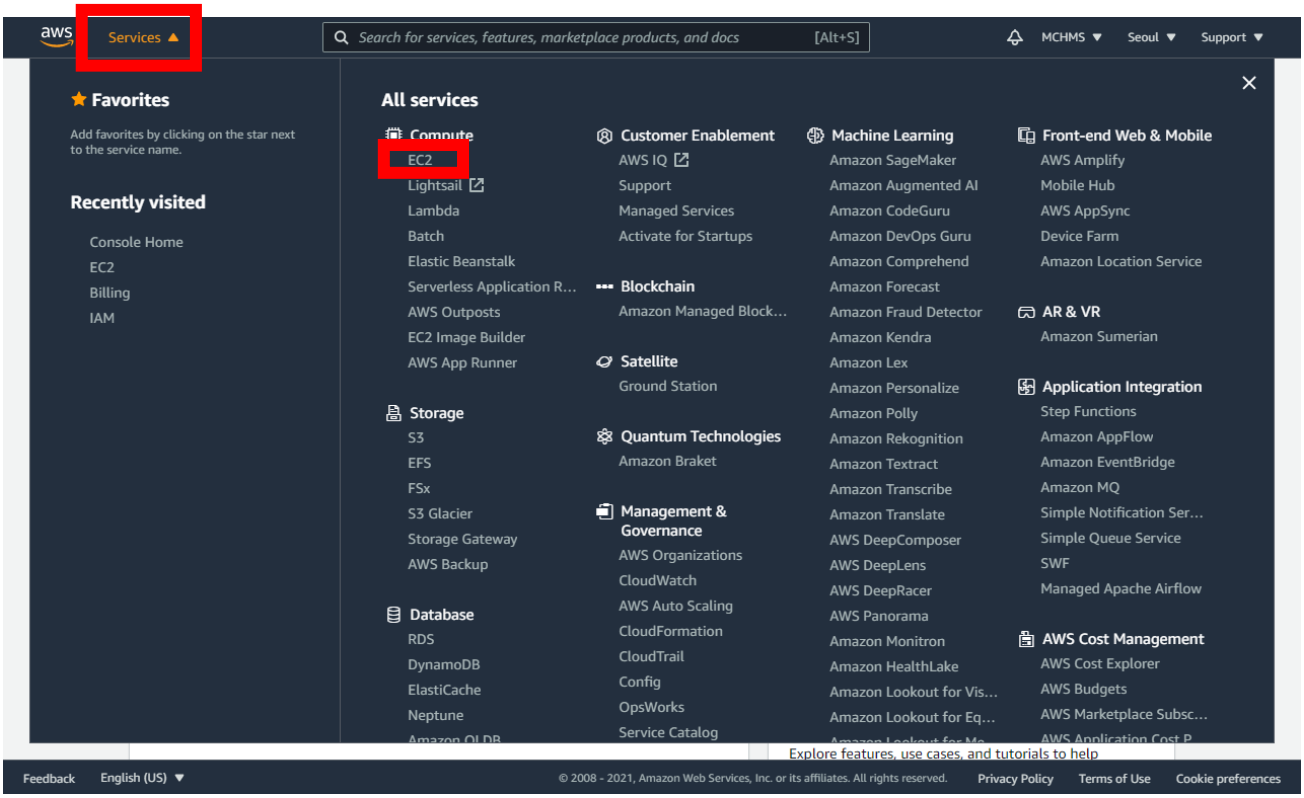


Figure 19. Amazon AWS EC2 Console Access Method

To access the EC2 console, click Services in the upper left corner and then click All services - Compute - EC2.

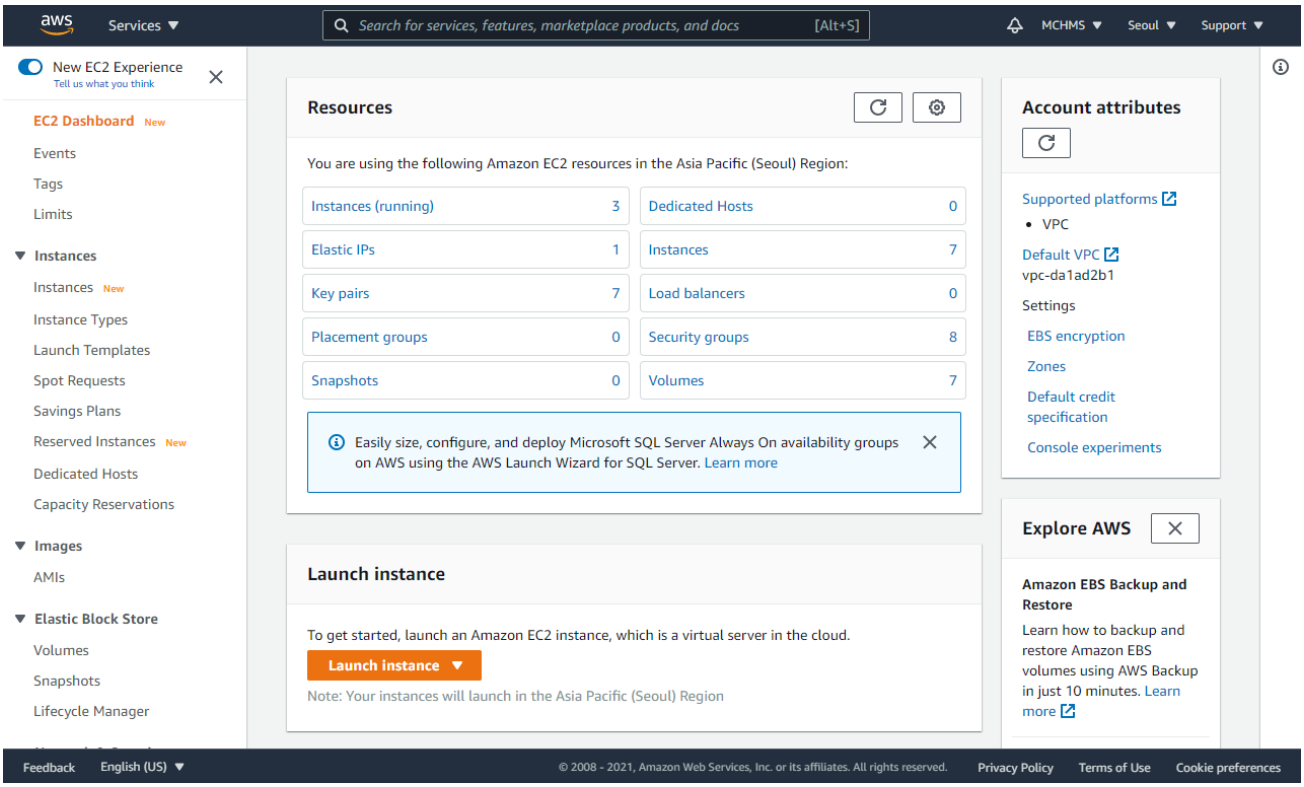


Figure 20. Amazon AWS EC2 Dashboard

4.2 Instance Termination, Startup, and Restart Methods

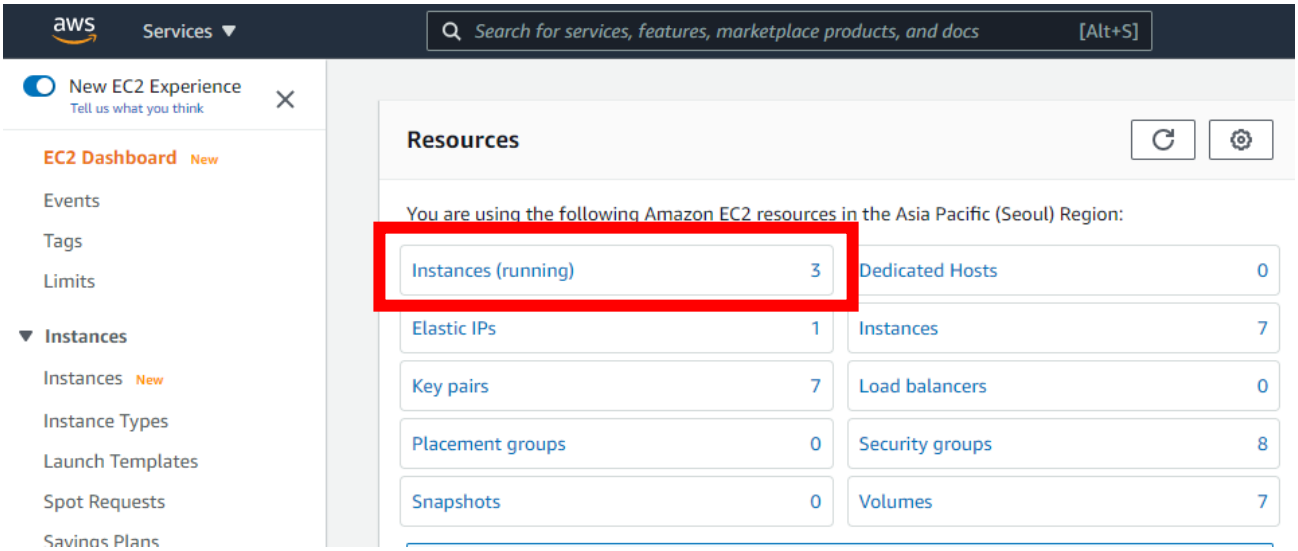


Figure 21. Amazon AWS EC2 Checking Current Running Instances

First, click Instances (running) in the center of the EC2 dashboard to enter the list of running instances.

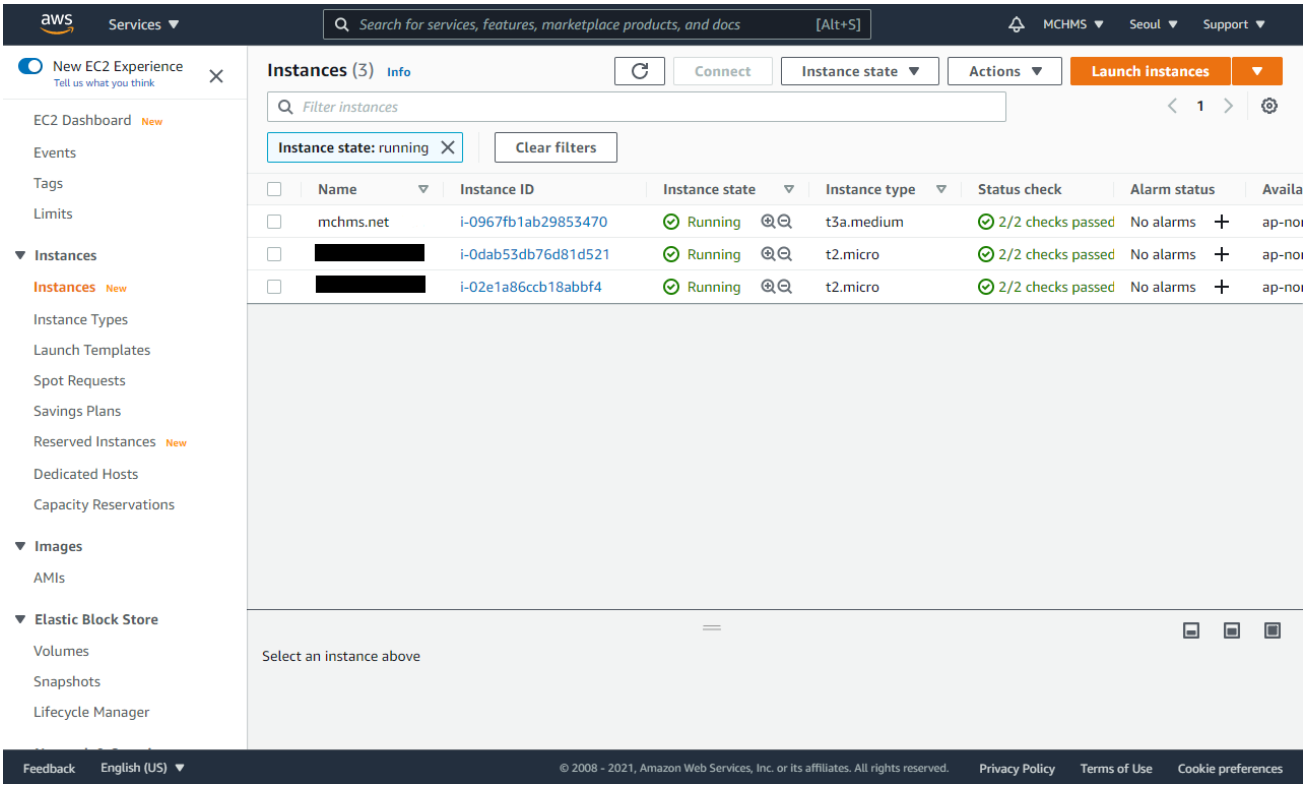


Figure 22. Amazon AWS EC2 List of Currently Running Instances

After right-click the instance user want to connect to among the currently running instances, the following window appears.

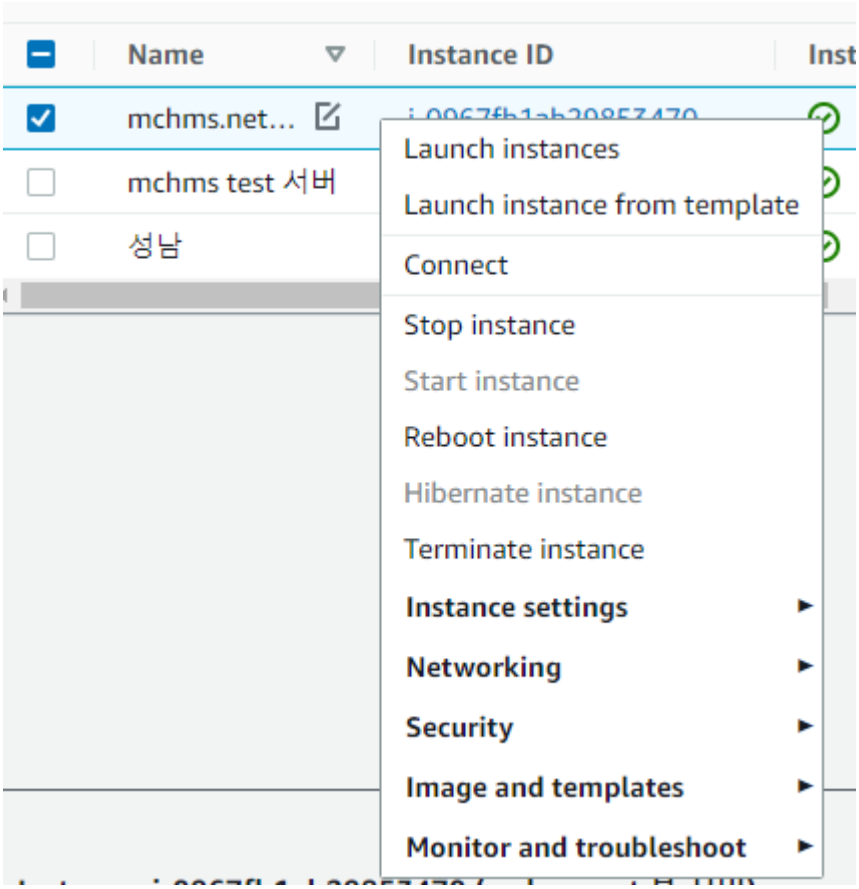


Figure 23. Right-clicking on an instance

Click Stop instance to stop the instance, click Start instance to start it, and click Reboot instance to restart it. Terminate instance is a button to delete an instance, so be careful not to press it.

4.3 Edit inbound rules

By setting inbound rules, administrator can block specific IP or allow access only from specific IP.

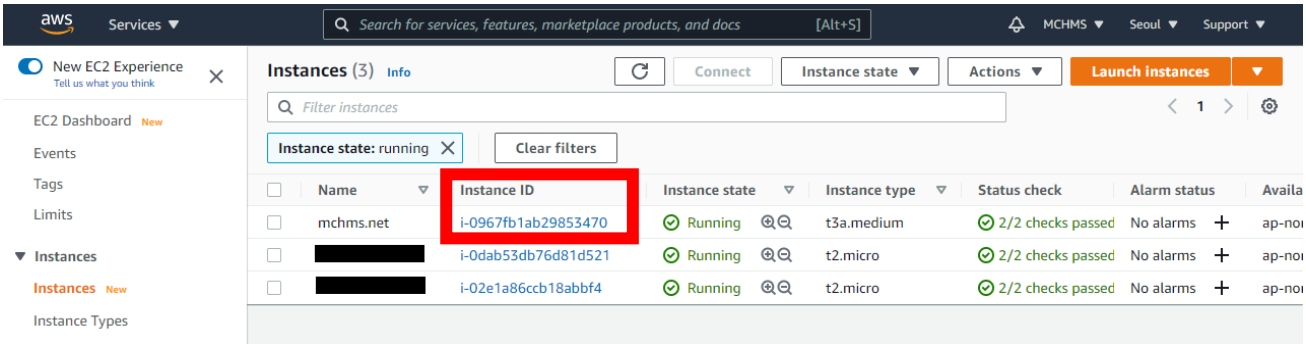


Figure 24. How to access the instance detail page

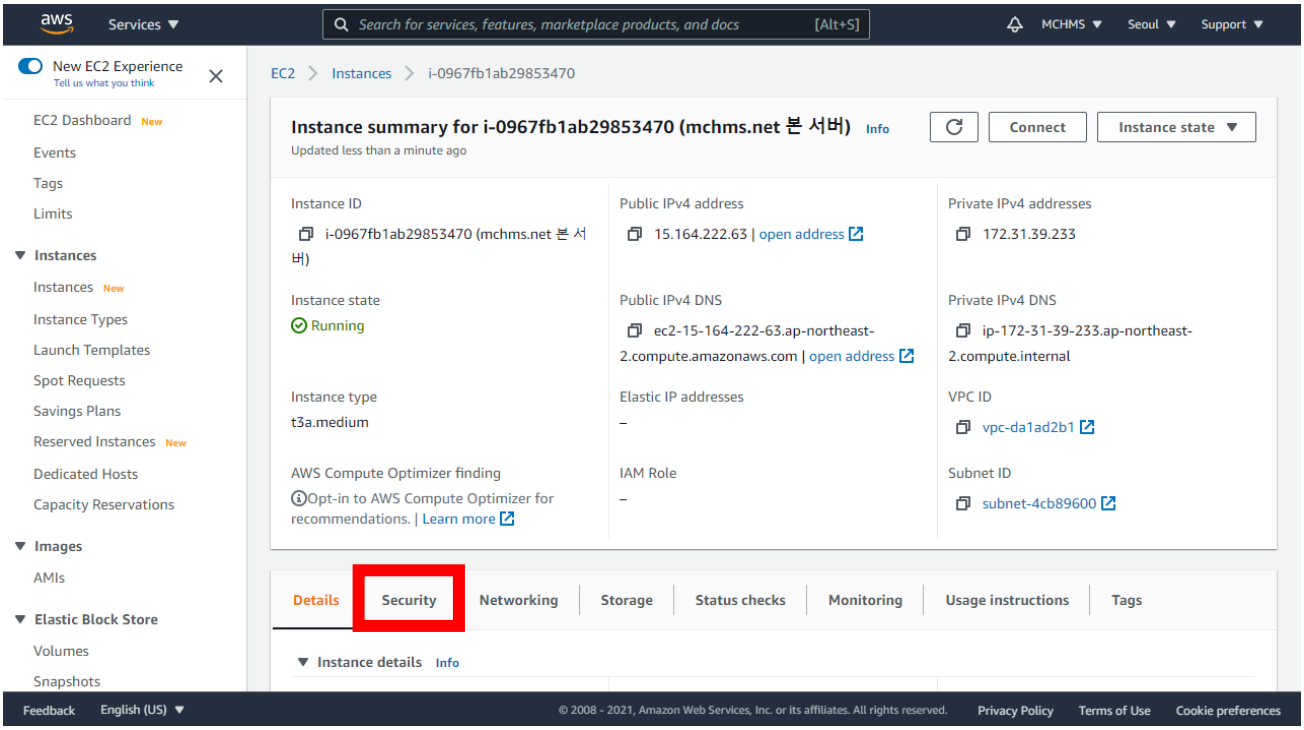


Figure 25. Amazon AWS EC2 Instance Details Page

Click the Instance ID in the instance list to access the instance's detail page. Then click the Security tab below.

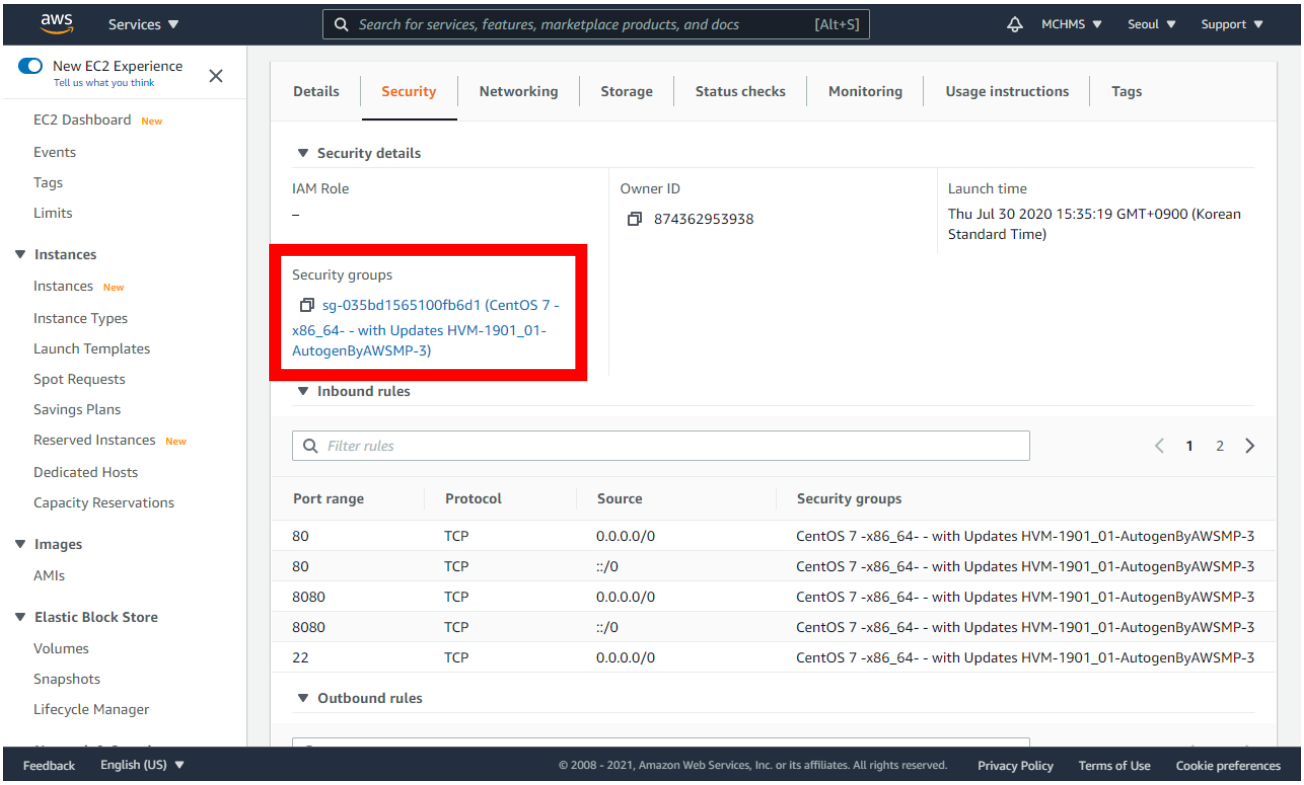


Figure 26. Amazon AWS EC2 Instance Detail Page – Security

Then, User can check the currently used Security groups, Inbound rules, Outbound rules, etc. To edit a rule, click the group name just below the Security groups item.

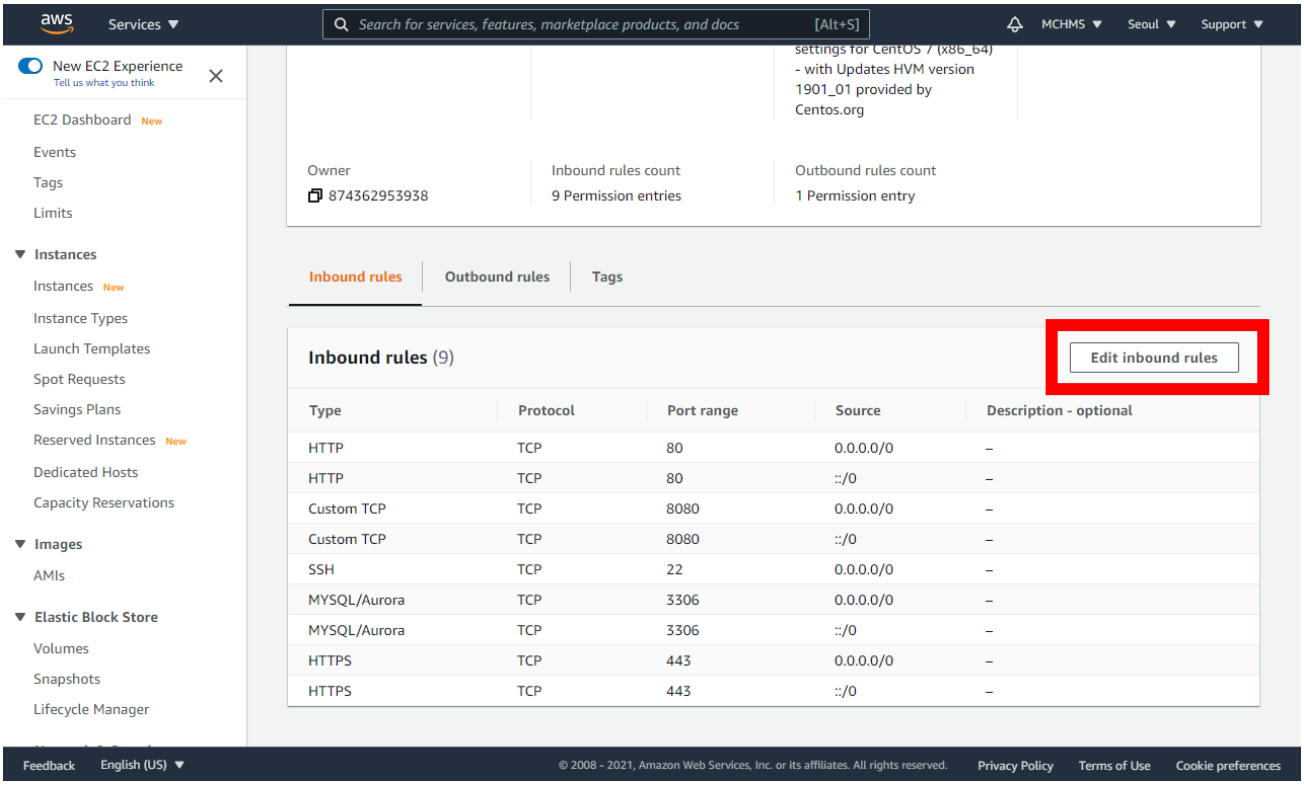


Figure 27. Amazon AWS EC2 Security Groups page

Scroll down and click Edit inbound rules.

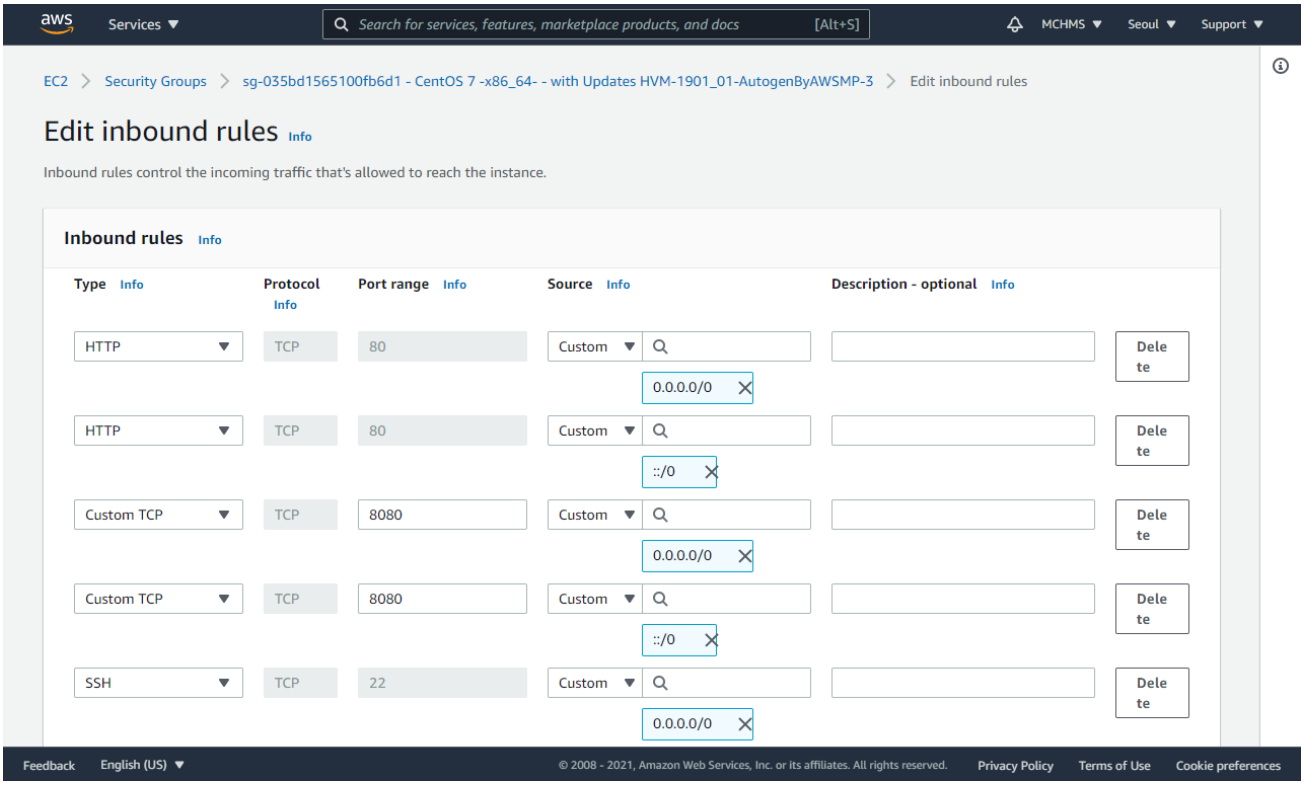


Figure 28. Amazon AWS EC2 Security Groups Edit Page

The page has Type, Protocol, Port No., Source, and Description columns. Connection can be allowed by modifying the above value, and only the added IP is allowed inbound. 0.0.0.0/0 (IPv4) and :/0 (IPv6) are allowed for both HTTP (port 80) and HTTPS (443) ports.

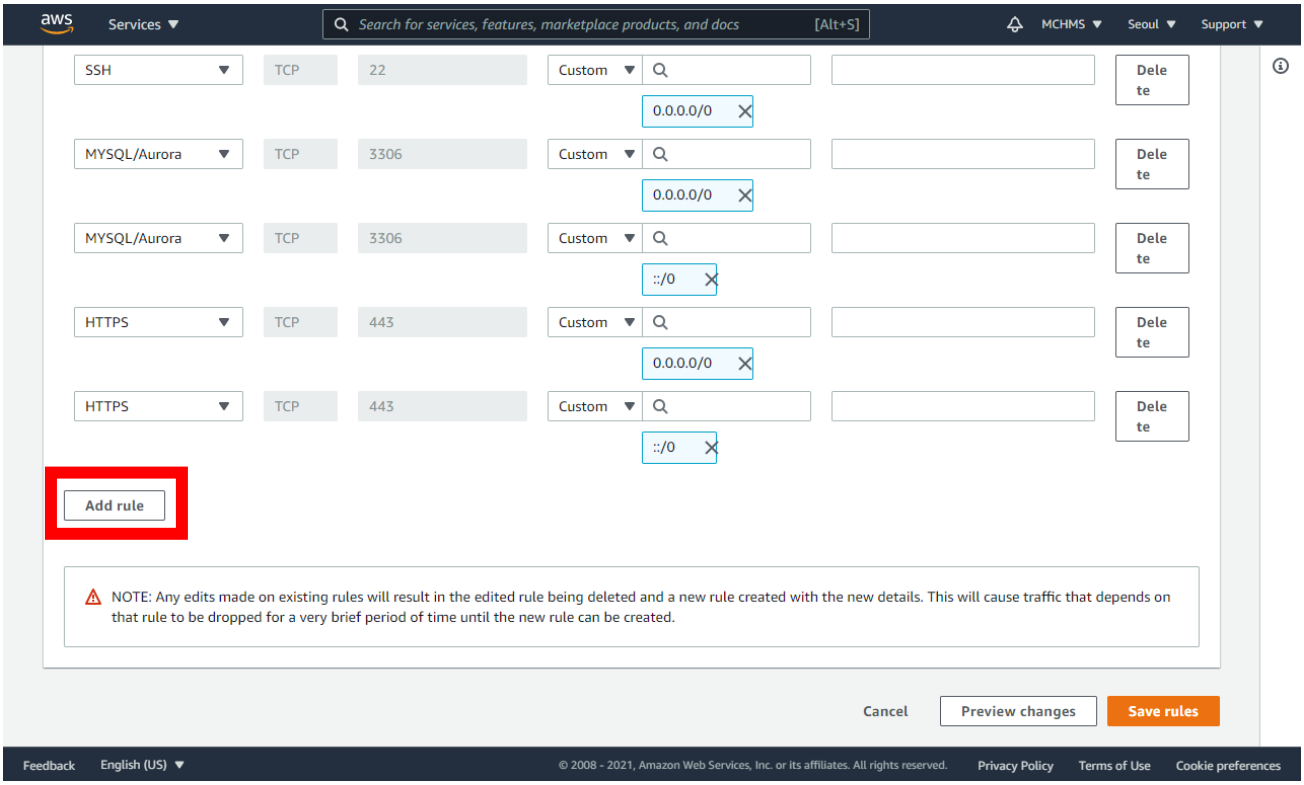


Figure 29. Inbound rule addition process 1

Since it is good for security to allow only a few internal people to access SSH, the process of adding only a specific IP to SSH is explained. To add a rule, click Add rule at the bottom left.

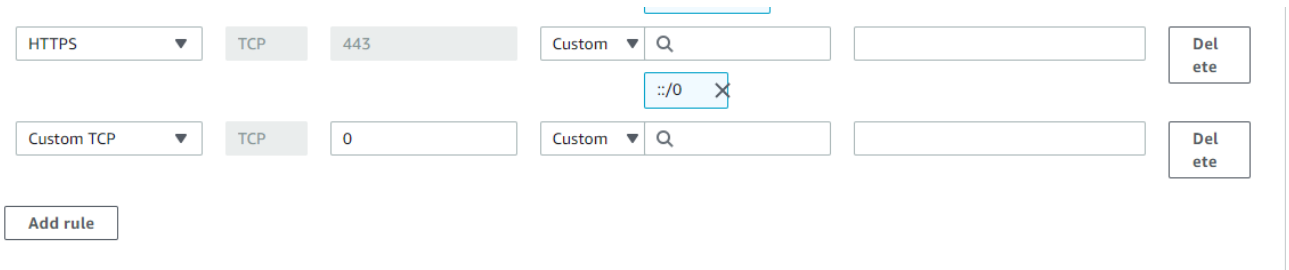


Figure 30. Inbound rule addition process 2 – As clicking Add role

As Click add role to add custom TCP to the bottom of the list.

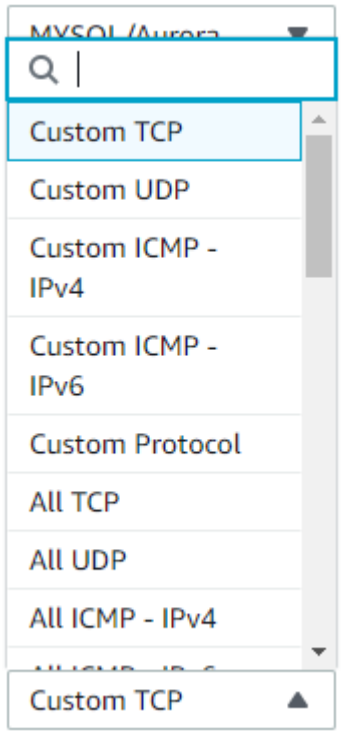


Figure 31. Inbound rule addition process 3 – When clicking Custom TCP in Type

If user clicks Custom TCP, a list of protocols to choose appears. Searching for SSH or find it and click it.

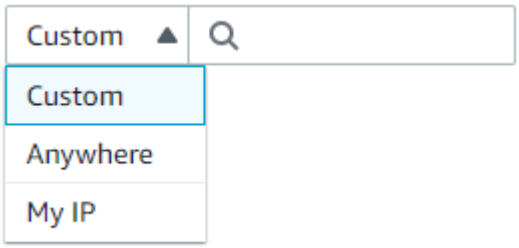


Figure 32. Inbound rule addition process 4 – When clicking Custom in the Source item

If user clicks Custom of Source, Custom, Anywhere and My IP appear. If user selects Anywhere, 0.0.0.0/0 and ::/0 are automatically entered. If user selects My IP, the IP of the computer user are currently accessing is automatically entered. If user wants to set it manually, use Custom.

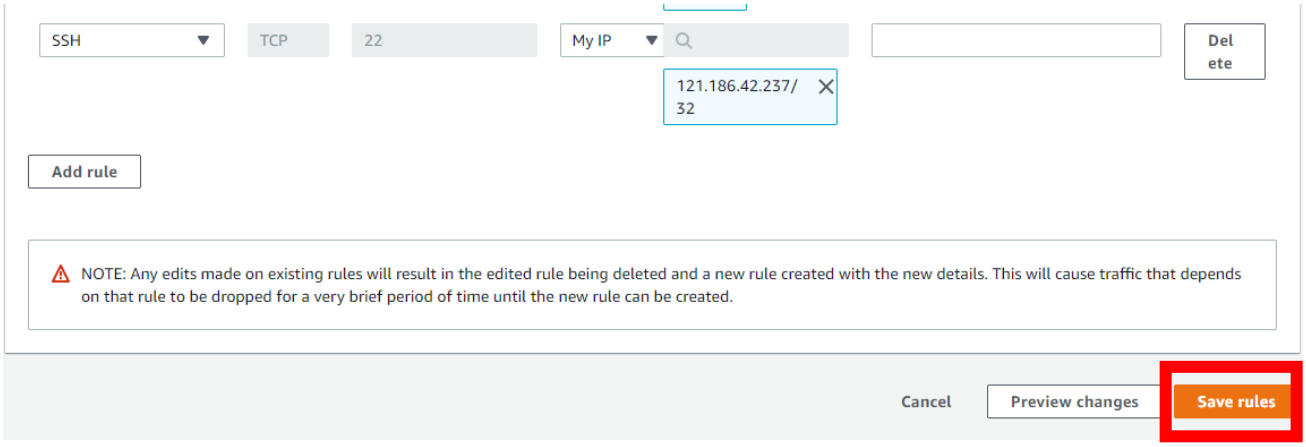


Figure 33. Inbound rule addition process 4 – Confirmation after completion of entry

After finishing setting, check again. The above example is a rule that allows My IP to SSH (TCP, Port 22). If user have entered correctly, click Save rules in the lower right corner to save it.

4.4 How to Expand Instance Capacity

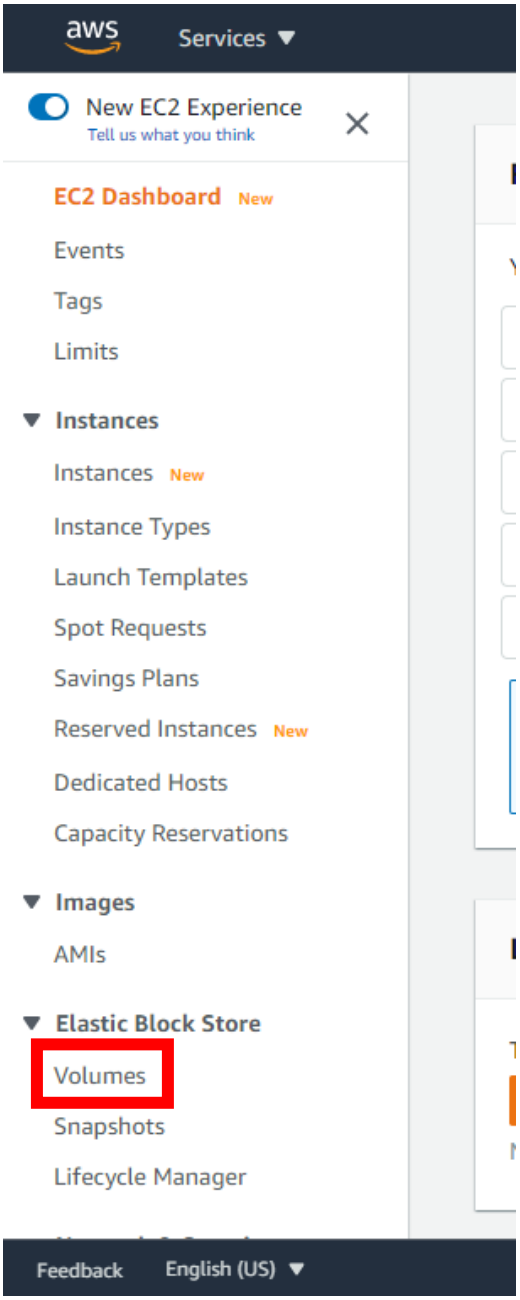


Figure 34. How to access the EBS Volume edit page in Amazon AWS EC2

To modify (extend) the capacity of an EC2 instance, enter the Volumes tab of the Elastic Block Store (EBS).

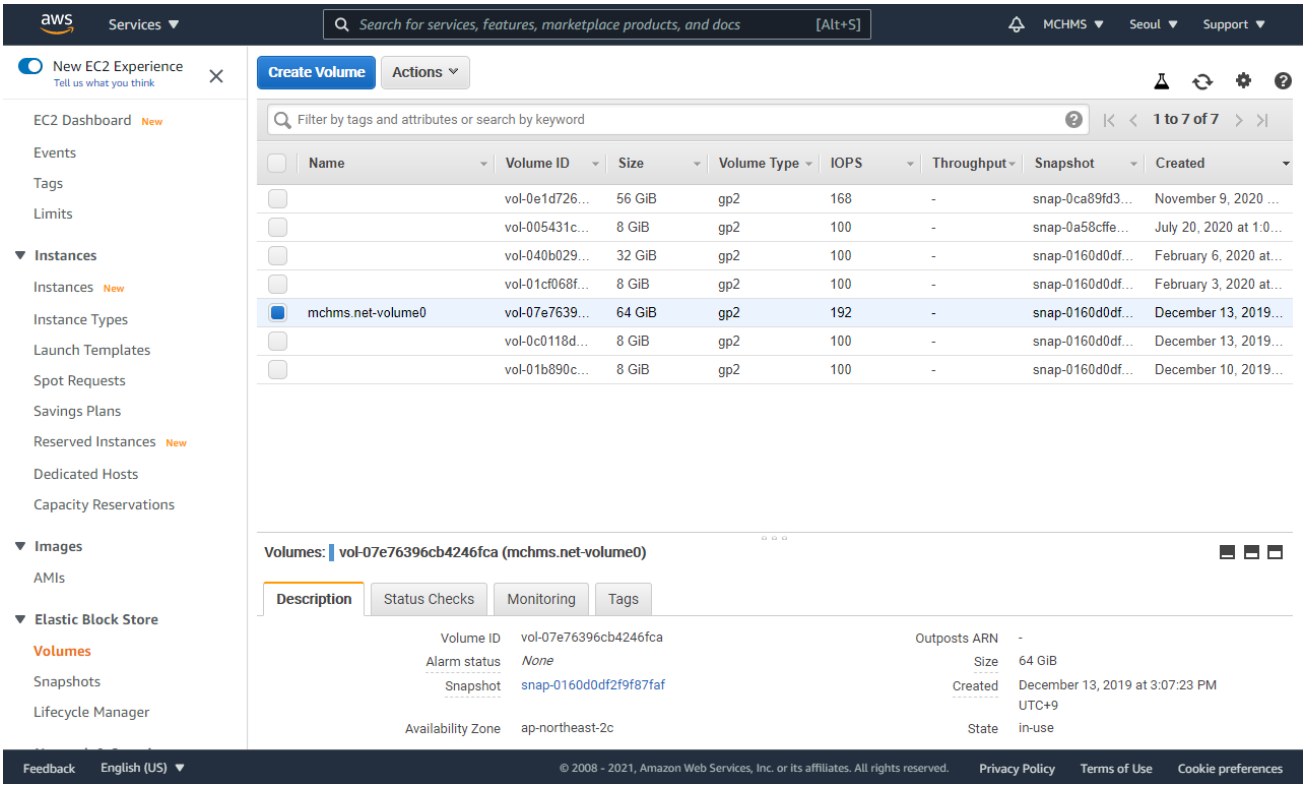


Figure 35. Amazon AWS EC2 EBS Volumes Page

When user access the Volumes page, the EBS Volume list as above is displayed. Find the volume user want to edit and right-click on it.

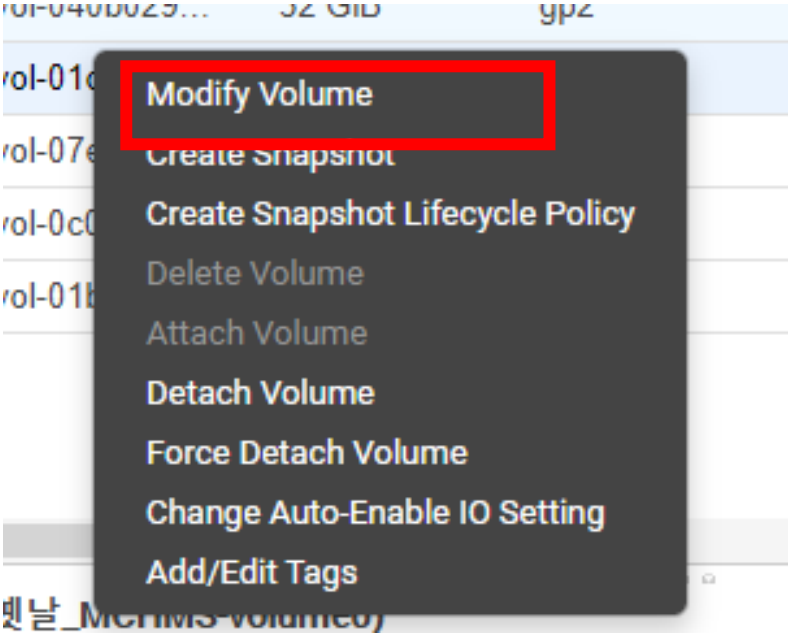


Figure 36. Window after Right-clicking on Amazon AWS EC2 Volume

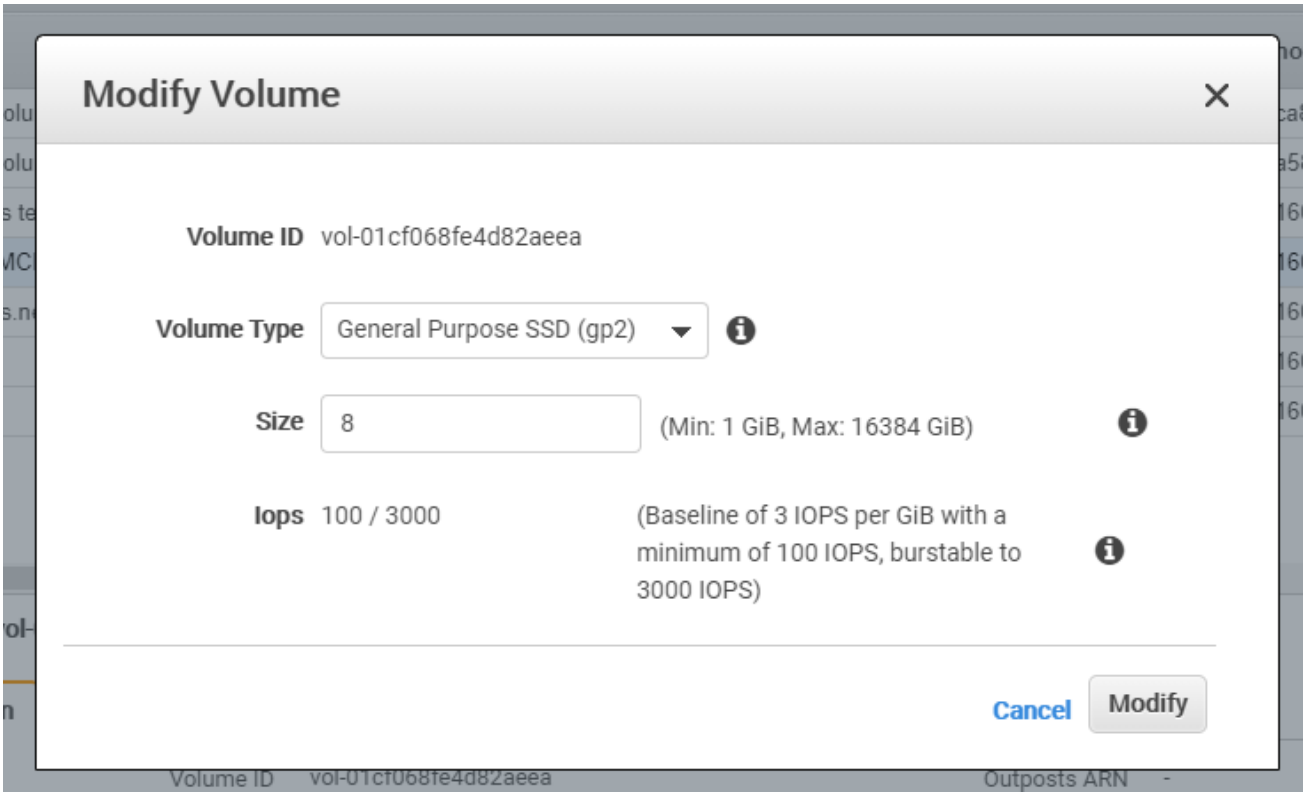


Figure 37. Modify Volume modal window

After that, if user clicks Modify Volume, a modal window appears, where user can enlarge the size of the volume. Once expanded, it cannot be reduced.

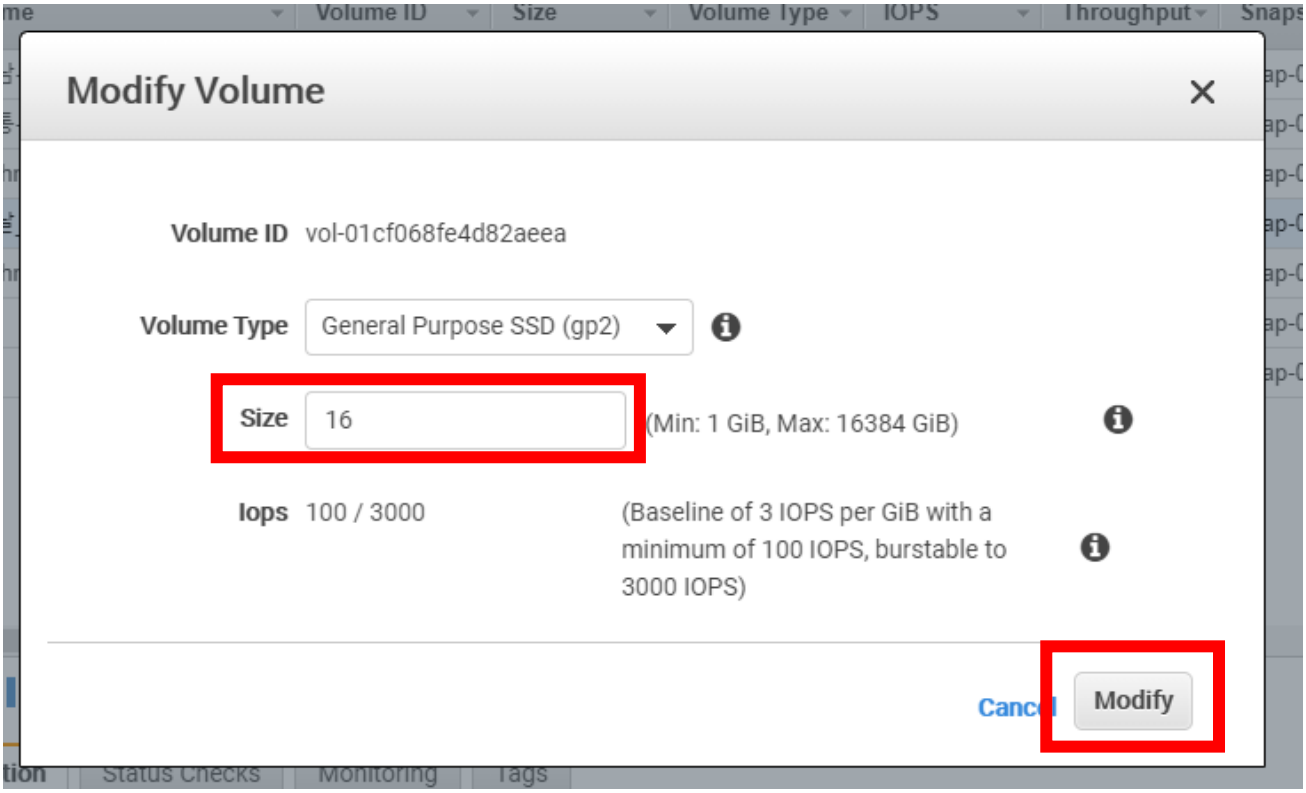


Figure 38. Instance capacity expansion process 1 – Size change

After entering the desired volume size, click the Modify button.

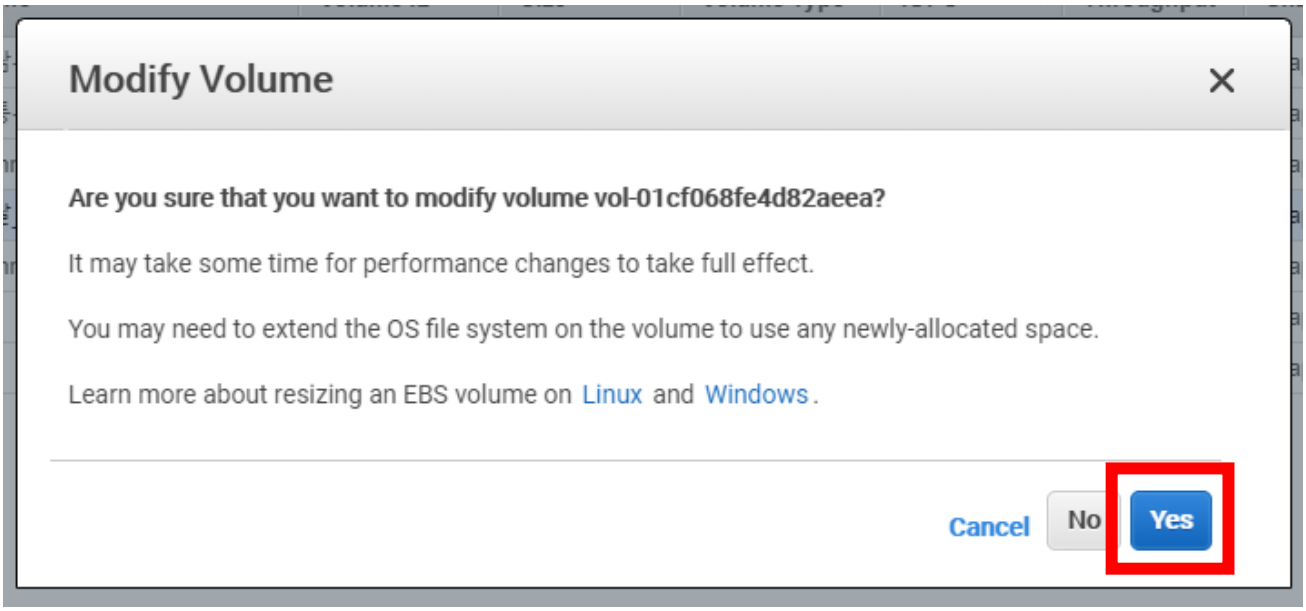


Figure 39. Instance capacity expansion process 2 – Alert window

Click Yes.

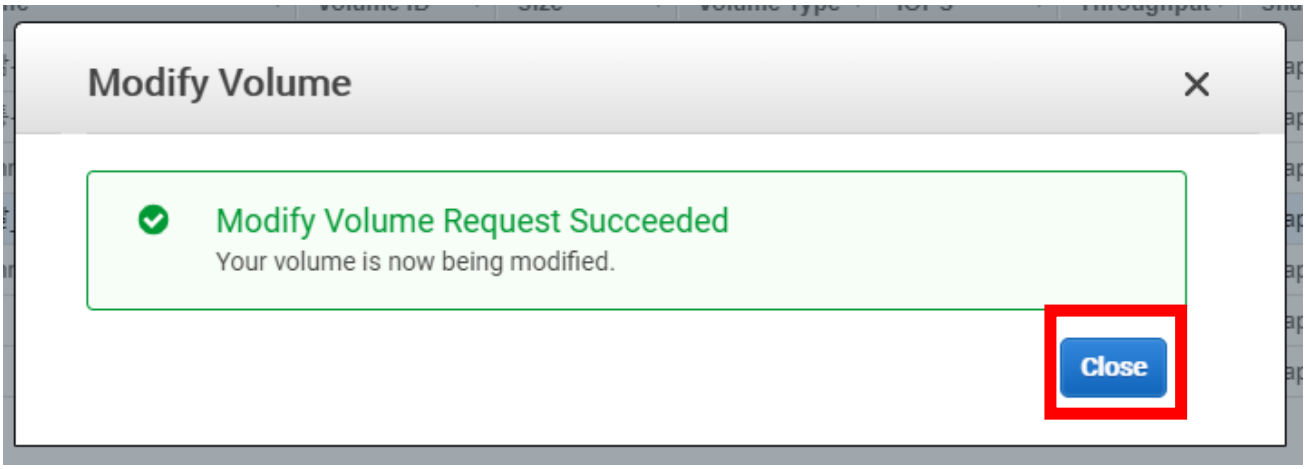


Figure 40. Instance Capacity Expansion Process 3 – Success Message

Click Close

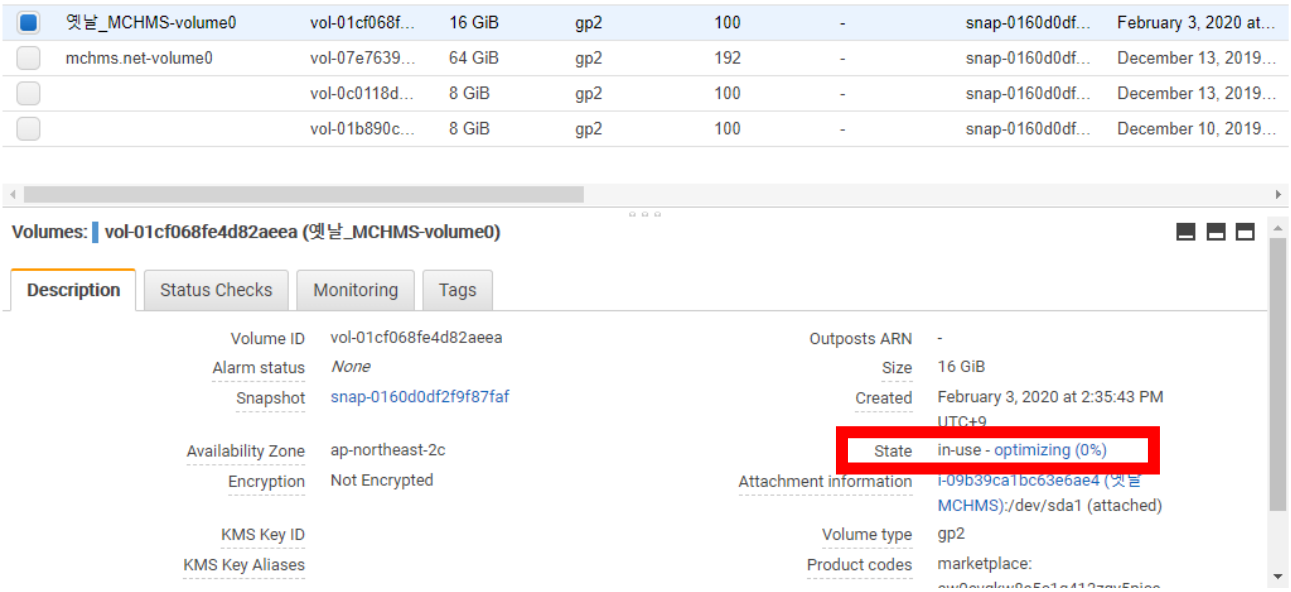


Figure 41. Instance capacity expansion process 4 – Volume capacity expansion

After pressing the volume and checking the following, user can see that the State item has been changed to in-used -optimizing (0%). Wait for it to complete. Once completed, SSH to the instance and log in with the superuser account.

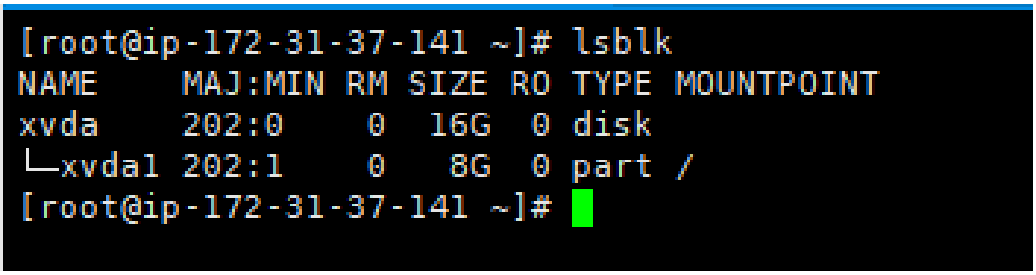


Figure 42. Executing the lsblk command

Execute the lsblk command in ssh to check the block device of the current instance.

xvda (names may vary) is the size of the physical disk volume, and xvda1 is the block size of the currently available logical partition. It can be seen that the capacity is different from each other.

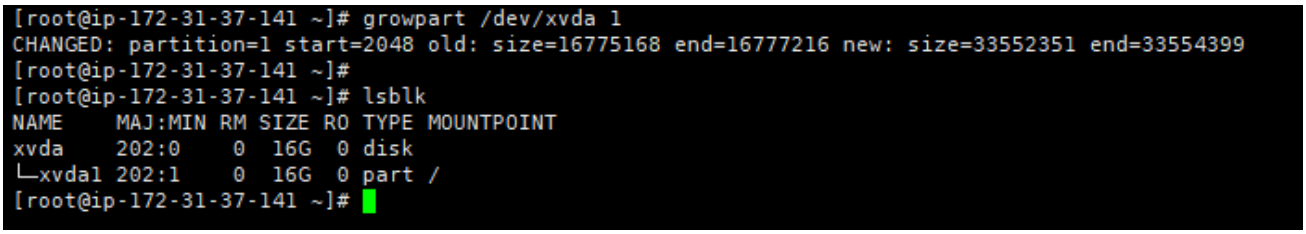


Figure 43. Running the growpart command

Execute the growpart /dev/xvda 1 command to maximize the xvda1 partition block size. If user run lsblk again after that, user can see that the block size of xvda1 has increased to 16GB.

```
[root@ip-172-31-37-141 ~]# df -lh
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        472M     0  472M   0% /dev
tmpfs           493M     0  493M   0% /dev/shm
tmpfs           493M   13M  480M   3% /run
tmpfs           493M     0  493M   0% /sys/fs/cgroup
/dev/xvda1      8.0G  3.1G  5.0G  39% /
tmpfs            99M     0   99M   0% /run/user/0
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]# xfs_growfs -d /
meta-data=/dev/xvda1             isize=512    agcount=4, agsize=524224 blks
         =                       sectsz=512   attr=2, projid32bit=1
         =                       crc=1        finobt=0 spinodes=0
data     =                       bsize=4096   blocks=2096896, imaxpct=25
         =                       sunit=0      swidth=0 blks
naming   =version 2              bsize=4096   ascii-ci=0 ftype=1
log      =internal               bsize=4096   blocks=2560, version=2
         =                       sectsz=512   sunit=0 blks, lazy-count=1
realtime =none                   extsz=4096   blocks=0, rtextents=0
data blocks changed from 2096896 to 4194043
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]# df -lh
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        472M     0  472M   0% /dev
tmpfs           493M     0  493M   0% /dev/shm
tmpfs           493M   13M  480M   3% /run
tmpfs           493M     0  493M   0% /sys/fs/cgroup
/dev/xvda1       16G  3.1G   13G  20% /
tmpfs            99M     0   99M   0% /run/user/0
[root@ip-172-31-37-141 ~]#
```

Figure 44. Executing the xfs_growfs command

However, the root partition is not yet extended. If user check by executing the df -lh command, user can see that the capacity of the mounted root partition is 8GB. In order to increase the capacity of the root partition, the xfs_growfs command must be executed.

Example log

```
[root@ip-172-31-37-141 ~]# fdisk -l

Disk /dev/xvda: 17.2 GB, 17179869184 bytes, 33554432 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x000b956b
```

```
      Device Boot      Start         End      Blocks   Id  System
/dev/xvda1   *        2048    16777215     8387584   83  Linux
[root@ip-172-31-37-141 ~]# clear
[root@ip-172-31-37-141 ~]# blkls
-bash: blkls: command not found
[root@ip-172-31-37-141 ~]# lsblk
NAME    MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda    202:0    0  16G  0 disk
└─xvda1 202:1    0   8G  0 part /
[root@ip-172-31-37-141 ~]# clear
[root@ip-172-31-37-141 ~]# lsblk
NAME    MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda    202:0    0  16G  0 disk
└─xvda1 202:1    0   8G  0 part /
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]# growpart /dev/xvda 1
CHANGED: partition=1 start=2048 old: size=16775168 end=16777216 new: size=33552351
end=33554399
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]# lsblk
NAME    MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda    202:0    0  16G  0 disk
└─xvda1 202:1    0  16G  0 part /
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]# df -lh
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        472M     0  472M   0% /dev
tmpfs           493M     0  493M   0% /dev/shm
tmpfs           493M   13M  480M   3% /run
tmpfs           493M     0  493M   0% /sys/fs/cgroup
/dev/xvda1      8.0G  3.1G  5.0G  39% /
tmpfs            99M     0   99M   0% /run/user/0
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]# xfs_growfs -d /
```

```
meta-data=/dev/xvda1              isize=512    agcount=4, agsize=524224 blks
         =                        sectsz=512   attr=2, projid32bit=1
         =                        crc=1        finobt=0 spinodes=0
data     =                        bsize=4096   blocks=2096896, imaxpct=25
         =                        sunit=0      swidth=0 blks
naming   =version 2               bsize=4096   ascii-ci=0 ftype=1
log      =internal                bsize=4096   blocks=2560, version=2
         =                        sectsz=512   sunit=0 blks, lazy-count=1
realtime =none                    extsz=4096   blocks=0, rtextents=0
data blocks changed from 2096896 to 4194043
[root@ip-172-31-37-141 ~]#
[root@ip-172-31-37-141 ~]# df -lh
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        472M     0  472M   0% /dev
tmpfs           493M     0  493M   0% /dev/shm
tmpfs           493M   13M  480M   3% /run
tmpfs           493M     0  493M   0% /sys/fs/cgroup
/dev/xvda1       16G  3.1G   13G  20% /
tmpfs            99M     0   99M   0% /run/user/0
[root@ip-172-31-37-141 ~]#
```

7. System management

5.1 How to access SSH

5.2 How to edit homepage

5.3 Database backup and recovery methods

5.4 Authorizing users directly with phpMyAdmin

(1) After entering mchms.net/phpmyadmin, click MCHMS->User table

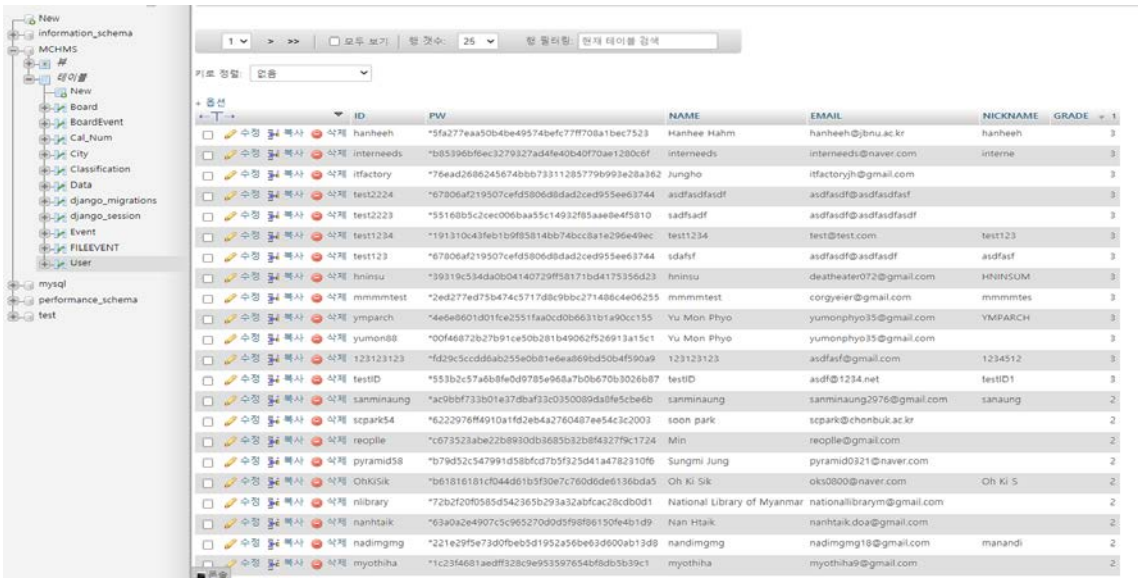


Figure 45.

(2) After 'double-clicking' GRADE in the corresponding row, user can change the value and authority.

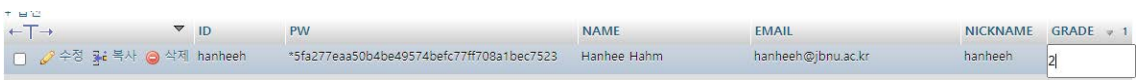


Figure 46.

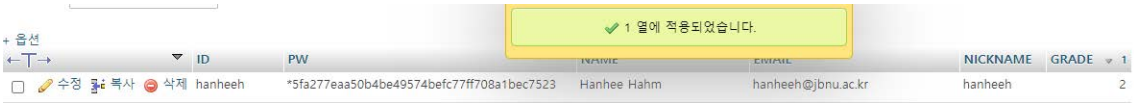


Figure 47.

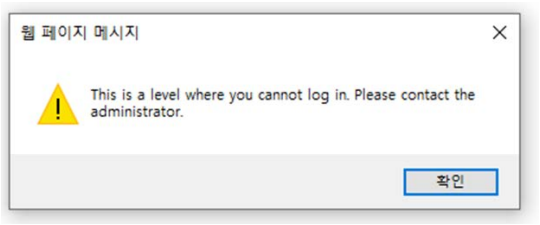


Figure 48.

If grade is 3, login is impossible



Figure 49.

If grade is 1,2, login is possible

8. System description

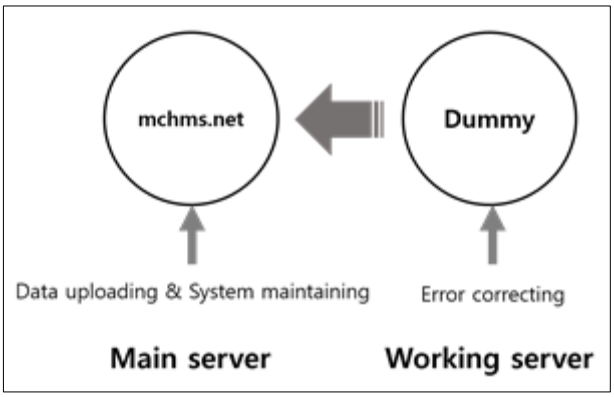


Figure 50. Current System model

Pic 1. Showing the current working system

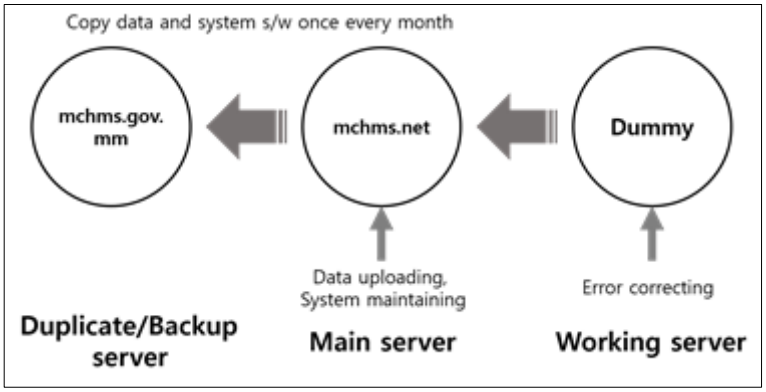


Figure 51. 2+1 System

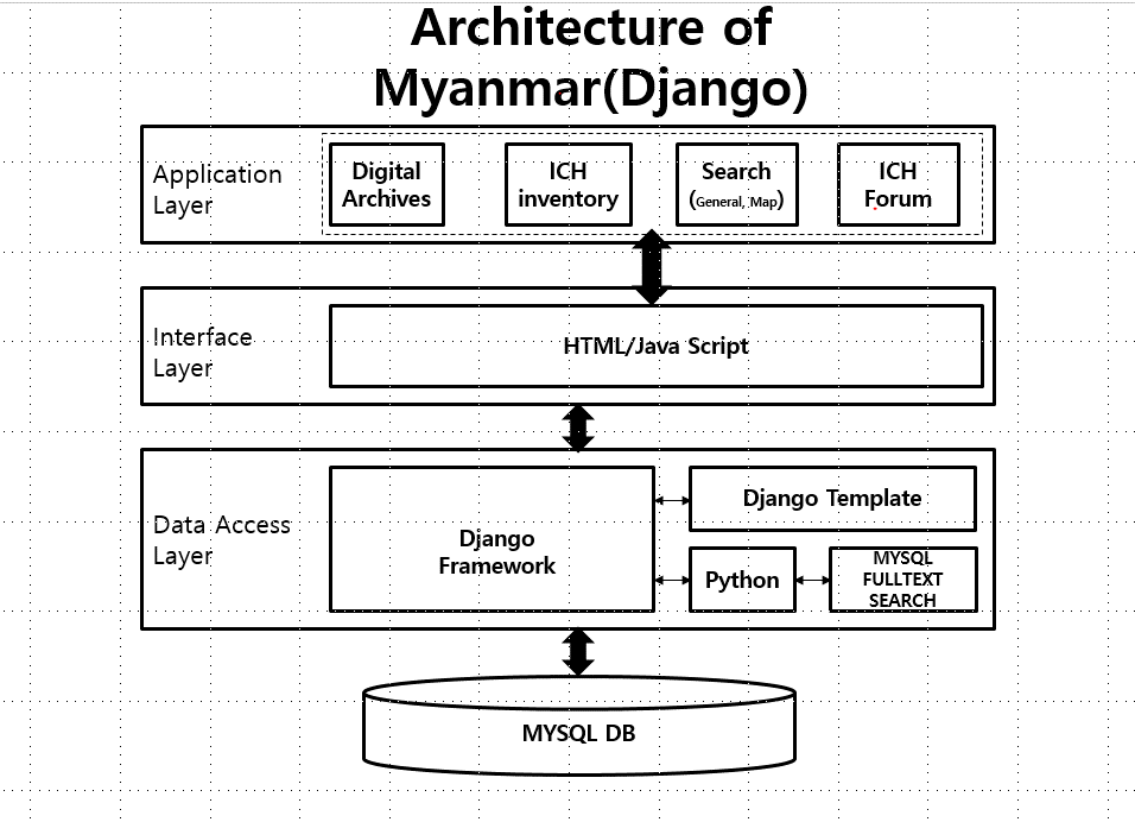
Pic 2. Showing the 2+1 시스템

Currently, two sites, mchms.net, mchms.gov.mm, and one mchms.net test server are being operated. mchms.net is a Spring and Django Framework server coexist, and mchms.gov.mm is developed as a Spring Framework server.

mchms.gov.mm does not have the ability to log in and write, only read. Actual data is uploaded to mchms.net, and the data uploaded to mchms.net is ported to mchms.gov.mm once a month.

Django has the structure of MVT. It is similar to MVC and consists of Model, View, and Template. Model means data, View means business logic, and Template means page to respond to.

The structure of Mchms.net is shown in the figure.



When an HTTP request comes in, it connects to the View (views.py) in the appropriate location from URLs (urls.py). In this view, data is read or loaded from the model (models.py) linked with the DB. HTTP Response is made by connecting this data and Template (.html).

mchms.gov.mm basically consists of Controller and Service Template.

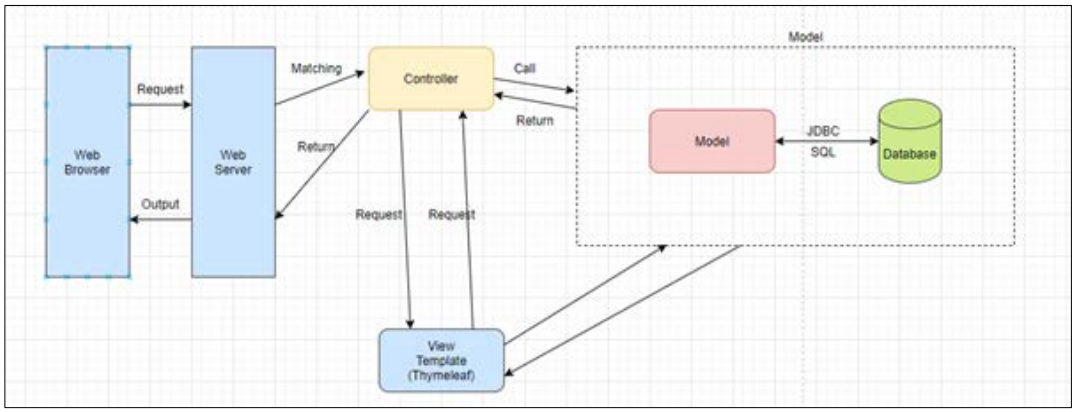
The controller controls the system and transforms the data.

Service inserts, deletes, and transforms data in DB.

Controller and Service are in JAVA.

Template is in charge of being displayed in the actual browser.

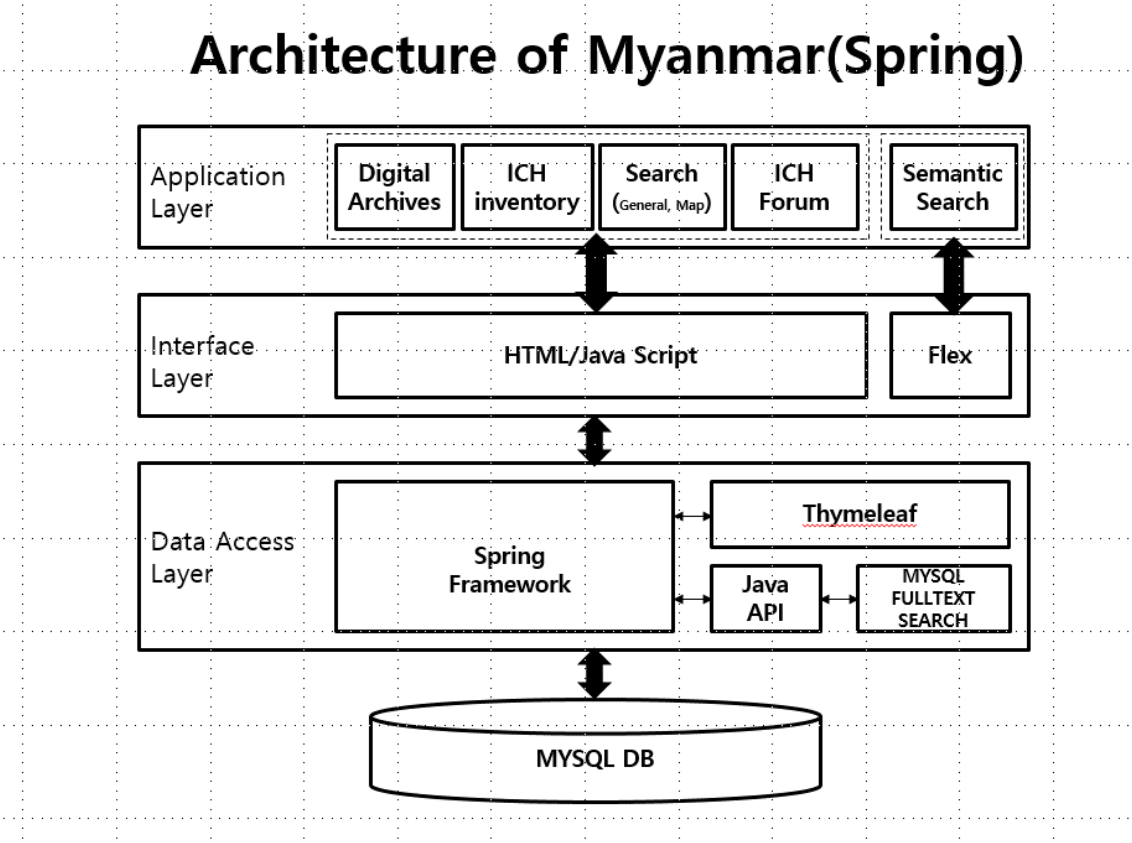
Template는 실제 브라우저에서 보여지는 일을 담당한다. Thymeleaf로 되어있고,



It is made of Thymeleaf, and when a user makes a URL request, it finds a controller that can handle this request and delivers the request. The controller that receives this request accesses the DB by calling the service. If you bring data from DB and pass it to the controller, the controller processes the received data and passes it to the template.

3. Developer Manual

(1) System strucrue



A. Service has a function to access DB and get data. It is divided by table.

B. Templates are divided into pages. Html file exists, and user can call Template by specifying the path in View.

1) Base is a part of every page and shows the search bar, login window and list of cities.

2) Login is connected to Register. Admin can log in or register as a member using your ID and password.

3) Register is a page for registering as a member. Admin can register an ID using ID, PW, Name, and Email.

4) Main is connected to Search. Admin can see articles from any city.

5) In Search, User can see the results searched for in the Base, or when User select a region, User can see the data related to the region. If User select Advanced, User can search in more detail. User can search by combining the contents of Title, Remark, Registrant, Registration date, and Serial Number with and, or, not. Also, using the registered coordinates of the data, it appears on the map and can be checked by region, and when you press Serial, Region, Classification, Title, or Registration date, it is sorted in ascending and descending order.

6) View displays input data.

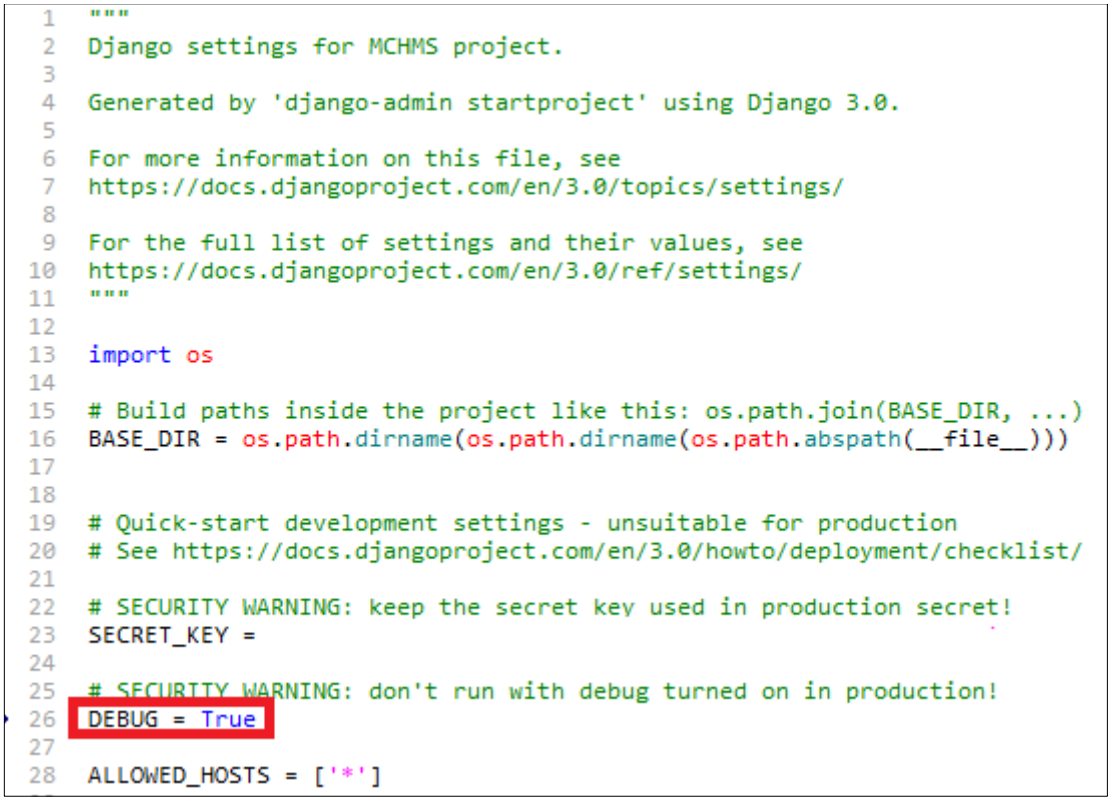
7) Write can input data. Classification is used to classify "characteristics of data" and Serial Number indicates registration information of data. Visibility allows you to decide whether to disclose or not.

8) Modify can modify the input data.

C. Django - If admin wants to know the location of the error, user can connect to the TELNET client and check it in vi (or cat) /var/log/httpd/error_log. If you change DEBUG = True in vi home/centos/public_html/MCHMS/MCHMS/setting.py, admin can check the error on the homepage as well.

Spring - Log appears in the location written in ₩src₩main₩resources₩logback.groovy. Check the log in this location and correct the error.

```
logFileRootPath = '/install/log/MCHMS/'
```



```
"""
Django settings for MCHMS project.

Generated by 'django-admin startproject' using Django 3.0.

For more information on this file, see
https://docs.djangoproject.com/en/3.0/topics/settings/

For the full list of settings and their values, see
https://docs.djangoproject.com/en/3.0/ref/settings/
"""

import os

# Build paths inside the project like this: os.path.join(BASE_DIR, ...)
BASE_DIR = os.path.dirname(os.path.dirname(os.path.abspath(__file__)))


# Quick-start development settings - unsuitable for production
# See https://docs.djangoproject.com/en/3.0/howto/deployment/checklist/

# SECURITY WARNING: keep the secret key used in production secret!
SECRET_KEY =

# SECURITY WARNING: don't run with debug turned on in production!
DEBUG = True

ALLOWED_HOSTS = ['*']
```

D. Currently, MCHMS is divided into three servers. mchms.gov.mm running on the local server in Myanmar, mchms.net running on the aws server, and 54.180.30.69 being used in the dummy server for testing. have.

IP = 15.164.222.63

ID = ****

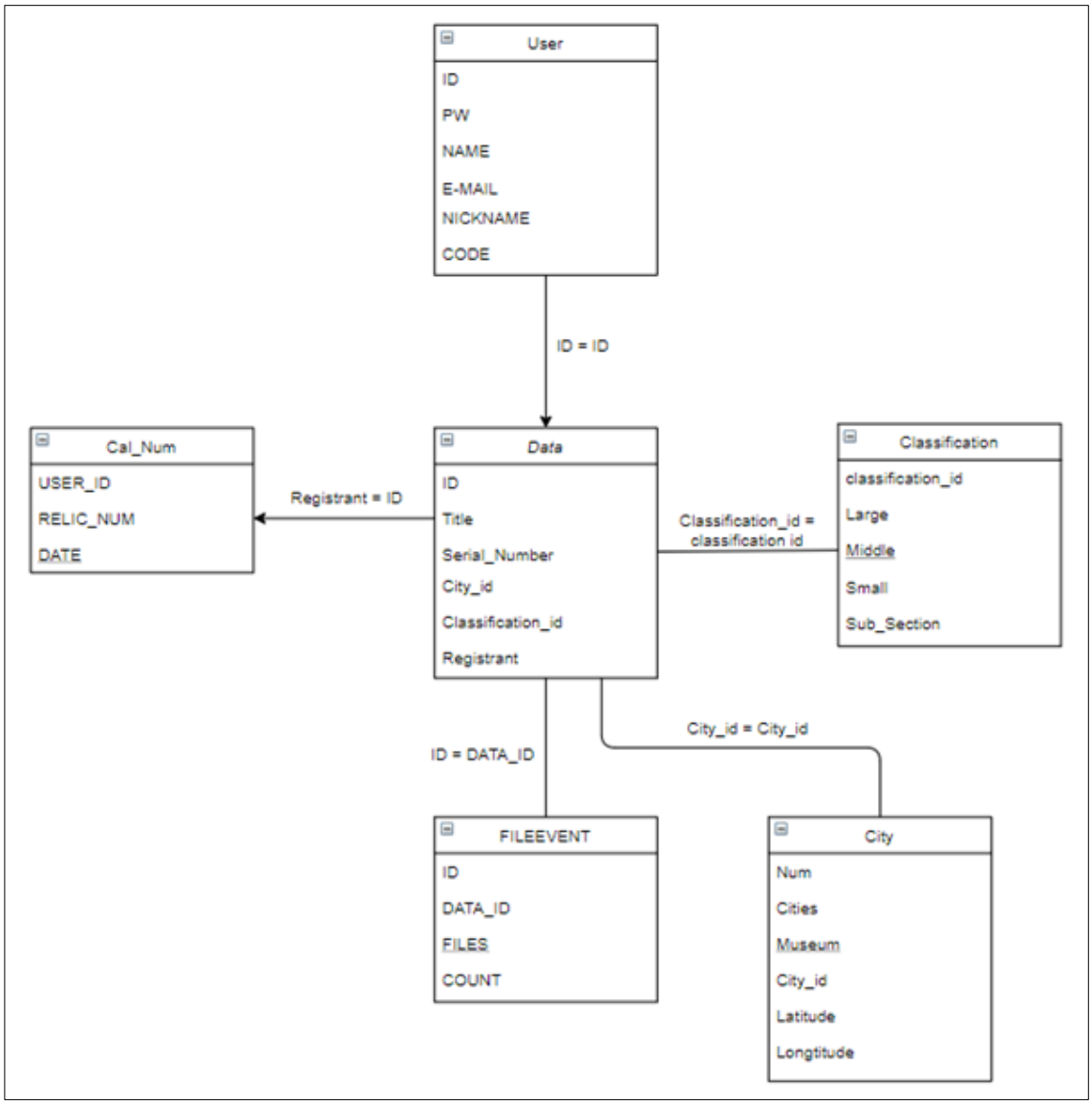
PW = ************

Database

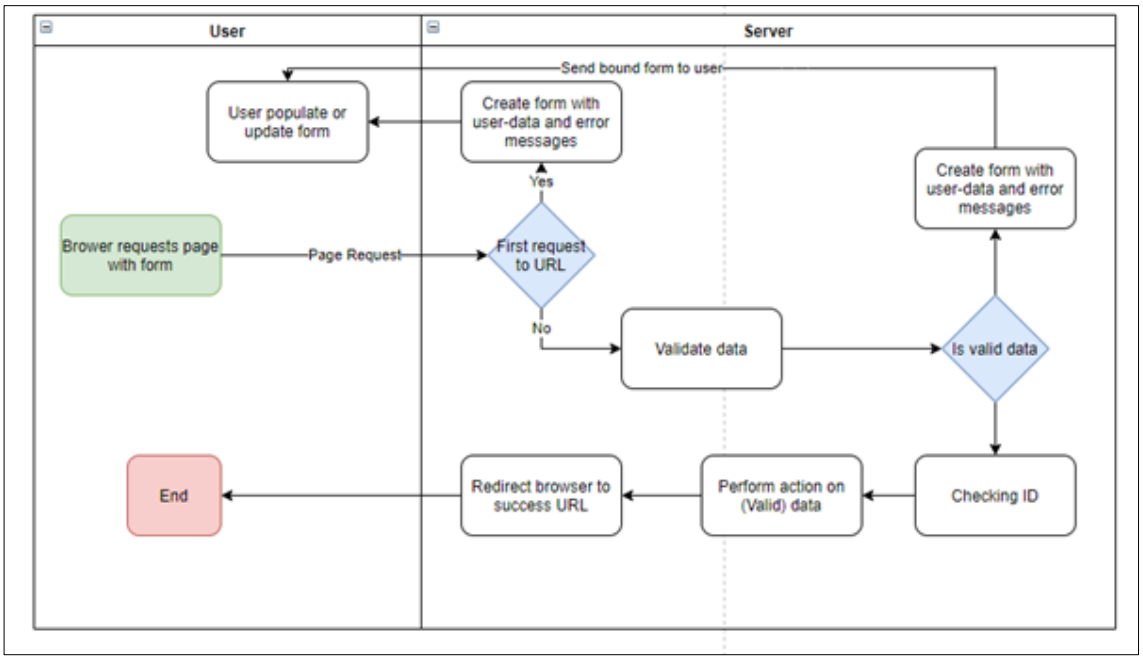
ID = ****

PW = *******

E. DB Structure



F. DFD

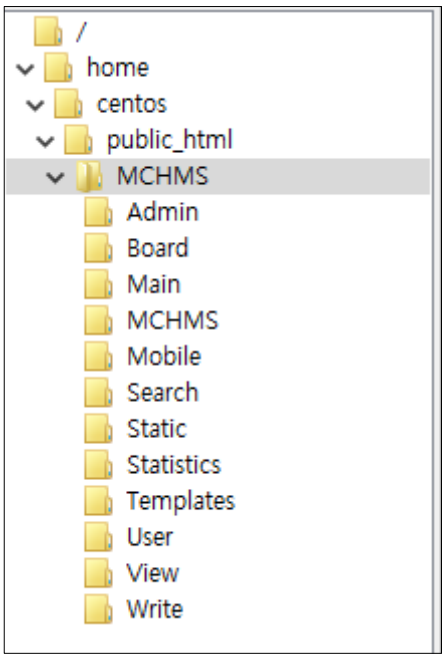

User
Server
Send bound form to user
User populate or update form
Create form with user-data and error messages
Create form with user-data and error messages
Yes
Brower requests page with form
Page Request
First request to URL
No
Validate data
Is valid data
End
Redirect browser to success URL
Perform action on (Valid) data
Checking ID

4. How to edit a page

After connecting to the above server information, it goes into /home/centos/public_html/MCHMS/MCHMS/urls.py. Each folder has a folder called urls.py. As mentioned in the Django structure, when an HTTP request comes in, urls.py handles this request.

In this urls.py, user can find a path using a variable with the same name as the url. (path('MCHMSLogin/', views.MCHMSLogin),) The left argument of the path function is url, and the right argument is the function name of the view. . There is a file called views.py in the folder of Urls.py.

You can find a function called MCHMSLogin in this file. In this function, if data and template are called and HTTP response is made, a login window appears on the screen.



(1) When design modifications are necessary

- The default location of templates is /home/centos/public_html/MCHMS/Templates/. As mentioned above, admin can find the Template and edit the design afterwards.

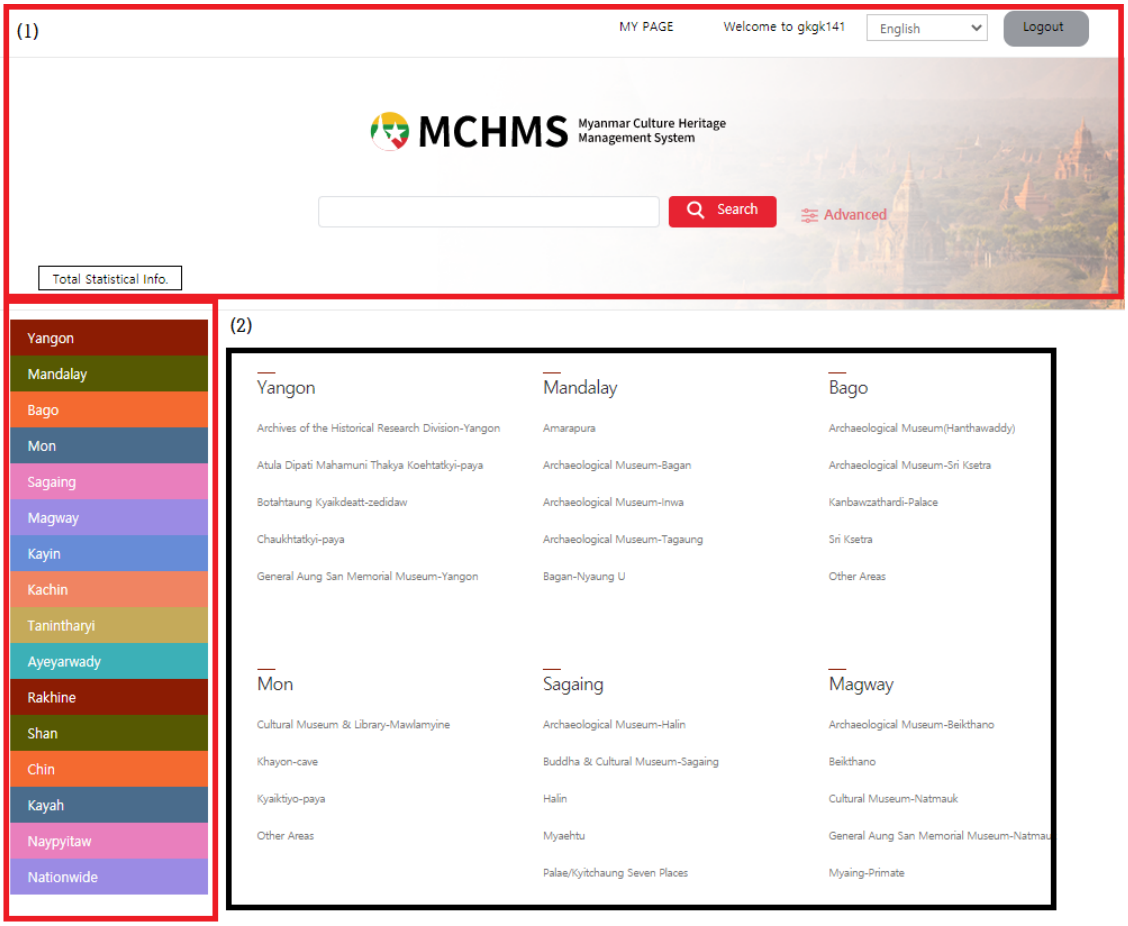
(2) When back-end part correction is necessary

- The back-end part can be modified in View.py. Django is based on Python, so you can modify it with Python.

If Apache is not restarted after steps 1 and 2 are completed, the changes will not be applied properly. Restart Apache by typing systemctl restart httpd in the shell.

5. Revision location and details of each page (Front)

1) Main Page



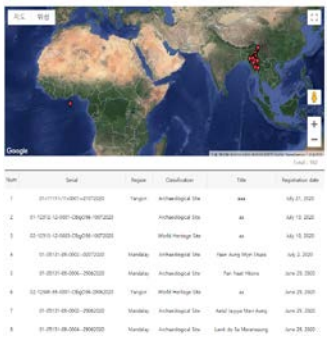
It consists of two html.

(1) - It can be modified in Template_Base.html and is responsible for the menu bar and search box.

- Use MCHMSWrite, MCHMSModify and Template_Base.html together.

(2) - It is possible to edit in Main/Main.html and shows each city and detailed city.

2) Search

		
MCHMSLargeSearch	MCHMSSearch	MCHMSSearch_process

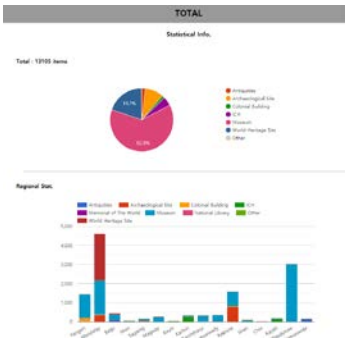
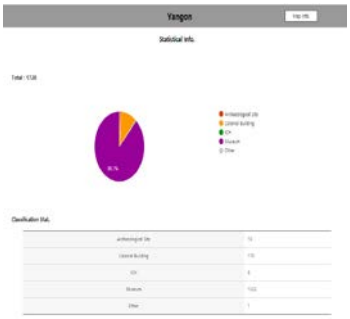
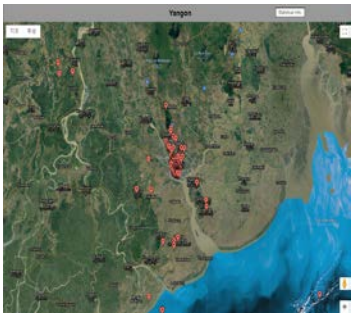
Search/MCHMSSearch.html is used as a same source, but the approach is different.

(1) - MCHMSLargeSearch is the result screen that appears when user select Classification from the left menu.

(2) - MCHMSSearch is the result screen that appears when user search or click the detailed city name in 1)-2.

(3) - MCHMSSearch_process is the screen displayed through Advanced.

3) Statistics

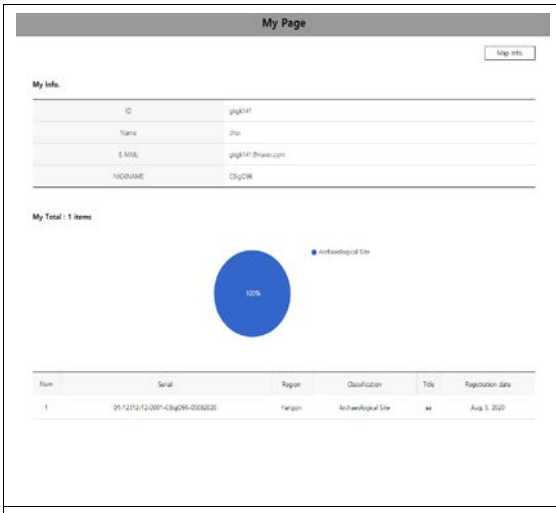
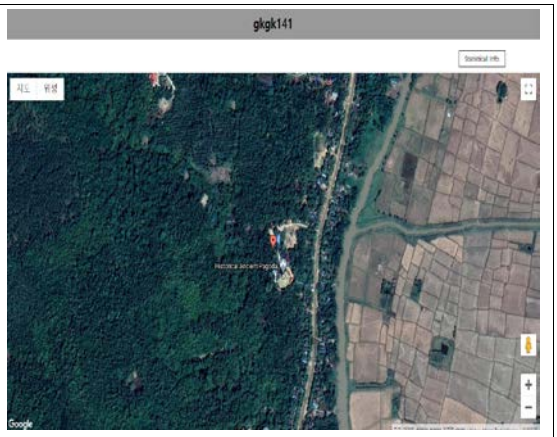
		
all_Statistics	Statistics	Statistics_Map

(1) - It can be modified in Statistics/all_Statistics and shows the total information and the saved values for each city.

(2) - It can be modified in Statistics/Statistics and shows information and result values for each city.

(3) - It can be modified in Statistics/Statistics_Map and the location is shown on the map.

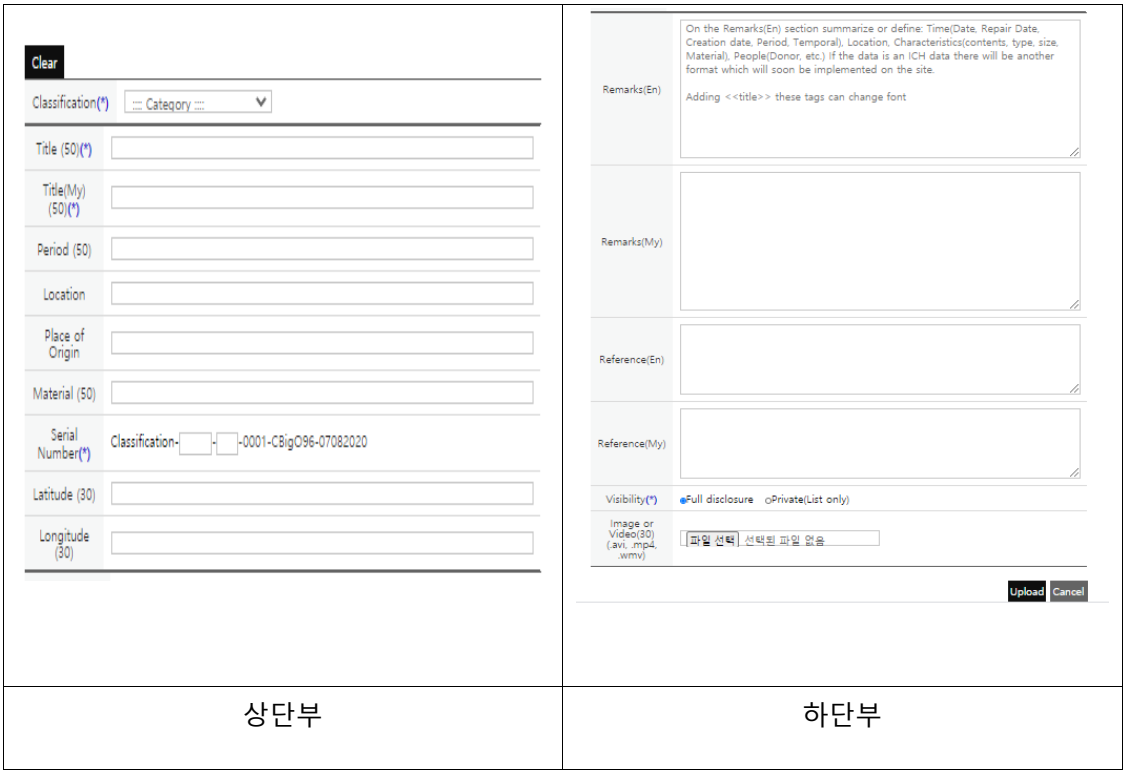
4) Mypage

	
Mypage	Contents_User

(1) - It can be edited in Mypage/Mypage, and the result of the user's information and uploaded data is displayed.

(2) - It can be edited in Contents_User and the user's information is displayed as a Map.

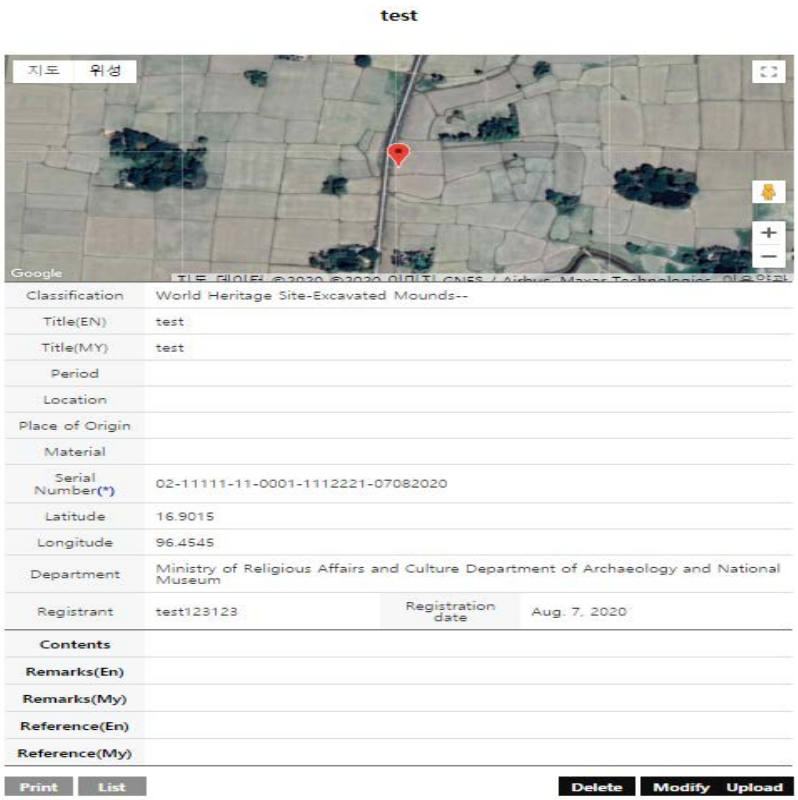
5) Upload



상단부	하단부

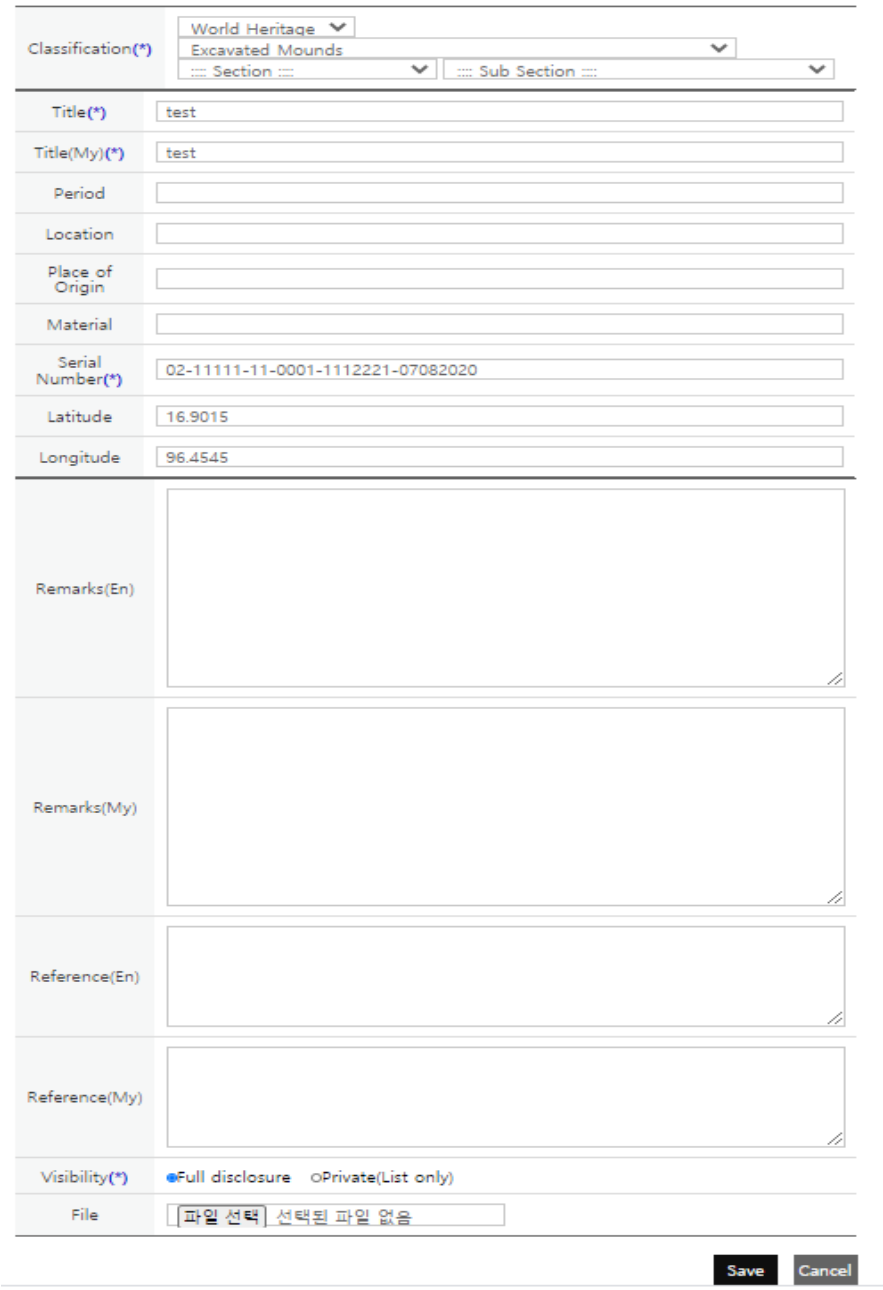
- Editing is possible in Write/MCHMSWrite.html. This is the page to insert data.

6) View



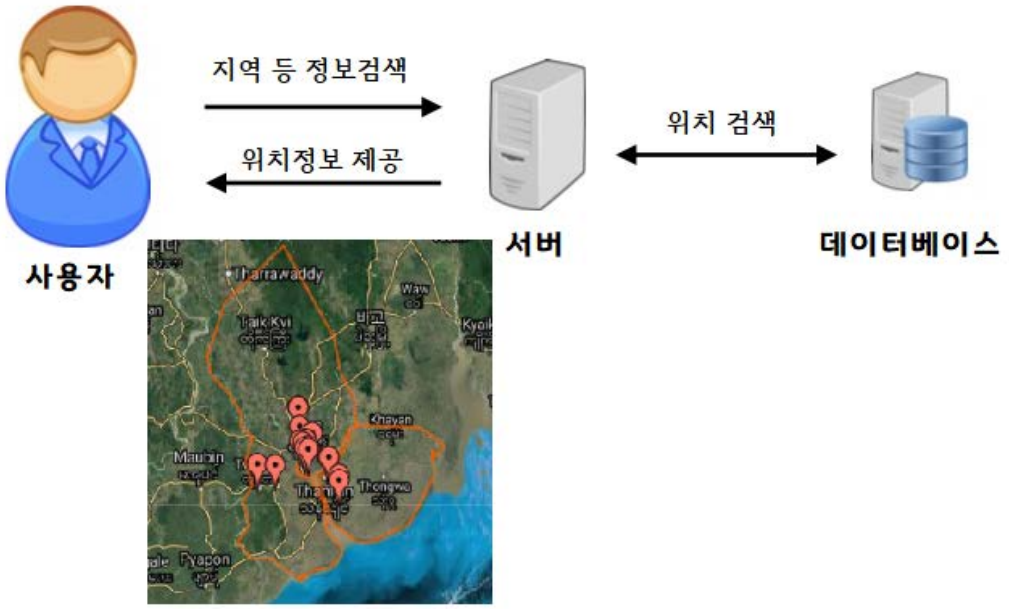
- Modification is possible in View/MCHMSView.html. it Shows information in Data.

7) Modify



- Modification is possible in View/MCHMSModify.html. Data uploaded by the author can be modified.

6. Map Search Principle



Currently, MCHMS is using the Google Maps API. When a user retrieves information such as a region, the server accepts it and retrieves the information from the database. The server displays the retrieved data as a marker on the map.

The information stored in the database has location information such as latitude and longitude and data information such as name and production date and time. If you click the coordinates on the map, you can check the information of the corresponding data.