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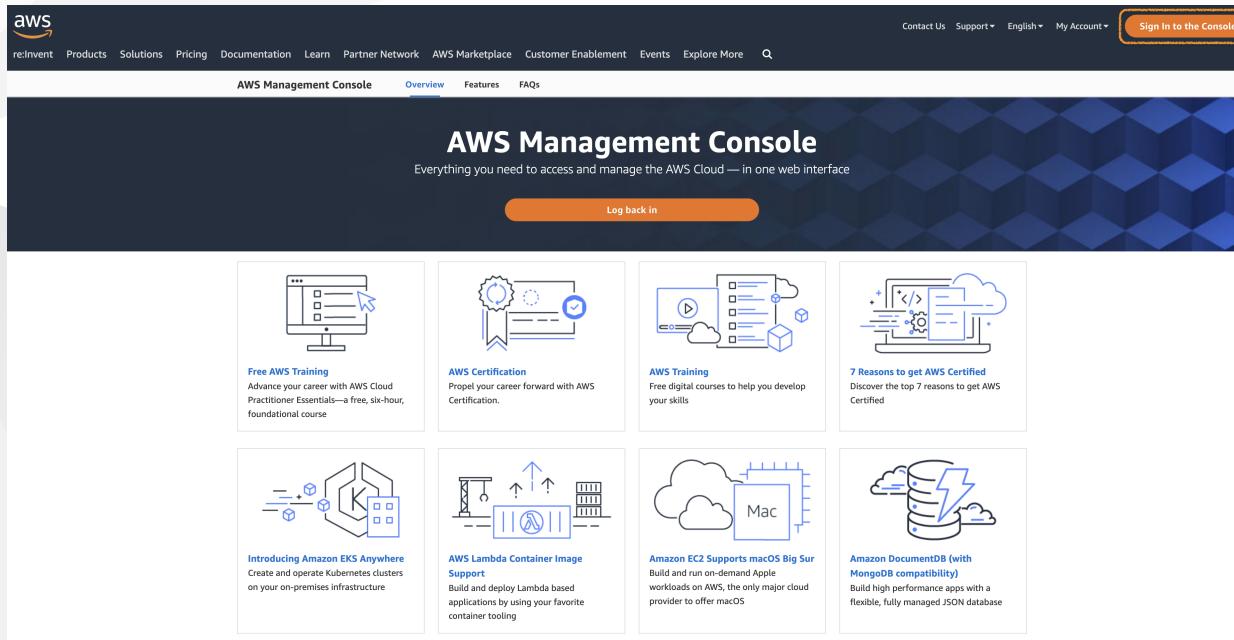
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VM Instance 만들기

실습을 위한 환경구성을 진행합니다.

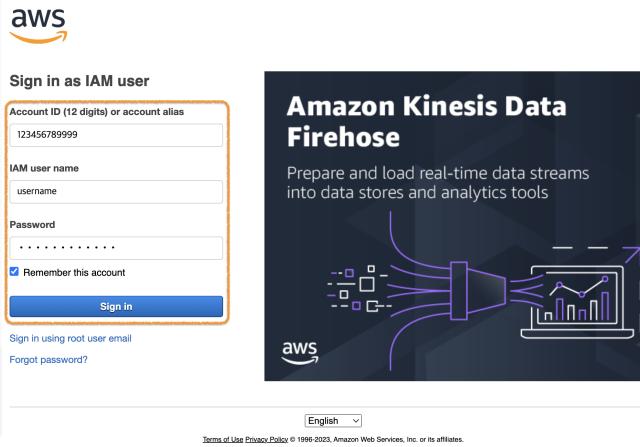
먼저 AWS Console에 로그인합니다.

<https://aws.amazon.com/console/>

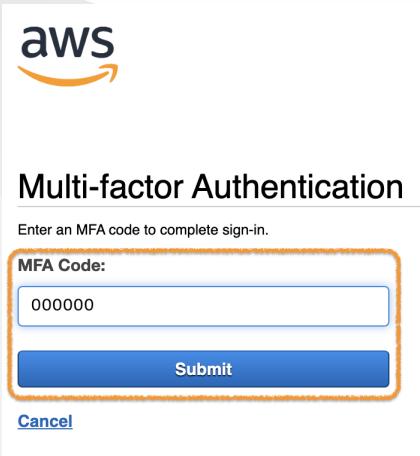


화면 우측 상단의 **Sign in to the Console**을 클릭합니다.

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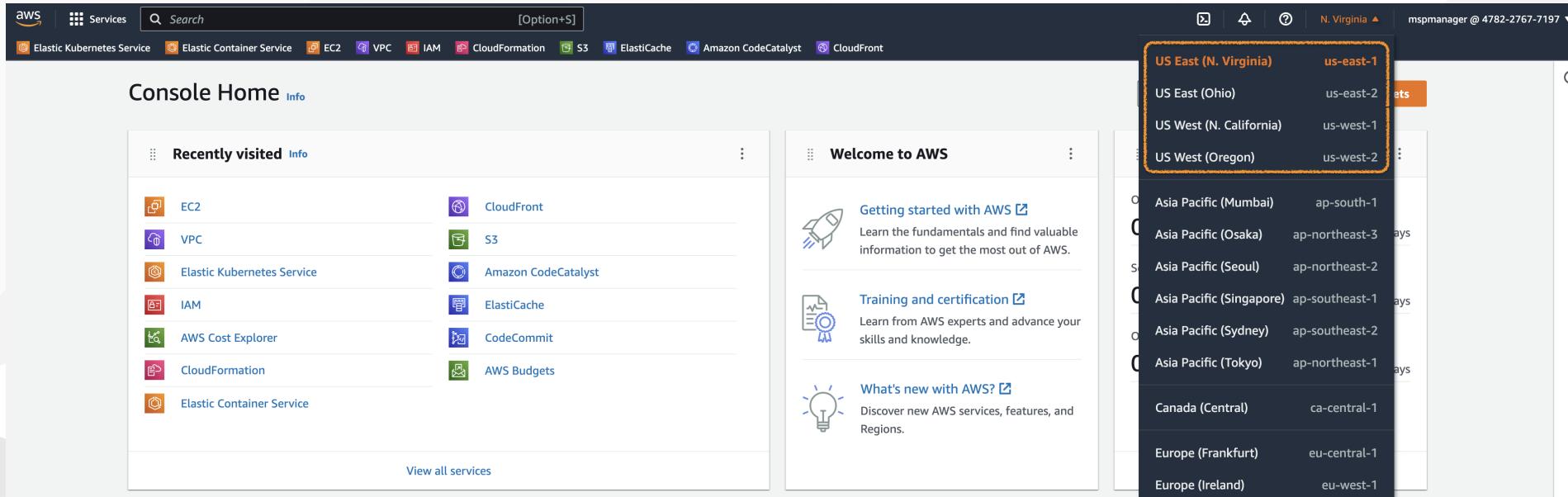


Account ID와 IAM user name을 이용해서 **sign in** 합니다.



MFA 구성한 경우, 위 그림과 같은 화면에서 MFA Code를 입력해야 합니다.

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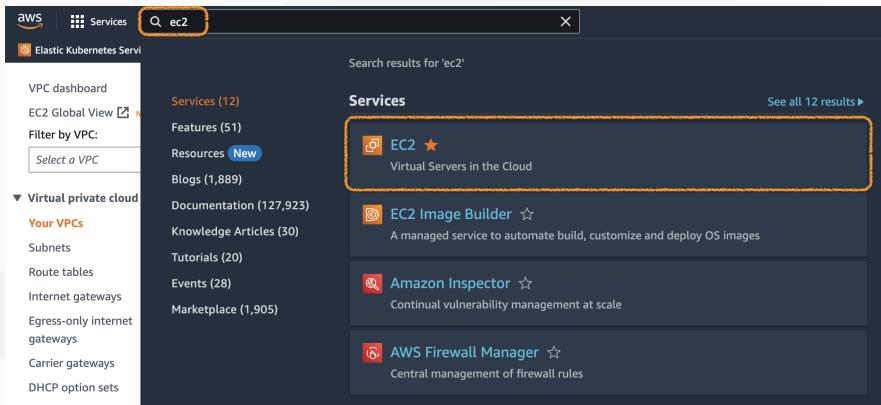


Sign in 후에는 가장 먼저 어느 Region에 VM Instance를 구성할지 결정해야 합니다.
우측 상단 Region 선택 메뉴에서 Region을 선택합니다.

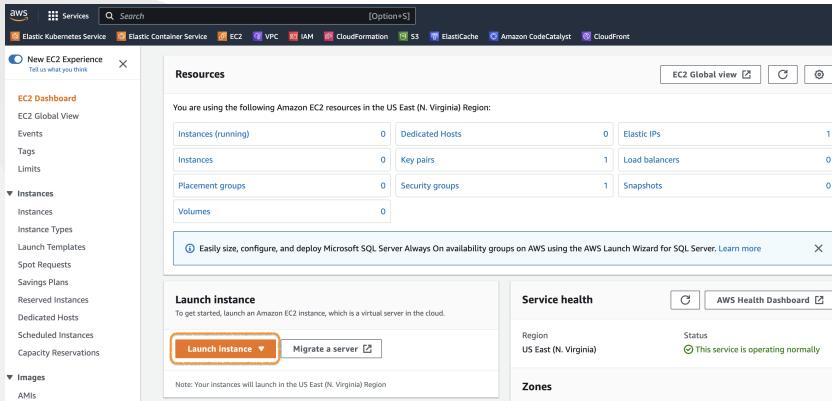
- 조별로 정해진 Region이 있습니다. 확인 후 진행해주세요.

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이제 EC2 Instance를 만들어 보겠습니다.

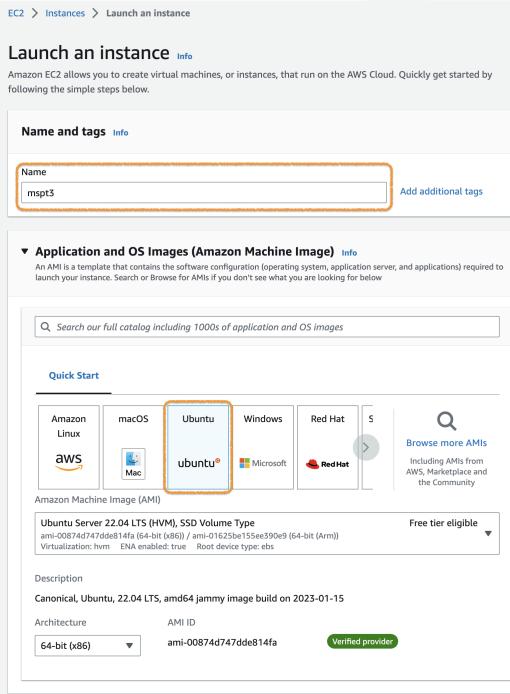


서비스 중에서 EC2를 검색하고 이동합니다.

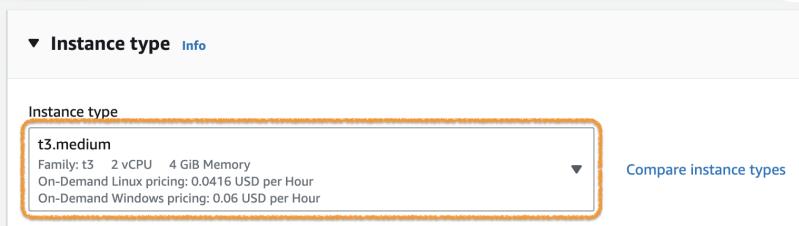


EC2 dashboard 화면에서 **Launch instance** 버튼을 클릭합니다.

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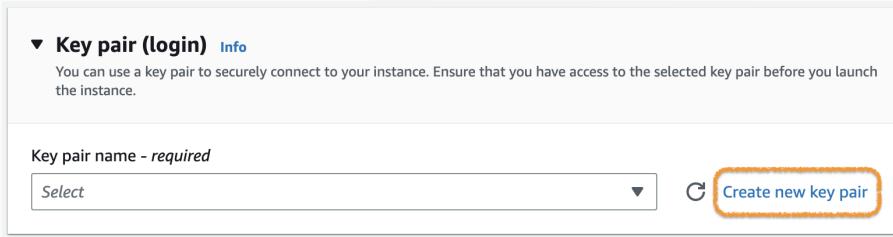


Instance 이름을 mspt3로 하고, AMI(Amazon Machine Image) 중에서 Ubuntu를 선택합니다.

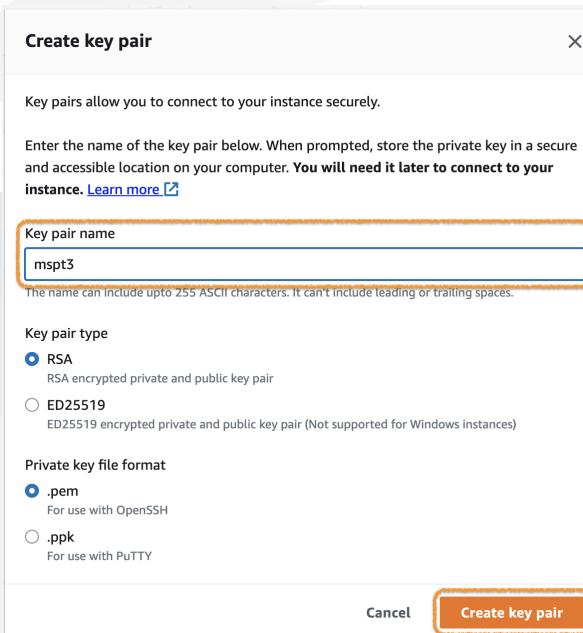


그 다음 Instance type은 t3.medium을 선택합니다.

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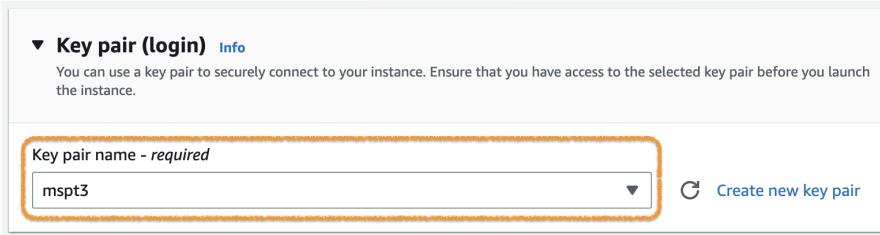
Key pair는 기존의 것을 사용하거나, 없는 경우에는 **Create new key pair**를 눌러 Key pair 생성 화면으로 이동합니다.



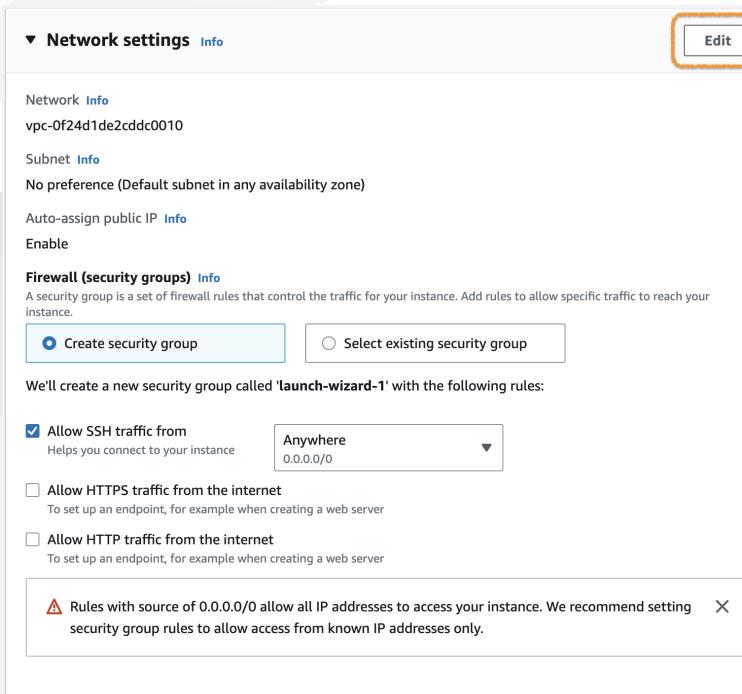
신규 생성이 필요한 경우 Key pair name에 mspt3를 입력하고, RSA type과 .pem format 선택 후 **Create key pair** 버튼을 클릭합니다.

생성되면 브라우저를 통해서 mspt3.pem 파일이 다운로드 됩니다. 잘 보관해두세요.

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다시 Instance 생성 화면으로 돌아오면, 앞에서 생성한 Key pair를 선택할 수 있습니다.



그 다음 Network settings에서 **Edit** 버튼을 클릭하여 상세 설정을 진행합니다.

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▼ Network settings [Info](#)

VPC - required [Info](#)
vpc-0f24d1de2cddc0010 (default) ▾ [Edit](#)

Subnet [Info](#)
subnet-0fb5bda2372ba0fd8 VPC: vpc-0f24d1de2cddc0010 Owner: 478227677197 Availability Zone: us-east-1a ▾ [Edit](#) Create new subnet [Edit](#)
IP addresses available: 4091 CIDR: 172.31.16.0/20

Auto-assign public IP [Info](#)
Enable ▾

Firewall (security groups) [Info](#)
A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

Create security group Select existing security group

Security group name - required
mspt3-sg
This security group will be added to all network interfaces. The name can't be edited after the security group is created. Max length is 255 characters. Valid characters: a-z, A-Z, 0-9, spaces, and -_:/()#,@[]+=&;!\$^*

Description - required [Info](#)
sg for mspt3

Inbound security groups rules

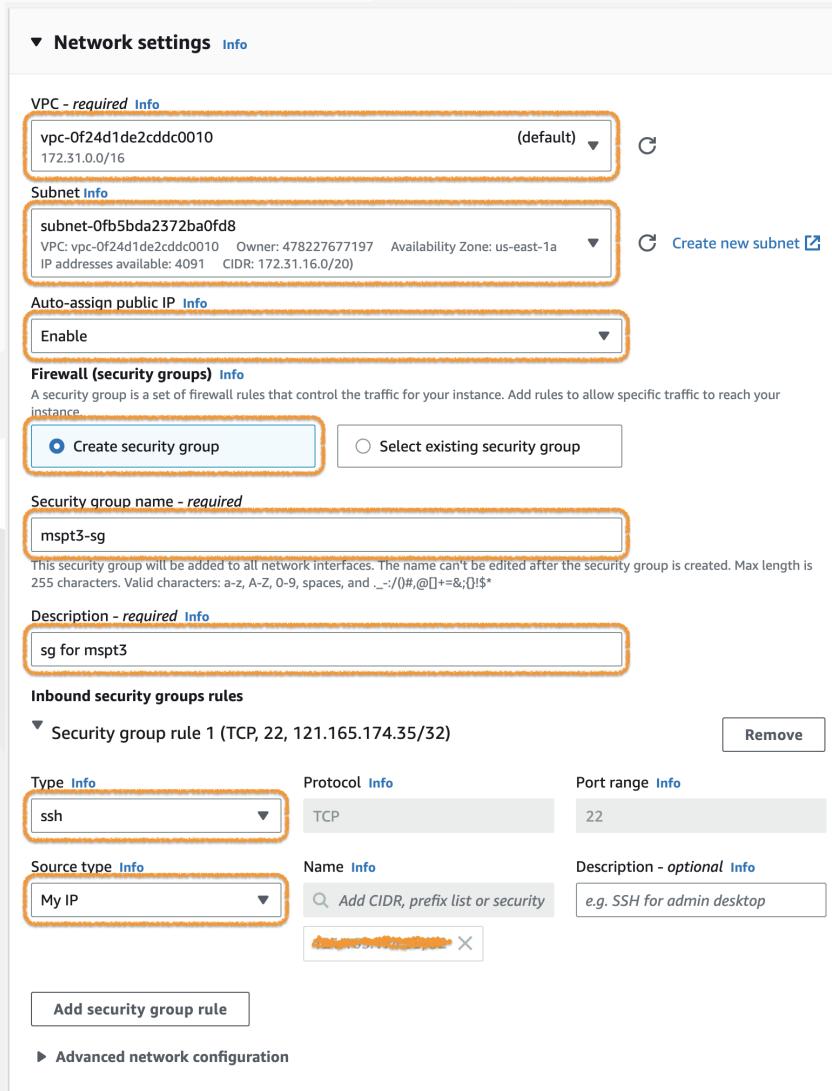
▼ Security group rule 1 (TCP, 22, 121.165.174.35/32) [Remove](#)

Type [Info](#) Protocol [Info](#) Port range [Info](#)
ssh TCP 22

Source type [Info](#) Name [Info](#) Description - optional [Info](#)
My IP Add CIDR, prefix list or security e.g. SSH for admin desktop [Edit](#) X

[Add security group rule](#)

► Advanced network configuration



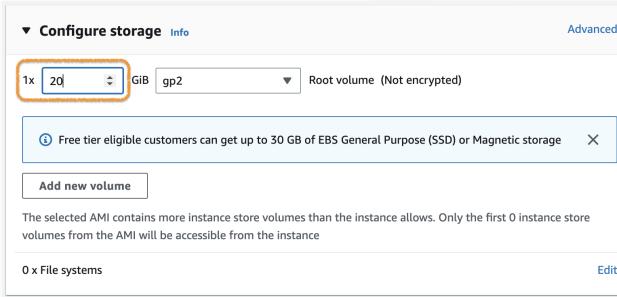
위 그림과 같이 입력합니다. (상세 내용은 다음페이지에 있습니다.)

Network 구성 (Network Settings)

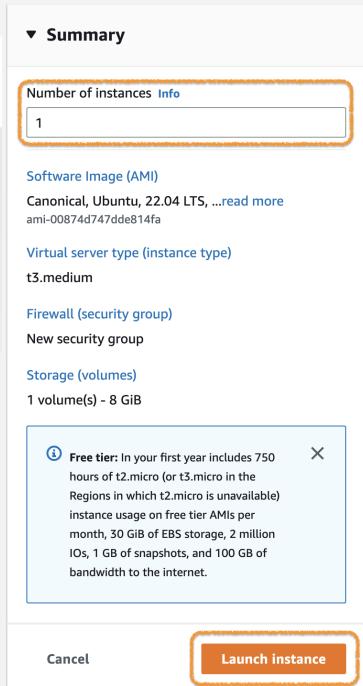
구분	설정
VPC	default VPC를 선택
Subnet	subnet 중 하나를 선택 (public subnet)
Auto-assign public IP	Enable
Firewall (security groups)	Create security group
Security group name	mspt3-sg
Description	sg for mspt3
Inbound security groups rules	ssh (TCP,22) , My IP

■ Security group은 우선 꼭 필요한 ssh (TCP,22) 만 My IP로 설정합니다. (이후에 추가로 설정합니다.)

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Storage를 20GiB로 설정합니다.



Number of instances를 1로 하고 Launch instance 버튼을 클릭합니다.

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The screenshot shows the AWS EC2 Instances page. On the left, there's a sidebar with various navigation options like EC2 Dashboard, EC2 Global View, Events, Tags, Limits, Instances (selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Scheduled Instances, Capacity Reservations, Images (AMIs, AMI Catalog), Elastic Block Store (Volumes, Snapshots, Lifecycle Manager), Network & Security (Security Groups, Elastic IPs, Placement Groups), and Compute Optimizer (Auto-scaling groups). The main area shows a table of instances. One instance, named 'mspt3' with the ID 'i-056c5c12bd39c3028', is selected and highlighted with an orange box. The table columns include Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, Public IPv4 DNS, Public IPv4 address, Elastic IP, and IPv6 IP. Below the table, a detailed view for the 'mspt3' instance is shown. It includes sections for Details, Security, Networking, Storage, Status checks, Monitoring, and Tags. Under the Details tab, the 'Instance summary' section is expanded, showing fields such as Instance ID (i-056c5c12bd39c3028 (mspt3)), Public IPv4 address (highlighted with an orange box), Private IP4 address (10.0.6.166), Instance state (Running), Private IP4 DNS name (ip-10-0-6-166.ec2.internal), Instance type (t3.medium), VPC ID (vpc-06f99ba2841d3459d (mspt3-vpc)), Subnet ID (subnet-0fac9913a344c3c2a (mspt3-subnet-public1-us-east-1a)), and Auto Scaling Group name. Other tabs in the details view include Security, Networking, Storage, Status checks, Monitoring, and Tags.

정상적으로 EC2 Instance가 생성되면 화면과 같이 표시됩니다.

SSH 접속을 위해 필요한 Public IPv4 address 또는 Public IPv4 DNS 정보를 기록해둡니다.

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과정중에는 SSH를 이용한 Instance 접속 외에도, 실행되는 애플리케이션 접속도 필요합니다.
애플리케이션 접속을 위해서 추가적인 Security group 설정을 진행합니다.

The screenshot shows the AWS EC2 Instances page. On the left, the navigation pane is visible with sections like New EC2 Experience, EC2 Dashboard, EC2 Global View, Events, Tags, Limits, Instances (selected), Images, Elastic Block Store, Network & Security, Load Balancing, and Auto Scaling. The main content area shows a table of instances. One instance, named 'mspt3' with the ID 'i-0caeef6441f32c3ba6', is selected and highlighted with an orange border. The 'Security' tab is selected in the instance details panel. Under 'Inbound rules', there is one rule: Name 'sgr-0e6ba8f270d6ad151', Port range '22', Protocol 'TCP', Source '0.0.0.0/0', and Security groups 'mspt3-sg'. Under 'Outbound rules', there is one rule: Name 'sgr-0277dc2c158d84404', Port range 'All', Protocol 'All', Destination '0.0.0.0/0', and Security groups 'mspt3-sg'. The 'mspt3-sg' link in the security group column of the inbound rules table is also highlighted with an orange border.

위와같이 EC2 Instance의 Security 탭에서 해당 Security group으로 이동합니다. (Security group명 옆의 아이콘 클릭)

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The screenshot shows the AWS EC2 Security Groups page. On the left, there's a sidebar with various navigation options like Instances, Images, and Network & Security. The main area displays a table of security groups. One row is selected, highlighted with a red box, and its details are shown in a modal window below. The modal window has tabs for Details, Inbound rules, Outbound rules, and Tags. The Inbound rules tab is active, showing a single rule with a red box around the 'Edit inbound rules' button. A red arrow points to this button.

Name	Security group ID	VPC ID	Description	Owner	Inbound rules count	Outbound rules count
-	sg-015b154e8e492a8e9	vpc-06f99ba2841d3459d	sg for mspt3	478227677197	1 Permission entry	1 Permission entry

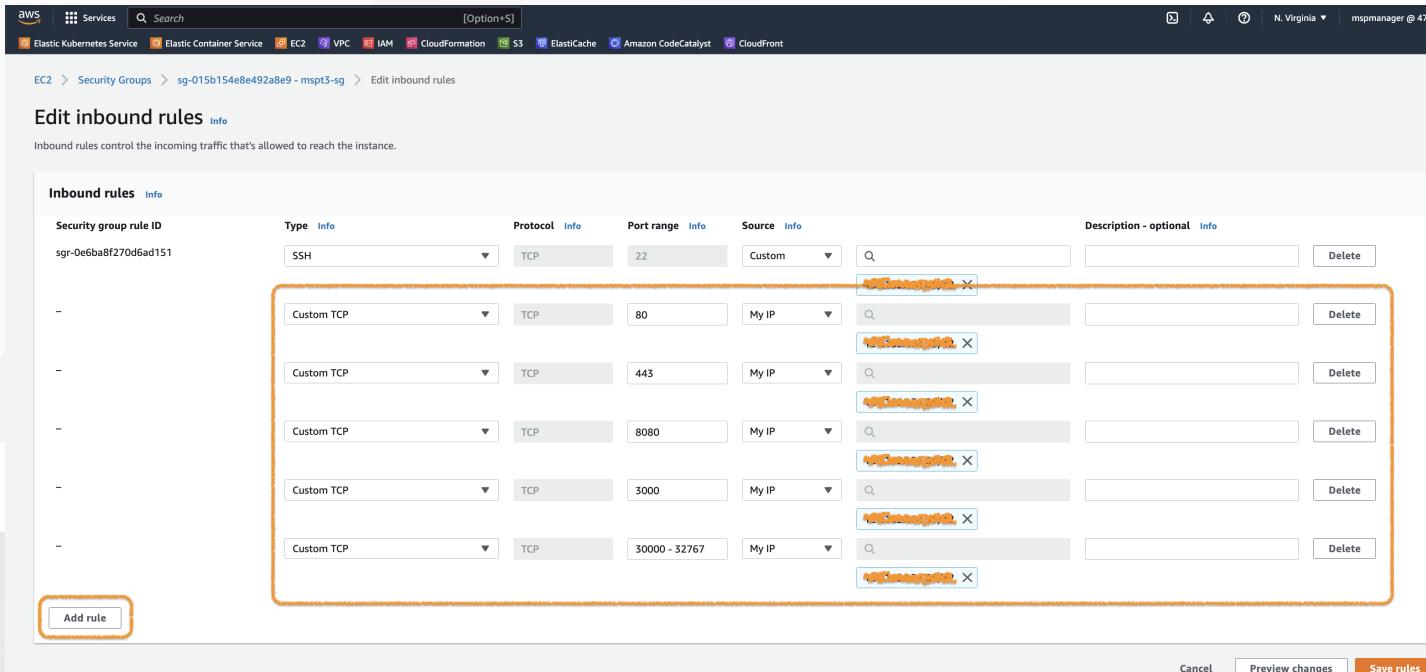
sg-015b154e8e492a8e9 - mspt3-sg

Inbound rules (1/1)

Name	Security group rule...	IP version	Type	Protocol	Port range	Source	Description
-	sgr-0e6ba8f270d6ad151	IPv4	SSH	TCP	22	121.165.174.35/32	-

Serurity group화면의 Inbound rules 탭에서 **Edit inbound rules** 버튼을 클릭합니다.

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The screenshot shows the AWS Management Console interface for managing security groups. The user is on the 'Edit inbound rules' page for a specific security group. Six new rules have been added, each allowing traffic from 'My IP' on specific ports. The rules are:

- Type: SSH, Protocol: TCP, Port range: 22, Source: Custom (My IP)
- Type: Custom TCP, Protocol: TCP, Port range: 80, Source: My IP
- Type: Custom TCP, Protocol: TCP, Port range: 443, Source: My IP
- Type: Custom TCP, Protocol: TCP, Port range: 8080, Source: My IP
- Type: Custom TCP, Protocol: TCP, Port range: 3000, Source: My IP
- Type: Custom TCP, Protocol: TCP, Port range: 30000 - 32767, Source: My IP

An 'Add rule' button is visible at the bottom left, and 'Save rules' is at the bottom right.

Add rule 버튼을 누르면 규칙을 추가할 수 있습니다. 아래 규칙을 추가해주세요.

Type	Port range	Source
Custom TCP	80	My IP
Custom TCP	443	My IP
Custom TCP	8080	My IP
Custom TCP	3000	My IP
Custom TCP	30000-32767	My IP

VM Instance 접속하기

생성된 VM Instance의 접속(SSH)은 다음의 방법 중 하나를 사용하면 됩니다.

- [접속방법1] Terminal 프로그램 (e.g. PowerShell, cmder, iTerm, etc.)
- [접속방법2] MobaXterm

SSH 접속을 위해서는 다음을 먼저 확인해야 합니다.

- VM Instance의 Public IPv4 address 또는 Public IPv4 DNS
- Key pair (mspt3.pem 파일)
- SSH 접속을 위한 Inbound traffic (Port:22) 이 허용되어 있는지 확인 (앞에서 이미 진행함.)

준비가 됐으면 [접속방법1] 또는 [접속방법2] 중 하나를 선택하고 해당부분으로 이동하세요.

다양한 접속방법에 대한 자세한 설명은 AWS 문서인 [Linux 인스턴스에 연결합니다](#) 를 참고하세요.

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[접속방법1] Terminal 프로그램

기본적인 터미널 프로그램을 사용한 접속방법입니다.

OS마다 제공되는 기본 툴을 사용해도 되고, 별도로 설치해서 사용해도 됩니다.

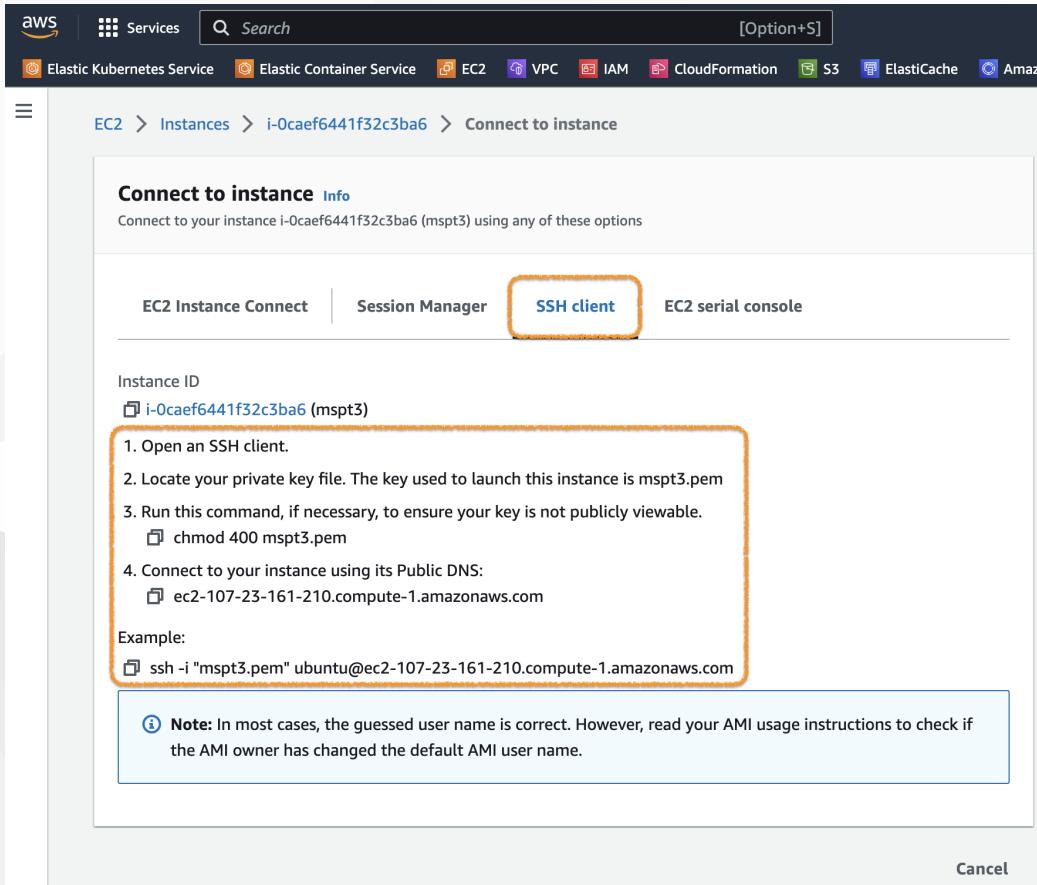
윈도우즈인 경우 [Windows Terminal](#)를 사용하면 여러가지 기능을 사용할 수 있어 편리합니다. (선택사항)

AWS Console에서 EC2 > Instances 화면으로 이동합니다.

The screenshot shows the AWS EC2 Instances page. On the left, there's a sidebar with 'Instances' selected under 'Instances'. The main area displays a table with one row for an instance named 'mspt3'. The 'Name' column has a checkbox checked, and the 'Connect' button in the top right of the table header is highlighted with a red box. The instance details show it's 'Running', 't3.medium', and has 2/2 checks passed. The URL in the browser is <https://console.aws.amazon.com/ec2/v2/home?region=us-east-1#Instances:instanceId=i-0caeef6441f32c3ba6>.

접속하려는 EC2 Instance를 선택하고, Connect 버튼을 클릭합니다.

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위 그림과 같이 Connect to instance 화면에서 SSH client 탭을 클릭하고, 아래 표시되는 절차에 따라 접속을 진행합니다.

원도우즈 환경에서는 3번 절차 (chomod 400 mspt3.pem)를 진행할 수 없습니다. 다음장의 내용을 참고하세요.

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(윈도우즈 환경인 경우 3번 절차 처리방법)

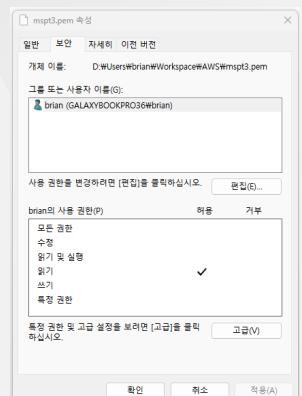
터미널 프로그램(e.g. PowerShell)에서 다음과 같이 실행합니다.

```
> icacls.exe mspt3.pem /reset  
처리된 파일: mspt3.pem  
1 파일을 처리했으며 0 파일은 처리하지 못했습니다.  
> icacls.exe mspt3.pem /GRANT:R "$(env:USERNAME):(R)"  
처리된 파일: mspt3.pem  
1 파일을 처리했으며 0 파일은 처리하지 못했습니다.  
> icacls.exe mspt3.pem /inheritance:r  
처리된 파일: mspt3.pem  
1 파일을 처리했으며 0 파일은 처리하지 못했습니다.
```

명령어 : icacls.exe mspt3.pem /reset

명령어 : icacls.exe mspt3.pem /GRANT:R "\$(env:USERNAME):(R)"

명령어 : icacls.exe mspt3.pem /inheritance:r



그림과 같이 mspt3.pem 파일의 권한을 변경하는 것입니다.

자세한 내용은 [오류: 보호되지 않는 프라이빗 키 파일](#)의 내용을 참고하세요.

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The screenshot shows a terminal window titled "ubuntu@ip-10-0-2-33: ~ (ssh)". The session is connected via AWS SSH using the private key "mspt3.pem". The user is connected to an Ubuntu 22.04.1 LTS instance (GNU/Linux 5.15.0-1028-aws x86_64). The terminal displays system information, including system load (0.0), memory usage (7%), swap usage (0%), and network interfaces (docker0 and ens5). It also shows a message about Ubuntu Pro features and a list of 4 available updates. The last login information is provided at the bottom.

```
ubuntu@ip-10-0-2-33: ~ (ssh)
→ aws ssh -i "mspt3.pem" ubuntu@ec2-[REDACTED].compute-1.amazonaws.com
Welcome to Ubuntu 22.04.1 LTS (GNU/Linux 5.15.0-1028-aws x86_64)

 * Documentation: https://help.ubuntu.com
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/advantage

System information as of Mon Jan 23 19:33:50 UTC 2023

System load: 0.0      Processes:          103
Usage of /: 11.4% of 19.20GB  Users logged in:     0
Memory usage: 7%
Swap usage:  0%      IPv4 address for docker0: 172.17.0.1
                      IPv4 address for ens5:   10.0.2.33

* Ubuntu Pro delivers the most comprehensive open source security and
  compliance features.

  https://ubuntu.com/aws/pro

4 updates can be applied immediately.
2 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

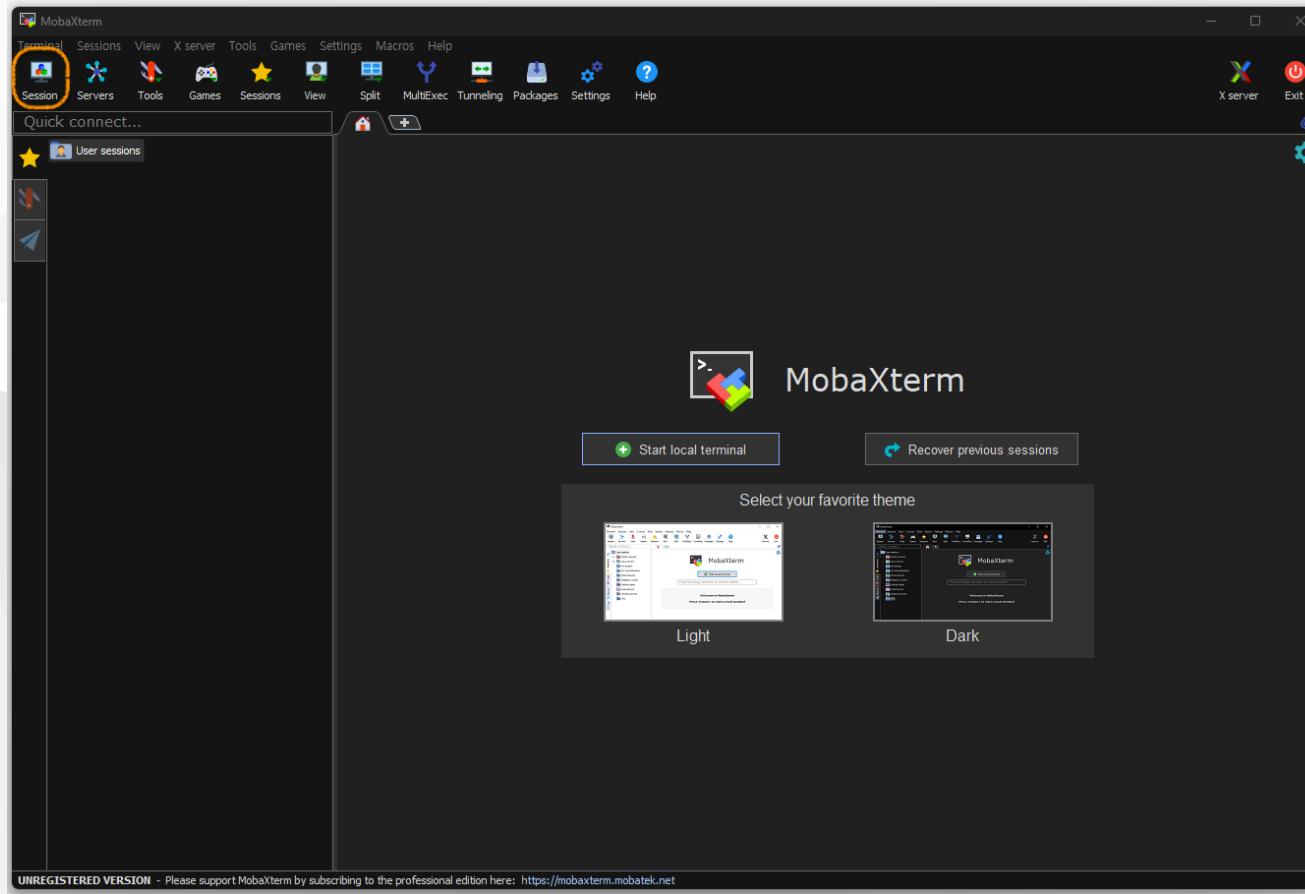
Last login: Mon Jan 23 18:54:59 2023 from 121.165.174.35
ubuntu@ip-10-0-2-33:~$
```

필요한 모든 절차를 거치고 정상적으로 접속되면 위와같은 화면이 표시됩니다.

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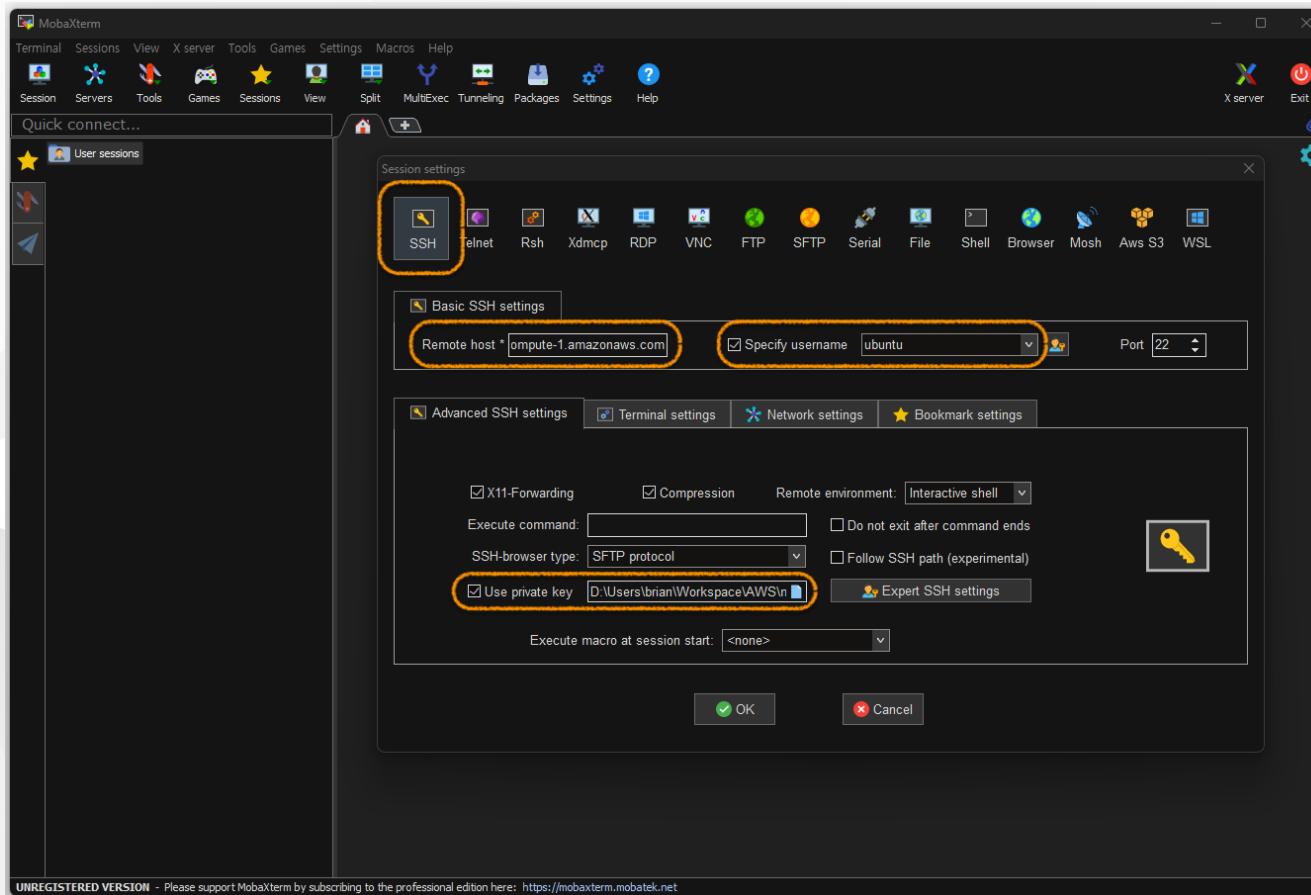
[접속방법2] MobaXterm

MobaXterm을 이용하여 VM Instance에 접속하는 방법입니다.



MobaXterm을 실행하고 **Session** 버튼을 클릭합니다.

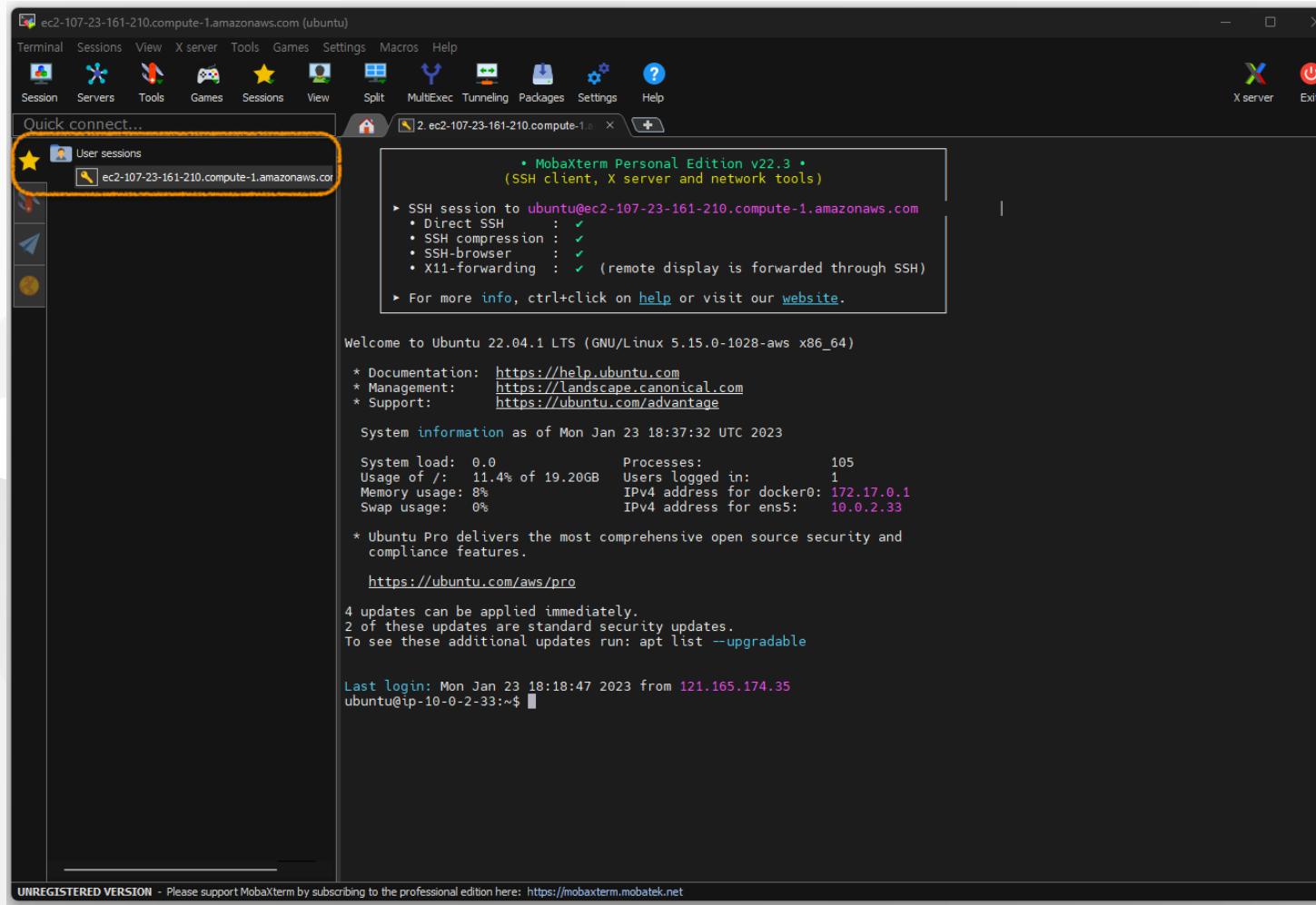
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접속방식은 **SSH**를 선택하고 다음 정보를 입력한 다음 **OK** 버튼을 클릭하여 접속합니다.

- **Remote host** : EC2 Instance의 Public IPv4 address 또는 Public IPv4 DNS
- **Specify username** : ubuntu
- **Use private key** : mspt3.pem

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접속되면 위와같은 화면이 표시됩니다.

다음 번 접속부터는 Quick connect의 User session을 이용할 수 있습니다.

Docker 설치하기

실습을 위해서 Docker 설치를 진행합니다.

설치하는 방법은 아래 두 가지 방법이 있습니다.

- [Docker Desktop](#) : One-click-install application for your Mac, Linux, or Windows
- [Docker Engine](#) : Open source containerization platform

우리 실습에는 앞에서 만든 Ubuntu linux에 Docker Engine을 설치해서 진행하도록 하겠습니다.

설치를 위해서는 [OS requirements](#) 를 만족하는 조건이어야 합니다.

우리가 만든 환경은 이 조건에 맞는 Ubuntu 22.04(LTS) 64bit 버전입니다.

Uninstall old versions

기존에 설치된 버전이 있거나 다시 설치를 진행하려고 하는 경우 먼저 기존버전 삭제를 진행합니다.

처음 설치를 하는 경우라면, 생략하고 다음 단계를 진행합니다.

```
ubuntu@ip-10-0-2-33:~$ sudo apt-get remove docker docker-engine docker.io containerd runc
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
E: Unable to locate package docker-engine
```

명령어 : `sudo apt-get remove docker docker-engine docker.io containerd runc`

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Install using the repository

Ubuntu의 Advanced Packaging Tool (APT) 를 이용해서 설치를 진행합니다.

먼저 package index를 업데이트 합니다.

```
ubuntu@ip-10-0-2-33:~$ sudo apt-get update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [114 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease [99.8 kB]
Get:4 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [831 kB]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [566 kB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [785 kB]
Fetched 2507 kB in 1s (3302 kB/s)
Reading package lists... Done
```

명령어 : `sudo apt-get update`

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다음은, HTTPS를 이용하기 위해서 몇 가지 패키지를 설치합니다.

```
ubuntu@ip-10-0-2-33:~$ sudo apt-get install -y ca-certificates curl gnupg lsb-release
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
lsb-release is already the newest version (11.1.0ubuntu4).
lsb-release set to manually installed.
ca-certificates is already the newest version (20211016ubuntu0.22.04.1).
ca-certificates set to manually installed.
curl is already the newest version (7.81.0-1ubuntu1.7).
curl set to manually installed.
gnupg is already the newest version (2.2.27-3ubuntu2.1).
gnupg set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 3 not upgraded.
```

명령어 : `sudo apt-get install -y ca-certificates curl gnupg lsb-release`

Docker GPG key를 추가합니다.

```
ubuntu@ip-10-0-2-33:~$ sudo mkdir -p /etc/apt/keyrings
ubuntu@ip-10-0-2-33:~$ curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo gpg --dearmor -o /etc/apt/keyrings/docker.gpg
```

명령어 : `sudo mkdir -p /etc/apt/keyrings`

명령어 : `curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo gpg --dearmor -o /etc/apt/keyrings/docker.gpg`

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Docker 설치를 위서 APT Repository를 설정합니다.

```
ubuntu@ip-10-0-2-33:~$ echo \
"deb [arch=$(dpkg --print-architecture) signed-by=/etc/apt/keyrings/docker.gpg] https://download.docker.com/linux/ubuntu \
$(lsb_release -cs) stable" | sudo tee /etc/apt/sources.list.d/docker.list > /dev/null
```

명령어 :

```
echo "deb [arch=$(dpkg --print-architecture) signed-by=/etc/apt/keyrings/docker.gpg] https://download.docker.com/linux/ubuntu $(lsb_release -cs) stable" | sudo tee /etc/apt/sources.list.d/docker.list > /dev/null
```

다시 Package index를 업데이트 합니다.

```
ubuntu@ip-10-0-2-33:~$ sudo apt-get update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [114 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease [99.8 kB]
Get:4 https://download.docker.com/linux/ubuntu jammy InRelease [48.9 kB]
Get:5 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:6 https://download.docker.com/linux/ubuntu jammy/stable amd64 Packages [11.9 kB]
Fetched 385 kB in 1s (652 kB/s)
Reading package lists... Done
```

명령어 : `sudo apt-get update`

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그리고, 마지막으로 Docker를 설치합니다.

```
ubuntu@ip-10-0-2-33:~$ sudo apt-get install -y docker-ce docker-ce-cli containerd.io docker-compose-plugin
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  docker-ce-rootless-extras docker-scan-plugin libltdl7 libslirp0 pigz slirp4netns
Suggested packages:
  aufs-tools cgroupfs-mount | cgroup-lite
The following NEW packages will be installed:
  containerd.io docker-ce docker-ce-cli docker-ce-rootless-extras docker-compose-plugin docker-scan-plugin libltdl7 libslirp0 pigz slirp4netns
0 upgraded, 10 newly installed, 0 to remove and 3 not upgraded.
Need to get 113 MB of archives.
After this operation, 431 MB of additional disk space will be used.
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 pigz amd64 2.6-1 [63.6 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 libltdl7 amd64 2.4.6-15build2 [39.6 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 libslirp0 amd64 4.6.1-1build1 [61.5 kB]
Get:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 slirp4netns amd64 1.0.1-2 [28.2 kB]
Get:5 https://download.docker.com/linux/ubuntu jammy/stable amd64 containerd.io amd64 1.6.15-1 [27.7 MB]
Get:6 https://download.docker.com/linux/ubuntu jammy/stable amd64 docker-ce-cli amd64 5:20.10.23~3-0~ubuntu-jammy [42.6 MB]
Get:7 https://download.docker.com/linux/ubuntu jammy/stable amd64 docker-ce amd64 5:20.10.23~3-0~ubuntu-jammy [20.5 kB]
Get:8 https://download.docker.com/linux/ubuntu jammy/stable amd64 docker-ce-rootless-extras amd64 5:20.10.23~3-0~ubuntu-jammy [8390 kB]
Get:9 https://download.docker.com/linux/ubuntu jammy/stable amd64 docker-compose-plugin amd64 2.15.1-1~ubuntu.22.04~jammy [9570 kB]
Get:10 https://download.docker.com/linux/ubuntu jammy/stable amd64 docker-scan-plugin amd64 0.23.0~ubuntu-jammy [3623 kB]
Fetched 113 MB in 1s (81.5 MB/s)

... 생략 ...
```

명령어 : `sudo apt-get install -y docker-ce docker-ce-cli containerd.io docker-compose-plugin`

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설치 후 다음 설정을 진행합니다. ([Docker Engine post-installation steps](#))

Docker daemon은 root 유저로 동작하고, Docker CLI(/usr/bin/docker)는 root 그룹/계정 권한을 가지고 있습니다.

```
ubuntu@ip-10-0-2-33:~$ ps -ef | grep -i dockerd
root      9282      1  0 07:09 ?        00:00:00 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/containerd.sock
ubuntu     9514    8611  0 07:18 pts/1    00:00:00 grep --color=auto -i dockerd
ubuntu@ip-10-0-2-33:~$ ls -al /usr/bin/docker
-rwxr-xr-x 1 root root 50717552 Jan 19 17:42 /usr/bin/docker
```

root가 아닌 계정(우리 실습환경의 user는 **ubuntu**입니다.)을 이용하여 Docker CLI를 사용하기 위해서 다음과 같이 진행합니다.

먼저 **docker** 그룹을 추가합니다.

```
ubuntu@ip-10-0-2-33:~$ sudo groupadd docker
```

명령어 : `sudo groupadd docker`

이미 docker 그룹이 있을수도 있습니다. (groupadd: group 'docker' already exists)

다음은 사용 중인 User(**ubuntu**)를 docker 그룹에 추가하고, 적용(docker 그룹으로 로그인)합니다.

```
ubuntu@ip-10-0-2-33:~$ sudo usermod -aG docker $USER
ubuntu@ip-10-0-2-33:~$ newgrp docker
```

명령어 : `sudo usermod -aG docker $USER`

명령어 : `newgrp docker`

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모두 정상적으로 설치되고 설정된 경우 다음과 같이 동작해야 합니다.

한 번 테스트 해보세요.

```
ubuntu@ip-10-0-2-33:~$ docker run --rm hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
2db29710123e: Pull complete
Digest: sha256:aa0cc8055b82dc2509bed2e19b275c8f463506616377219d9642221ab53cf9fe
Status: Downloaded newer image for hello-world:latest
```

Hello from Docker!

This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:

1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
(amd64)
3. The Docker daemon created a new container from that image which runs the executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it to your terminal.

To try something more ambitious, you can run an Ubuntu container with:

```
$ docker run -it ubuntu bash
```

Share images, automate workflows, and more with a free Docker ID:

```
https://hub.docker.com/
```

For more examples and ideas, visit:

```
https://docs.docker.com/get-started/
```

명령어 : `docker run --rm hello-world`

Git clone하기 (실습파일 다운로드)

이후 진행되는 실습과정들에 사용되는 파일들을 다운로드 하겠습니다.

```
ubuntu@ip-10-0-2-33:~$ git clone https://github.com/JungSangup/mspt3.git
Cloning into 'mspt3'...
remote: Enumerating objects: 2715, done.
remote: Counting objects: 100% (362/362), done.
remote: Compressing objects: 100% (212/212), done.
remote: Total 2715 (delta 150), reused 360 (delta 148), pack-reused 2353
Receiving objects: 100% (2715/2715), 285.64 MiB | 40.88 MiB/s, done.
Resolving deltas: 100% (1530/1530), done.
```

명령어 : `git clone https://github.com/JungSangup/mspt3.git`

hands_on_files 디렉토리 아래에 실습에 필요한 파일들이 있습니다.