

Lab1. Cloud Virtual Machine Fundamentals

1. 목적

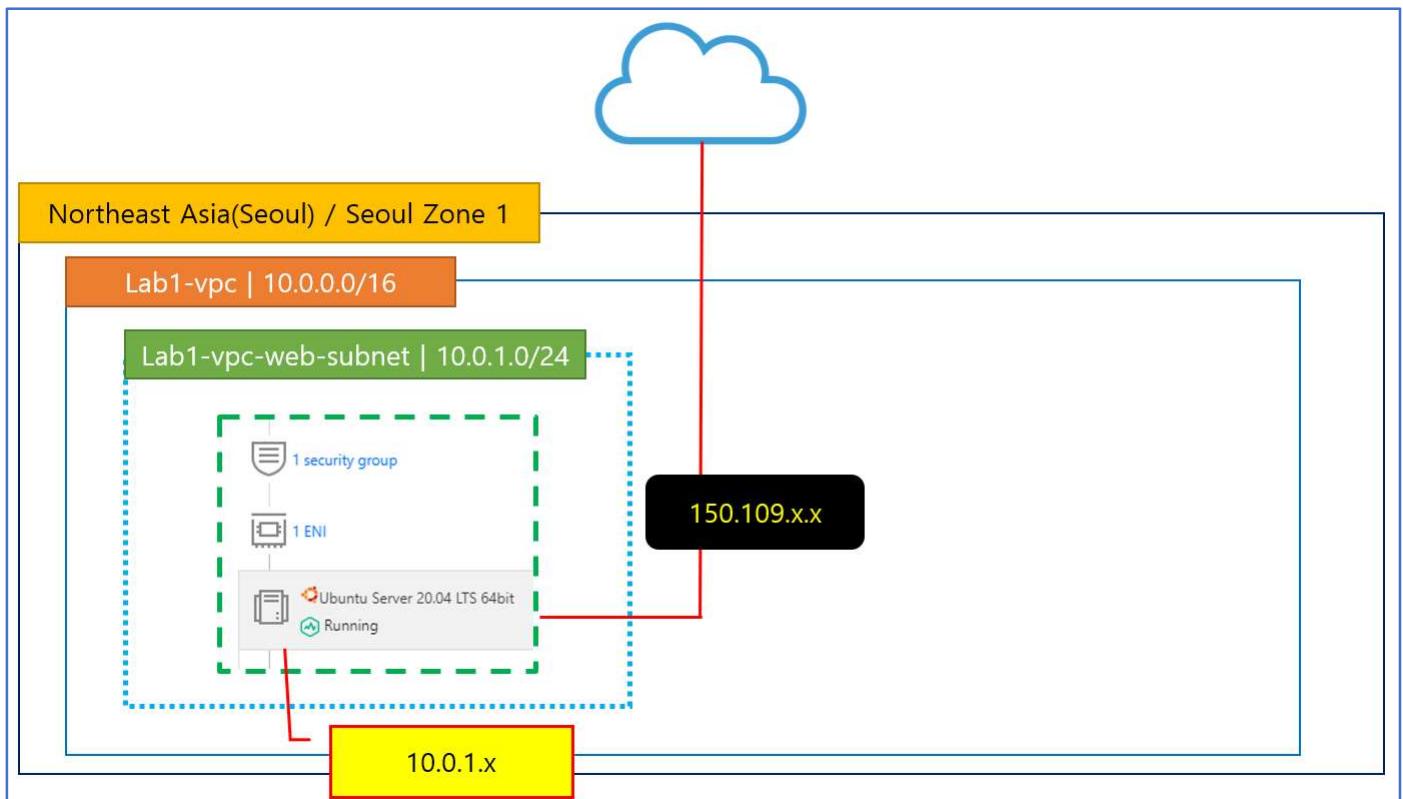
- 이번 Lab에서는 Tencent Cloud에서 제공하는 Compute의 제품 중 CVM(Cloud Virtual Machine)을 이용해서 Linux Server Instance를 생성한다. 생성한 Linux Server Instance를 가지고 Apache Web Service를 설치하고 간단한 홈페이지를 구현한다.

2. 사전 준비물

- Tencent Cloud Account

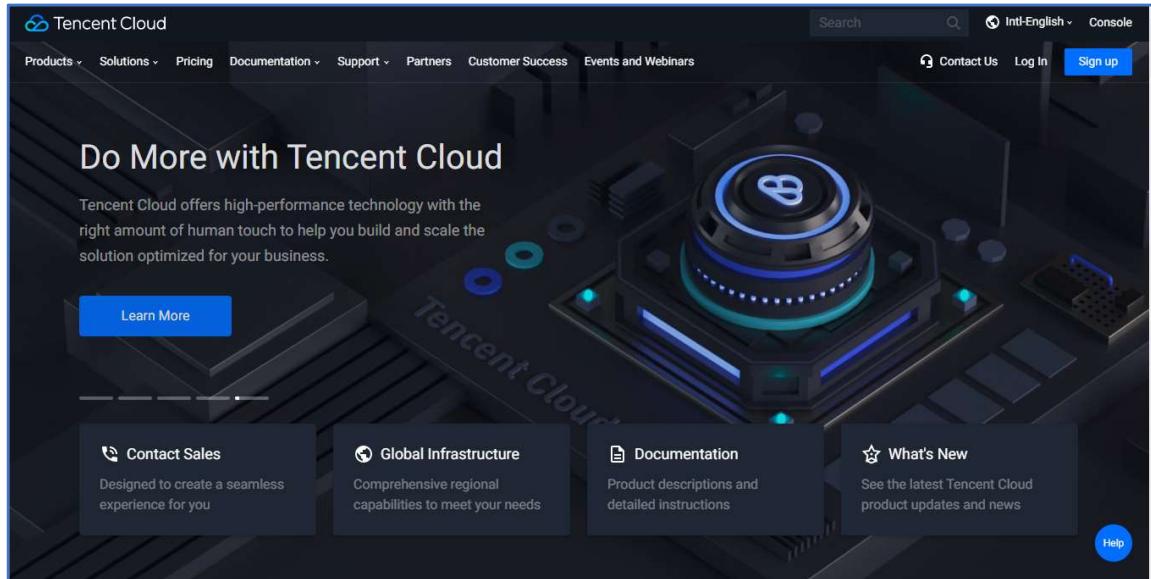
3. 목차

- Task1. Web Server를 위한 VPC 및 Subnet 생성하기
- Task2. Cloud Virtual Machine 생성하기 – Select Model
- Task3. Cloud Virtual Machine 생성하기 – Complete Configuration
- Task4. Cloud Virtual Machine 생성하기 – Confirm Configuration
- Task5. EIP 설정하고 Linux Server Instance에 연결하기

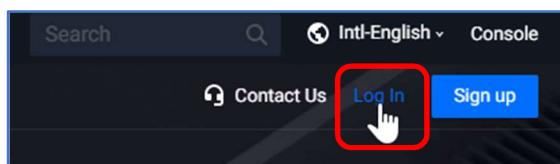


Task1. CVM을 위한 VPC, Subnet, Security Group 그리고 SSH Key 생성하기

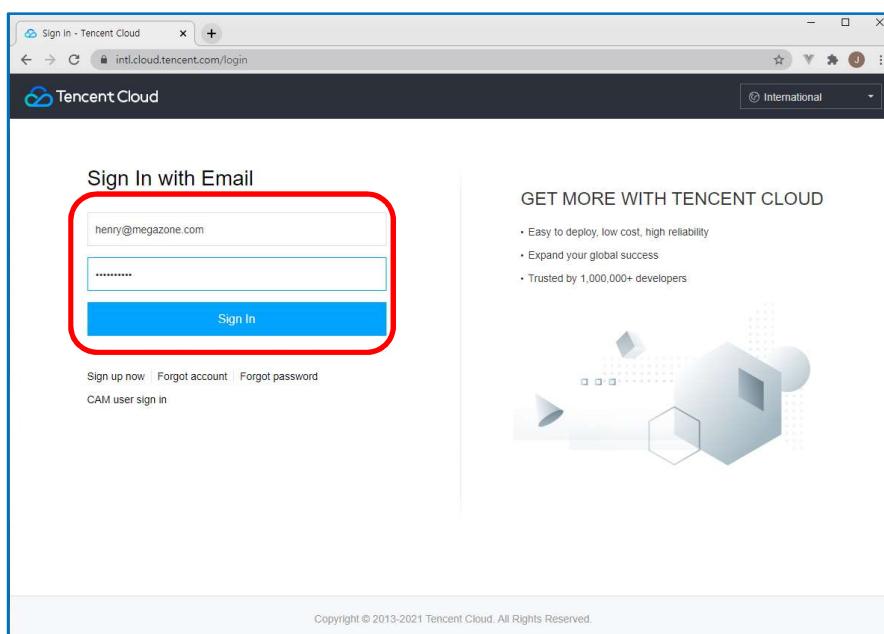
1. Tencent Cloud 홈페이지를 방문한다. <https://intl.cloud.tencent.com/>



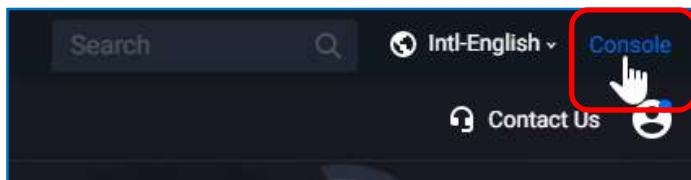
2. 이미 가입한 계정으로 로그인을 하기 위해 페이지 우측 상단의 [Log In] 링크를 클릭한다.



3. [Sign in] 페이지에서 [Sign In with Email]에 여러분의 아이디(Email형식)과 패스워드를 입력하고 [Sign In] 파란색 버튼을 클릭한다.



4. VPC를 생성하기 위해 로그인 후, 웹 페이지 우측 상단의 [Console] 링크를 클릭한다.



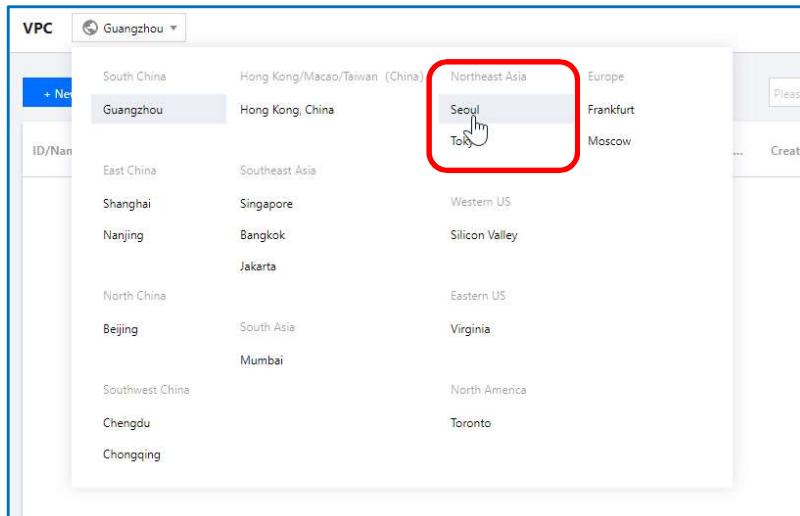
5. [Console] 페이지에 들어왔다. VPC를 생성하기 위해 [All Products] 섹션의 [Networking] > [Virtual Private Cloud] 링크를 클릭한다.

A screenshot of the Tencent Cloud Console dashboard. The top navigation bar shows account information and a balance of 0.00 USD. Below this, there are sections for 'Recently Visited' and 'Currently in Use'. The main area is titled 'All Products' and contains several categories: Compute, Game Service, Application Security, Enterprise Distributed DBMS, Container Services, Monitoring & OPS, CDN & Acceleration, Networking, NoSQL Database, and Database SaaS Tool. The 'Networking' category is highlighted with a red box. Within the Networking section, 'Virtual Private Cloud' is listed under 'Direct Connect'.

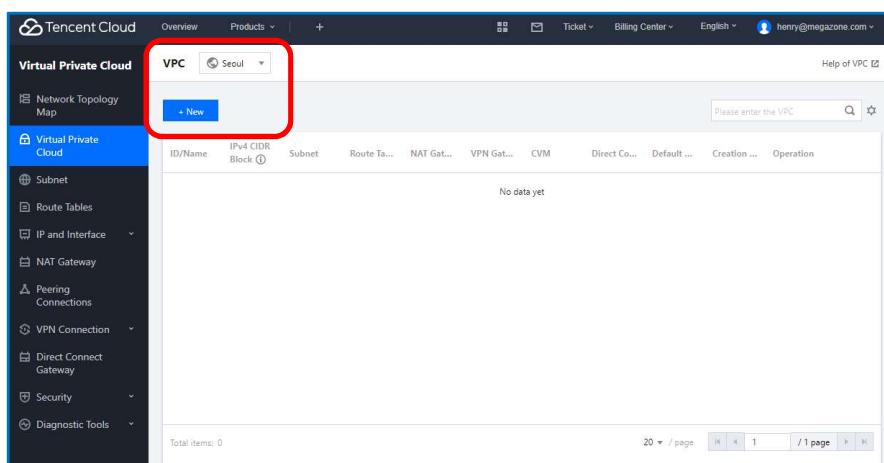
6. Virtual Private Cloud의 Dashboard 페이지이다.

A screenshot of the Virtual Private Cloud (VPC) dashboard. The left sidebar has a tree view with 'Virtual Private Cloud' selected. The main content area shows the 'VPC' tab is active, with a 'Guangzhou' location dropdown. Below this is a search bar and a table header for creating new VPCs. The table body is currently empty, displaying 'No data yet'. The sidebar also includes links for Network Topology Map, Subnet, Route Tables, IP and Interface, NAT Gateway, Peering Connections, VPN Connection, Direct Connect Gateway, Security, and Diagnostic Tools.

7. 먼저 VPC가 어느 Region에 생성되는지 설정해야 하는데, 만일 현재의 [Region]이 [Guangzhou]에 맞춰져 있다면 클릭하여 [Seoul] 리전으로 맞춘다.



8. [Seoul]에 설정되었다. 이제 새 VPC를 생성하기 위해 [+New] 파란색 버튼을 클릭한다.



9. [Create VPC] 창이 나타난다. 먼저 [VPC information] 설정을 하자. [Region]은 이미 Northeast Asia(Seoul)로 맞춰져 있다. 다음과 같이 설정한다.

- ① [Name] : lab1-vpc
- ② [Ipv4 CIDR Block] : 10.0.0.0/16

VPC information
Region Northeast Asia(Seoul)
Name lab1-vpc
Ipv4 CIDR Block 10 . 0 . 0 / 16

For better usage of VPC, it's recommended to have a proper network structure.

[Advanced Options ▾](#)

10. 다음은 [Subnet Information] 설정이다. 역시 다음과 같이 설정하고 [OK] 파란색 버튼을 클릭한다.

- ① [Subnet Name] : lab1-vpc-seoul-1
- ② [IPv4 CIDR Block] : 10.0.1.0/24
- ③ [Availability Zone] : Seoul Zone 1

Subnet Information

Subnet Name	lab1-vpc-seoul-1
IPv4 CIDR Block	10 . 0 . 1 . 0 / 24
Remaining IPs: 253	
Availability Zone	Seoul Zone 1
Associated route table	Default
Advanced Options ▾	
<button>OK</button> <button>Close</button>	

11. 새 VPC가 생성되었다.

VPC Seoul Help of VPC

+ New	ID/Name	IPv4 CIDR Block	Subnet	Route Table	NAT Gateway	VPN Gateway	CVM	Direct Con...	Default VPC	Creation Ti...	Operation
lab1-vpc	vpc-dc3e7mg6	10.0.0.0/16	1	1	0	0	0	0	No	2021-06-02 10:14:34	<a>Delete <a>More

12. 두번째 Subnet을 생성하기 위해 좌측 메뉴에서 [Subnet]을 클릭한다. 목록에 보면 방금 생성한 Subnet lab1-vpc-seoul-1을 확인할 수 있다.

Tencent Cloud Overview Products + Help of Subnet

Virtual Private Cloud

Subnet Seoul All VPCs

ID/Name	Network	CIDR	Availability ...	Associated r...	CVM	Available IPs	Default Sub...	Creation Time	Operation
subnet-dgn69tf lab1-vpc-seoul-1	vpc-dc3e7mg6	10.0.1.0/24	Seoul Zone 1	rtb-4q0axd7l default	0	253	No	2021-06-02 10:14:35	<a>Delete <a>More

13. 두 번째 Subnet을 생성하기 위해 Subnet 생성의 Region이 Seoul임을 확인하고 [+New] 파란색 버튼을 클릭한다.

The screenshot shows the 'Subnet' list page. At the top left, there is a dropdown for 'Region' set to 'Seoul'. Below it is a 'Filter' button. A large red box highlights the blue '[+ New]' button located just below the filter. The main table lists one existing subnet: 'subnet-dgn6a9tf' associated with 'vpc-dc3e7mg6' and 'lab1-vpc'. The table includes columns for ID/Name, Network, CIDR, Availability Zone, Associated route table, CVM, Available IPs, Default Subnet, Creation Time, and Operation.

14. 다음의 각 값을 입력한 후, [Create] 파란색 버튼을 클릭한다.

- ① [Network] : lab1-vpc | 10.0.0.0/16
- ② [Subnet Name] : lab1-vpc-seoul-2
- ③ [VPC IP Range] : 10.0.0.0/16
- ④ [CIDR] : 10.0.2.0/24
- ⑤ [Availability Zone] : Seoul Zone 2

The screenshot shows the 'Create a Subnet' dialog box. It has a 'Network' dropdown set to 'vpc-dc3e7mg6(lab1-vpc | 10.0.0.0/16)'. A red box highlights the entire input row for 'Subnet Name', 'VPC IP Range', 'CIDR', 'Availability Zone', and 'Associated route table'. The 'Subnet Name' field contains 'lab1-vpc-seoul-2', 'VPC IP Range' is '10.0.0.0/16', 'CIDR' is '10.0.2.0/24', 'Availability Zone' is 'Seoul Zone 2', and 'Associated route table' is 'default'. At the bottom are 'Create' and 'Cancel' buttons.

15. [Subnet] 목록에 lab1-vpc-seoul-1과 lab1-vpc-seoul-2 두개의 Subnet을 확인할 수 있다.

The screenshot shows the 'Subnet' list page again. A red box highlights the second row, which contains the subnet 'lab1-vpc-seoul-2'. This row includes the same details as the first: 'vpc-dc3e7mg6' and 'lab1-vpc'. The table structure is identical to the one in step 13.

16. Security Group을 생성할 차례이다. 페이지 상단의 [Products]에 마우스를 올려놓으면 나타나는 드롭다운 메뉴에서 검색창에 Security Group을 입력한 후, 검색 결과에서 Virtual Private Cloud-Security-Group 메뉴를 클릭한다.

The screenshot shows the Tencent Cloud Control Panel. At the top, there's a navigation bar with 'Cloud' (selected), 'Overview', 'Products', and a '+' button. On the right, there are notifications (6) and a 'Ticket' link. Below the navigation is a search bar with 'Security Group' typed in. A red box highlights the search bar and the dropdown menu below it, which lists 'Cloud Virtual Machine - Security Groups' and 'Virtual Private Cloud - Security Group'. Other menu items like 'Cloud Object Storage', 'CDN', 'Cloud Load Balancer', and 'Tencent' are also visible.

17. [Security Group] 페이지에 들어왔다. 새 Security Group을 생성하기 위해, 생성될 Region이 Seoul임을 확인하고, [New] 파란색 버튼을 클릭한다.

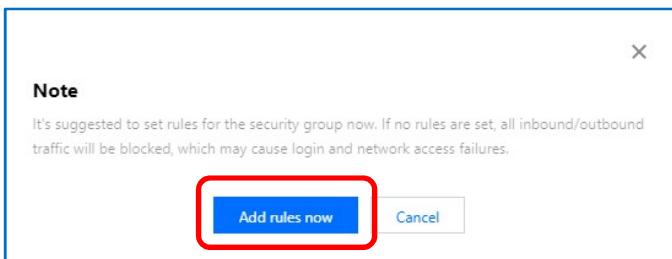
The screenshot shows the 'Virtual Private Cloud - Security Group' page. On the left, there's a sidebar with options like Network Topology Map, Virtual Private Cloud, Subnet, Route Tables, IP and Interface, NAT Gateway, Peering Connections, VPN Connection, Direct Connect Gateway, and Security (which is expanded to show Security Group). The main area is titled 'Security Group' and shows a note about security group limits. A blue 'New' button is highlighted with a red box. The table below shows no data yet. At the bottom, there are pagination controls.

18. 다음의 각 값을 설정한 후, [OK] 파란색 버튼을 클릭한다.

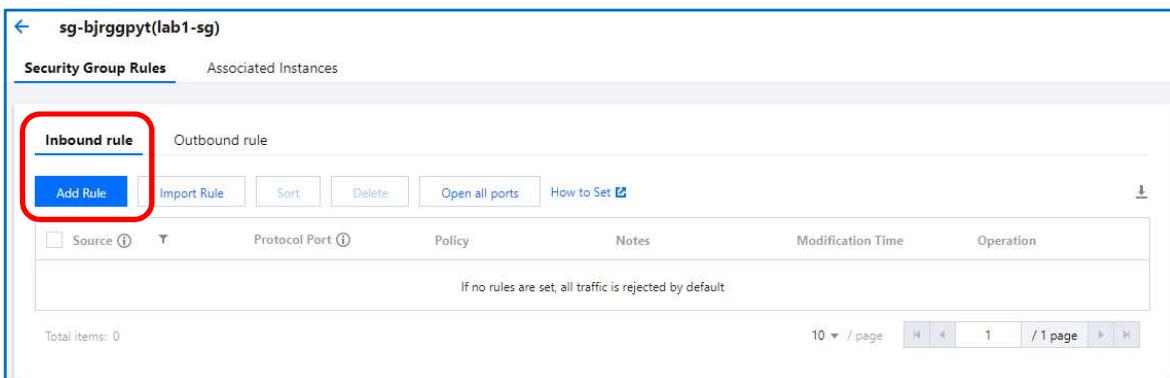
- ① [Template] : Custom
- ② [Name] : lab1-sg
- ③ [Project] : DEFAULT PROJECT

The screenshot shows the 'New security group' dialog box. It has fields for 'Template' (set to 'Custom'), 'Name' (set to 'lab1-sg'), and 'Project' (set to 'DEFAULT PROJECT'). The 'Notes' field contains 'Custom'. At the bottom, there are 'Advanced' and 'Display template rule' buttons, and 'OK' and 'Cancel' buttons. A red box highlights the 'Template', 'Name', and 'Project' fields.

19. [Note] 창이 나타난다. Rule을 추가하기 위해 [Add rules now] 파란색 버튼을 클릭한다.



20. [Security Group Rules] 페이지이다. 새로 [Inbound rule]을 추가하기 위해 [Add Rule] 파란색 버튼을 클릭한다.



21. [Add inbound rule] 창이다. 다음의 각 값을 설정한 후, 계속 추가하려면 [+New Line] 링크를 클릭한다. 설정에 필요한 Inbound Rule추가를 마쳤으면 [Complete] 파란색 버튼을 클릭하여 창을 닫는다.

- ① [Type] : Ping, [Source] : all, [Protocol Port] : ICMP, [Policy] : Allow
- ② [Type] : HTTP(80), [Source] : all, [Protocol Port] : TCP:80, [Policy] : Allow
- ③ [Type] : Login Linux CVMs(22), [Source] : all, [Protocol Port] : TCP:22, [Policy] : Allow
- ④ [Type] : Custom, [Source] : all, [Protocol Port] : TCP:443, [Policy] : Allow

The screenshot shows the 'Add inbound rule' dialog box. It has a table with columns: Type, Source, Protocol Port, Policy, and Notes. There are four rows of data, each with a red box around it:

- Type: Ping, Source: all, Protocol Port: ICMP, Policy: Allow, Notes: Ping service open.
- Type: HTTP (80), Source: all, Protocol Port: TCP:80, Policy: Allow, Notes: Web service HTTP(80) open.
- Type: Login Linux CVMs(22), Source: all, Protocol Port: TCP:22, Policy: Allow, Notes: TCP port 22 open for Linux !
- Type: Custom, Source: all, Protocol Port: TCP:443, Policy: Allow, Notes:

At the bottom of the dialog box are 'Complete' and 'Cancel' buttons.

22. [Inbound rule] 목록에서 결과를 확인할 수 있다.

The screenshot shows a table of inbound rules for a security group named 'sg-bjrggpyt(lab1-sg)'. The table has columns for Source, Protocol/Port, Policy, Notes, Modification Time, and Operation. There are 8 rows of rules listed:

Source	Protocol/Port	Policy	Notes	Modification Time	Operation
0.0.0.0/0	ICMP	Allow	Ping service open.	2021-06-02 11:15:34	Edit Insert ▾ Delete
z/0	ICMPv6	Allow	Ping service open.	2021-06-02 11:15:34	Edit Insert ▾ Delete
0.0.0.0/0	TCP:80	Allow	Web service HTTP(80) open.	2021-06-02 11:15:34	Edit Insert ▾ Delete
z/0	TCP:80	Allow	Web service HTTP(80) open.	2021-06-02 11:15:34	Edit Insert ▾ Delete
0.0.0.0/0	TCP:22	Allow	TCP port 22 open for Linux CVMs.	2021-06-02 11:15:34	Edit Insert ▾ Delete
z/0	TCP:22	Allow	TCP port 22 open for Linux CVMs.	2021-06-02 11:15:34	Edit Insert ▾ Delete
0.0.0.0/0	TCP:443	Allow		2021-06-02 11:15:34	Edit Insert ▾ Delete
z/0	TCP:443	Allow		2021-06-02 11:15:34	Edit Insert ▾ Delete

Total items: 8 10 / page 1 / 1 page

23. 마지막으로 SSH Key를 생성하자. 페이지 상단 메뉴 중 [Products]에 마우스를 올리면 나타나는 드롭다운 메뉴에서 검색창에 SSH Key를 입력한 후, 검색 결과에서 Cloud Virtual Machine-SSH Key를 클릭한다.

The screenshot shows the 'Products' section of the Tencent Cloud dashboard. A red box highlights the search bar containing 'SSH Key'. Below it, a search result for 'Cloud Virtual Machine - SSH Key' is shown. The navigation bar includes categories like Compute, Basic Storage Service, CDN & Acceleration, Networking, Cloud Virtual Machine, Cloud Object Storage, CDN, and Cloud Load Balancer.

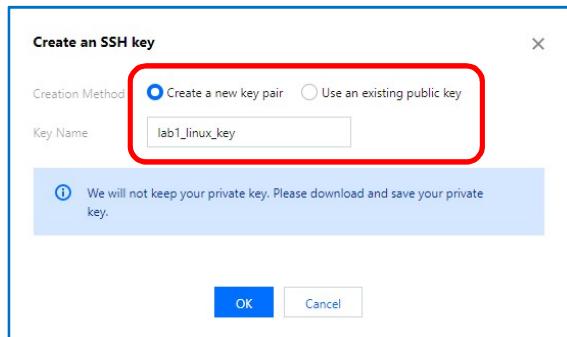
24. [SSH Key] 페이지이다. 새 SSH Key를 생성하기 위해 [New] 파란색 버튼을 클릭한다.

The screenshot shows the 'SSH Key' creation page. A blue box highlights the 'New' button. The left sidebar shows navigation options including Instances, Placement Group, Images, Auto Scaling, Cloud Block Storage, Snapshots, SSH Key (which is selected), Security Groups, EIP, Service Migration, and Recycle Bin. The main area displays a table with columns for ID/Name, Bound Instances, Bound Custom Images, Creation Time, and Operation. The table currently shows 'No data yet'.

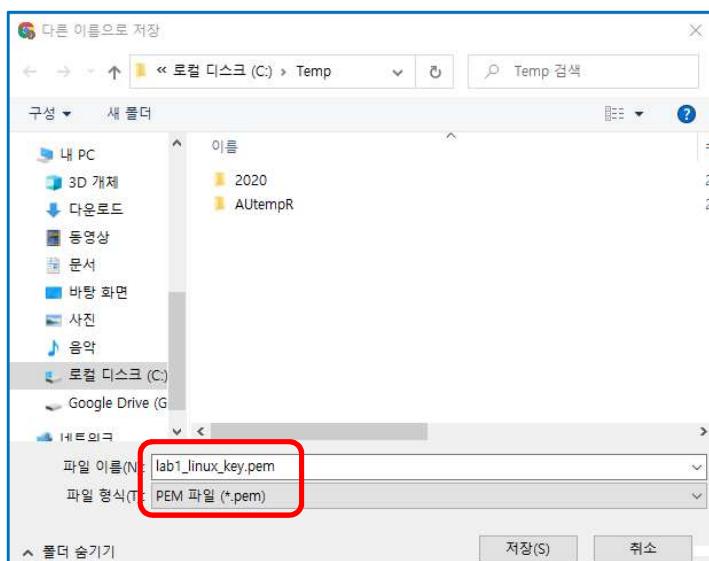
25. [Create an SSH key] 창이다. 각 값을 설정한 후, [OK] 파란색 버튼을 클릭하여 창을 닫는다.

① [Creation Method] : Create a new key pair

② [Key Name] : lab1_linux_key



26. 방금 새로 생성한 **SSH Key**를 다운로드하기 위한 창이 나타나면 찾기 쉬운 위치에 저장한다. 이번 실습에서는 **C:/Temp** 폴더에 저장하기로 한다. [저장] 버튼을 클릭하면 방금 생성한 **lab1_linux_key.pem** 파일이 다운로드 후 해당 폴더에 저장된다.



27. [SSH Key] 목록에서 확인할 수 있다.

ID/Name	Bound Instances	Bound Custom Images	Creation Time	Operation
skey-0ee9yrqt lab1_linux_key	0	0	2021-06-02 12:44:05	Bind an instance Unbind an instance Delete

Task2. Cloud Virtual Machine 생성하기

1. 이제 가상머신 CVM을 생성하기 위해 페이지 상단의 메뉴 중 [Products] > [Compute] > [Cloud Virtual Machine]을 클릭한다.

The screenshot shows the Tencent Cloud interface with the 'Products' menu open. Under the 'Compute' section, 'Cloud Virtual Machine' is highlighted with a hand cursor icon. Other categories like 'Auto Scaling', 'Batch Compute', 'Container Services', 'Serverless', 'Middleware', 'Basic Storage Service', 'Data Processing', 'Data Migration', 'Game Service', 'CDN & Acceleration', 'Enterprise Content Deliver...', 'Global Application Acceler...', 'Networking', 'Cloud Load Balancer', 'Virtual Private Cloud', 'Direct Connect', 'Cloud Connect Network', 'Elastic Network Interface', 'NAT Gateway', 'Peering Connection', 'VPN Connection', 'Video Service', 'Tencent Real-Time Comm...', 'Cloud Streaming Services', 'Video on Demand', 'Media Processing Service', 'Instant Messaging', 'Tencent Push Notification ...', 'Short Message Service', and 'Simple Email Service' are also listed.

2. [Cloud Virtual Machine] Dashboard 페이지이다. 좌측메뉴를 보면 [Instances]에 맞춰져있다. 먼저 생성할 Instances가 위치할 Region을 Seoul로 설정한다. 그리고 Instances를 생성하기 위해 [Create] 파란색 버튼을 클릭한다.

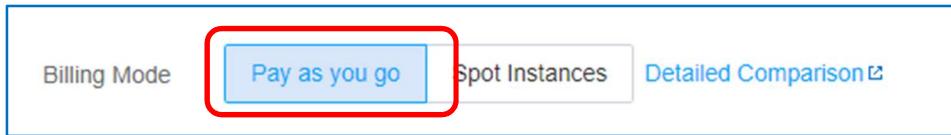
The screenshot shows the 'Instances' dashboard for Cloud Virtual Machine. On the left sidebar, 'Instances' is selected. At the top, there are buttons for 'Create', 'Start up', 'Shutdown', 'Restart', 'Reset Password', and 'More Actions'. A red box highlights the 'Create' button. Below the buttons is a search bar and a message stating 'No instances are found in this region. You can create an instance or change the region'. At the bottom, there is a pagination control showing 'Total items: 0' and '20 / page'.

3. CVM 생성 페이지이다. 모두 3단계를 수행하여 가상 머신을 생성한다.

The screenshot shows the 'Custom Configuration' step of the CVM creation wizard. It has three tabs: '1. Select Model', '2. Complete Configuration', and '3. Confirm Configuration'. The '1. Select Model' tab is active, showing 'Billing Mode' options: 'Pay as you go' (selected), 'Spot Instances', and 'Detailed Comparison'. Below this are dropdown menus for 'Region' (Guangzhou, Shanghai, Nanjing, Beijing, Chengdu, Chongqing, Hong Kong, China) and 'Availability Zone' (Random AZ, Seoul Zone 1, Seoul Zone 2). A note at the bottom states: 'Tencent Cloud products in different regions cannot communicate via private network. Selecting the region closest to your customers can reduce access latency and increase download speed. CVM's region cannot be changed after the creation.' There are also 'View My CVM Region' and 'Detailed Comparison' links. The '2. Complete Configuration' and '3. Confirm Configuration' tabs are visible at the top of the next section.

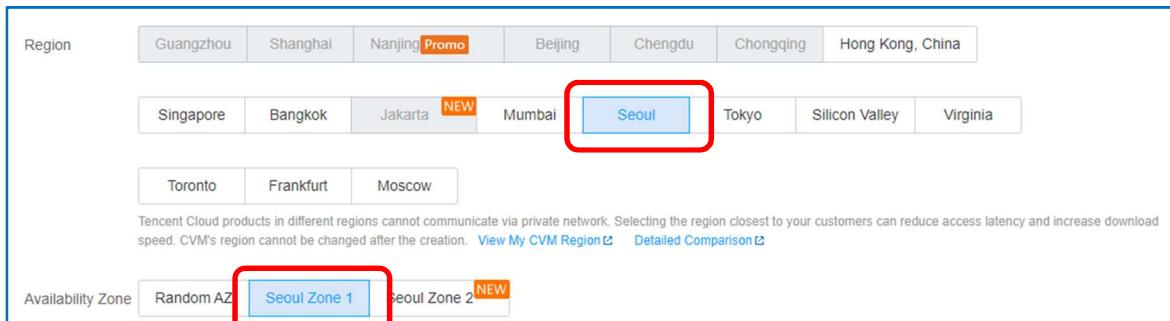
4. 1단계 **Select Model** 단계이다. 각각의 값을 설정한 후, [Next: Complete Configuration] 파란색 버튼을 클릭하여 다음 단계로 진행한다.

① **[Billing Mode]** : Pay as you go

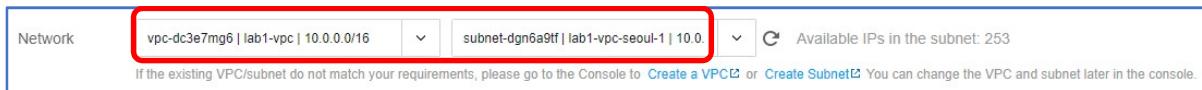


② **[Region]** : Seoul

③ **[Availability Zone]** : Seoul Zone 1



④ **[Network]** : lab1-vpc | 10.0.0.0/16, lab1-vpc-seoul-1 | 10.0.1.0/24



⑤ **[Instance]** : Standard | Standard S3

S3.SMALL1 | 1-core | 1GB | 0.02USD/hr

1.Select Model		2.Complete Configuration		3.Confirm Configuration			
Instance	All CPU	Total Mem					
All Models	Standard	High IO	MEM-optimized	Compute	GPU-based	Big Data	Cloud Physical Machine 2.0
All types	Standard S5 <small>Promo</small>	Standard SA2	Standard S4	Standard Network-optimized SN3ne	Standard S3	Standard SA1	Standard S1
Standard S2	Standard S1						
<input checked="" type="radio"/> Standard S3	S3.SMALL1	1-core	1GB	Intel Xeon Skylake 6133(2.5 GHz)	1.5Gbps	200k PPS	23 availability zone(s) <small>0.02USD/hr</small>
<input type="radio"/> Standard S3	S3.SMALL2	1-core	2GB	Intel Xeon Skylake 6133(2.5 GHz)	1.5Gbps	200k PPS	15 availability zone(s) <small>0.04USD/hr</small>
<input type="radio"/> Standard S3	S3.SMALL4	1-core	4GB	Intel Xeon Skylake 6133(2.5 GHz)	1.5Gbps	200k PPS	21 availability zone(s) <small>0.06USD/hr</small>
<input type="radio"/> Standard S3	S3.MEDI...	2-core	4GB	Intel Xeon Skylake 6133(2.5 GHz)	1.5Gbps	250k PPS	15 availability zone(s) <small>0.08USD/hr</small>

⑥ [Image] : Public image

Ubuntu | 64-bit | Ubuntu Server 20.04 LTS 64bit

Image

Public image Custom Image Shared Image

Ubuntu 64-bit Ubuntu Server 20.04 LTS 64bit

Please note that instances purchased in this region cannot switch between Linux and Windows systems.

⑦ [System disk] : Premium Cloud Storage | 50 GB

System disk

Premium Cloud Storage 50 GB Learn more ↗

System disk type cannot be changed after purchase.

Data disk [+ Add a cloud data disk](#) You can add 20 data disk(s)

⑧ [Public network bandwidth] : Assign a dedicated public IP for free

By Traffic | 100 Mbps

Public network bandwidth

Assign a dedicated public IP for free

By Traffic Detailed Comparison ↗

1Mbps 5Mbps 20Mbps 100Mbps 100 Mbps

Note: the traffic fee is settled on an hourly basis. When your account balance becomes negative, the service will be stopped in 2 hours.

⑨ [Amount] : 1

Selected Model S3.SMALL1(Standard S3, 1-core, 1 GB) Configuration Fee 0.03 USD/hr ([Billing Details](#))

Amount 1

Network Fee 0.12 USD/GB

Next: Complete Configuration

5. 2단계 Complete Configuration 단계이다. 다음의 각각의 값을 설정한다.

① [Security Groups] : [Existing Security Groups] | lab1-sg

1. Select Model 2. Complete Configuration 3. Confirm Configuration

Security Groups [New security group](#) Existing Security Groups [Operation Guide](#) ↗

sg-bjrggpyt | lab1-sg

To open other ports, you can [New security group](#) ↗

② [Project] : DEFAULT PROJECT

③ [Tag] : N/A

The screenshot shows a 'Tag' configuration interface. At the top, there is a 'Project' dropdown set to 'DEFAULT PROJECT'. Below it is a table with columns for 'Tag key' and 'Tag value'. A note at the bottom says: 'If the existing tags or tag values are not suitable, you can go to the console and [create new tags or tag values](#)'.

④ [Instance Name] : webserver-seoul

The screenshot shows an 'Instance Name' input field containing 'webserver-seoul'. To the right, a note says: 'Supports batch sequential naming or pattern string-based naming. You can enter up to 60 characters. 45 characters remaining.'

⑤ [Login Methods] : SSH Key Pair

⑥ [Username] : ubuntu

⑦ [SSH Key] : lab1_linux_key

The screenshot shows the 'Login Methods' section. It includes tabs for 'Set Password', 'SSH Key Pair' (which is selected), and 'Random Password'. Under 'Username', 'ubuntu' is listed. Under 'SSH Key', 'skey-0ee9yrqt | lab1_linux_key' is listed. A red box highlights the 'SSH Key' input field.

⑧ [Security Reinforcement] : Enable for Free

⑨ [Cloud Monitoring] : Enable for Free

⑩ [Scheduled Termination] : N/A

The screenshot shows three sections: 'Security Reinforcement' (checkbox checked, note: 'Install the component to activate Anti-DDoS and Cloud Workload Protection for free'), 'Cloud Monitoring' (checkbox checked, note: 'FREE cloud monitoring, analysis, alarming, and server monitoring metrics (component installation required)'), and 'Scheduled Termination' (checkbox unchecked, note: 'Enable it to terminate CVM at a specified time').

6. [Advanced Settings] 링크를 클릭하면 추가 설정을 할 수 있다. 다음의 각 값을 설정하고 [Next: Confirm Configuration] 파란색 버튼을 클릭하여 다음 단계로 진행한다.

① [Hostname] : webserver-seoul

Advanced Settings

Hostname	webservice-seoul	Supports batch sequential naming or pattern string-based naming 2-60 characters, including uppercase and lowercase letters, numbers, hyphens "-" and dots ". ". It supports the {R: number} format, but colons ":" and braces "{}" are not allowed. Hyphens "-" and dots "." cannot be used consecutively, and cannot be placed at the beginning or end of the hostname. A number-only password is not allowed.
CAM Role	None	<input type="button" value="Create CAM Role"/>
Placement Group	<input type="checkbox"/> Add the instance to a placement group	

② [Custom data] : 다음의 내용을 복사하여 붙여넣는다.

```
#!/bin/bash
sudo apt update
sudo apt install -y apache2
sudo a2enmod ssl
sudo a2ensite default-ssl.conf
sudo systemctl reload apache2
sudo mv /var/www/html/index.html /var/www/html/index.bak
sudo bash -c 'echo "<html><h1>Hello, Tencent Cloud!</h1></html>" > /var/www/html/index.html'
```

Custom data

```
#!/bin/bash
sudo apt update
sudo apt install -y apache2
sudo a2enmod ssl
sudo a2ensite default-ssl.conf
sudo systemctl reload apache2
```

The above input is encoded with base64

7. 마지막 3단계 **Confirm Configuration** 단계이다. 각 항목을 점검하고 변경할 내용이 없으면 **[Agree Tencent Cloud Service Terms]** 체크박스를 체크하고 **[Enable]** 주황색 버튼을 클릭하여 CVM을 생성한다.

Custom Configuration

1.Select Model 2.Complete Configuration **3.Confirm Configuration**

Please make sure port 22 and the ICMP protocol are allowed in the current security group. Otherwise, you will not be able to remotely log in to or ping the CVM. View
Keep your password in mind. If you forgot your password, reset it on the CVM console. [View](#)

Region and model	Seoul Zone 1; S3.SMALL1 (Standard S3, 1-core 1 GB)	<input type="button" value="Edit"/>
Image	Public image: Ubuntu Server 20.04 LTS 64bit	<input type="button" value="Edit"/>
Storage and Bandwidth	50 GB system disk; By Traffic: 100Mbps	<input type="button" value="Edit"/>
Security Groups	Custom Template	<input type="button" value="Edit"/>
Set Information	Login by password (custom)	<input type="button" value="Edit"/>
Advanced Settings	<input type="button" value="Generate API Explorer Reusable Scripts"/>	

Selected Model S3.SMALL1(Standard S3, 1-core, 1 GB) Configuration Fee **0.03**USD/hr ([Billing Details](#)) Agree "[Tencent Cloud Service Terms](#)"

Amount Network Fee **0.12**USD/GB

8. 잠시 시간이 흐른 뒤, **Instance**가 생성되면 다음 그림과 같이 새로운 인스턴스가 만들어진 것을 볼 수 있다.

The screenshot shows the 'Instances' page in the Tencent Cloud console. The instance 'ins-7dzsh5dr' is highlighted with a red box. Key details for this instance include:

- ID/Name: ins-7dzsh5dr
- Status: Running
- Monitoring: Seoul Zone 1
- Instance Type: Standard S3
- Instance Configuration: 1-core 1GB 99Mbps, System disk: Premium, Cloud Storage, Network: lab1-vpc
- Primary IPv4: 150.109.247.77 (Public), 10.0.1.11 (Private)
- Billing: Pay as you go, Created at 2021-06-02, Last modified at 14:00:14
- Operation: Log In, More

9. Instance가 성공적으로 만들어지면 이미 입력한 로그인 계정으로 핸드폰 문자와 Email로 성공 메시지와 이메일이 날라온다.

Left Screenshot (Smartphone Message):

A screenshot of a smartphone displaying a text message. The message content is:

Untitled
[Web발신]
Dear Tencent Cloud user, your (Account ID: 200018656283, Name: henry@megazone.com) CVM is (1 in total) created successfully. For more information, please visit the Tencent Cloud console.

Right Screenshot (Tencent Cloud Confirmation Page):

The page title is 'CVM Created Successfully'. The message says:

Dear Tencent Cloud user,
Your (Account ID: 200018656283, Name: henry@megazone.com) CVM (1 in total) is created successfully.
The operating system is Ubuntu Server 20.04 LTS 64bit and the default account is ubuntu. If you forgot the password, please reset it on Console.

A table provides detailed information about the created CVM:

Resource ID/Name	Resource Configuration	Status
ins-80br5kh webserver-seoul	Zone: ap-seoul-1 Configuration: S3/1Core/1GB/98Mbps System Disk: CLOUD_PREMIUM/50GB Network Type: Virtual Private Cloud IP Address: 150.109.245.141 (Public IP) 10.0.1.12 (Private IP)	SUCCESS

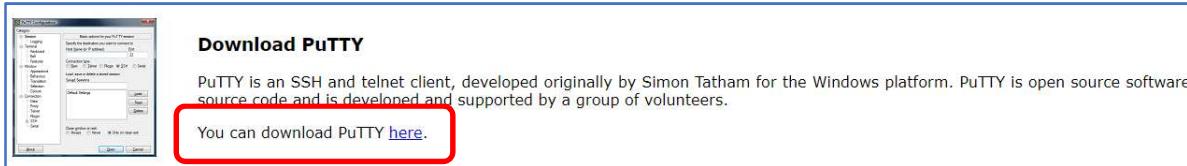
Notes:

1. For the CVM login (from Windows/Linux) and system reinstallation, please see the [CVM operation guide](#).

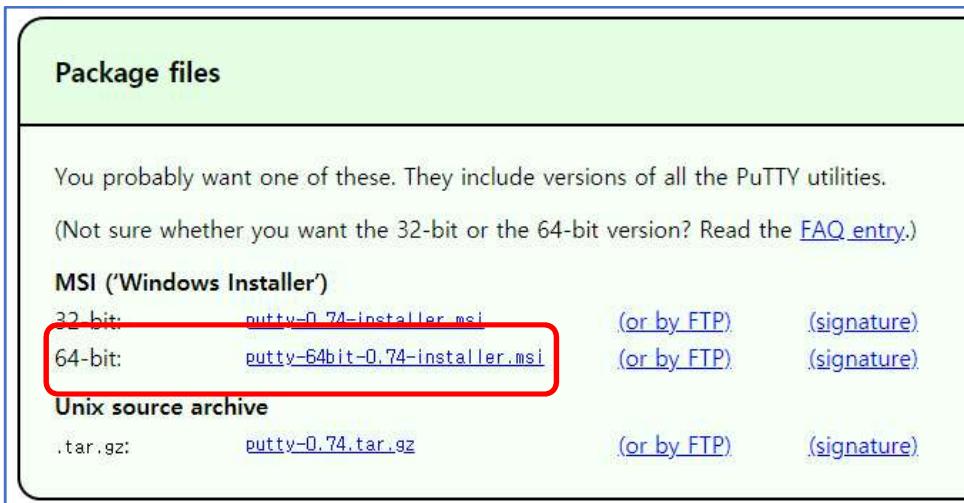
Thank you!
Tencent Cloud

Task3. PuTTY 프로그램 설치하고 Private Key 생성하기

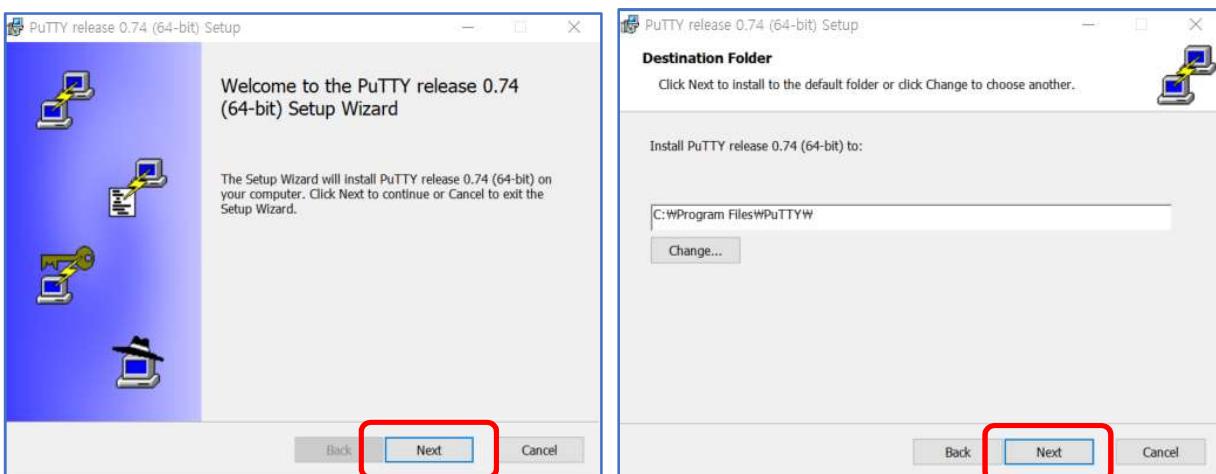
1. Linux 인스턴스 접속을 위해서는 일반적으로 **SSH** 접속용 프로그램이 필요하다. 가장 일반적으로 사용하는 **SSH** 툴은 **PuTTY**이다. <https://www.putty.org/> 에 접속한 후, [Download PuTTY] 섹션의 "You can download PuTTY here"의 **here** 링크를 클릭한다.

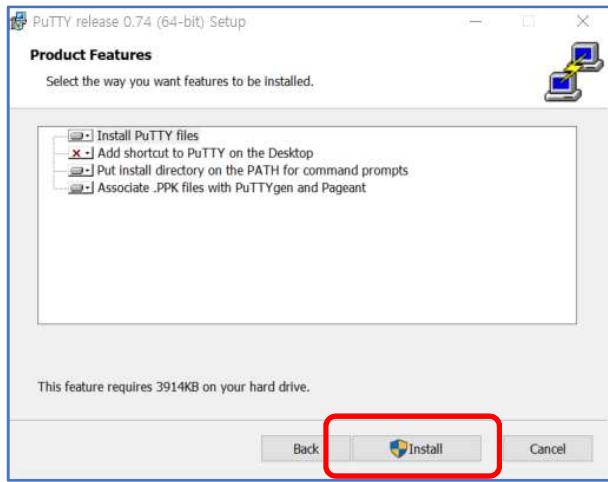


2. [Download PuTTY:latest release(0.74)]페이지에서 본인 PC 혹은 Notebook의 운영체제 버전(**Windows** or Unix)과 CPU Architecture(32-bit or **64-bit**)를 확인하여 다운로드 받을 수 있도록 링크를 클릭한다. 여기서는 일반적으로 **Windows(MSI)**의 64-bit를 다운로드받기 위해 해당 링크(**putty-64bit-0.74-install.msi**)를 클릭하도록 하겠다.

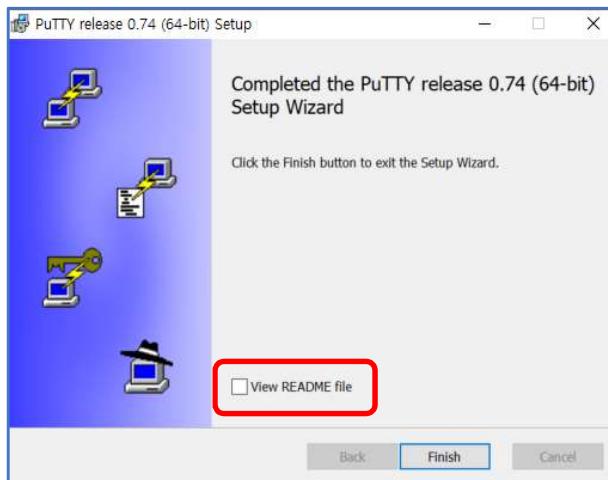


3. 해당 파일이 다운로드가 끝나면 바로 탐색기에서 더블클릭하여 프로그램을 설치한다. 설치할 때에는 해당 화면에서 기본값을 사용하도록 계속 [Next] 그리고 [Install] 버튼을 클릭한다.

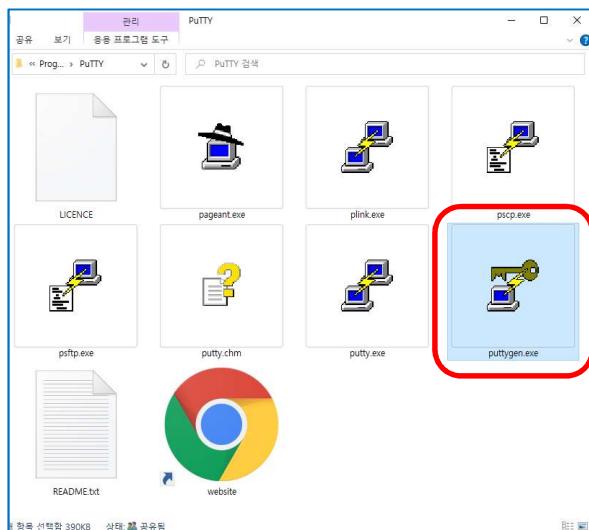




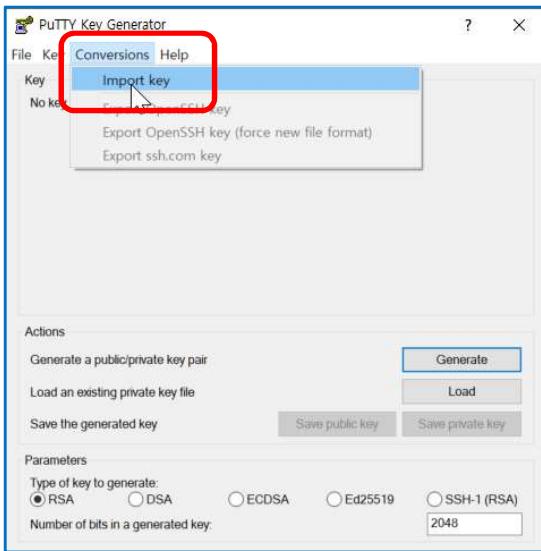
4. 설치 마지막 창이다. [View README file] 체크박스를 체크해제하고 [Finish] 버튼을 클릭하여 설치를 모두 마친다.



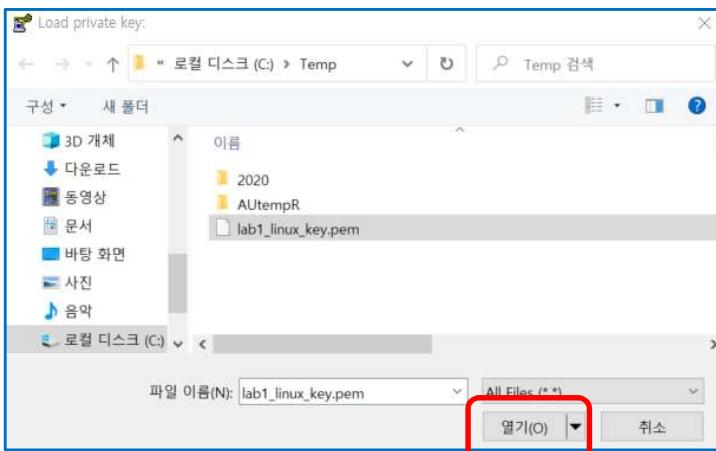
5. 위 Task1-26에서 이미 다운로드 받은 "키 페어 파일"을 PuTTY 프로그램과 연결하기 위해 PuTTY 프로그램이 설치된 경로(**C:\Program Files\PuTTY**)로 이동한다. 그 폴더에 가면 **puttygen.exe**파일이 있는데, 더블클릭하여 실행한다.



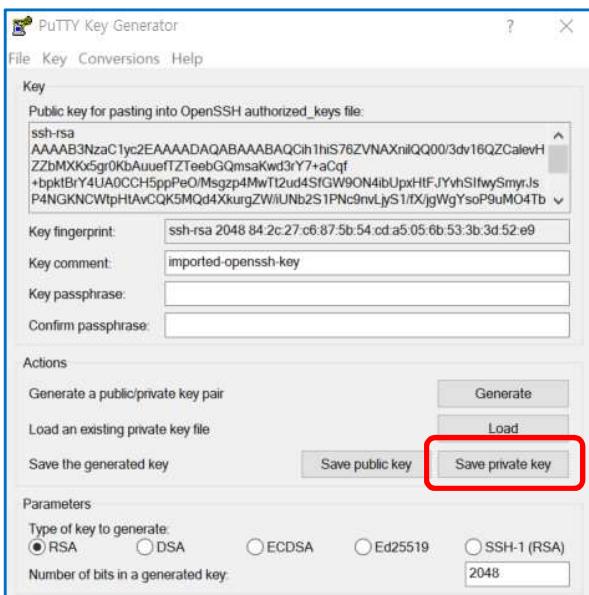
6. [PuTTY Key Generator]창에서 [Conversions] > [Import Key] 메뉴를 선택한다.



7. 이미 다운로드 받은 키 페어 파일(**lab1_linux_key.pem**)을 선택한 후 [열기] 버튼을 클릭한다.



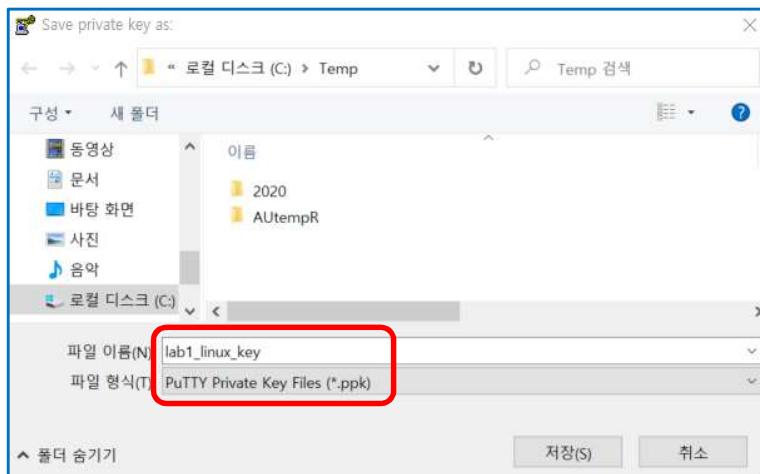
8. PuTTY로 Import할 Private Key의 생성을 위해 [Save private key] 버튼을 클릭한다.



9. [PuTTYgen Warning] 창에서 [예(Y)]를 클릭한다.



10. 이전에 pem 파일을 다운로드 받았던 동일한 폴더에 **lab1_linux_key.ppk** 파일을 저장하기 위해 [저장] 버튼을 클릭한다. 저장한 후, [PuTTY Key Generator]창은 닫는다.

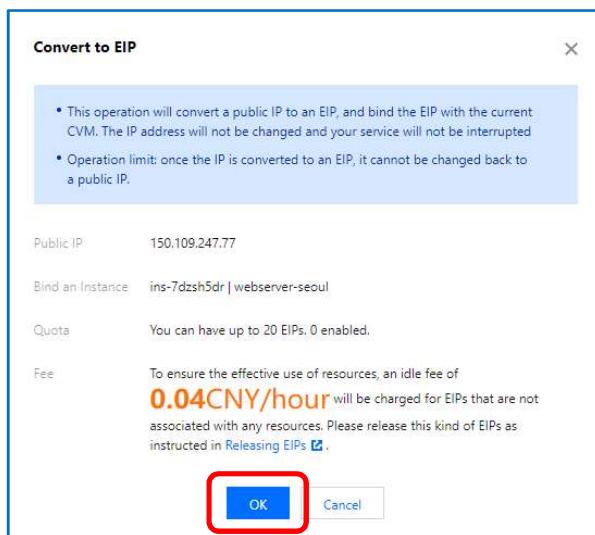


Task4. EIP 설정하고 Linux Server Instance에 연결하기

- EIP는 고정 IP를 설정하는 것이다. 기본적으로 제공되는 Public IP는 시스템 재 부팅할 때, 다른 IP주소로 변경될 수 있다. 따라서 고정 IP로 설정하려면 [EIP]를 구매하고 설정해야 한다. 방금 생성한 Instance에서 [Primary IPv4]의 [Public] 오른쪽의 EIP 버튼 을 클릭한다.

ID/Name	Monitoring	Status	Availability	Instance Type	Instance Configuration	Primary IPv4	Instance Billing	Network Billing	Operation
1 result found for "Project:DEFAULT PROJECT" Back to list									
ins-7dzsh5dr New webserver-seoul		Running	Seoul Zone 1	Standard S3 	1-core 1GB 99Mbps System disk: Premium Cloud Storage Network: lab1-vpc	150.109.247.77 (Public) 	Pay as you go Created at 2021-06-02 14:00:14	Bill by traffic	Log In More ▾

- [Convert to EIP]창이 나타나면 [OK] 파란색 버튼을 클릭한다.



- EIP 설정이 성공적으로 마쳐지면 방금 생성한 인스턴스의 [Primary IPv4]의 Public IP가 [EIP]로 변경된 것을 볼 수 있다.

ID/Name	Monitoring	Status	Availability	Instance Type	Instance Configuration	Primary IPv4	Instance Billing	Network Billing	Operation
1 result found for "Project:DEFAULT PROJECT" Back to list									
ins-7dzsh5dr New webserver-seoul		Running	Seoul Zone 1	Standard S3 	1-core 1GB 99Mbps System disk: Premium Cloud Storage Network: lab1-vpc	150.109.247.77 (EIP) 10.0.1.11 (Private)	Pay as you go Created at 2021-06-02 14:00:14	Bill by traffic	Log In More ▾

- 공인 IP가 설정되었기 때문에 Linux Server에 연결해 보자. 방금 생성한 인스턴스를 [Instances] 목록에서 링크 클릭한다.

ID/Name	Monitoring	Status	Availability	Instance Type	Instance Configuration	Primary IPv4	Instance Billing	Network Billing	Operation
1 result found for "Project:DEFAULT PROJECT" Back to list									
ins-7dzsh5dr New webserver-seoul		Running	Seoul Zone 1	Standard S3 	1-core 1GB 99Mbps System disk: Premium Cloud Storage Network: lab1-vpc	150.109.247.77 (EIP) 10.0.1.11 (Private)	Pay as you go Created at 2021-06-02 14:00:14	Bill by traffic	Log In More ▾

5. 방금 생성한 **Linux Server** 인스턴스 요약 페이지이다. 화면 아래쪽의 [EIP]의 IP Address의 버튼을 클릭하여 주소를 복사한다.

Basic Information

Instance Info

- Name: webserver-seoul
- Instance ID: ins-7dzsh5dr
- UUID: 0037449a-0d3c-4e06-859b-b67b1ed39148
- Instance Specification: Standard S3 | S3.SMALL1
- Project: Default Project
- Region: Seoul
- Availability Zone: Seoul Zone 1
- Key: skey-0ee9yrqt(lab1_linux_key)
- Role: None
- Tag: None

Architecture

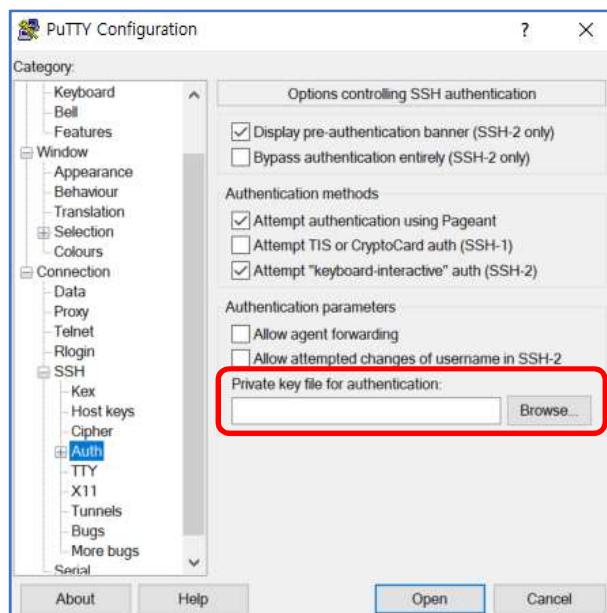
Northeast Asia(Seoul)/Seoul Zone 1 /subnet-dgn6a9tf

- 1 security group
- 1 ENI
- Ubuntu Server 20.04 LTS 64bit
Running
- System disk disk-gm6psn5d(webserver-seoul_SYSTEM_DISK)
Premium Cloud Storage, 50GB
Pay as you go. Creation Time: 2021-06-02 13:00:07
- Mount cloud disk

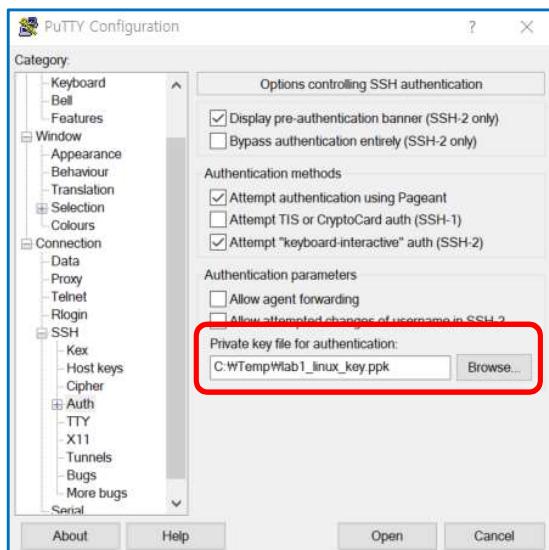
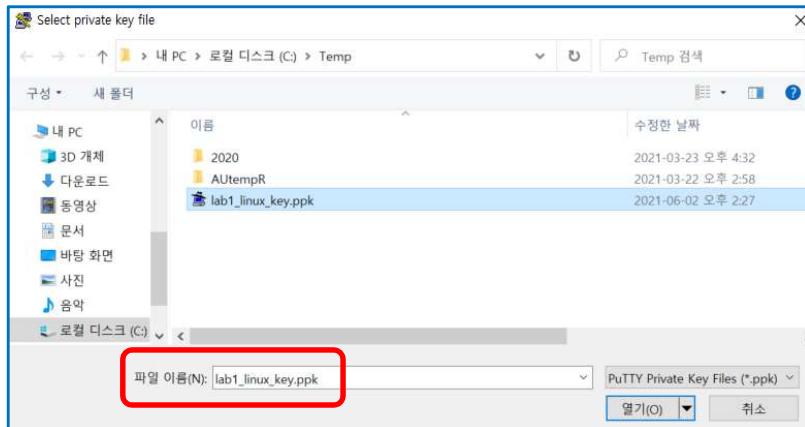
Network Information

Network	vpc-dc3e7mg6(lab1-vpc 10.0.0.0/16)
Subnet	subnet-dgn6a9tf(lab1-vpc-seoul-1)
EIP	150.109.247.77
Primary private IPv4	10.0.1.11
Act as internet gateway	No

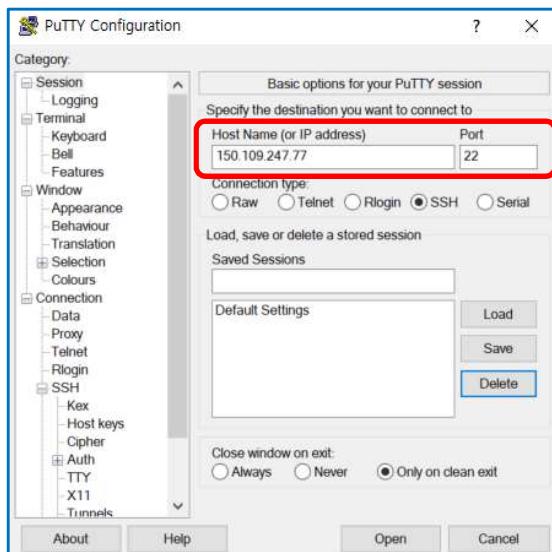
6. Task3에서 설치한 PuTTY 프로그램을 실행한 다음, [Connection] > [SSH] > [Auth] 메뉴의 [Private key file for authentication:]의 [Browse...] 버튼을 클릭한다.



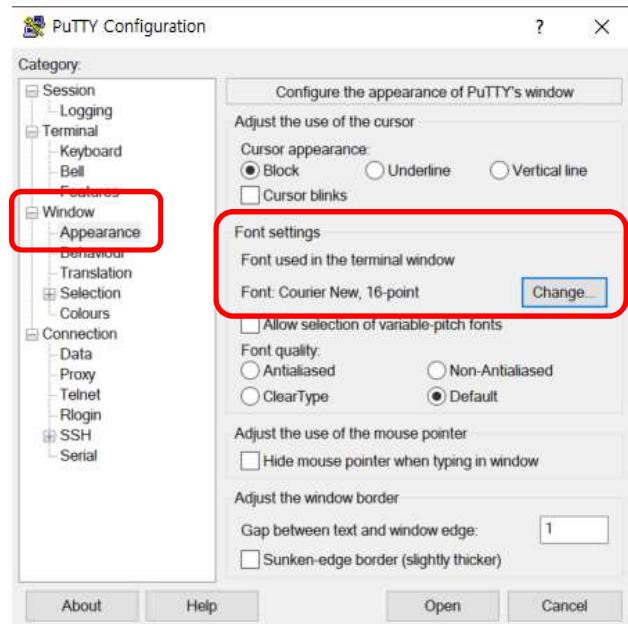
7. 위 Task3-10에서 이미 저장한 **Private Key**의 저장위치에서 **lab1_linux_key.ppk** 파일을 선택하고 버튼을 클릭한다.



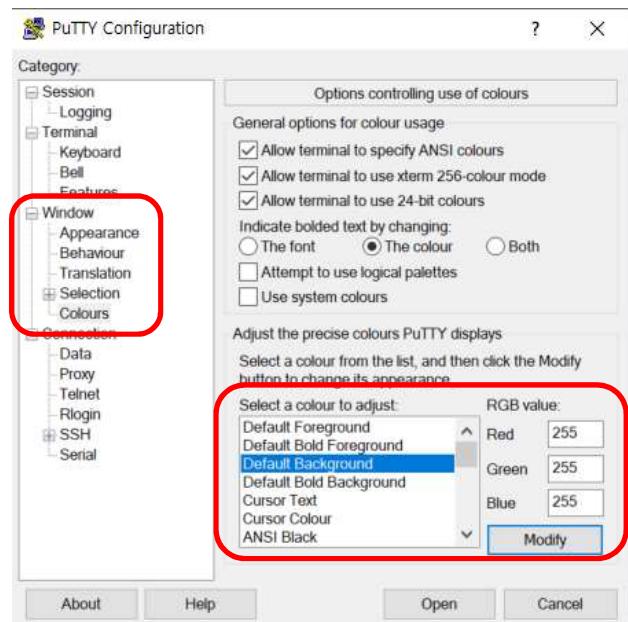
8. PuTTY 메뉴 중 [Session] > [Host Name(or IP address)]에 위 5번에서 복사한 **Linux Server Instance EIP**를 붙여넣는다.



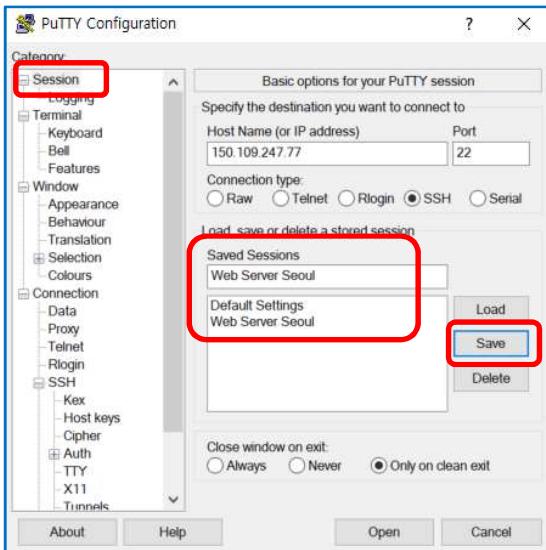
9. [Port]가 22번에 맞춰져 있고, 필요하다면 [Window] > [Appearance] > [Font settings]에서 [Change] 버튼을 클릭하여 본인이 선호하는 Font와 글자크기를 선택할 수 있다.



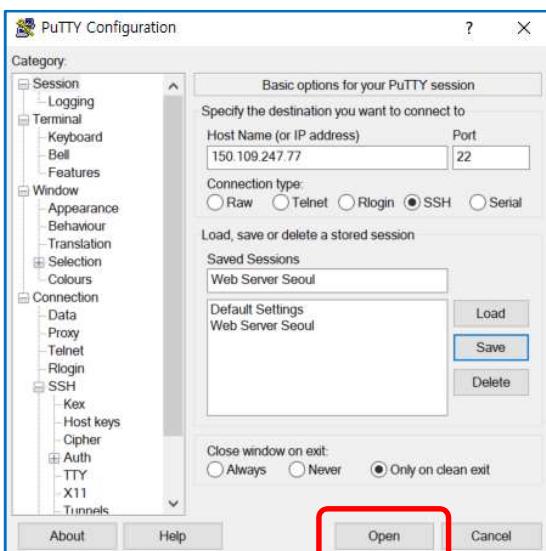
10. 또한 필요하다면, [Window] > [Colours] > [RGB value:]에서 잠시 뒤 연결할 터미널의 배경색과 전경색을 설정할 수 있다. 참고로 필자는 [Default Foreground] 색상은 검은색으로, [Default Background] 색상은 흰색으로 설정했다.



11. 이런 기타 설정을 모두 마치면 다음에 연결할 때 다시 설정하는 것을 반복하지 않기 위해 지금까지 설정한 내용들을 저장하면 편하다. 다시 [Session]으로 돌아가서 [Saved Sessions] 아래 텍스트 박스에 간단히 **Web Server Seoul**이라고 입력하고 [Save] 버튼을 클릭한다.



12. 모든 설정을 마쳤다. 이제 [Open] 버튼을 클릭하여 Tencent Cloud에 우리가 생성한 Web Server Seoul에 연결해 보자.



13. [PuTTY Security Alert]창이 나타난다. 여기서 [예(Y)]를 클릭한다.



14. 정상적으로 서버와 원격 연결이 되면 다음과 같이 Login을 하기 위한 창이 나타난다.



15. **webserver-seoul**의 **username**은 **ubuntu**이다. 다음 그림과 같이 성공적으로 원격 연결에 성공하였다.

```
ubuntu@VM-1-11-ubuntu: ~
login as: ubuntu
Authenticating with public key "imported-openssh-key"
Welcome to Ubuntu 20.04 LTS (GNU/Linux 5.4.0-72-generic x86_64)

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

System information as of Wed 02 Jun 2021 01:47:40 PM CST

System load: 0.1 Processes: 111
Usage of /: 6.8% of 49.16GB Users logged in: 0
Memory usage: 25% IPv4 address for eth0: 10.0.1.11
Swap usage: 0%

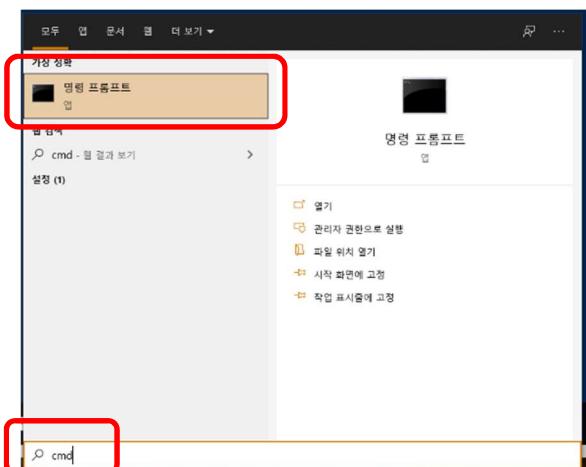
* Pure upstream Kubernetes 1.21, smallest, simplest cluster ops!

https://microk8s.io/

ubuntu@VM-1-11-ubuntu:~$ hostname
VM-1-11-ubuntu
ubuntu@VM-1-11-ubuntu:~$
```

A screenshot of a terminal window showing a successful SSH session to an Ubuntu 20.04 LTS machine. The session starts with a login prompt for "ubuntu". After authentication, it displays system information, including the kernel version (5.4.0-72-generic) and an IPv4 address (10.0.1.11). It then shows a link to the Kubernetes documentation and the command "hostname" being run. The prompt ends with a dollar sign.

16. 여러분 컴퓨터의 [시작] 버튼 오른쪽의 검색 창에서 cmd를 입력하여 [명령 프롬프트] 창을 실행한다.



17. [명령 프롬프트]창에서 다음과 같이 PING test를 한다. Ping 다음 주소는 방금 생성한 webserver-seoul의 EIP이다.

ping {Your Server's Public IP}

```
c:\ 명령 프롬프트
Microsoft Windows [Version 10.0.19042.985]
(c) Microsoft Corporation. All rights reserved.

C:\Users\HZC01-HENRY>ping 150.109.247.77

Ping 150.109.247.77 32바이트 데이터 사용:
150.109.247.77의 응답: 바이트=32 시간=4ms TTL=51
150.109.247.77의 응답: 바이트=32 시간=4ms TTL=51
150.109.247.77의 응답: 바이트=32 시간=3ms TTL=51
150.109.247.77의 응답: 바이트=32 시간=4ms TTL=51

150.109.247.77에 대한 Ping 통계:
    패킷: 보냄 = 4, 받음 = 4, 손실 = 0 (0% 손실),
   往返 시간(밀리초):
    최소 = 3ms, 최대 = 4ms, 평균 = 3ms

C:\Users\HZC01-HENRY>
```

18. Ping 테스트가 성공한 이유는 실습에서 생성한 **Security group**의 **Inbound rule**에서 **ICMP**를 허용했기 때문이다. Instance 상세 페이지에서 상단 메뉴 중 **[Security Groups]**를 클릭한다.

The screenshot shows the AWS Lambda instance details page for 'ins-7dzsh5dr' (webserver-seoul). The 'Security Groups' tab is highlighted with a red box. The page displays instance information, network settings, and architecture details. In the architecture section, it shows a single security group associated with one ENI, which is connected to an Ubuntu Server 20.04 LTS 64bit instance. The instance is running and has a system disk named 'disk-gm6spn5d'. The network information section shows the VPC and subnet details, including the Public IP (150.109.247.77).

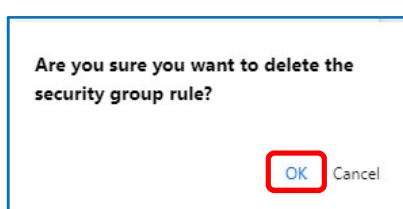
19. 해당 Instance와 연동하고 있는 **Security group** 목록이 보인다. [Rule preview] 섹션에서 해당 **Security group**의 오른쪽에 있는 **[Edit Rules]** 링크를 클릭한다.

The screenshot shows the AWS CloudFormation console's Security Groups page. A note at the top states: "Note: Since December 17, 2019, the following limits have been applied: maximum security groups of an instance, maximum instances of a security group, number of referenced rules. To learn more, please refer to Limitation Description." Below this, a table lists a bound security group with priority 1, named 'sg-bjrggpyt lab1-sg'. The 'Edit Rules' button is highlighted with a red box.

20. 해당 Security group의 [Security Group Rules] 중 [Inbound rule] 목록이다. 여기서 제일 위에 있는 ICMP의 제일 오른쪽에 있는 [Operation] > [Delete] 링크를 클릭하여 ICMP를 삭제한다.

The screenshot shows the 'Security Group Rules' page for the 'sg-bjrggpyt(lab1-sg)' security group. It displays an 'Inbound rule' table with several entries. The first entry, which is ICMP (Protocol Port 0.0.0.0), is highlighted with a red box. Its 'Delete' link in the 'Operation' column is also highlighted with a red box.

21. 정말 삭제할 것인지를 묻는다. [OK]를 클릭하여 ICMP Rule을 삭제한다.



22. 다시 명령 프롬프트 창으로 돌아와서 한번 더 Ping 테스트를 수행한다. Ping 테스트가 수행되지 않는 것을 확인할 수 있다.

The screenshot shows a Windows Command Prompt window. The user runs 'ping 150.109.247.77' and receives multiple responses from the target IP address. The user then runs another 'ping 150.109.247.77' and receives no responses, indicating network connectivity issues.

```
C:\> 명령 프롬프트
Microsoft Windows [Version 10.0.19042.985]
(c) Microsoft Corporation. All rights reserved.

C:\Users\HZ001-HENRY>ping 150.109.247.77

Ping 150.109.247.77 32바이트 데이터 사용:
150.109.247.77의 응답: 바이트=32 시간=4ms TTL=51
150.109.247.77의 응답: 바이트=32 시간=4ms TTL=51
150.109.247.77의 응답: 바이트=32 시간=3ms TTL=51
150.109.247.77의 응답: 바이트=32 시간=4ms TTL=51

150.109.247.77에 대한 Ping 통계:
패킷: 보냄 = 4, 받음 = 4, 손실 = 0 (0% 손실),
황록 시간(밀리초):
최소 = 3ms, 최대 = 4ms, 평균 = 3ms

C:\Users\HZ001-HENRY>ping 150.109.247.77

Ping 150.109.247.77 32바이트 데이터 사용:
요청 시간이 만료되었습니다.
요청 시간이 만료되었습니다.
요청 시간이 만료되었습니다.
요청 시간이 만료되었습니다.

150.109.247.77에 대한 Ping 통계:
패킷: 보냄 = 4, 받음 = 0, 손실 = 4 (100% 손실),

C:\Users\HZ001-HENRY>
```

23. 다시 해당 Instance의 Security group 페이지로 돌아와서 ICMP Inbound Rule을 추가하자. [Add Rule] 파란색 버튼을 클릭한다.

The screenshot shows the AWS Lambda Security Group Rules page. The 'Inbound rule' tab is selected. At the top, there are buttons for 'Add Rule' (highlighted with a red box), 'Import Rule', 'Sort', 'Delete', 'Open all ports', and 'How to Set'. Below these are five existing rules:

Source	Protocol Port	Policy	Notes	Modification Time	Operation
::/0	ICMPv6	Allow	Ping service open.	2021-06-02 11:15:34	Edit Insert ▾ Delete
0.0.0.0/0	TCP:80	Allow	Web service HTTP(80) open.	2021-06-02 11:15:34	Edit Insert ▾ Delete
::/0	TCP:80	Allow	Web service HTTP(80) open.	2021-06-02 11:15:34	Edit Insert ▾ Delete
0.0.0.0/0	TCP:22	Allow	TCP port 22 open for Linux CVMs.	2021-06-02 11:15:34	Edit Insert ▾ Delete

24. [Add inbound rule] 창이 나타나면, 다음과 같이 값을 설정한 후, [Complete] 파란색 버튼을 클릭한다.

① [Type] : Ping, [Source] : all, [Protocol Port] : ICMP, [Policy] : Allow

The screenshot shows the 'Add inbound rule' dialog box. It has fields for Type (Ping), Source (all), Protocol Port (ICMP), Policy (Allow), and Notes (Ping service open). The entire row is highlighted with a red box. At the bottom are 'Complete' and 'Cancel' buttons.

25. ICMP가 [Inbound rule]에 포함되었다.

The screenshot shows the AWS Lambda Security Group Rules page. The 'Inbound rule' tab is selected. The newly added ICMP rule is highlighted with a red box. The table shows two rules:

Source	Protocol Port	Policy	Notes	Modification Time	Operation
0.0.0.0/0	ICMP	Allow	Ping service open.	2021-06-02 14:08:03	Edit Insert ▾ Delete
::/0	ICMPv6	Allow	Ping service open.	2021-06-02 14:08:03	Edit Insert ▾ Delete

26. 이제 명령 프롬프트로 돌아가서 다시 한번 Ping 테스트를 수행해 본다. 정상적으로 잘 수행되는 것을 확인할 수 있다.

```
C:\Windows\system32>ping 150.109.247.77

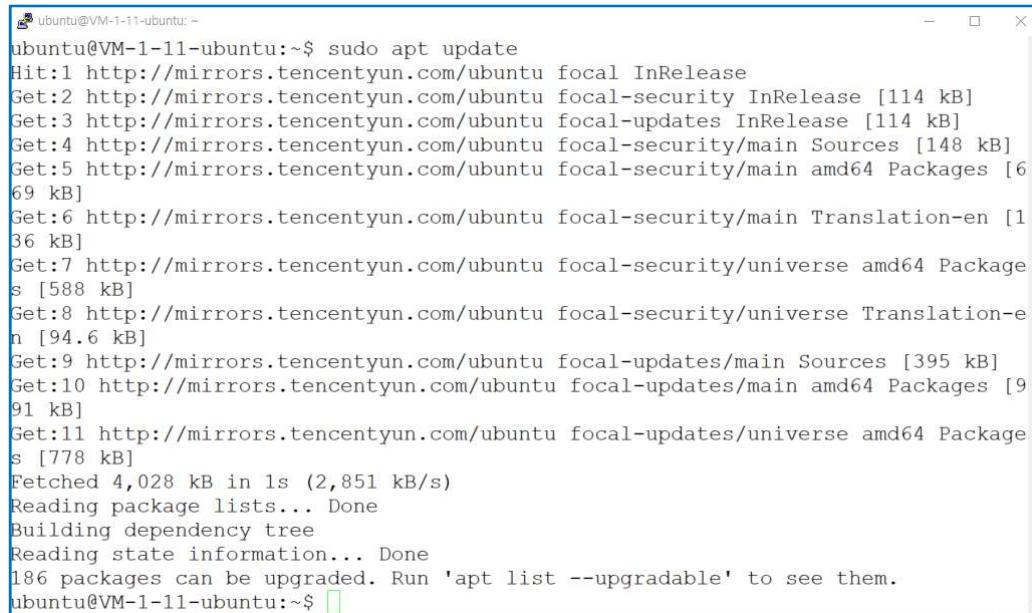
Ping 150.109.247.77의 데이터 사용:
150.109.247.77의 응답: 바이트=32 시간=3ms TTL=51
150.109.247.77의 응답: 바이트=32 시간=4ms TTL=51
150.109.247.77의 응답: 바이트=32 시간=4ms TTL=51
150.109.247.77의 응답: 바이트=32 시간=4ms TTL=51

150.109.247.77에 대한 Ping 통계:
파ケット 보냄 = 4, 받음 = 4, 손실 = 0 (0% 손실),
왕복 시간(밀리초):
최소 = 3ms, 최대 = 4ms, 평균 = 3ms

C:\Windows\system32>
```

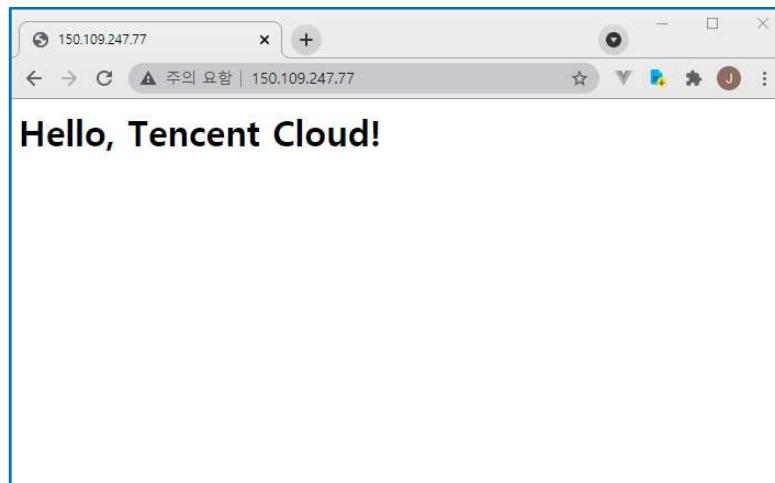
27. 방금 생성한 webserver-seoul이 인터넷이 잘 되는지 원격 연결되어 있는 PuTTY 터미널 안에서 다음의 명령어를 사용해 보자. 에러없이 인터넷에 잘 연결되는 것을 확인할 수 있다.

```
$ sudo apt update
```



```
ubuntu@VM-1-11-ubuntu:~$ sudo apt update
Hit:1 http://mirrors.tencentyun.com/ubuntu focal InRelease
Get:2 http://mirrors.tencentyun.com/ubuntu focal-security InRelease [114 kB]
Get:3 http://mirrors.tencentyun.com/ubuntu focal-updates InRelease [114 kB]
Get:4 http://mirrors.tencentyun.com/ubuntu focal-security/main Sources [148 kB]
Get:5 http://mirrors.tencentyun.com/ubuntu focal-security/main amd64 Packages [669 kB]
Get:6 http://mirrors.tencentyun.com/ubuntu focal-security/main Translation-en [136 kB]
Get:7 http://mirrors.tencentyun.com/ubuntu focal-security/universe amd64 Packages [588 kB]
Get:8 http://mirrors.tencentyun.com/ubuntu focal-security/universe Translation-en [94.6 kB]
Get:9 http://mirrors.tencentyun.com/ubuntu focal-updates/main Sources [395 kB]
Get:10 http://mirrors.tencentyun.com/ubuntu focal-updates/main amd64 Packages [991 kB]
Get:11 http://mirrors.tencentyun.com/ubuntu focal-updates/universe amd64 Packages [778 kB]
Fetched 4,028 kB in 1s (2,851 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
186 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@VM-1-11-ubuntu:~$
```

28. 마지막으로 우리가 설치한 Web Server인 **Apache Web Server**의 홈페이지를 확인해 보자. 여러분의 컴퓨터나 Notebook에서 **Web Browser**를 열고 **http://{Your Server's Public IP}**를 통해 홈페이지를 확인한다.



Task5. Custom Image로 새 CVM Instance 생성하기

- Custom Image를 생성하기 위해서 [Cloud Virtual Machine] 페이지 좌측 메뉴에서 [Snapshots] > [Snapshot List]를 클릭한다. 아직 생성한 Snapshot이 없는 것을 확인할 수 있다.

The screenshot shows the Tencent Cloud interface for managing Cloud Virtual Machines. On the left, there's a sidebar with various options like Instances, Placement Group, Images, Auto Scaling, Cloud Block Storage, and Snapshots. The 'Snapshots' section is expanded, and 'Snapshot List' is selected, indicated by a red box. The main content area is titled 'Snapshot List' and shows a table with one row: 'Total items: 0'. There's also a note at the top: 'Note: all snapshot-related operation will not be available from the moment that your account balance becomes zero. If you fail to pay the overdue payment within 30 days, all snapshot-related operations will be restricted.' Below the table, there are buttons for 'Delete' and 'Create'.

- 방금 생성한 webserver-seoul 인스턴스의 Image를 생성하기 위해 해당 인스턴스를 선택하고 제일 오른쪽 메뉴인 [Operation] > [Create Image] 메뉴를 클릭한다.

The screenshot shows the instance details page for 'ins-7dzsh5dr webserver-seoul'. The instance is listed in the table with details like Status (Running), Availability Zone (Seoul Zone 1), Instance Type (Standard S3), and Primary IPv4 (150.109.247.77). On the right, a context menu is open with several options: 'Purchase with Same Configurations', 'Instance Status', 'Instance Settings' (selected), 'Reinstall the System', 'Password/Key', 'Resource Quota', 'IP/EIP', and 'Security Groups'. The 'Create Image' option is highlighted with a red box.

- [Create custom image]창이 나타나면 다음과 같이 각각의 값을 설정하고 [Create Image] 파란색 버튼을 클릭한다.

- [Image Name] : lab1-webserver-golden-img
- [Description] : Apache2 + Static Home Page(HTML) for My Site

Create custom image

1 Enter image info

You've selected 1 instance. [Collapse](#)

ID/Name	Instance Type	Instance Configuration
ins-7dzsh5dr webserver-seoul	Standard S3	1-core 1GB 99Mbps System disk: Premium Cloud Storage Network: vpc-dc3e7mg6

Note:

- When a custom image is created, a related snapshot is created automatically. To delete this snapshot, you need to delete the associated image first. [CBS Snapshot \(International\) was commercialized on Mar. 1, 2019.](#) You may be charged for snapshot service for your custom images. Please make sure your account has enough balance before creating the image. For details, please see [Snapshot Introduction](#).
- This instance supports online creation of images. It takes about 10 minutes to create the image.
- To create a custom image using Linux instance, please make sure that [there are no data disk configurations under /etc/fstab](#). Otherwise the instances created using this image cannot be started up normally. If there're mounted data disks, please comment out or delete the custom configurations of data disks in /etc/fstab

Image Name * lab1-webserver-golden-img

Supports only letters, numbers and hyphens

Description Apache2 + Static Home Page(HTML) for My Site

You can enter 16 more characters.

Create Image

4. 방금 생성한 Custom Image를 확인하려면 [Cloud Virtual Machine] 페이지의 좌측 메뉴 중 [Images] 메뉴를 클릭하면 된다.

Cloud Virtual Machine

Images						
Public Image		Custom Image				
		Shared Image				
Note						
1. Microsoft discontinued maintenance support for the Windows Server 2008 R2 operating system on January 14, 2020. Accordingly, Tencent Cloud officially deactivated the public image for Windows Server 2008 R2 Enterprise Edition SP1 64-bit on March 16, 2020 . Now you cannot use this image to purchase new CVM instances or reinstall CVM instances. However, the use of custom images, marketplace images, and imported images will not be affected.						
2. Tencent Cloud plans to start charging custom images according their snapshot size in Q1 2020. You can go to snapshot list and image details page to check the updated information on associated snapshots of the image.						
3. Image service uses CBS snapshot for data storage. CBS Snapshot (International) was commercialized on March 1, 2019 . Please note that you may be charged for snapshot service for your custom images. For details, please see Snapshot Introduction .						
4. You can adjust the policy according to your actual requirements to avoid unnecessary costs. <ul style="list-style-type: none"> When a custom image is created, a related snapshot is created automatically. To delete this snapshot, you need to delete the associated image first. Please check associated snapshots in Image Details page. For shared images, only the creator of the image is charged. Image snapshots are billed by the size of snapshots. You can check the total snapshot size in Snapshot Overview. 						
Create an Instance Cross-region replication Import Image Delete		<input type="text"/> Separate keywords with " ", and separate tags using the Enter key				
ID/Name	Status	Type	Capacity	Operation System	Creation Time	Operation
<input type="checkbox"/> img-jithpxn9 lab1-webserver-golden-img	Normal	Custom Image	50GB	Ubuntu Server 20.04 LTS 64bit	2021-06-02 17:43:56	Create an Instance Share More
Total items: 1						

5. 방금 생성한 Custom Image로 Instance를 생성해 보자. [Cloud Virtual Machine] 페이지에서 좌측 메뉴 중 [Instances] 메뉴를 클릭하여 Instance 페이지로 이동한다.

The screenshot shows the Cloud Virtual Machine Instances page. The left sidebar has a red box around the 'Instances' tab. The main area shows one instance: 'ins-7dzsh5dr webserver-seoul'. The instance is running in Seoul Zone 1 with a Standard S3 configuration. It has 1-core, 1GB memory, and an EIP assigned.

6. Instance 목록에서 **webserver-seoul** 인스턴스를 선택하고 [Shutdown] 버튼을 클릭하여 해당 Instance를 정지시킨다.

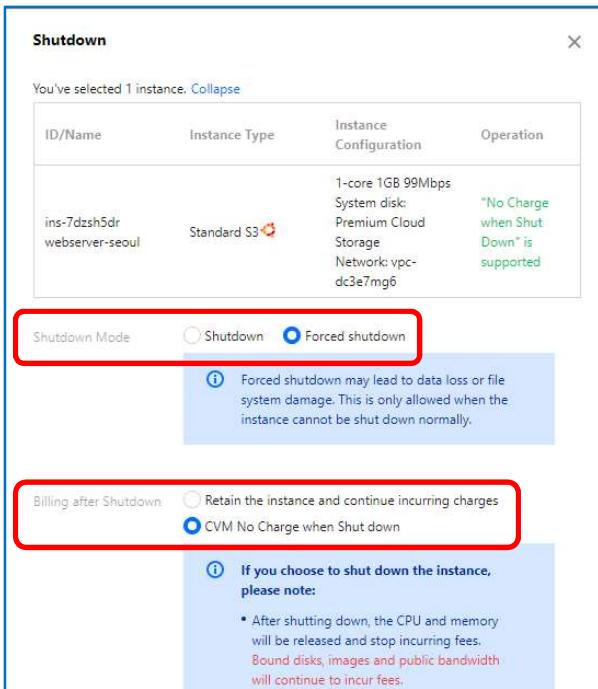
The screenshot shows the Instances page with the 'Shutdown' button highlighted by a red box and a cursor icon. The 'ins-7dzsh5dr webserver-seoul' instance is selected.

7. 혹시 인증창이 나타나면 핸드폰을 통해 전송받은 인증번호를 입력한다.

The screenshot shows the Identity Verification dialog box. It displays a message about account security, the verification method as 'Mobile Verification', the mobile number '+82 102***1340', the SMS verification code '442861', and a timer showing '32 seconds' remaining. There are 'OK' and 'Cancel' buttons at the bottom.

8. [Shutdown] 창이 나타나면, 다음의 값을 설정한 후, [OK] 파란색 버튼을 클릭한다.

- ① **[Shutdown Mode] : Forced shutdown**
- ② **[Billing after Shutdown] : CVM No Charge when Shut down**



9. **webserver-seoul** 인스턴스가 Shutdown 되었음을 확인한다. 이제 새 인스턴스를 생성하기 위해 [Create] 파란색 버튼을 클릭한다.

ID/Name	Monitoring	Status	Availability Zone	Instance Type	Instance Configuration	Primary IPv4	Instance Billing Mode
ins-7dzsh5dr webserver-seoul		Shut down	Seoul Zone 1	Standard S3	1-core 1GB 99Mbps System disk: Premium Cloud Storage Network: vpc-dc3e7mg6	150.109.247.77 (EIP) 10.0.1.11 (Private)	Pay as you go-Stop charging Created at 2021-06-02 14:00:14

10. 1단계 **Select Model** 단계이다. 다음의 각 값을 설정 후, [Next: Complete Configuration] 파란색 버튼을 클릭하여 다음 단계로 진행한다.

- ① **[Billing Mode]** : Pay as you go
- ② **[Region]** : Seoul
- ③ **[Availability Zone]** : Seoul Zone 2

④ [Network] : lab1-vpc | 10.0.0.0/16, lab1-vpc-seoul-2 | 10.0.2.0/24

The screenshot shows the Network configuration interface. At the top, there are dropdown menus for 'Network' (set to 'vpc-dc3e7mg6 | lab1-vpc | 10.0.0.0/16') and 'subnet' (set to 'subnet-8xwng7h9 | lab1-vpc-seoul-2 | 10.0.2.0/24'). Below these, a note says: 'If the existing VPC/subnet do not match your requirements, please go to the Console to Create a VPC or Create Subnet. You can change the VPC and subnet later in the console.' A red box highlights the network and subnet fields.

⑤ [Instance] : Standard | Standard S5

Standard S5 | S5.SMALL1 | 1-core | 1GB | 0.01USD/hr

The screenshot shows the instance selection interface. It includes filters for 'All CPU' and 'Total Mem'. Under 'Standard' models, 'Standard S5' is selected (highlighted with a red box). Other options shown include Standard S2 and Standard S1. The table lists two instances:

Model	Specifications	vCPU	MEM	CPU	Private network bandwidth	Packets In/Out	Supported Availability Zones	Notes	Fee
Standard S5	S5.SMALL1 Intel Xeon Cascade Lake 8255C/Intel Xeon Cooper Lake(2.5 GHz)	1-core	1GB	1.5Gbps	250k PPS	12 availability zone(s)	None	0.01USD/hr	
Standard S5	S5.SMALL2 Intel Xeon Cascade Lake 8255C/Intel Xeon Cooper Lake(2.5 GHz)	1-core	2GB	1.5Gbps	250k PPS	27 availability zone(s)	None	0.03USD/hr	

⑥ [Image] : Custom Image | lab1-webserver-golden-img

⑦ [System disk] : Premium Cloud Storage | 50 GB

⑧ [Data disk] : N/A

The screenshot shows the system disk configuration interface. It includes tabs for 'Image' (selected), 'Public image', and 'Shared image'. A red box highlights the 'Custom Image' tab, which displays 'lab1-webserver-golden-img | img-b5vvguv'. Below this, a note says: 'Please note that Linux/Windows cannot switch between Linux and Windows systems.' The 'System disk' section shows a 'Premium Cloud Storage' dropdown set to '50 GB' (with a red box around it). The 'Data disk' section has a '+ Add a cloud data disk' button.

⑨ [Public network bandwidth] : Assign a dedicated public IP for free

By Traffic | 100 Mbps

⑩ [Amount] : 1

The screenshot shows the public network bandwidth configuration interface. It includes a checkbox for 'Assign a dedicated public IP for free' (checked) and a 'By Traffic' button (highlighted with a red box). A slider bar shows '100 Mbps' (highlighted with a red box). Below the slider, a note says: 'Note: the traffic fee is settled on an hourly basis. When your account balance becomes negative, the service will be stopped in 2 hours.' The 'Selected Model' is 'S5.SMALL1(Standard S5, 1-core, 1 GB)'. The 'Configuration Fee' is '0.02USD/hr' (with a link to 'Billing Details'). The 'Network Fee' is '0.12USD/GB'. The 'Amount' is set to '1'. A 'Next: Complete Configuration' button is at the bottom right.

11. 2번째 단계인 **Complete Configuration** 단계이다. 각각의 값을 설정한다.

① [Security Groups] : Existing Security Groups | lab1-sg

The screenshot shows a navigation bar with tabs: 'Security Groups' (disabled), 'New security group' (disabled), 'Existing Security Groups' (selected), and 'Operation Guide'. Below the tabs is a dropdown menu containing 'sg-bjrggpyt | lab1-sg', which is highlighted with a red box. At the bottom of the page, there is a note: 'To open other ports, you can [New security group](#)'.

② [Project] : DEFAULT PROJECT

③ [Tag] : N/A

The screenshot shows a table for managing tags. The 'Project' column shows 'DEFAULT PROJECT'. The 'Tag' row has columns for 'Tag key' (with a note '(Optional) Please select a tag key'), 'Tag value' (with a note '(Optional) Please select the tag value'), and 'Operation' (with a 'Delete' button). An 'Add' button is at the bottom left, and a note at the bottom right says 'If the existing tags or tag values are not suitable, you can go to the console and [create new tags or tag values](#)'.

④ [Instance Name] : webserver-pusan

⑤ [Login Methods] : SSH Key Pair

⑥ [Username] : ubuntu

⑦ [SSH Key] : lab1_linux_key

The screenshot shows the 'Instance Name' field set to 'webserver-pusan', which is highlighted with a red box. Below it are fields for 'Login Methods' (Set Password, **SSH Key Pair**, Random Password, Follow image), 'Username' (ubuntu), and 'SSH Key' (skey-0ee9yrqt | lab1_linux_key). A note at the bottom says 'If no suitable key is found, you can [Create Now](#)'. To the right of the instance name field is a note: 'Supports batch sequential naming or pattern string-based naming. You can enter up to 60 characters. 45 characters remaining'.

⑧ [Security Reinforcement] : Enable for Free

⑨ [Cloud Monitoring] : Enable for Free

⑩ [Scheduled Termination] : N/A

The screenshot shows three sections: 'Security Reinforcement' with a checked checkbox and a note 'Install the component to activate Anti-DDoS and Cloud Workload Protection for free [Details](#)', 'Cloud Monitoring' with a checked checkbox and a note 'FREE cloud monitoring, analysis, alarming, and server monitoring metrics (component installation required) [Details](#)', and 'Scheduled Termination' with an unchecked checkbox and a note 'Enable it to terminate CVM at a specified time.'

⑪ [Amount] : 1 확인 후, [Next: Confirm Configuration] 파란색 버튼을 클릭한다.

Selected Model S5.SMALL1(Standard S5, 1-core, 1 GB) Configuration Fee 0.02USD/hr (Billing Details)
Amount - 1 + Network Fee 0.12USD/GB Previous Next: Confirm Configuration

12. 마지막 3단계 **Confirm Configuration** 단계이다. 각각의 항목을 확인하고 편집할 부분이 없으면 **[Agree Tencent Cloud Service Terms]** 체크하고 **[Enable]** 주황색 버튼을 클릭하여 Instance를 생성한다.

Please make sure port 22 and the ICMP protocol are allowed in the current security group. Otherwise, you will not be able to remotely log in to or ping the CVM. View
Please remember your key, as the password will become unavailable after a key is set for login. If you forget your key, re-bind an SSH key on the CVM console. View

1. Select Model 2. Complete Configuration 3. Confirm Configuration

Selected Model S5.SMALL1(Standard S5, 1-core, 1 GB) Configuration Fee 0.02USD/hr (Billing Details)
Amount - 1 + Network Fee 0.12USD/GB Previous Enable

13. 새 인스턴스가 생성되었다.

ID/Name	Monitoring	Status	Availability Zone	Instance Type	Instance Configuration	Primary IPv4	Instance Billing Mode
2 results found for "Project:DEFAULT PROJECT" Back to list							
ins-kyb7iwev New webserver-pusan	Running	Running	Seoul Zone 2	Standard S5	1-core 1GB 100Mbps System disk: Premium Cloud Storage	101.33.68.91 (Public) 10.0.2.12 (Private)	Pay as you go Created at 2021-06-02 17:51:43
ins-7dash5dr webserver-seoul	Shut down	Shut down	Seoul Zone 1	Standard S3	1-core 1GB 99Mbps System disk: Premium Cloud Storage Network: lab1-vpc	150.109.247.77 (EIP) 10.0.1.11 (Private)	Pay as you go-Stop charging Created at 2021-06-02 14:00:14

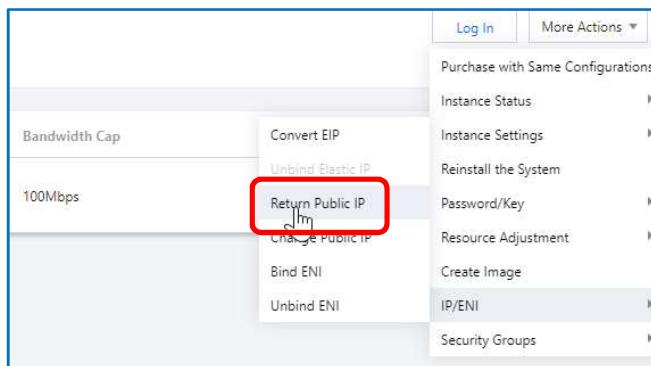
14. 새로 생성된 **webserver-pusan**의 링크를 클릭하여 상세 페이지로 들어간다. 그리고 상단 메뉴 중 **[Public IP]**를 클릭한다.

ins-kyb7iwev (webserver-pusan)

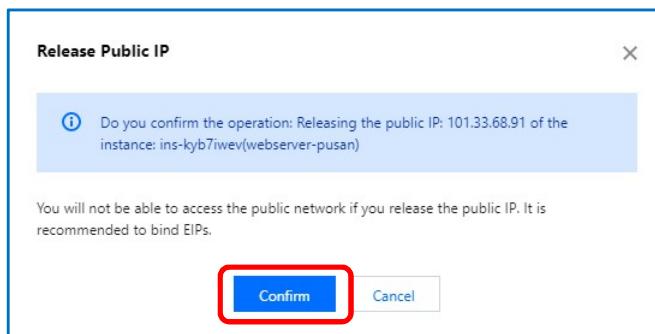
Basic Information ENI Public IP Monitoring Security Groups Operation Logs

ID/Name	IP	IP Type	Billing Mode
eip-m3u1k2gl Unnamed	101.33.68.91	Public IP	Bill by traffic

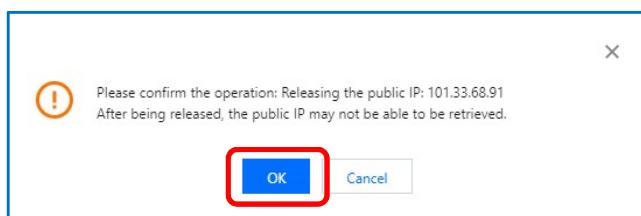
15. **webserver-seoul** 인스턴스가 사용하던 EIP를 **webserver-pusan** 인스턴스가 사용하려면 먼저 **webserver-pusan**의 Public IP를 제거해야 한다. **webserver-pusan**의 Public IP를 제거하기 위해 페이지 우측 상단의 [More Actions] > [IP/ENI] > [Return Public IP] 를 클릭한다.



16. [Release Public IP] 창이 나타난다. [Confirm] 파란색 버튼을 클릭한다.



17. 한번 더 Confirm 창이 나타난다. [OK]를 클릭한다.



18. 이제 **webserver-pusan** 인스턴스의 Public IP는 Release 되었다.

ins-r0jemqhr (webserver-pusan)					
Basic Information	ENI	Public IP	Monitoring	Security Groups	Operation Logs
ID/Name		IP		IP Type	

19. 현재 정지된 **webserver-seoul**의 EIP를 Unbind하기 위해 [Cloud Virtual Machine] 페이지의 좌측 메뉴 중 [EIP] 메뉴를 클릭한다. 현재 EIP는 **webserver-seoul**과 bind 되어 있는 것을 확인할 수 있다.

The screenshot shows the EIP management interface for a Seoul region. On the left sidebar, 'EIP' is selected under the 'Cloud Virtual Machine' category. The main table lists an EIP entry:

ID/Name	Status	EIP address	Billing Mode	Bandwidth Cap	Bind resources
eip-ncgcoxd	Bound	150.109.247.77	Bill by traffic	99 Mbps	ins-7dzsh5dr webserver-seoul

A red box highlights the entire row for the EIP entry.

20. EIP와 **webserver-seoul**과 Unbind하기 위해 해당 인스턴스의 제일 오른쪽 메뉴 [Operation] > [More] > [Unbind]를 클릭한다.

The screenshot shows the EIP list page with the 'More' dropdown menu open for the selected EIP entry. The 'Unbind' option is highlighted with a red box.

21. [Unbind EIP] 창이 나타난다. [OK]를 클릭하여 EIP와 **webserver-seoul** 인스턴스를 unbind 한다.

The screenshot shows the 'Unbind EIP' confirmation dialog. It contains the following information:

- A note: "Please note that your cloud resources may not be able to access to internet if the EIP is unbound. After unbinding, you can bind this EIP to other cloud resources."
- EIP: 150.109.247.77
- Bind an Instance: ins-7dzsh5dr | webserver-seoul
- Fee: After unbinding the Bill by traffic EIP, An IP idle fee of **0.04 USD/hour** will be incurred. To end billing, you need to release EIP. For details, see Release EIP.
- Buttons: OK (highlighted with a red box) and Cancel.

22. 정말 unbind할 것인지를 묻는다. [OK] 버튼을 클릭한다.

The screenshot shows a confirmation dialog asking: "Are you sure you want to unbind the EIP 150.109.247.77?". It contains two buttons: OK (highlighted with a red box) and Cancel.

23. Unbind 된 결과를 확인할 수 있다.

ID/Name	Status	EIP address	Billing Mode	Bandwidth Cap
eip-ngczoefd Unnamed	Not bound, incurring idle fee	150.109.247.77	Bill by traffic	99 Mbps

24. 위에서 새로 생성한 **webserver-pusan**과 **Bind**하기 위해 **EIP**의 가장 오른쪽 메뉴 **[Operation] > [More]** > **[Bind]** 메뉴를 클릭한다.

ID/Name	Status	EIP address	Billing Mode	Bandwidth Cap	Bind resources	Bound resource type	Application Time	Tag	Operation
eip-ngczoefd Unnamed	Not bound, incurring idle fee	150.109.247.77	Bill by traffic	99 Mbps	-	-	2021-06-02 14:00:14	-	Adjustment netw More ▾ Edit Tags Bind Release

25. **[Bind resources]** 창이 나타난다. 먼저 **[CVM Instances]**를 선택하고, 목록에서 **webserver-pusan**을 선택 한다. 그리고 **[OK]** 파란색 버튼을 클릭한다.

Please select the resource to be bound with the EIP (eip-ngczoefd)

CVM Instances NAT Gateway ENI

Instance ID/Name	Availability Zone	Private IP	Bound public IP
ins-kyb7iwev webserver-pusan	Seoul Zone 2	10.0.2.12	-
ins-7dzsh5dr webserver-seoul	Seoul Zone 1	10.0.1.11	-

OK Cancel

26. **[Confirm to Bind]** 창이 나타난다. **[OK]** 파란색 버튼을 클릭한다.

Confirm to Bind

! Please confirm the EIP (150.109.247.77) Are you sure you want to bind CVM (ins-kyb7iwev)?

OK Cancel

27. 결국 **webserver-seoul**의 EIP를 **webserver-pusan**이 Bind하였다.

The screenshot shows the EIP management interface. A table lists EIP resources. One entry is highlighted with a red box: "eip-ncgcoxd Unnamed" with status "Bound". To its right, the instance ID "ins-kyb7iwev" and name "webserver-pusan" are listed under "Bind resources".

28. 페이지의 좌측 메뉴 중 **[Instances]** 메뉴를 클릭하여 인스턴스 Dashboard로 이동한다. 그리고 **webserver-seoul** 인스턴스를 삭제한다. **webserver-seoul**을 선택하고 상단 메뉴 중 **[More Actions] > [Terminate/Return]** 메뉴를 클릭하여 삭제한다.

The screenshot shows the Instances dashboard. It lists two instances: "ins-kyb7iwev" (Running) and "ins-7dzsh5dr" (Shut down). The "ins-7dzsh5dr" instance is selected. In the top navigation bar, the "More Actions" dropdown is open, and the "Terminate/Return" option is highlighted with a red box.

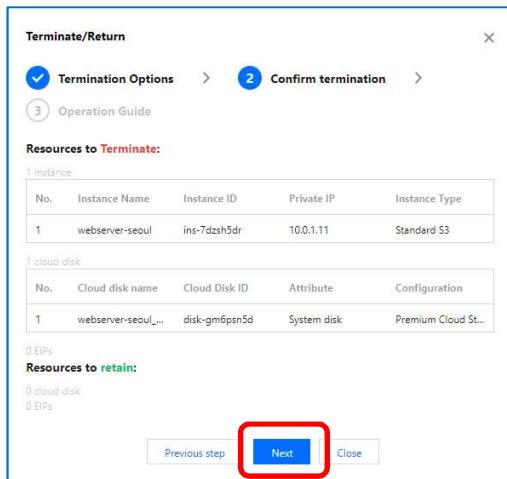
29. **[Terminate/Return]** 창의 첫번째 단계인 **Termination Options** 창이다. 다음의 각 값을 설정하고 **[Next]** 파란색 버튼을 클릭한다.

① **[Termination start time]** : Terminate Now

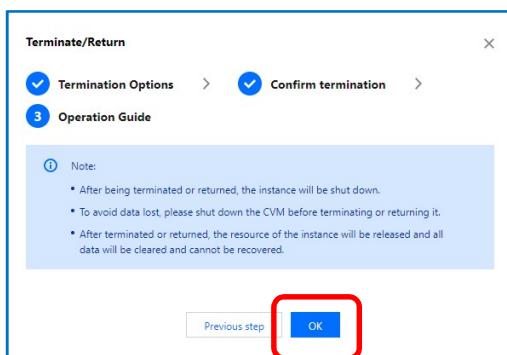
② **[Resource Release Options]** : Release now

The screenshot shows the "Terminate/Return" dialog, step 1: Termination Options. It displays the selected instance "ins-7dzsh5dr" (Shut down). A note at the bottom states: "After termination (instance release and scheduled termination), all data will be cleared and cannot be recovered. Please back up your data in advance." Two options are available: "Terminate Now" (selected) and "Scheduled Termination". Below it, another section for "Resource Release Options" has two options: "Release now" (selected) and "Release 2 hours later".

30. 계속해서 두번째 단계인 **Confirm termination** 단계이다. 계속 [Next] 파란색 버튼을 클릭한다.



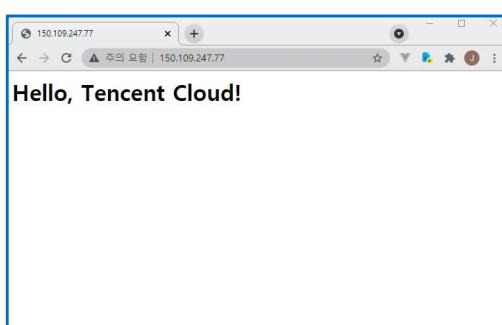
31. 마지막 단계인 **Operation Guide** 단계이다. [OK] 파란색 버튼을 클릭한다.



32. 성공적으로 **webserver-seoul** 인스턴스가 삭제되었다.

The screenshot shows theInstances management interface. At the top, it says 'Seoul 2' and has buttons for 'Create', 'Start Up', 'Shutdown', 'Restart', 'Reset Password', and 'More Actions'. A search bar is present. The main table lists instances with columns: ID/Name, Monitoring, Status, Availability Zone, Instance Type, Instance Configuration, Primary IP-v4, Instance Billing Mode, Network Billing Mode, Project, and Operation. One instance, 'webserver-seoul', is shown as 'Running' in 'Seoul Zone 2'. At the bottom right, there are buttons for 'Log In' and 'More'.

33. **webserver-pusan** 인스턴스의 EIP인 **150.109.247.77**을 복사한 후, 웹 브라우저를 통해 접속해 보자.
webserver-seoul과 동일한 웹 페이지가 나타나는 것을 알 수 있다.



Task6. Cloud Data Disk 생성하기

1. **Data disk**를 생성하기 위해 **[Cloud Virtual Machine]** 페이지에서 좌측 메뉴 중 **[Cloud Block Storage]** 메뉴를 클릭한다.

The screenshot shows the Cloud Block Storage interface. On the left sidebar, 'Cloud Block Storage' is highlighted with a red box. The main area displays a table of existing disks:

ID/Name	Monitoring	Status	Availability Zone	Attribute	Type	Capacity	Associated Instance
disk-99pqq26t webserver-pusan_SYS...		Mounted	Seoul Zone 2	System disk	Premium Cloud Storage	50GB	ins-kyb7iwev webserver-pusan

Total items: 1

2. 새 Disk를 생성하기 위해 **[Create]** 파란색 버튼을 클릭한다.

The screenshot shows the same Cloud Block Storage interface as before, but with the 'Create' button in the top navigation bar highlighted with a red box and a cursor icon pointing at it.

3. **[Purchase Data Disk]** 창이 나타난다. 다음과 같이 각 값을 설정하고 **[OK]** 파란색 버튼을 클릭한다.

- ① **[Availability Zone]** : Seoul Zone2(1)
- ② **[Cloud Disk Type]** : Premium Cloud Storage
- ③ **[Capacity]** : 100 GB
- ④ **[Disk Name]** : data-disk-high-io
- ⑤ **[Project]** : DEFAULT PROJECT
- ⑥ **[Billing Mode]** : Pay-as-you-go
- ⑦ **[Quantity]** : 1 disk(s)
- ⑧ **[Expiry/Overdue Protection]** : Enable

Purchase Data Disk

1. Elastic cloud disk can ONLY be mounted to instances in the same AZ.
2. After purchase, the data disk needs to be mounted to an instance and initialized before use. [Learn more](#)

Availability Zone * Seoul Zone 1(0) Seoul Zone 2(1)

Note: cloud disks cannot be mounted to CVMs in other AZs; and the AZ of cloud disk cannot be changed.

Cloud Disk Type * Premium Cloud Storage SSD cloud disks Enhanced SSD

Quick Disk Creation Create a cloud disk with a snapshot

Capacity * 100 GB

Disk Name data-disk-high-io

Project DEFAULT PROJECT

Tags Add

Billing Mode * Pay-as-you-go

Quantity * 1 disk(s)

Expiry/Overdue Protection Enable Recommended

Fee 0.01 USD/hour

OK Close

4. 성공적으로 Data disk가 생성되었다.

Cloud Block Storage Seoul(1)

Create Mount Unmount Terminate/Return Expiry/Overdue Protection More Actions

Separate keywords with "|", and separate tags using the Enter key

ID/Name	Monitoring	Status	Availability Zone	Attribute	Type	Capacity	Associated Instance
disk-ej4mpv5r data-disk-high-io		To be mounted	Seoul Zone 2	Data disk	Premium Cloud Storage	100GB	-
disk-99ppq26t webserver-pusan_SYS...		Mounted	Seoul Zone 2	System disk	Premium Cloud Storage	50GB	ins-kyb7iwev webserver-pusan

5. Cloud Block Storage 목록에서 방금 생성한 Data disk를 선택하고 제일 오른쪽 메뉴인 [Operation] > [More] > [Mount]메뉴를 클릭한다.

Cloud Block Storage Seoul(1)

Create Mount Unmount Terminate/Return Expiry/Overdue Protection More Actions

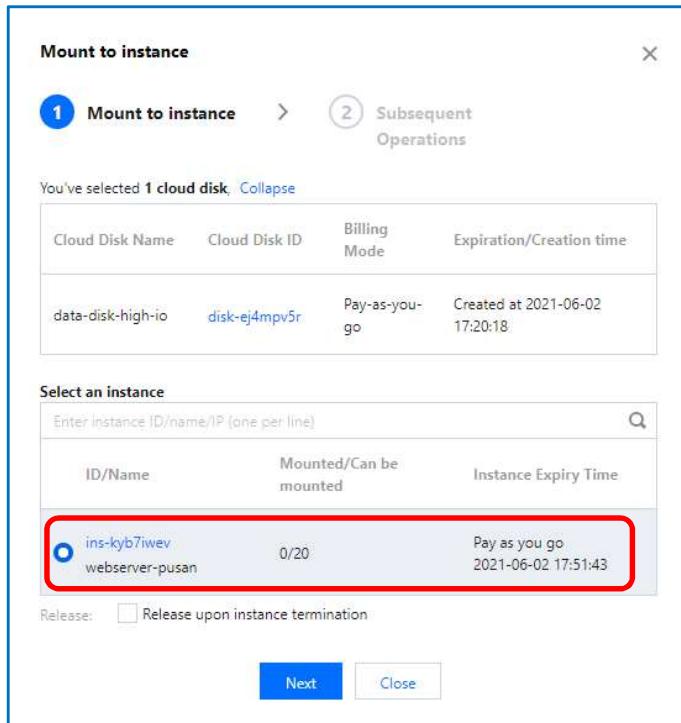
Separate keywords with "|", and separate tags using the Enter key

ID/Name	Monitoring	Status	Availability Zone	Attribute	Type	Capacity	Associated Instance	Total Snapshot Size	Release upon i...	Operation
disk-ej4mpv5r data-disk-high-io		To be mounted	Seoul Zone 2	Data disk	Premium Cloud Storage	100GB	-	No snapshots created	Do not release upon instance termination	Review Create a snapshot More
disk-99ppq26t webserver-pusan_SYS...		Mounted	Seoul Zone 2	System disk	Premium Cloud Storage	50GB	ins-kyb7iwev webserver-pusan	No snapshots created	Release upon instance termination	Review Create a snapshot

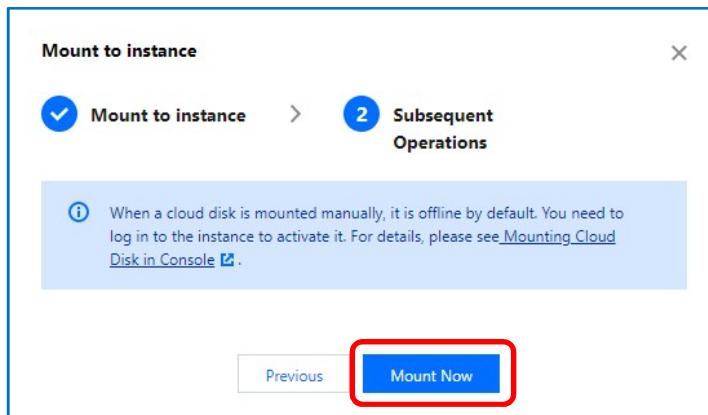
Total items: 2

Assign to Project Terminate/Return Modify properties Edit Tags

6. [Mount to instance] 창이 나타난다. 제1단계로 Mount to instance에서 webserver-pusan 인스턴스를 선택하고 [Next] 파란색 버튼을 클릭한다.



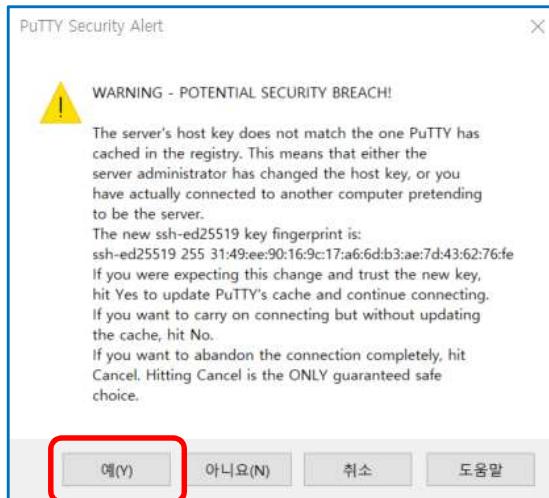
7. 제2단계인 Subsequent Operations에서 [Mount Now] 파란색 버튼을 클릭한다.



8. Data disk가 webserver-pusan 인스턴스와 Mount가 되었다.

ID/Name	Monitoring	Status	Availability Zone	Attribute	Type	Capacity	Associated Instance
disk-ej4mpv5r data-disk-high-io		Mounted	Seoul Zone 2	Data disk	Premium Cloud Storage	100GB	ins-kyb7iwev webserver-pusan
disk-99pqq26t webserver-pusan_SYS...		Mounted	Seoul Zone 2	System disk	Premium Cloud Storage	50GB	ins-kyb7iwev webserver-pusan

9. PuTTY 프로그램으로 webserver-pusan 인스턴스에 접속해 보자. 인스턴스가 사용하는 System disk가 변경되었기 때문에 새로 인증서 확인창이 나타나게 된다. [예(Y)]를 클릭한다.



10. websersver-pusan 인스턴스에 연결되었다.

```
ubuntu@VM-2-12-ubuntu: ~
login as: ubuntu
Authenticating with public key "imported-openssh-key"
Welcome to Ubuntu 20.04 LTS (GNU/Linux 5.4.0-72-generic x86_64)

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

System information as of Wed 02 Jun 2021 05:37:08 PM CST

System load: 0.02 Processes: 110
Usage of /: 6.8% of 49.16GB Users logged in: 0
Memory usage: 23% IPv4 address for eth0: 10.0.2.12
Swap usage: 0%

* Pure upstream Kubernetes 1.21, smallest, simplest cluster ops!

https://microk8s.io/
Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your
Internet connection or proxy settings

Last login: Wed Jun  2 16:20:35 2021 from 211.60.50.190
ubuntu@VM-2-12-ubuntu:~$
```

11. 먼저 아래의 명령으로 apt 목록을 update한다.

\$ sudo apt update

```
ubuntu@VM-2-12-ubuntu: ~
ubuntu@VM-2-12-ubuntu:~$ sudo apt update
Hit:1 http://mirrors.tencentyun.com/ubuntu focal InRelease
Hit:2 http://mirrors.tencentyun.com/ubuntu focal-security InRelease
Hit:3 http://mirrors.tencentyun.com/ubuntu focal-updates InRelease
Reading package lists...
Building dependency tree
Reading state information... Done
186 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@VM-2-12-ubuntu:~$
```

12. 다음의 명령으로 현재 **webserver-pusan** 가상머신의 하드디스크를 확인한다.

```
$ sudo fdisk -l
```

```
ubuntu@VM-2-12-ubuntu:~$ sudo fdisk -l
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: gpt
Disk identifier: 884D39AE-2030-4231-B486-520515A9ADD7

/dev/vdal    2048      4095      2048   1M BIOS boot
/dev/vda2   4096 104857566 104853471   50G Linux filesystem

Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
ubuntu@VM-2-12-ubuntu:~$
```

13. 다음 명령어를 이용해서 새로 추가한 하드디스크의 파티션 설정을 한다. 우선 필요한 매뉴얼을 보기 위해 **m**을 입력한다.

```
$ sudo fdisk /dev/vdb
```

```
Command (m for help) : m
```

```
ubuntu@VM-2-12-ubuntu: ~
ubuntu@VM-2-12-ubuntu:~$ sudo fdisk /dev/vdb
Welcome to fdisk (util-linux 2.34).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table.
Created a new DOS disklabel with disk identifier 0xbfb1b419e.

Command (m for help): m
```

14. 이 중에서 새 파티션을 추가하기 위해 **n**을 입력한다.

```
Command (m for help) : n
```

```
ubuntu@VM-2-12-ubuntu: ~
Command (m for help): m
Help:

a  toggle a bootable flag
b  edit nested BSD disklabel
c  toggle the dos compatibility flag

d  delete a partition
F  list free unpartitioned space
l  list known partition types
n  add a new partition
p  print the partition table
t  change a partition type
v  verify the partition table
i  print information about a partition

m  print this menu
u  change display/entry units
x  extra functionality (experts only)

I  load disk layout from sfdisk script file
O  dump disk layout to sfdisk script file

w  write table to disk and exit
q  quit without saving changes

g  create a new empty GPT partition table
G  create a new empty SGI (IRIX) partition table
o  create a new empty DOS partition table
s  create a new empty Sun partition table

Command (m for help): n
```

15. Partition type에서 **p**를 선택하여 새로운 Primary 파티션을 생성한다. Primary Partition은 4개까지 생성 할 수 있는데, 1을 입력한다. 파티션을 시작하는 첫번째 섹터를 선택하라고 나오면 기본값을 선택하기 위해 그냥 엔터키를 누른다. 마지막으로 마지막 섹터도 엔터를 눌러서 가장 마지막 섹터를 선택할 수 있도록 한다.

```
Select (default p) : p
Partition number : (1-4, default 1) : 1
First sector (2048-209715199, default 2048) : 엔터키
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-209715199, default 209715199) :
엔터키
```

확인된 파티션 정보가 맞으면 **w**를 입력해서 파티션 정보를 하드디스크에 써 주면 파티션 설정이 완료된다.

```
Command (m for help) : w
```

```
Command (m for help): n
Partition type
  p  primary (0 primary, 0 extended, 4 free)
  e  extended (container for logical partitions)
Select (default p): p
Partition number (1-4, default 1): 1
First sector (2048-209715199, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-209715199, default 209715199):

Created a new partition 1 of type 'Linux' and of size 100 GiB.

Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.

ubuntu@VM-2-12-ubuntu:~$
```

16. 다시 파티션 확인해 보자. 방금 추가한 파티션 /dev/vdb1 100GB이 보인다.

```
$ sudo fdisk -l
```

```
ubuntu@VM-2-12-ubuntu:~$ sudo fdisk -l
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: gpt
Disk identifier: 884D39AE-2030-4231-B486-520515A9ADD7

/dev/vda1      2048        4095      2048   1M BIOS boot
/dev/vda2     4096 104857566 104853471   50G Linux filesystem

Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0xbfb1b419e

/dev/vdb1      2048 209715199 209713152  100G 83 Linux
ubuntu@VM-2-12-ubuntu:~$
```

17. 설정한 파티션은 리눅스 시스템에 마운트하여 사용하기 전에 포맷 작업을 해야 한다. 다음의 명령어를 사용하여 ext4 파일 시스템으로 포맷 작업을 수행한다. mkfs도 관리자 권한이 필요하기 때문에 sudo 명령어를 같이 사용해야 한다.

```
$ sudo mkfs.ext4 /dev/vdb1
```

```
ubuntu@VM-2-12-ubuntu:~$ mkfs
mkfs: no device specified
try 'mkfs -h' for more information
ubuntu@VM-2-12-ubuntu:~$ sudo mkfs.ext4 /dev/vdb1
mkfs 1.45.5 (07 Jan 2020)
Creating filesystem with 26214144 4k blocks and 6553600 inodes
Filesystem UUID: f2fflebe-615a-4143-a0ac-8927612346d6
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
    4096000, 7962624, 11239424, 20480000, 23887872

Allocating group tables: done
Writing inode tables: done
Creating journal (131072 blocks): done
Writing superblocks and filesystem accounting information: done

ubuntu@VM-2-12-ubuntu:~$
```

18. datadisk 이름의 디렉토리를 생성하고 이 디렉토리를 방금 포맷한 /dev/vdb1과 마운트한다.

```
$ mkdir datadisk
```

```
$ ls
```

```
$ sudo mount /dev/vdb1 datadisk
```

```
ubuntu@VM-2-12-ubuntu:~/datadisk$ mkdir datadisk
ubuntu@VM-2-12-ubuntu:~/datadisk$ ls
datadisk
ubuntu@VM-2-12-ubuntu:~/datadisk$ mount /dev/vdb1 datadisk
mount: only root can do that
ubuntu@VM-2-12-ubuntu:~/datadisk$ sudo mount /dev/vdb1 datadisk
```

19. datadisk 디렉토리로 이동하여 hello.txt 파일 하나를 생성한다. 그리고 hello.txt 파일 안에 Hello, Tencent Cloud Block Disk라는 문장을 입력하고 저장한다.

```
$ cd datadisk
```

```
$ sudo nano hello.txt
```

...

```
$ cat hello.txt
```

```
ubuntu@VM-2-12-ubuntu:~/datadisk$ cd datadisk
ubuntu@VM-2-12-ubuntu:~/datadisk$ sudo nano hello.txt
ubuntu@VM-2-12-ubuntu:~/datadisk$ cat hello.txt
Hello, Tencent Cloud Block Disk
ubuntu@VM-2-12-ubuntu:~/datadisk$
```

```
GNU nano 4.8          hello.txt          Modified ^

Hello, Tencent Cloud Block Disk

^G Get Help   ^O Write Out   ^W Where Is   ^K Cut Text   ^J Justify
^X Exit      ^R Read File    ^A Replace    ^U Paste Text  ^T To Spell
```

20. 다음의 명령어를 통해 마운트되어있는 /dev/vdb1을 언마운트한다. 그리고 **datadisk** 디렉토리로 이동해서 목록을 확인해 보면 위에서 생성한 **hello.txt** 파일이 보이지 않는 것을 확인할 수 있다.

```
$ sudo umount /dev/vdb1
```

```
$ ls
```

```
$ cd datadisk
```

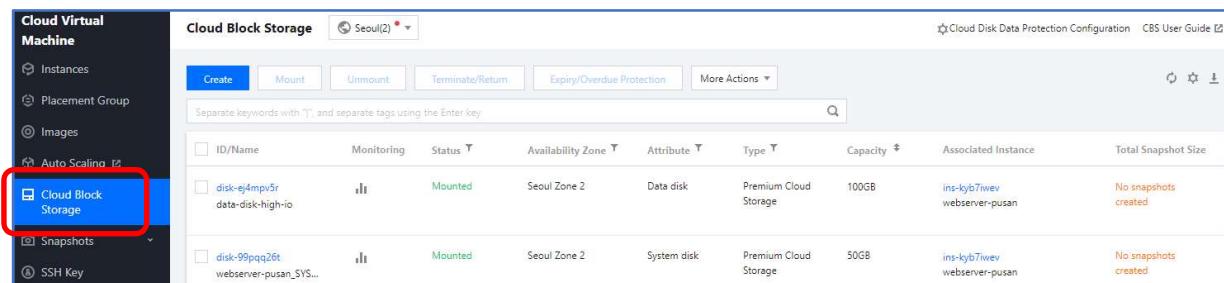
```
$ ls
```

```
$ cd ..
```

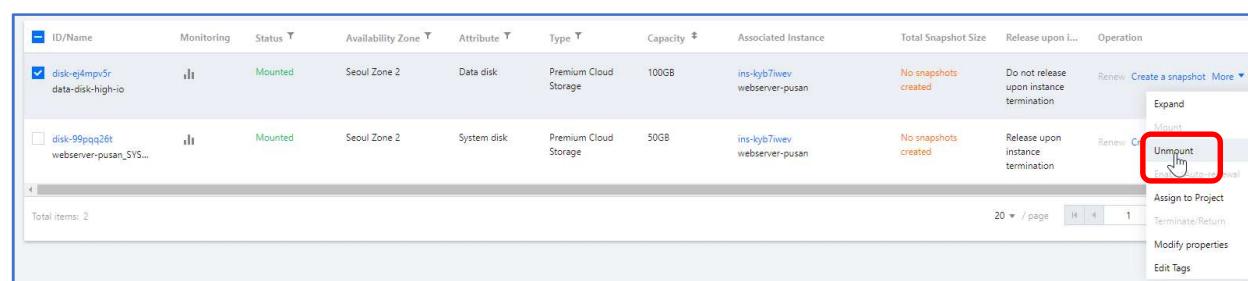
```
$ ls
```

```
ubuntu@VM-2-12-ubuntu: ~/datadisk$ cd ..
ubuntu@VM-2-12-ubuntu: ~$ sudo umount /dev/vdb1
ubuntu@VM-2-12-ubuntu: ~$ ls
datadisk
ubuntu@VM-2-12-ubuntu: ~$ cd datadisk
ubuntu@VM-2-12-ubuntu: ~/datadisk$ ls
ubuntu@VM-2-12-ubuntu: ~/datadisk$ cd ..
ubuntu@VM-2-12-ubuntu: ~$ ls
datadisk
ubuntu@VM-2-12-ubuntu: ~$
```

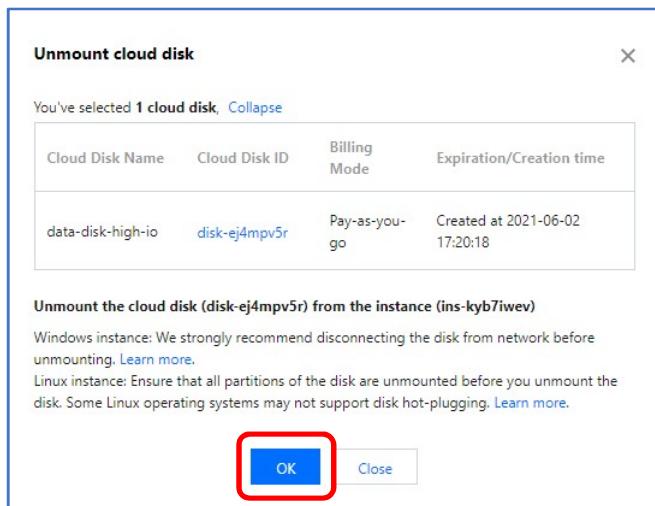
21. 그럼 **webserver-pusan** 가상 머신에 Mount했던 **Data Disk**를 분리하기로 한다. 다시 **Tencent Cloud Console**로 돌아와서, 페이지 좌측 메뉴 중 **[Cloud Block Storage]** 메뉴를 클릭하여 해당 페이지로 이동한다.



22. **Data Disk**를 분리하기 위해 **data-disk-high-io**를 선택하고 제일 오른쪽 메뉴인 **[Operation] > [More] > [Unmount]**를 클릭한다.



23. [Unmount cloud disk] 창에서 [OK] 파란색 버튼을 클릭한다.



24. 인증창이 나오면 [Send Verification Code] 파란색 버튼을 클릭하여 인증번호를 받아서 [OK] 버튼을 클릭한다.



25. 이제 webserver-pusan 인스턴스에서 data-disk-high-io Data Disk는 분리되었다.

ID/Name	Monitoring	Status	Availability Zone	Attribute	Type	Capacity	Associated Instance
disk-ej4mpv5r data-disk-high-io		To be mounted	Seoul Zone 2	Data disk	Premium Cloud Storage	100GB	-
disk-99pqq26 webserver-pusan_SY...		Mounted	Seoul Zone 2	System disk	Premium Cloud Storage	50GB	ins-kyb7iwev webserver-pusan

26. 이제 새로운 인스턴스를 생성해 보자. 페이지 좌측 메뉴 중 [Instances]를 클릭하여 Instance Dashboard로 이동한다. 현재 Seoul 리전에는 webserver-pusan 인스턴스만 있는 것을 확인한다. 새 인스턴스를 생성하기 위해 [Create] 파란색 버튼을 클릭한다.

The screenshot shows the 'Instances' section of the Tencent Cloud console. At the top, there's a 'Create' button highlighted with a red box. Below it, a table lists one instance: 'ins-kyb7iweb' (status: Running, zone: Seoul Zone 2, type: Standard S5). The table includes columns for ID/Name, Monitoring, Status, Availability Zone, Instance Type, Instance Configuration, Primary IPv4, and Instance Billing Mode. A search bar and a checkbox for pending instances are also present.

27. Task2를 참조하여 새로운 Instance를 생성한다. CVM 생성 페이지는 모두 3단계를 수행하여 인스턴스를 생성한다.

This screenshot shows the 'Custom Configuration' step of the CVM creation wizard. It's divided into three tabs: 1. Select Model (active), 2. Complete Configuration, and 3. Confirm Configuration. Under 'Billing Mode', 'Pay as you go' is selected. In the 'Region' section, 'Seoul' is chosen from a list that includes Guangzhou, Shanghai, Nanjing (Promo), Beijing, Chengdu, Chongqing, Hong Kong, China, Singapore, Bangkok, Jakarta (NEW), Mumbai, Seoul, Tokyo, Silicon Valley, and Virginia. The 'Availability Zone' section shows 'Seoul Zone 2' selected. Network settings like 'Default VPC (Default)' and 'Default-Subnet (Default)' are also visible.

28. 1단계 **Select Model** 단계이다. 각각의 값을 설정한 후, [Next: Complete Configuration] 파란색 버튼을 클릭하여 다음 단계로 진행한다.

① **[Billing Mode]** : Pay as you go

A close-up view of the 'Billing Mode' selection area. It shows three options: 'Pay as you go' (highlighted with a red box), 'Spot Instances', and 'Detailed Comparison'.

② **[Region]** : Seoul

③ **[Availability Zone]** : Seoul Zone 2

A close-up view of the 'Region' and 'Availability Zone' selection areas. In the 'Region' section, 'Seoul' is selected from a list that includes Guangzhou, Shanghai, Nanjing (Promo), Beijing, Chengdu, Chongqing, Hong Kong, China, Singapore, Bangkok, Jakarta (NEW), Mumbai, Seoul, Tokyo, Silicon Valley, and Virginia. In the 'Availability Zone' section, 'Seoul Zone 2' is selected from a list that includes Random AZ, Seoul Zone 1, and Seoul Zone 2 (highlighted with a red box).

- ④ [Network] : lab1-vpc | 10.0.0.0/16, lab1-vpc-seoul-2 | 10.0.2.0/24

Network: vpc-dc3e7mg6 | lab1-vpc | 10.0.0.0/16
 Subnet: subnet-8xwng7h9 | lab1-vpc-seoul-2 | 10.0.2.0/24
 Available IPs in the subnet: 252
If the existing VPC/subnet do not match your requirements, please go to the Console to [Create a VPC](#) or [Create Subnet](#). You can change the VPC and subnet later in the console.

- ⑤ [Instance] : Standard | Standard S5

S5.SMALL1 | 1-core | 1GB | 0.01USD/hr

Model	Specifications	vCPU	MEM	CPU	Private network bandwidth	Packets In/Out	Supported Availability Zones	Notes	Fee
Standard S5	S5.SMALL1 Intel Xeon Cascade Lake 8255C/Intel Xeon Cooper Lake(2.5 GHz)	1-core	1GB		1.5Gbps	250k PPS	13 availability zone(s)	None	0.01USD/hr
Standard S5	S5.SMALL2 Intel Xeon Cascade Lake 8255C/Intel Xeon Cooper Lake(2.5 GHz)	1-core	2GB		1.5Gbps	250k PPS	28 availability zone(s)	None	0.03USD/hr

- ⑥ [Image] : Public image

Ubuntu | 64-bit | Ubuntu Server 20.04 LTS 64bit

Image: Public image
 Ubuntu | 64-bit | Ubuntu Server 20.04 LTS 64bit

Please note that instances purchased in this region cannot switch between Linux and Windows systems.

- ⑦ [System disk] : Premium Cloud Storage | 50 GB

System disk: Premium Cloud Storage | 50 GB
 System disk type cannot be changed after purchase.

Data disk: + Add a cloud data disk You can add 20 data disk(s)

- ⑧ [Public network bandwidth] : Assign a dedicated public IP for free

By Traffic | 100 Mbps

Public network bandwidth Assign a dedicated public IP for free

By Traffic Detailed Comparison ↗

1Mbps 5Mbps 20Mbps 100Mbps 100Mbps Mbps

Note: the traffic fee is settled on an hourly basis. When your account balance becomes negative, the service will be stopped in 2 hours.

⑨ [Amount] : 1

Selected Model S3.SMALL1(Standard S3, 1-core, 1 GB) Configuration Fee 0.03USD/hr (Billing Details)

Amount 1

Network Fee 0.12USD/GB

Next: Complete Configuration

29. 2단계 **Complete Configuration** 단계이다. 다음의 각각의 값을 설정한다.

① [Security Groups] : [New security groups]

ICMP, TCP:22, Allow private access만 체크

Security Groups New security group Existing Security Groups Operation Guide ↗

allow common IPs/ports

ICMP Allows ping command on the CVM from internet TCP:80 When the CVM is used as web server (HTTP)

TCP:22 Allows remote login via SSH key for Linux instances TCP:443 When the CVM is used as web server (HTTPS)

TCP:3389 Allows remote login via RDP for Windows instances Allow private access Allows private network access among different cloud resources (IPv4)

To open other ports, you can [New security group](#).

② [Project] : DEFAULT PROJECT

③ [Tag] : N/A

Project	DEFAULT PROJECT		
Tag	Tag key	Tag value	Operation
	(Optional) Please select a tag key	(Optional) Please select the tag value	Delete
Add If the existing tags or tag values are not suitable, you can go to the console and create new tags or tag values .			

④ [Instance Name] : lab1-server

⑤ [Login Methods] : Set Password

⑥ [Username] : ubuntu

⑦ [Password] : P@\$\$W0rd1234

⑧ [Confirm Password] : P@\$\$W0rd1234

Instance Name: lab1-server

Login Methods: Set Password (highlighted), SSH Key Pair, Random Password

Note: please keep your password in mind. If you forgot your password, please reset it on CVM Console.

Username: ubuntu

Password: (redacted)

Confirm Password: (redacted)

⑨ [Security Reinforcement] : Enable for Free

⑩ [Cloud Monitoring] : Enable for Free

⑪ [Scheduled Termination] : N/A

Security Reinforcement	<input checked="" type="checkbox"/> Enable for Free Install the component to activate Anti-DDoS and Cloud Workload Protection for free Details
Cloud Monitoring	<input checked="" type="checkbox"/> Enable for Free FREE cloud monitoring, analysis, alarming, and server monitoring metrics (component installation required) Details
Scheduled Termination	<input type="checkbox"/> Enable Scheduled Termination Enable it to terminate CVM at a specified time.

30. [Advanced Settings] 링크를 클릭하면 추가 설정을 할 수 있다. 다음의 각 값을 설정하고 [Next: Confirm Configuration] 파란색 버튼을 클릭하여 다음 단계로 진행한다.

① [Hostname] : lab1-server

Advanced Settings

Hostname: lab1-server

CAM Role: None

Placement Group: Add the instance to a placement group

Custom data: (Optional) The custom data is used to configure instances during launching. It supports the Shell format. The original data cannot exceed 16KB. The Shell script must start with "#" or "!" and the path to the interpreter reading the script (usually /bin/bash).

The above input is encoded with base64

31. 마지막 3단계 Confirm Configuration 단계이다. 각 항목을 점검하고 변경할 내용이 없으면 [Agree Tencent Cloud Service Terms] 체크박스를 체크하고 [Enable] 주황색 버튼을 클릭하여 CVM을 생성한다.

1.Select Model **2.Complete Configuration** **3.Confirm Configuration**

Please make sure port 22 and the ICMP protocol are allowed in the current security group. Otherwise, you will not be able to remotely log in to or ping the CVM. View
Keep your password in mind. If you forget your password, reset it on the CVM console. [View](#)

- ▼ Region and model Seoul Zone 2; S5.SMALL1 (Standard S5, 1-core 1 GB) [Edit](#)
- ▼ Image Public image: Ubuntu Server 20.04 LTS 64bit [Edit](#)
- ▼ Storage and Bandwidth 50 GB system disk; By Traffic: 94Mbps [Edit](#)
- ▼ Security Groups Custom Template [Edit](#)
- ▼ Set Information Login by password (custom) [Edit](#)
- ▼ Advanced Settings [Edit](#)

[Generate API Explorer Reusable Scripts](#) ?

Selected Model S5.SMALL1(Standard S5, 1-core, 1 GB)

Amount - 1 +

Configuration Fee **0.02USD/hr** ([Billing Details](#))

Network Fee **0.12USD/GB**

Agree "Tencent Cloud Service Terms" Previous Enable

32. 잠시 시간이 흐른 뒤, **Instance**가 생성되면 다음 그림과 같이 새로운 인스턴스가 만들어진 것을 볼 수 있다.

33. 페이지의 좌측 메뉴 중 **[Cloud Block Storage]** 메뉴를 클릭하여 해당 페이지로 이동한다. 현재 3개의 **System Disk**, **Data Disk**를 확인할 수 있다.

Cloud Block Storage								
Create Mount Unmount Terminate/Return Expiry/Overdue Protection More Actions								
Separate keywords with " ", and separate tags using the Enter key ?								
ID/Name	Monitoring	Status	Availability Zone	Attribute	Type	Capacity	Associated Instance	Total Snapshot
disk-gqlx0783 lab1-server_SYSTEM...	[Mount]	Mounted	Seoul Zone 2	System disk	Premium Cloud Storage	50GB	ins-g1h12k29 lab1-server	No snapshots created
disk-ej4tmpv5r data-disk-high-io	[Mount]	To be mounted	Seoul Zone 2	Data disk	Premium Cloud Storage	100GB	-	No snapshots created
disk-99pqpq26t webserver-pusan_SY...	[Mount]	Mounted	Seoul Zone 2	System disk	Premium Cloud Storage	50GB	ins-kyb7iwev webserver-pusan	No snapshots created

34. Data Disk의 data-disk-high-io를 방금 생성한 lab1-server에 Mount 한다. [Cloud Block Storage] 목록에서 data-disk-high-io를 선택하고 제일 오른쪽 메뉴인 [Operation] > [More] > [Mount] 메뉴를 클릭한다.

The screenshot shows the 'Cloud Block Storage' interface with the 'Seoul(3)' region selected. A table lists three cloud disks. The second disk, 'disk-ej4mpv5r data-disk-high-io', has its status changed to 'To be mounted'. In the 'Operation' column for this disk, the 'Mount' button is highlighted with a red box. Other columns include ID/Name, Monitoring, Status, Availability Zone, Attribute, Type, Capacity, Associated Instance, Total Snapshot S..., Release upon..., and Operation.

35. [Mount to instance] 창이 나타나면 [Select an instance] 목록에서 lab1-server를 선택하고 [Next] 패션 버튼을 클릭한다.

The screenshot shows the 'Mount to instance' dialog. Step 1: Mount to instance is completed. Step 2: Subsequent Operations is shown. It lists one selected cloud disk: 'data-disk-high-io' (disk-ej4mpv5r). The 'Select an instance' section shows two instances: 'ins-g1h12k29 lab1-server' and 'ins-kyb7iwev webserver-pusan'. The first instance is selected and highlighted with a red box. Below the instances is a 'Release:' checkbox and a note about releasing upon instance termination. At the bottom are 'Next' and 'Close' buttons, with 'Next' highlighted with a red box.

36. 다음 단계에서 [Mount Now] 버튼을 클릭한다.

The screenshot shows the 'Mount to instance' dialog at the 'Mount to instance' step. It includes a note about manually mounting disks being offline by default. At the bottom are 'Previous' and 'Mount Now' buttons, with 'Mount Now' highlighted with a red box.

37. Data Disk인 `data-disk-high-io0`이 `lab1-server` 가상 머신과 마운트되었다.

The screenshot shows the Cloud Block Storage interface with the Seoul(3) region selected. A red box highlights the second row, which contains the data disk `disk-ej4mpv5r` (`data-disk-high-io0`) with a capacity of 100GB, mounted on the `lab1-server`.

ID/Name	Monitoring	Status	Availability Zone	Attribute	Type	Capacity	Associated Instance
disk-gqlx0783 lab1-server_SYSTEM...	■	Mounted	Seoul Zone 2	System disk	Premium Cloud Storage	50GB	ins-g1h12k29 lab1-server
disk-ej4mpv5r data-disk-high-io0	■	Mounted	Seoul Zone 2	Data disk	Premium Cloud Storage	100GB	ins-g1h12k29 lab1-server
disk-99ppq26t webserver-pusan_SY...	■	Mounted	Seoul Zone 2	System disk	Premium Cloud Storage	50GB	ins-kyb7iwev webserver-pusan

38. [Instances] Dashboard 페이지로 이동해서 `lab1-server`의 Public IP를 복사해서 PuTTY를 통해 접속한다.

The screenshot shows the Instances Dashboard with the Seoul 2 region selected. It lists two running instances: `ins-g1h12k29` (`lab1-server`) and `ins-kyb7iwev` (`webserver-pusan`). A red arrow points from the Public IP of `ins-g1h12k29` (101.33.80.40) in the dashboard to the Host Name field in the PuTTY configuration window below.

ID/Name	Monitoring	Status	Availability Zone	Instance Type	Instance Configuration	Primary IPv4	Instance Billing Mode
ins-g1h12k29 lab1-server	■	Running	Seoul Zone 2	Standard S5	1-core 1GB 94Mbps System disk: Premium Cloud Storage Network: lab1-vpc	101.33.80.40 (Public)	Pay as you go Created at 2021-06-03 10:15:11
ins-kyb7iwev webserver-pusan	■	Running	Seoul Zone 2	Standard S5	1-core 1GB 99Mbps System disk: Premium Cloud Storage Network: lab1-vpc	10.109.247.77 (EIP) 10.0.2.12 (Private)	Pay as you go Created at 2021-06-02 17:51:43

The screenshot shows the PuTTY Configuration dialog. The `Host Name (or IP address)` field is highlighted with a red box and contains the value `101.33.80.40`. The `Connection type:` section shows `SSH` selected. The `Category:` sidebar on the left is expanded to show all options.

PuTTY Configuration

Category:

- Session
- Logging
- Terminal
- Keyboard
- Bell
- Features
- Window
- Appearance
- Behaviour
- Translation
- Selection
- Colours
- Connection
- Data
- Proxy
- Telnet
- Rlogin
- SSH
- Serial

Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address): `101.33.80.40` **Port**: `22`

Connection type: Raw Telnet Rlogin SSH Serial

Load, save or delete a stored session

Saved Sessions

- Default Settings
- Web Server Seoul

Close window on exit: Always Never Only on clean exit

Buttons: About, Help, Open, Cancel

39. 새 인증서창에서 접속을 위해 [예(Y)]를 클릭하고 원격접속한다.



40. 본 실습에서 필자는 이전 인스턴스들과 구별하기 위해 터미널의 배경색을 변경했다. Login ID는 **ubuntu**, 비밀번호는 **P@\$\$W0rd1234**를 입력해서 로그인한다.

```
ubuntu@lab1-server:~$ login as: ubuntu
ubuntu@101.33.80.40's password:
Welcome to Ubuntu 20.04 LTS (GNU/Linux 5.4.0-72-generic x86_64)

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

 System information as of Thu 03 Jun 2021 09:25:23 AM CST

 System load: 0.02      Processes:          108
 Usage of /: 6.7% of 49.16GB  Users logged in:    0
 Memory usage: 24%           IPv4 address for eth0: 10.0.2.15
 Swap usage:  0%

 => There is 1 zombie process.

 * Pure upstream Kubernetes 1.21, smallest, simplest cluster ops!

 https://microk8s.io/
ubuntu@lab1-server:~$
```

41. 먼저 다음의 명령으로 apt 목록을 update한다.

\$ sudo apt update

```
ubuntu@lab1-server:~$ Get:43 http://mirrors.tencentyun.com/ubuntu focal-updates/restricted amd64 Packages [241 kB]
Get:44 http://mirrors.tencentyun.com/ubuntu focal-updates/restricted Translation-en [35.5 kB]
Get:45 http://mirrors.tencentyun.com/ubuntu focal-updates/restricted amd64 c-n-f Metadata [456 B]
Get:46 http://mirrors.tencentyun.com/ubuntu focal-updates/universe amd64 Package s [179 kB]
Get:47 http://mirrors.tencentyun.com/ubuntu focal-updates/universe Translation-e n [168 kB]
Get:48 http://mirrors.tencentyun.com/ubuntu focal-updates/universe amd64 c-n-f M etadata [17.6 kB]
Get:49 http://mirrors.tencentyun.com/ubuntu focal-updates/multiverse amd64 Packa ges [21.7 kB]
Get:50 http://mirrors.tencentyun.com/ubuntu focal-updates/multiverse Translation- en [5,564 B]
Get:51 http://mirrors.tencentyun.com/ubuntu focal-updates/multiverse amd64 c-n-f M etadata [604 B]
Fetched 32.2 MB in 6s (5,095 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
186 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@lab1-server:~$
```

42. 다음의 명령으로 인스턴스의 파티션 정보를 확인해 본다. 현재 이 인스턴스는 **100GB의 /dev/vdb10**이 마운트되어 있는 것을 알 수 있다.

\$ sudo fdisk -l

```
ubuntu@lab1-server:~$ sudo fdisk -l
Disk /dev/vda: 100 GiB, 107374182400 bytes, 209715200 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
Disklabel type: gpt
Disk identifier: 884D39AE-2030-4231-B486-520515A9ADD7

Device Start End Sectors Size Type
/dev/vdal 2048 4095 2048 1M BIOS boot
/dev/vda2 4096 104857566 104853471 50G Linux filesystem

Disk /dev/vdb: 100 GiB, 107374182400 bytes, 209715200 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
Disklabel type: dos
Disk identifier: 0xbfb1b419e

/dev/vdb1 2048 209715199 209713152 100G 83 Linux
ubuntu@lab1-server:~$
```

43. **test** 디렉토리를 생성하고, **/dev/vdb1**과 마운트한다. **/dev/vdb1**에 위에서 생성한 **hello.txt** 파일이 있는 것을 알 수 있다.

```
$ mkdir test
$ ls
$ sudo mount /dev/vdb1 test
$ cd test
$ ls
```

```
ubuntu@lab1-server:~/test$ 
ubuntu@lab1-server:~$ mkdir test
ubuntu@lab1-server:~$ ls
test
ubuntu@lab1-server:~$ sudo mount /dev/vdb1 test
ubuntu@lab1-server:~$ cd test
ubuntu@lab1-server:~/test$ ls
hello.txt lost+found
ubuntu@lab1-server:~/test$
```

44. **hello.txt** 파일의 내용을 확인해 보자.

```
$ cat hello.txt
ubuntu@lab1-server:~/test$ 
ubuntu@lab1-server:~/test$ cat hello.txt
Hello, Tencent Cloud Block Disk
ubuntu@lab1-server:~/test$
```