

Lab7. Implementing TencentDB for MySQL

1. 목적

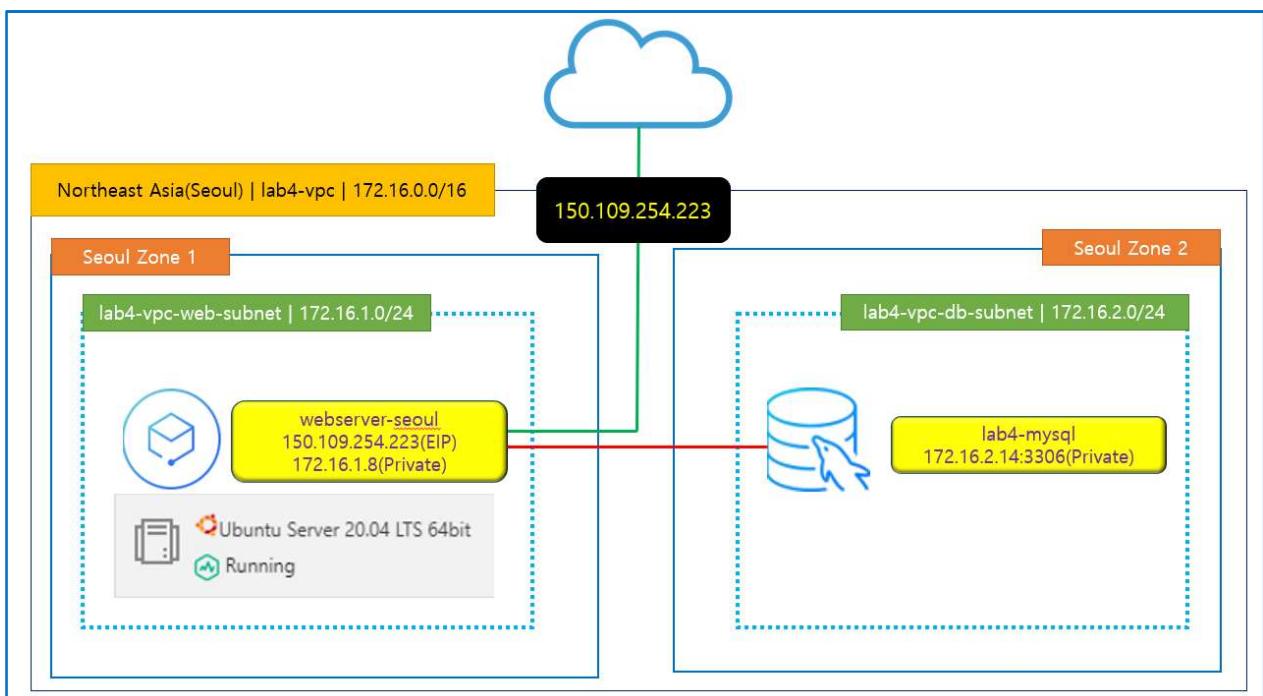
- 이번 Lab에서는 Tencent Cloud에서 제공하는 Database Service 중 TencentDB for MySQL을 설치하고 이용하는 방법을 다룬다. MySQL Database Server는 새로운 Subnet 생성 후 설치한다. 설치 후 Web Server의 Private Network를 이용해서 연결하는 방법을 다룬다. 또한 MySQL 연결계정을 생성하고, 이 계정을 통해 Database를 생성하고 그 안에 TABLE을 생성한 후, CSV 파일을 업로드하여 데이터 Import를 수행한다.

2. 사전 준비물

- Tencent Cloud Account

3. 목차

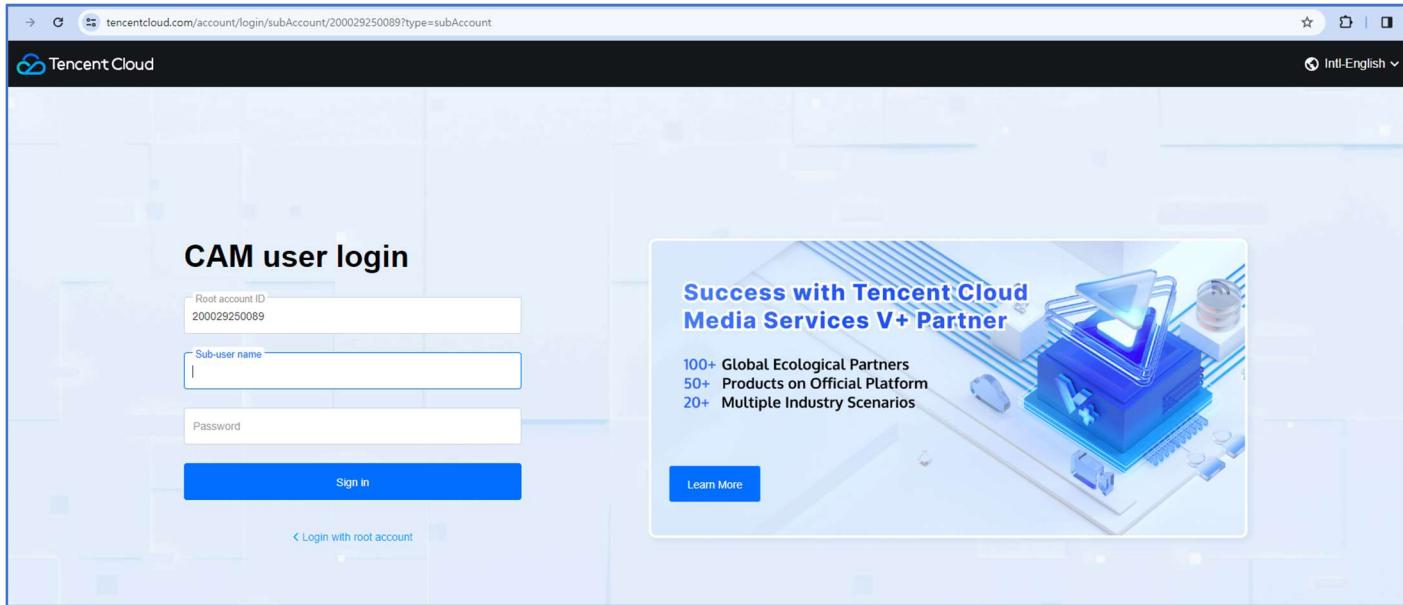
- Task1. VPC(Virtual Private Cloud)와 Subnet 생성하기
- Task2. Web Server CVM 설치하기
- Task3. TencentDB for MySQL 설치하기
- Task4. MySQL Database Server에 직접 연결하기
- Task5. Web Server에서 Private Network으로 Database Server에 연결하기
- Task6. TencentDB for MySQL Data 관리하기



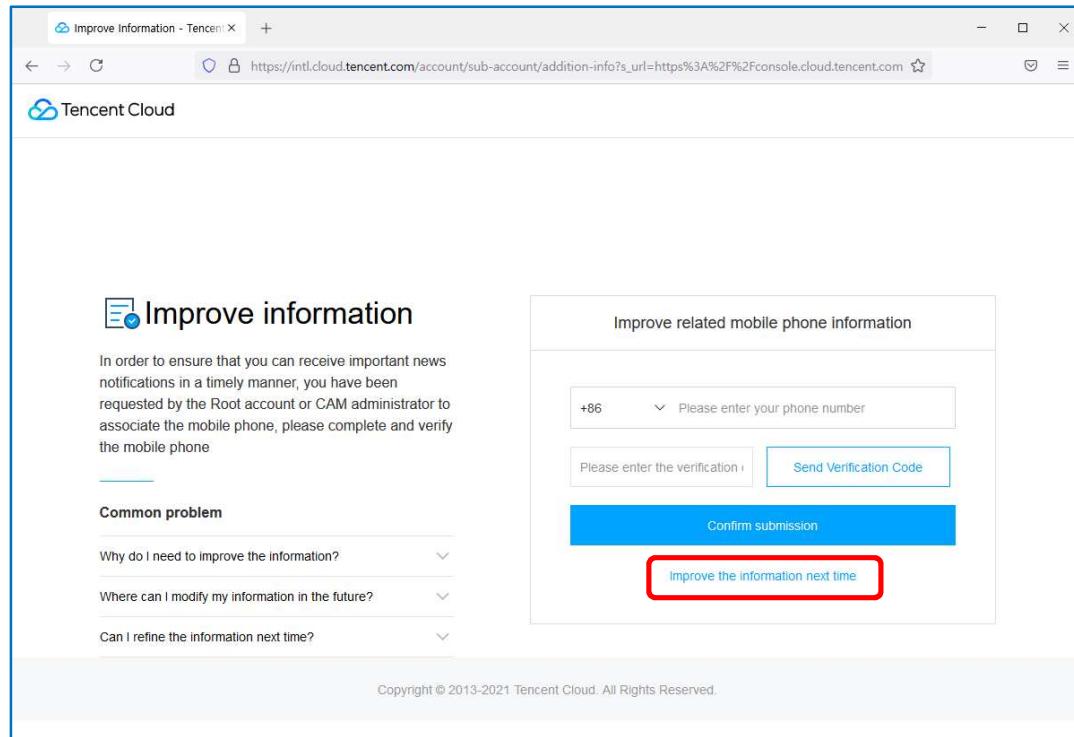
Task1. VPC(Virtual Private Cloud)와 Subnet 생성하기

1. Tencent Cloud CAM User Sing in 페이지를 방문한다.

<https://www.tencentcloud.com/login/subAccount/200029250089?type=subAccount>



2. **Sub-user name**과 **Password**는 교육 당일 교육 진행요원 혹은 Trainer로부터 부여 받는다. 부여 받은 **Sub-user name**과 **Password**를 입력하고 **[Sing in]** 파란색 버튼을 클릭한다. 로그인 후 **[Improve information]** 페이지 또는 **[Complete information]** 페이지에서, 다음 그림처럼 **[Improve related mobile phone information]**창의 **the information next time** 링크를 또는 **[Add mobile number]** 창의 **[Next time]**을 클릭하여 전화번호 입력을 생략한다.



Complete information

Please add a mobile number and verify the number so that you won't miss important messages from Tencent Cloud.

FAQs

- Why do I need to complete my information? ▼
- What if I want to change the information later? ▼
- Can I complete the information next time? ▼

Add mobile number

+93

Send code

Confirm

Next time

3. 다음 그림은 로그인 과정을 모두 수행하면 나타나는 화면이다. 페이지 우측 상단에는 로그인한 **Sub-user name**이 나오고, 또한 페이지 상단에서 **Hello**, 다음에 **Sub-user name**이 나오게 된다.

Hello, user-00
Account Id: 200029337219

Please enter the name of the product, e.g. CVM

Recently Visited

Cloud Object Storage Cloud Block Storage

Currently in Use ⓘ

Cloud Object Storage Cloud Block Storage Cloud Virtual Machine

All Products

Compute	Data Migration	Network Security	Relational Database
Cloud Virtual Machine Tencent Cloud Lighthouse Auto Scaling Batch Compute	Migration Service Platform	Anti-DDoS Anti-DDoS Advanced Cloud Firewall Tencent Cloud EdgeOne	Cloud Native Database TDSQL-C TencentDB for MySQL TencentDB for MariaDB TencentDB for SQL Server TencentDB for PostgreSQL
Container Services	Data Development & Governance	Endpoint Security	Enterprise Distributed DBMS
Tencent Kubernetes Engine	Data Development and Governance Platform	Cloud Workload Protection Platform	
CDN & Acceleration			

Product Documentation [View More](#)

- [Cloud Object Storage](#)
- [Cloud Block Storage](#)
- [Cloud Virtual Machine](#)
- [Cloud Block Storage](#)
- [Content Delivery Network](#)

4. VPC를 생성하기 위해 상단 메뉴 [Products] > [Networking] > [Virtual Private Cloud]를 클릭한다.

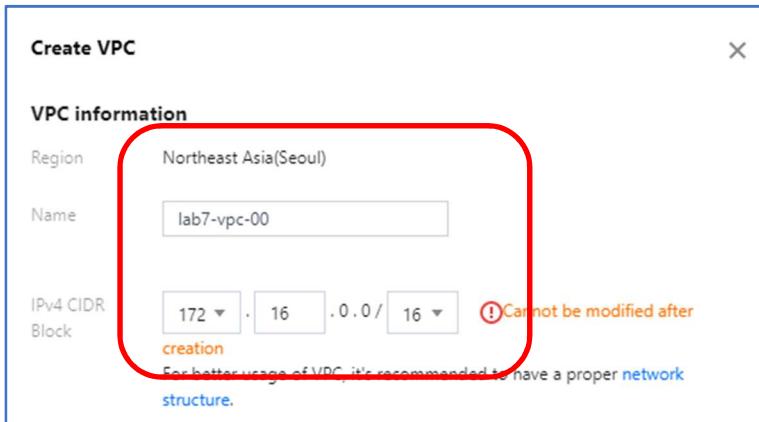
The screenshot shows the Tencent Cloud Product Catalog interface. The top navigation bar includes 'Cloud', 'Overview', 'Products', and a search bar. The main area is divided into several categories: Compute, Basic Storage Service, CDN & Acceleration, Networking, Relational Database, Container Services, Data Processing, Video Service, Enterprise Distributed DBMS, Serverless, Data Migration, Network Security, Telecommunication, NoSQL Database, Middleware, Game Service, Anti-DDoS, Instant Messaging, Tencent Push Notification ..., Management & Audit, Monitoring & OPS, Endpoint Security, Cloud Workload Protection, Domains & Websites, Database SaaS Tool, Cloud Access Management, Basic Cloud Monitor, Data Security, Secrets Manager, Cloud Resource Management, Big Data Platform, CloudAudit, Tencent Cloud Organization, Key Management Service, Tencent Infrastructure as ..., Elastic MapReduce, Tag, Security Management, API Explorer, and Optical Character Recognition. A red box highlights the 'Virtual Private Cloud' button under the Networking section, which is currently being clicked by a cursor icon.

5. [Virtual Private Cloud] 페이지로 이동했다. VPC가 생성될 Region이 Seoul임을 확인하고 새로 생성하기 위해 [Create] 파란색 버튼을 클릭한다.

The screenshot shows the VPC creation page. At the top, there is a 'VPC' tab and a dropdown menu set to 'Seoul'. Below this is a large blue 'Create' button, which is also highlighted with a red box. The main table has columns for 'ID/Name', 'IPv4 CIDR Block', 'Subnet', 'Route table', 'NAT gateway', 'VPN gateway', 'CVM', and 'Direct conn...'. One row is visible, showing 'vpc-jpt0erk0' as the ID/Name, '172.29.0.0/16' as the IPv4 CIDR Block, and '0' for Subnet, Route table, NAT gateway, VPN gateway, CVM, and Direct connection. A small blue icon is next to the CVM column. At the bottom left, it says 'Total items: 1'.

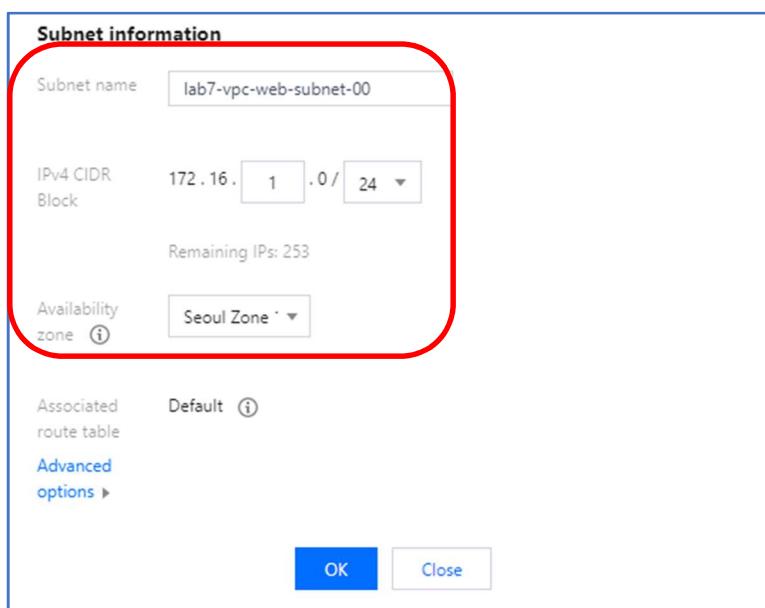
6. [Create VPC] 창이 나타난다. 먼저 [VPC information] 섹션에서 다음의 각 값을 설정한다.

- ① [Region] : Northeast Asia(Seoul)
- ② [Name] : lab7-vpc-XX(여기서 XX는 계정번호를 의미)
- ③ [IPv4 CIDR Block] : 172.16.0.0/16



7. 다음은 [Subnet Information] 섹션이다. 다음의 각 값을 설정하고 [OK] 파란색 버튼을 클릭한다.

- ① [Subnet Name] : lab7-vpc-web-subnet-XX(여기서 XX는 계정번호를 의미)
- ② [IPv4 CIDR Block] : 172.16.1.0/24
- ③ [Availability Zone] : Seoul Zone 1



8. VPC가 생성되었다.

ID/Name	IPv4 CIDR Block	Subnet	Route table	NAT gateway	VPN gateway	CVM	Direct conn...	Default VPC
vpc-b96kr8ru lab7-vpc-00	172.16.0.0/16	0	0	0	0	0	0	No
vpc-jpt0erk0 Default-VPC	172.29.0.0/16	0	0	0	0	0	0	Yes

Total items: 2

9. 또 하나의 Subnet을 생성하기 위해 웹 페이지 좌측 메뉴 중 [Subnet]을 클릭한다. 새로 Subnet을 생성하기 위해 [Create] 파란색 버튼을 클릭한다.

ID/Name	Network	CIDR	Availability z...	Associated ro...	CVM	Available IPs	Default subnet
subnet-kzowtp3l lab7-vpc-web-subnet-00	vpc-b96kr8ru lab7-vpc-00	172.16.1.0/24	Seoul Zone 1	rtb-ohskb0w7 default	0	253	No
subnet-n4h1p26t Default-Subnet	vpc-jpt0erk0 Default-VPC	172.29.0.0/20	Seoul Zone 2	rtb-gw8r2i6f default	0	4093	Yes

Total items: 2

10. 다음의 각 값을 설정하고 [Create] 파란색 버튼을 클릭한다.

- ① [Network] : lab7-vpc-XX(여기서 XX는 계정번호를 의미) | 172.16.0.0/16
- ② [Subnet Name] : lab7-vpc-db-subnet-XX(여기서 XX는 계정번호를 의미)
- ③ [VPC IP Range] : 172.16.0.0/16
- ④ [CIDR] : 172.16.2.0/24
- ⑤ [Availability Zone] : Seoul Zone 2

Create a subnet

Network: vpc-b96kr8ru(lab7-vpc-00 | 172.16.0.0/16) 1 existing subnets

Subnet name	VPC IP range	CIDR	Availability zone
lab7-vpc-db-subnet-00	21/60 172.16.0.0/16	172.16.2.0 / 24	Seoul Zone 1

+ New line

Advanced options ▾

Create **Cancel**

11. 지금까지 2개의 Subnet^{0| lab7-vpc-XX(여기서 XX는 계정번호를 의미)} 아래 생성되었다.

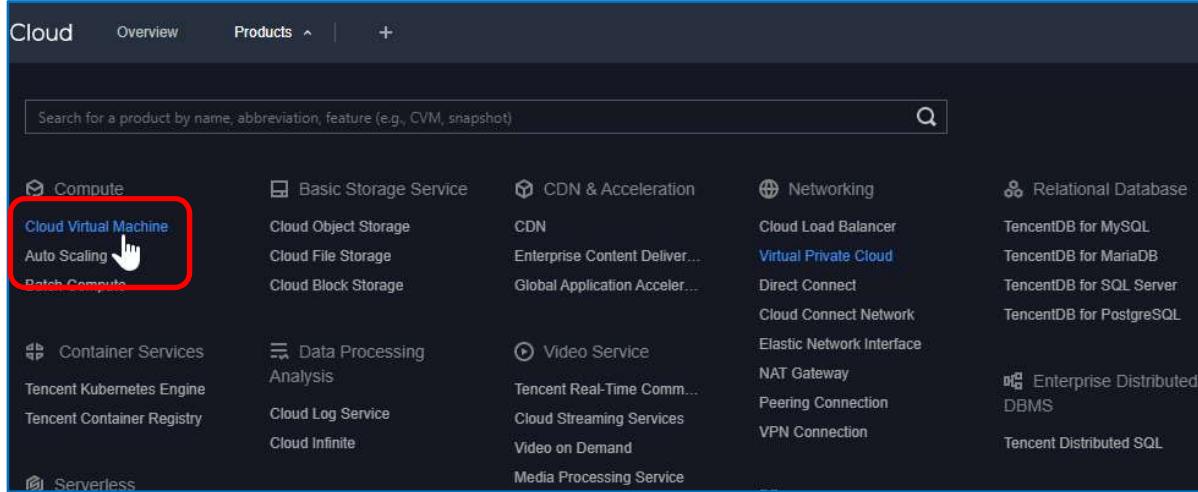
Subnet Seoul All VPCs

ID/Name	Network	CIDR	Availability z...	Associated ro...	CVM	Available IPs	Default subnet
subnet-fnepsjqt lab7-vpc-db-subnet-00	vpc-b96kr8ru lab7-vpc-00	172.16.2.0/24	Seoul Zone 2	rtb-ohskb0w7 default	0	253	No
subnet-kzowtp3l lab7-vpc-web-subnet-00	vpc-b96kr8ru lab7-vpc-00	172.16.1.0/24	Seoul Zone 1	rtb-ohskb0w7 default	0	253	No
subnet-n4h1p26t Default-Subnet	vpc-jpt0erk0 Default-VPC	172.29.0.0/20	Seoul Zone 2	rtb-gw8r2i6f default	0	4093	Yes

Total items: 3

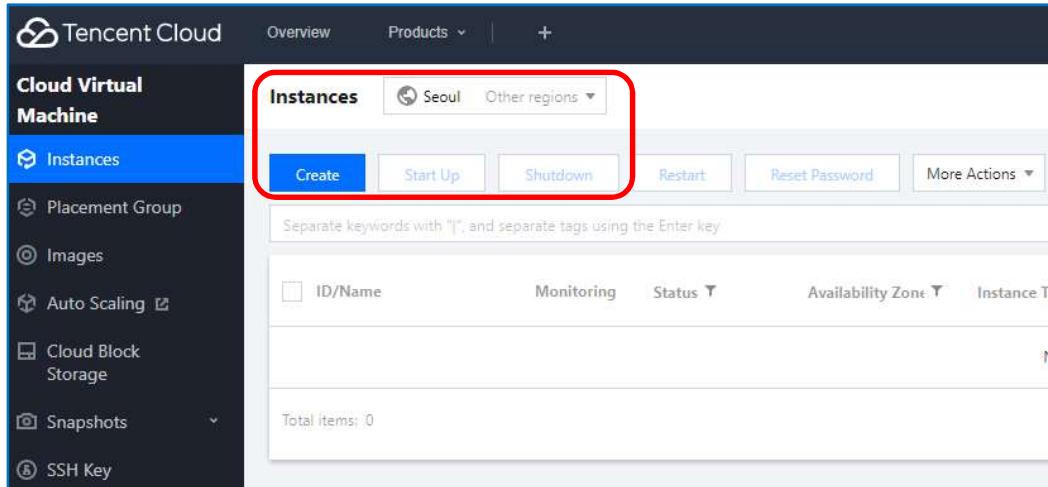
Task2. Web Server CVM 설치하기

1. Lab5 의 Task2 을 참조하여 lab7-vpc-web-subnet-XX(여기서 XX 는 계정번호를 의미)에 Web Server 역할을 할 CVM 을 생성하도록 한다. 먼저 CVM 을 생성하기 위해 페이지 상단의 메뉴 [Products] > [Compute] > [Cloud Virtual Machine]을 클릭한다.



The screenshot shows the Tencent Cloud interface under the 'Products' menu. In the 'Compute' section, the 'Cloud Virtual Machine' option is highlighted with a red box and a hand cursor icon, indicating it is the selected category. Other options like 'Auto Scaling' and 'Batch Compute' are also visible.

2. CVM Instance 를 생성하기 위해 먼저 Instance 가 생성될 Region 이 Seoul 임을 확인하고, [Create] 파란색 버튼을 클릭한다.



The screenshot shows the 'Instances' tab of the Cloud Virtual Machine section in the Tencent Cloud interface. The 'Create' button is highlighted with a red box and a hand cursor icon, indicating it is the next step to start creating a new instance. The region is set to 'Seoul'.

3. [Cloud Virtual Machine (CVM)] 페이지에 들어왔다. [Billing Mode]는 사용한 만큼 지불하는 [Pay as you go](종량제)를 선택한다.

The screenshot shows the 'Custom configuration' step of the CVM setup. Under 'Basic configurations', the 'Pay-as-you-go' option is selected and highlighted with a red box. Other options like 'Spot instances' are also listed.

4. [Region]은 [Seoul]에 맞추고, [Availability zone]은 [Seoul Zone 1]을 선택한다.

The screenshot shows the region selection interface. Under 'Region', the 'Asia Pacific' tab is selected. Under 'Availability zone', the 'Seoul Zone 1' option is selected and highlighted with a red box.

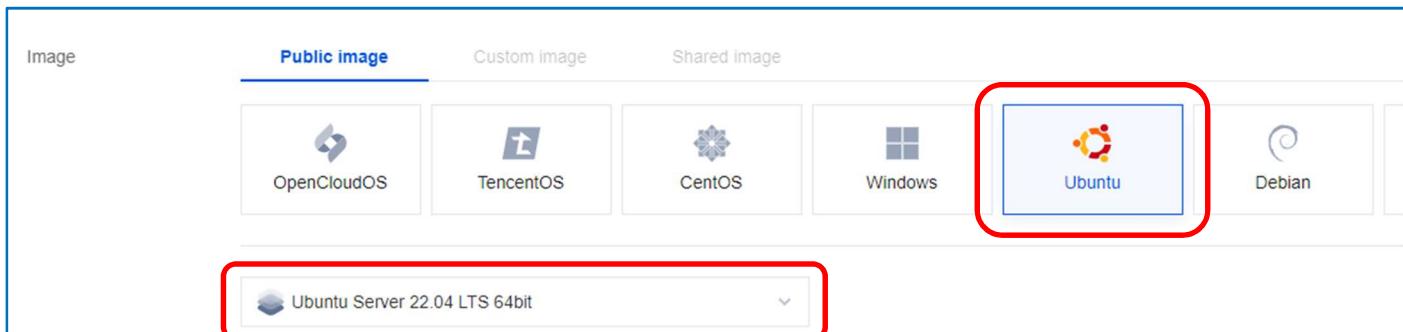
5. 두번째 [Instance configurations] 섹션에서는 CPU와 Memory등을 선택할 수 있다. 기본값은 Standard Model이다. [Instance] > [Instance family]는 [Standard]를 선택하고 [Model]에서는 [Standard S3] 선택한다.

The screenshot shows the instance configuration filters. Under 'Instance family', the 'Standard' button is selected and highlighted with a red box. Under 'Model', the 'Standard S5' button is selected and highlighted with a red box.

6. 위에서 선택한 [Standard S5]는 기본적으로 2Core vCPU에 2GB의 메모리를 가진다.

Instance ⓘ	Specifications	vCPU ⓘ	MEM	Processor	Private network bandwidth	Packets in/out ⓘ	Supported AZ ⓘ	Reference fee ⓘ
<input checked="" type="radio"/> Standard S5 (22% off)	S5.MEDIUM2	2Core	2GB	Intel Xeon Cascade Lake 8255C...	1.5Gbps	300K PPS	30 AZ(s) <small>More</small>	0.02USD/hour 0.03-USD/hour
<input type="radio"/> Standard S5 (22% off)	S5.MEDIUM4	2Core	4GB	Intel Xeon Cascade Lake 8255C...	1.5Gbps	300K PPS	31 AZ(s) <small>More</small>	0.04USD/hour 0.06-USD/hour
<input type="radio"/> Standard S5 (22% off)	S5.MEDIUM8	2Core	8GB	Intel Xeon Cascade Lake 8255C...	1.5Gbps	300K PPS	31 AZ(s) <small>More</small>	0.09USD/hour 0.12-USD/hour
<input type="radio"/> Standard S5 (22% off)	S5.LARGE8	4Core	8GB	Intel Xeon Cascade Lake 8255C...	1.5Gbps	500K PPS	31 AZ(s) <small>More</small>	0.12USD/hour 0.16-USD/hour
<input type="radio"/> Standard S5 (22% off)	S5.LARGE16	4Core	16GB	Intel Xeon Cascade Lake 8255C...	1.5Gbps	500K PPS	31 AZ(s) <small>More</small>	0.18USD/hour 0.23-USD/hour

7. 서버 이미지를 선택하는 순서이다. [Public image]의 목록에서 Ubuntu, 64-bit, Ubuntu Server 22.04 LTS 64bit를 선택한다.



8. [Storage]에서 [Premium cloud disk]를 선택하고, 용량은 기본 용량 [50GB]를 사용하기로 한다.

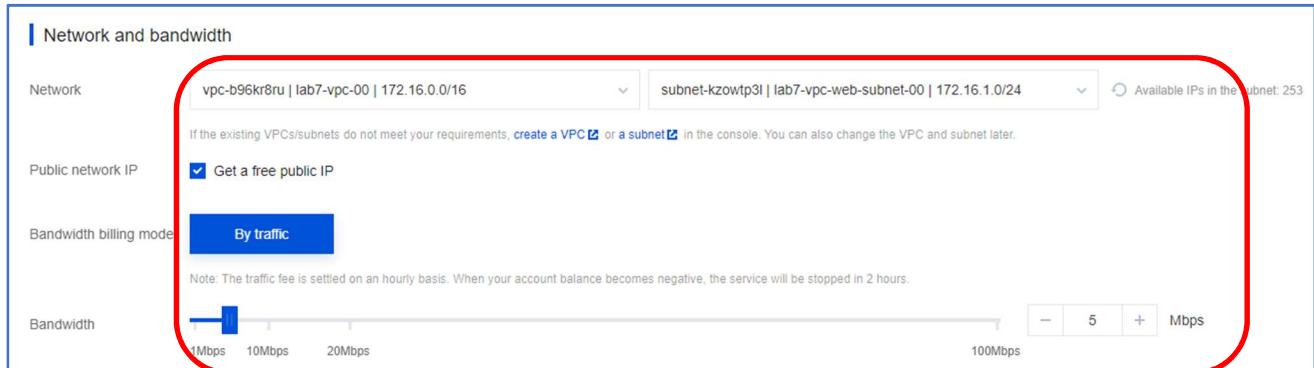
Storage	Usage	Model	Capacity	Quantity	数据备份点	Total performance
	System disk	Premium cloud disk	- 50 + GB	1	/	Basic performance: IOPS: 2200, bandwidth: 107.5 MB/s

9. 페이지를 스크롤다운하여 첫번째 설정 단계를 확인한다. 그리고 [Next: Configure network and host] 파란색 버튼을 클릭한다.

Selected S5.MEDIUM2 (Standard S5, 2C2G)
Quantity - 1 + Configuration fee \$0.04

Next: Configure network and host

10. [Network and bandwidth] 섹션에서, [Network]는 Task1에서 생성한 [lab7-vpc-XX] (여기서 XX는 계정번호를 의미)와 [lab7-vpc-seoul-XX | 172.16.1.0/24] (여기서 XX는 계정번호를 의미)를 선택한다. 또한 [Public network IP] 역시 기본값 그대로 [Get a free public IP]가 체크되어 있는지 확인하고, [Bandwidth]는 최대 100Mbps로 설정한다.



11. [Security group] 섹션에서, [Existing security group]를 선택하고, 목록에서 이미 생성한 lab5-sgXX(여기서 XX는 계정번호를 의미)보안그룹을 선택한다. 그러면, 이미 보안그룹에서 설정해 놓은 [Inbound rules]에서 확인할 수 있다.

The screenshot shows the 'Security group' configuration page. Under 'Security group', the 'Existing security group' tab is selected, showing a list with 'sg-6ij3fu5 | lab5-sg00'. Below it, the 'Inbound rules' tab is selected, displaying a table of rules:

Source	Protocol + Port	Policy	Notes
0.0.0.0/0	ICMP	Allow	Ping service open.
::/0	ICMPV6	Allow	Ping service open.
0.0.0.0/0	TCP:80	Allow	Web service HTTP(80) open.
::/0	TCP:80	Allow	Web service HTTP(80) open.
0.0.0.0/0	TCP:22	Allow	TCP port 22 open for Linux CVMs.
::/0	TCP:22	Allow	TCP port 22 open for Linux CVMs.

12. [Other settings] 섹션에서, [Tag]는 관리 편의성을 위해 특정 문자열을 태깅하는 옵션이다. 이번 Lab에서는 태그 없이 진행하기로 한다.

The screenshot shows the 'Other settings' configuration page. Under 'Tag', there is a 'Tag key' input field and a 'Tag value' input field, both currently empty. A 'Delete' button is to the right. Below these fields is a '+ Add' button.

13. [Instance name]은 영문으로 입력한다. 여기서는 예제로 **lab7-webserver-XX(여기서 XX는 계정번호를 의미)**으로 입력하기로 한다. 128자리까지 인스턴스 이름으로 지정할 수 있다.

Instance name lab7-webserver-00

14. [Login methods]는 [SSH key pair]를 선택한다. **Ubuntu Server**인 경우 [Login name]은 자동으로 **ubuntu**이다. 이 계정은 **Ubuntu Server**의 관리자 계정이다. [Key pair]는 Lab5에서 생성한 Key pair인 **lab5_linuxXX_key(여기서 XX는 계정번호를 의미)**를 목록에서 선택한다.

Login methods Set password SSH key pair Reset password after creation

Login name ubuntu

Key pair skey-jd1244hf | lab5_linux00_key

If existing keys are not suitable, you can [create a new one](#).

15. 무료로 사용할 수 있는 [Security Reinforcement]와 [Cloud Monitoring] 서비스를 설정한다. 이번 Lab에서는 기본사항을 그대로 체크된 상태로 사용하기로 한다. [Scheduled Termination] 역시 필요하지 않기 때문에 기본 해제 상태 그대로 진행한다.

Termination protection Prevent instances from being accidentally terminated in the console or via API

Security services Enable for free
Install the Cloud Workload Protection agent and activate CWP Basic for free

Cloud Monitor Enable for free
FREE cloud monitoring, analysis, alarming, and server monitoring metrics (component installation required)

Scheduled termination Enable scheduled termination
Enable it to terminate the CVM instance at the specified time

16. [Advanced Settings] 링크를 클릭하면 숨겨진 여러가지 설정 화면이 나타난다. [Hostname]에 lab7-webserver-XX(여기서 XX는 계정번호를 의미)을 입력한다. 나머지 값들은 기본값 그대로 이용한다. [Placement group]은 재해복구를 위해 배치 방법을 설정하는 옵션이다. 재해복구가 필요하지 않으니 [Placement group] 체크박스는 해제하고 진행하기로 한다.

Hostname: lab7-webserver-00

Project: DEFAULT PROJECT

CAM role: Select a CAM role

Placement group: Add the instance to a placement group

If the existing placement groups are not suitable, please [create a new one](#).

17. [Custom data]에 다음의 내용을 복사하여 붙여 넣는다.

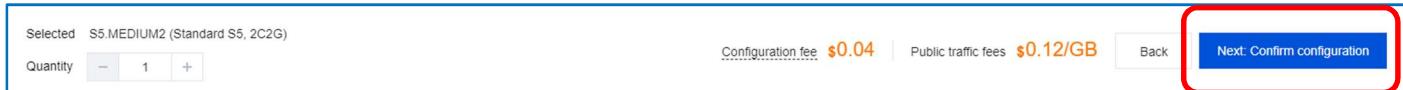
```
#!/bin/bash
sudo apt update
sudo apt install -y apache2
sudo a2enmod ssl
sudo a2ensite default-ssl.conf
sudo systemctl reload apache2
sudo mv /var/www/html/index.html /var/www/html/index.bak
sudo bash -c 'echo "<html><h1>Hello, Tencent Cloud!</h1></html>" > /var/www/html/index.html'
```

Custom data

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

The above input is encoded with base64.

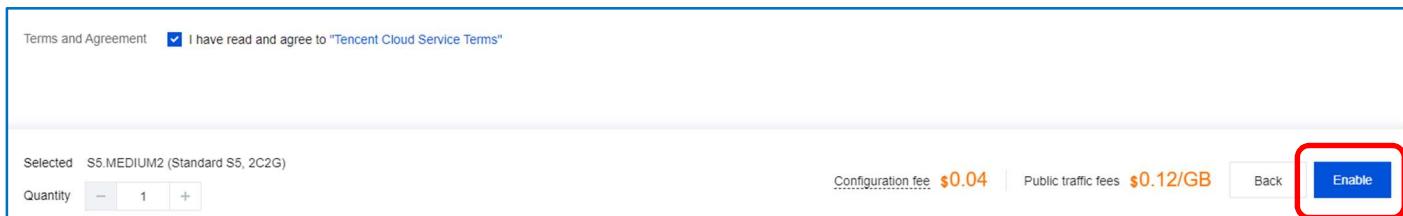
18. 페이지를 스크롤다운하여 다음 그림에서 [Next: Confirm configuration] 파란색 버튼을 클릭하여 다음 단계를 진행한다.



19. [Confirm Configuration] 화면에서는 지금까지 선택한 옵션들을 일목요연하게 보여준다. 설정의 마지막 화면이다. 각각의 내용을 확인하고 수정이 필요하면 [Edit] 링크를 클릭하여 수정하면 된다.

This screenshot shows the 'Confirm Configuration' page with three main sections: 'Basic and instance configurations', 'Network and security group', and 'Other settings'. The 'Basic and instance configurations' section includes CVM billing mode (Pay-as-you-go), Region (Seoul), Availability zone (Seoul Zone 1), Instance type (S3.MEDIUM2), Image (Ubuntu Server 22.04 LTS 64bit | 20GB), and Data disk (Not set). The 'Network and security group' section includes Network (vpc-b96kr8ru), Subnet (subnet-kzowtp3l), Public network IP (172.16.1.0/24), Network billing mode (By traffic | 5Mbps), and Security group (sg-04cdujnd). The 'Other settings' section includes 'Set password' and a dropdown menu. A blue 'Edit' link is visible in each section header.

20. 설정을 마치기 위해 [Terms and Agreement] 체크박스에 체크하고, [Enable] 파란색 버튼을 클릭한다.



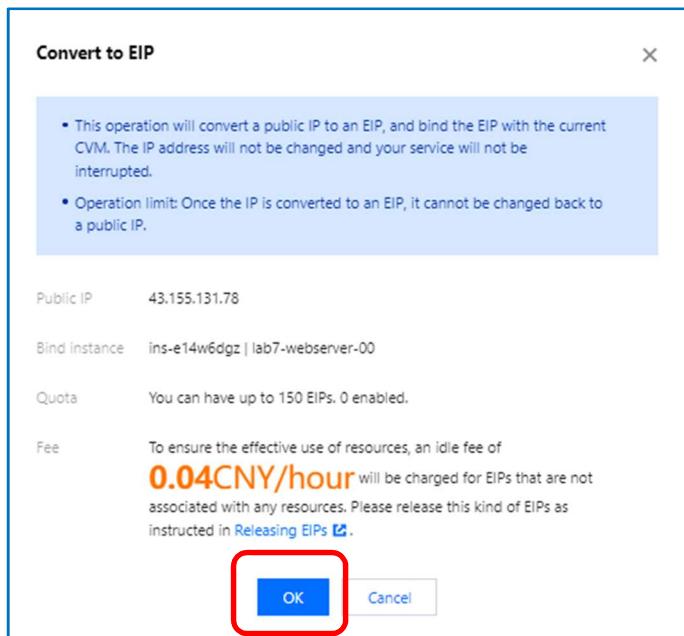
21. 잠시 시간이 흐른 뒤, 다음 그림과 같이 새로운 Instance가 만들어진 것을 볼 수 있다.

ID/Name	Monitoring	Status	Availability	Instance type	Instance configuration	Primary IPv4	Instance billing mode	Operation
1 result found for "Project:DEFAULT PROJECT" Back to previous								
ins-1fmd5do5 New lab7-webserver-00	Running	Seoul Zone 1	Standard S5	2-core 2GB 100Mbps System disk:Premium Cloud Disk Network:lab7-vpc-00	43.128.148.90 (Public) 172.16.1.13 (Private)	Pay-as-you-go Created at 2024-01-23 21:07:08	Log in More ▾	

22. 방금 생성한 Web Server에 EIP를 적용한다. **lab7-webserver-XX(여기서 XX는 계정번호를 의미)**에서 [Primary IPv4]의 [Public] 오른쪽의 EIP 버튼 을 클릭한다.

ID/Name	Monitoring	Status	Availability	Instance type	Instance configuration	Primary IPv4	Instance billing mode	Operation
1 result found for "Project:DEFAULT PROJECT" Back to previous								
ins-1fmd5do5 New lab7-webserver-00	Running	Seoul Zone 1	Standard S5	2-core 2GB 100Mbps System disk:Premium Cloud Disk Network:lab7-vpc-00	43.128.148.90 (Public) 172.16.1.13 (Private)	Pay-as-you-go Created at 2024-01-23 21:07:08	Log in More ▾	

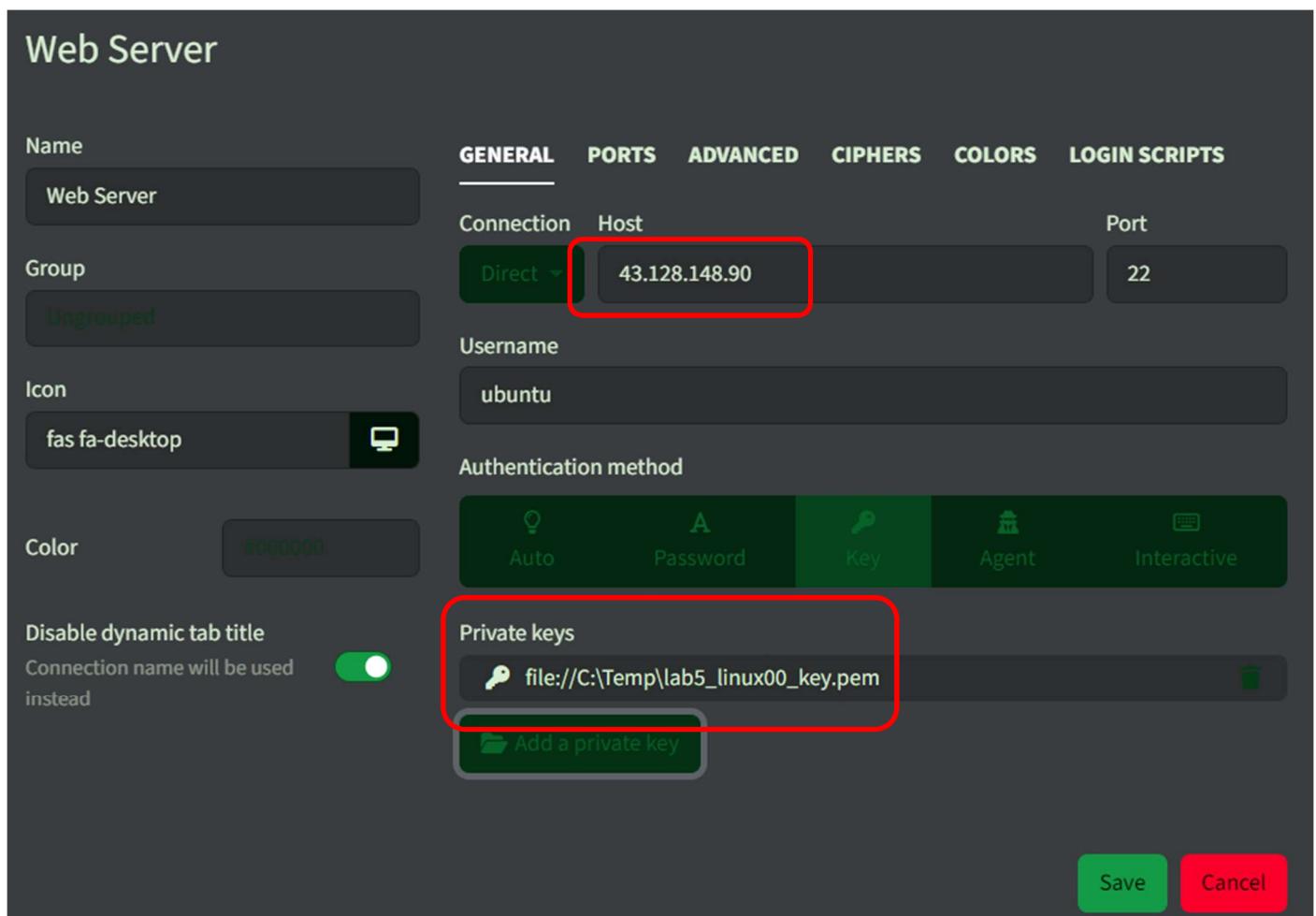
23. [Convert to EIP]창이 나타나면 [OK] 파란색 버튼을 클릭한다.



24. 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 mode
1 result found for "Project:DEFAULT PROJECT" Back to previous							
ins-1fmd5do5 lab7-webserver-00		Running	Seoul Zone 1	Standard S5	2-core 2GB 100Mbps System disk:Premium Cloud Disk Network:lab7-vpc-00	43.128.148.90 (EIP) 172.16.1.13 (Private)	Pay-as-you-go Created at 2024-01-23 21:07:08

25. Tabby 프로그램을 실행한다. 다음과 같이 설정한다.



26. 정상적으로 서버와 원격 연결이 되었다.

```
Welcome to Ubuntu 22.04 LTS (GNU/Linux 5.15.0-91-generic x86_64)

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

System information as of Tue Jan 23 08:11:35 PM CST 2024

System load: 0.04296875      Processes: 123
Usage of /: 7.8% of 49.10GB  Users logged in: 0
Memory usage: 14%           IPv4 address for eth0: 172.16.1.13
Swap usage: 0%              

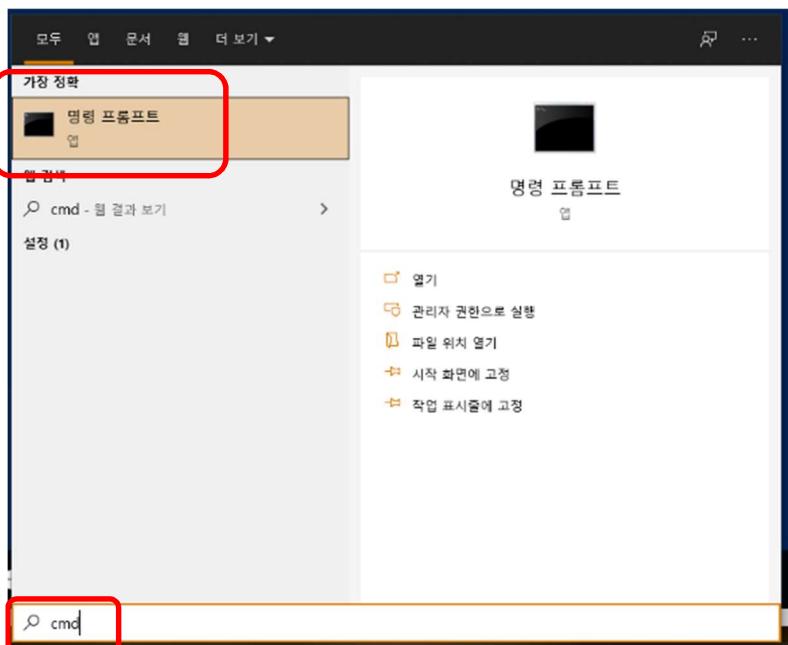
* Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s just raised the bar for easy, resilient and secure K8s cluster deployment.

https://ubuntu.com/engage/secure-kubernetes-at-the-edge

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@lab7-webserver-00:~$
```

27. 컴퓨터나 노트북에서 [시작] 버튼 오른쪽의 검색 창에서 cmd를 입력하여 [명령 프롬프트] 창을 실행한다.



28. [명령 프롬프트]창에서 다음과 같이 PING test를 한다. Ping 다음 주소는 방금 생성한 lab7-webserver-XX(여기서 XX는 계정번호를 의미)의 EIP이다.

ping {Your Server's Public IP}

```
C:\WINDOWS\system32\cmd + v
Microsoft Windows [Version 10.0.22621.1105]
(c) Microsoft Corporation. All rights reserved.

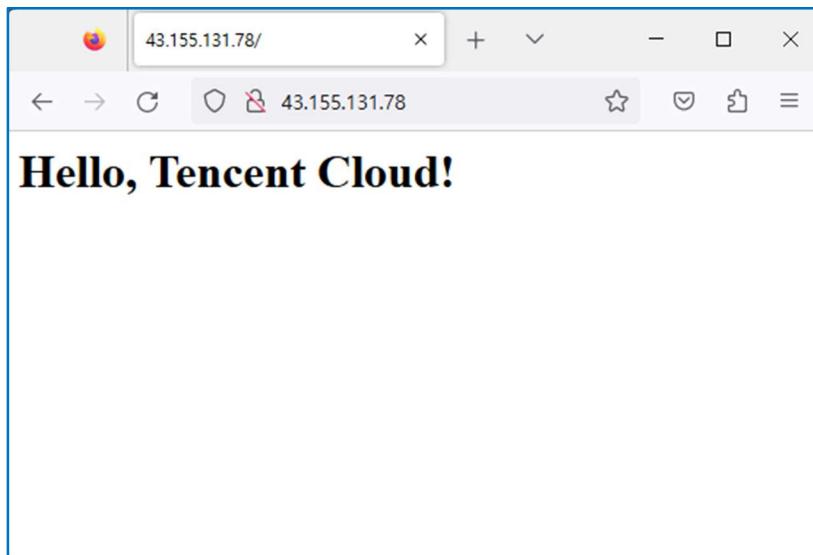
C:\Users\MZC01-HENRY>ping 43.155.131.78

Ping 43.155.131.78 32바이트 데이터 사용 :
43.155.131.78의 응답: 바이트=32 시간=3ms TTL=50
43.155.131.78의 응답: 바이트=32 시간=3ms TTL=50
43.155.131.78의 응답: 바이트=32 시간=4ms TTL=50
43.155.131.78의 응답: 바이트=32 시간=4ms TTL=50

43.155.131.78에 대한 Ping 통계:
    패킷: 보냄 = 4, 받음 = 4, 손실 = 0 (0% 손실),
    왕복 시간(밀리초):
        최소 = 3ms, 최대 = 4ms, 평균 = 3ms

C:\Users\MZC01-HENRY>
```

29. 웹 브라우저를 통해 lab7-webserver-XX(여기서 XX는 계정번호를 의미)의 EIP를 통해 성공적으로 웹 서비스 실행을 확인한다.



Task3. TencentDB for MySQL 설치하기

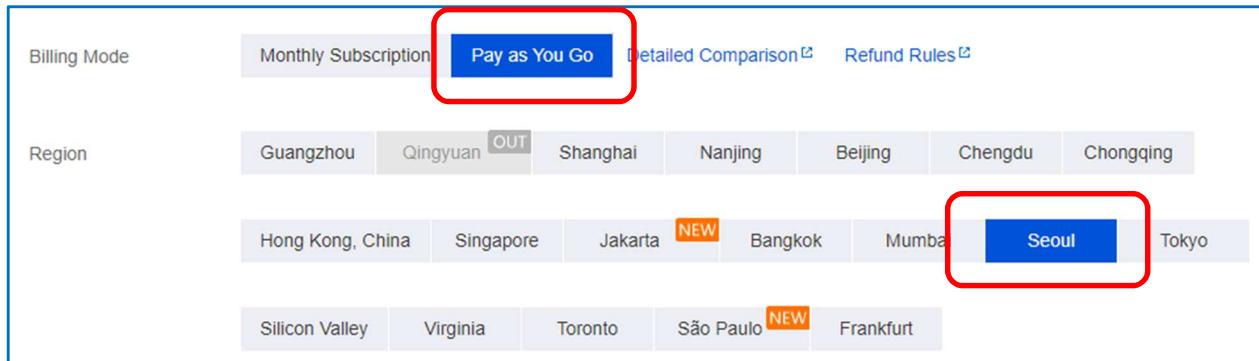
- [TencentDB for MySQL]을 생성하기 위해 상단 메뉴 [Products] > [Relational Database] > [TencentDB for MySQL] 을 클릭한다.

The screenshot shows the Tencent Cloud interface under the 'Cloud' tab. In the 'Products' menu, 'Relational Database' is selected. The 'Relational Database' section contains several services: Basic Storage Service, CDN & Acceleration, Networking, and Relational Database. Within 'Relational Database', 'TencentDB for MySQL' is highlighted with a red box and a cursor icon pointing to it. Other options like 'TencentDB for SQL Server' and 'TencentDB for PostgreSQL' are also listed.

- [MySQL – Instance List] 페이지로 들어왔다. MySQL을 생성할 Region은 [Seoul]이다. MySQL Instance를 생성하기 위해 [Create] 파란색 버튼을 클릭한다.

The screenshot shows the 'MySQL - Instance List' page. On the left, there's a sidebar with 'Database' and 'Relational Database' sections, including 'MySQL' and 'Instance List'. The main area has a header with 'MySQL - Instance List' and dropdowns for 'Seoul' and 'Other regions 0'. Below the header are buttons for 'Create' (highlighted with a red box), 'Comparative Monitoring', 'Restart', and 'Renew'. A search bar and a table header with columns like 'Instance ID/Name', 'Monitoring/Status/Tas...', 'AZ', 'Configuration', 'Database Version', 'Engine', and 'Private Network Address'. A message at the bottom says 'No database instances in this region. Please select another region or Buy Now'.

3. [TencentDB for MySQL] 생성 페이지이다. [Billing Mode]는 [Pay as You Go]를 선택한다. 설치 [Region]은 [Seoul]이다.



4. [Version]은 [MySQL8.0]으로, [Engine]은 [InnoDB]로, [Architecture]는 [Two-node]로, [Disk Type]은 [Local SSD disk]로, [Source AZ]는 [Seoul Zone 2]에 원본 서버를 놓고, [Replica AZ]을 [Seoul Zone 1]에 맞춤으로 복제서버는 [Seoul Zone 1]에 놓기로 한다.

The screenshot displays the detailed configuration settings for the database instance:

- Database Version:** MySQL8.0 (highlighted in blue)
- Engine:** InnoDB (highlighted in blue)
- Architecture:** Two-Node (highlighted in blue)
- Disk Type:** Local SSD disk
- Source AZ:** Seoul Zone 1
- Replica AZ:** Seoul Zone 1

Below the configuration, there is descriptive text about TDSQL-C and its features.

TDSQL-C, the latest TencentDB product is recommended. Being 100% compatible with MySQL, it takes just a few seconds to auto-scaling are also supported. Pay-as-you-go billing is adopted.

The most commonly used OLTP storage engine, with complete transaction support and powerful capability of highly concurrent access.

Two-node (1 source, 1 replica) architecture with local SSD storage, featuring robust performance and ease of use. The source node is located in Seoul Zone 2 and the replica node is located in Seoul Zone 1.

Products in the same VPC but different AZs can communicate with each other via private network. For example, in the same VPC, the source instance in Seoul Zone 2 and the replica instance in Seoul Zone 1 can communicate via private network.

5. [Instance Specification]은 목록에서 제일 스펙이 작은 [General-1core 1000MB memory]를 선택하고, [Hard Disk]는 기본값 그대로 [200GB]를 선택한다.

Type	vCPU	MEM	Max IOPS	Max Storage Capacity	Reference Fees
<input checked="" type="radio"/> General	1-core	1000MB	1200	3000GB	0.05555556USD/hour
<input type="radio"/> General	1-core	2000MB	2000	3000GB	0.11111112USD/hour
<input type="radio"/> General	2-core	4000MB	4000	3000GB	0.22222223USD/hour

Hard Disk

200 GB (Increment: 5GB)

Local SSD, featuring powerful performance with a maximum IOPS of 1200

6. [Next: Set Network and Database] 파란색 버튼을 클릭한다.

Selected: General-1core 1000 MB memory Quantity: 1

Configuration Fees: 0.10277956USD/hour Backup Fees: 0.000127USD/GB/hour

Next: Set Network and Database

7. 2단계 [Set Network and Database] 단계이다.

8. MySQL Database Server가 위치할 VPC와 Subnet 설정이다. 이 실습의 목적에 맞게 VPC는 lab7-vpc-XX(여기서 XX는 계정번호를 의미), Subnet은 이전 Task에서 생성한 lab7-vpc-db-subnet-XX(여기서 XX는 계정 번호를 의미)을 선택한다.

Network: vpc-4ciclo10 | lab7-vpc-00 | 172.16.0.0/16

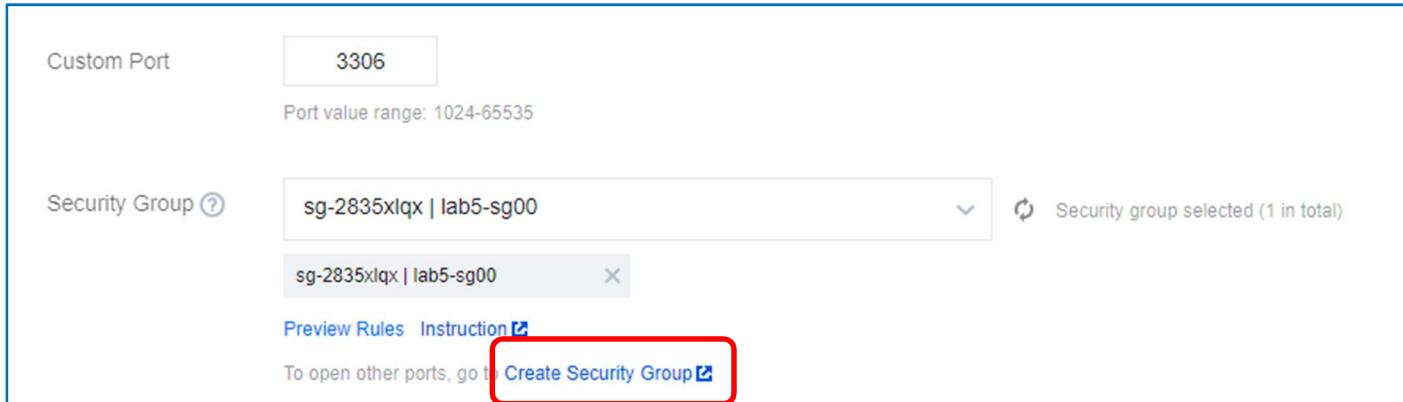
Subnet: subnet-hqcwnkpn | lab7-vpc-db-subnet-00 | 172.16.2.0/24

If the existing networks do not meet your requirements, go to [Create VPCs](#) or [Create Subnets](#). After the TencentDB instance is purchased, the VPC and subnet can be modified.

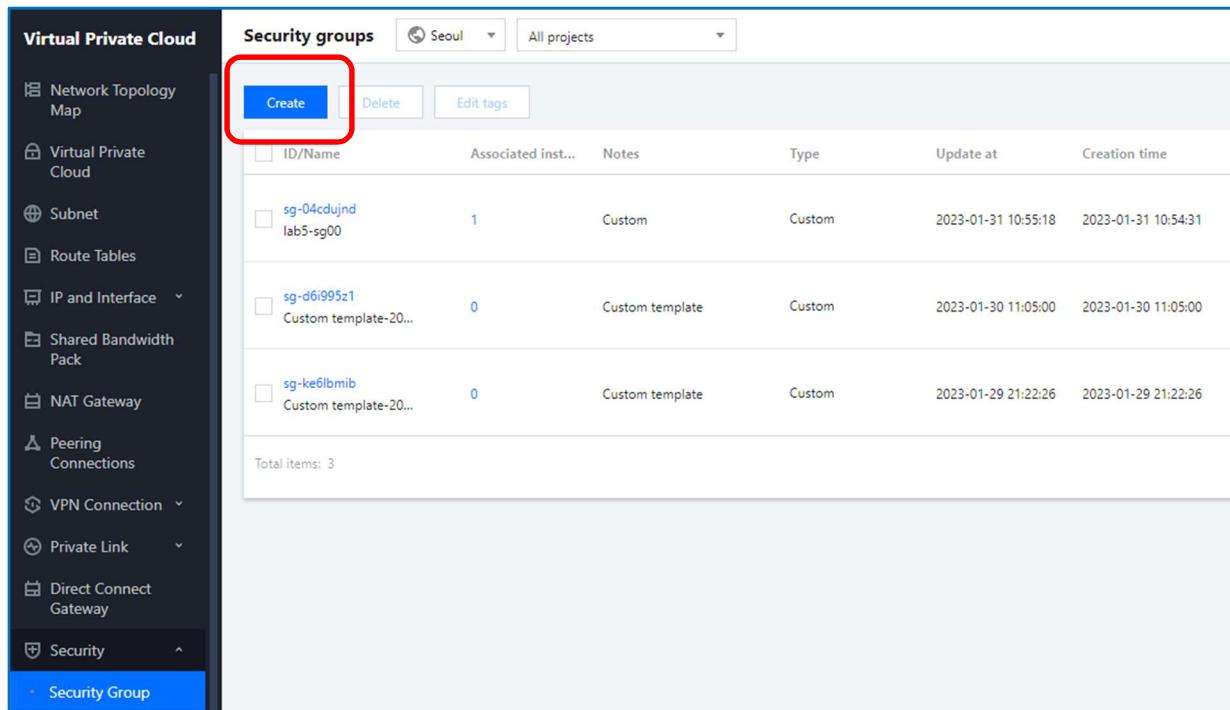
In the current network environment, only devices in the "" VPC can access this database instance.

In lab7-vpc-00 in SeoulRegion, 1 CVM(s) can be accessed over the private network. [View Details](#)

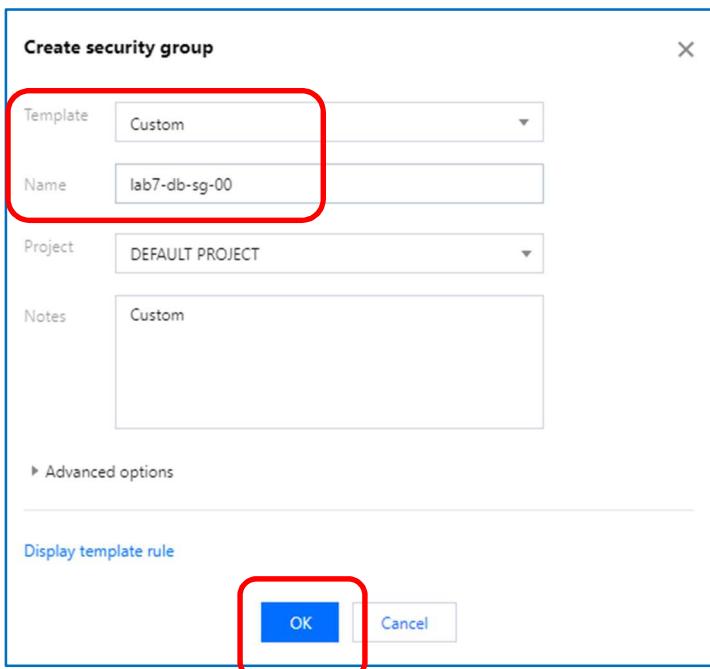
9. [Security Group]은 기존의 Security Group과 다르기 때문에 [Create Security Group] 링크를 클릭하여 새 Security Group을 생성한다.



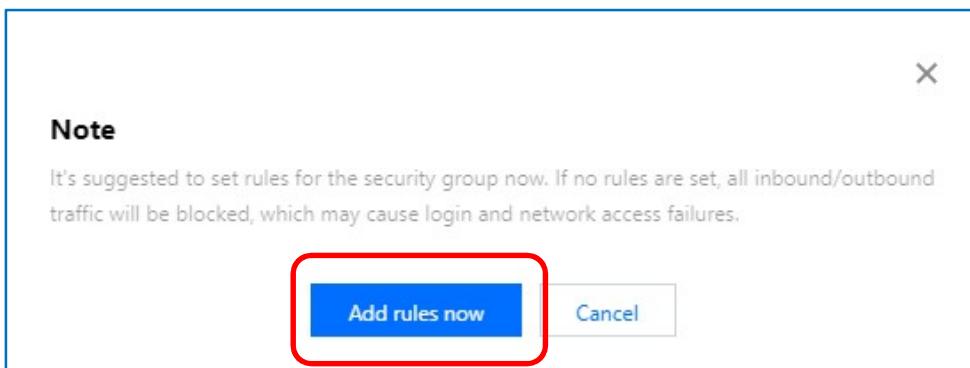
10. [Security Group] 페이지로 들어왔다. 새 Security Group을 생성하기 위해 [Create] 파란색 버튼을 클릭한다.



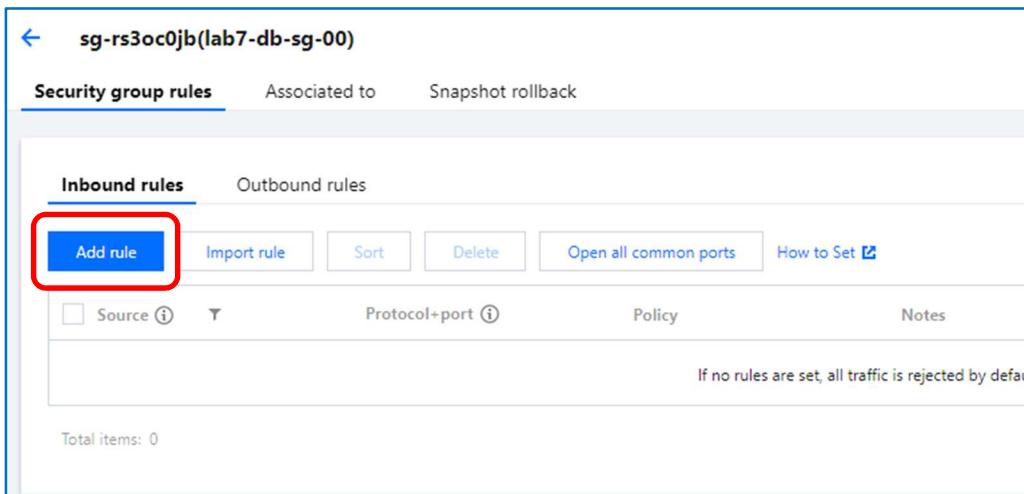
11. [Create security group]창이다. 다음 그림과 같이 [Template]는 [Custom]으로, [Name]은 lab7-db-sg-XX(여기서 XX는 계정번호를 의미)라고 명명하고 나머지 값은 기본값 그대로 놓고, [OK] 파란색 버튼을 클릭하여 생성한다.



12. [Add rules now] 파란색 버튼을 클릭하여 새로 생성하는 Security Group에 Port를 추가하자.



13. 아직 [Inbound rule]이 없다. [Add Rule] 파란색 버튼을 클릭하여 [Inbound rule]을 추가한다.



14. MySQL Database Server Instance는 [Ping]과 [MySQL port(3306)]만 추가한다. 더 포트를 추가하려면 [+New Line] 링크를 클릭하여 추가하면 된다. 필요한 포트를 추가했으면 [OK] 파란색 버튼을 클릭하여 페이지를 닫는다.

Add inbound rule

Type	Source ⓘ	Protocol:port ⓘ	Policy	Remark
Ping	IP address or CIDR block all	ICMP	Allow	Ping service open.
MySQL(3306)	IP address or CIDR block all	TCP:3306	Allow	MySQL service(3306) open

+ New line

OK Cancel

15. 방금 추가한 포트 목록이다. Ping을 위한 ICMP와 MySQL Port인 TCP:3306을 확인할 수 있다.

Inbound rules Outbound rules

Add rule	Import rule	Sort by priority	Edit all	Delete	Open all common ports	How	Separate keywords with ":", press Enter to separate filter	Q
Source ⓘ	Protocol:port ⓘ		Policy	Remark	Modification time	Operation		
0.0.0.0/0	ICMP	Allow	Ping service open.	2024-01-23 20:27:01		Edit Insert ▾ Delete		
::/0	ICMPv6	Allow	Ping service open.	2024-01-23 20:27:01		Edit Insert ▾ Delete		
0.0.0.0/0	TCP:3306	Allow	MySQL service(3306) open	2024-01-23 20:27:01		Edit Insert ▾ Delete		
::/0	TCP:3306	Allow	MySQL service(3306) open	2024-01-23 20:27:01		Edit Insert ▾ Delete		

Total items: 4

10 / page 1 / 1 page

16. 이번에는 메뉴 중 [Outbound rules]를 클릭하여 Outbound rule을 추가한다. [Add rule] 버튼을 클릭한다.

The screenshot shows the AWS Lambda Security Group rules interface. The top navigation bar has a back arrow and the text "sg-ohghyx7(lab7-db-sg-00)". Below it, there are tabs for "Security group rules", "Associated to", and "Snapshot rollback". The "Outbound rules" tab is currently selected and highlighted with a red box. Below the tabs is a toolbar with buttons: "Add rule" (highlighted with a red box), "Import rule", "Sort by priority", "Edit all", "Delete", "Open all common ports", "How", and "Separate". There is also a "to Set" link. The main area displays columns for "Target", "Protocol:port", "Policy", "Remark", and "Modification time". A note at the bottom states: "If no rules are set, all traffic is rejected by default."

17. [Add outbound rule] 팝업창에서, [Type]은 Custom으로, [Target]은 172.16.1.0/24로, [Protocol+port]는 TCP:3306, 그리고 마지막으로 [Policy]는 Allow를 선택하고 [OK] 파란색 버튼을 클릭한다.

The screenshot shows the "Add outbound rule" dialog box. It has tabs for "Type", "Target", "Protocol:port", "Policy", and "Remark". The "Type" field is set to "Custom" (highlighted with a red box). The "Target" dropdown is set to "IP address or CIDR block" and contains "172.16.1.0/24" (highlighted with a red box). The "Protocol:port" field contains "TCP:3306". The "Policy" dropdown is set to "Allow". At the bottom are "OK" and "Cancel" buttons.

18. 다음 그림과 같이 Outbound rule도 설정되었다.

The screenshot shows the Outbound rules list. The "Outbound rules" tab is selected. The list includes a single rule: "172.16.1.0/24" (Target), "TCP:3306" (Protocol:port), and "Allow" (Policy). The entire row of this rule is highlighted with a red box. The top toolbar includes "Add rule", "Import rule", "Sort by priority", "Edit all", "Delete", "Open all common ports", "How", and "Separate". There is also a "to Set" link.

19. 다시 MySQL 설정페이지로 돌아와서 방금 생성한 **Security Group**으로 설정을 맞춘다.

The screenshot shows the AWS RDS Security Groups page. A red box highlights the 'sg-ohghyxi7 | lab7-db-sg-00' entry in the list. To the right of the list, there is a note: 'Security group selected (1 in total)'. Below the list, there are links for 'Preview Rules' and 'Instruction'.

20. [Instance Name]을 입력하기 위해 [Name It Now]를 선택하고, **lab7-mysql-XX(여기서 XX는 계정번호를 의미)**로 넣는다.

The screenshot shows the AWS RDS Database Settings page. The 'Name It Now' button is highlighted in blue. The input field contains 'lab7-mysql-00'. Below the input field, there is a note: 'It can contain up to 60 letters, digits, or symbols (-_.!/:@=).'. At the bottom, there is a note: 'When multiple instances are purchased at a time, a sequence number will be automatically appended at the end of each instance name.'

21. 나머지 설정 값은 그대로 기본값을 사용하기로 한다.

The screenshot shows the AWS RDS Database Settings page with several configuration options:

- Character Set:** Options include LATIN1, **UTF8**, GBK, and UTF8MB4. UTF8 is highlighted in blue.
- Collation:** Option is set to **UTF8_GENERAL_CI**.
- Table Name Case Sensitivity:** Options are **Enable** (highlighted in blue) and **Disable**. A note states: "lower_case_table_names=1" and "In MySQL 8.0, the case sensitivity of the table name cannot be modified after it is set."
- Password Complexity:** Options are **Enable** (highlighted in blue) and **Close**.
- Root Password:** Options are **Set Now** (highlighted in blue) and **Set After Creation**.

22. [Root Password]에서는 [Set Now]를 선택하고, TencentDB for MySQL의 관리자인 root 계정의 패스워드를 입력한다. Lab에서는 P@\$\$W0rd1234를 사용하기로 한다. 동일한 값으로 Confirm Password도 입력한다.

Root Password

Set Now **Set After Creation**

Enter the password

Confirm the password

23. [Next: Confirm the configuration info] 파란색 버튼을 눌러 다음 단계를 진행한다.

Selected General-1-core 1000 MB memory Quantity **-** **1** **+**

Configuration Fees **0.10277956 USD/hour** Backup Fees **0.0000127 USD/GB/hour**

Previous **Next: Confirm the configuration info**

24. 마지막 3단계인 [Confirm the configuration info] 단계이다.

Select a basic configuration **Set Network and Database** **3 Confirm the configuration info**

Selected Configuration

Basic and Instance Configuration		Edit	
Billing Mode	Pay as You Go	Region	Seoul
Database Version	8.0	Engine	InnoDB
Disk Type	Local SSD disk	Instance Configuration	General-1-core 1000 MB memory
AZ	Seoul Zone 2(Source)/Seoul Zone 1(Replica)		
Architecture	Two-Node		
Disk Size	200 GB		

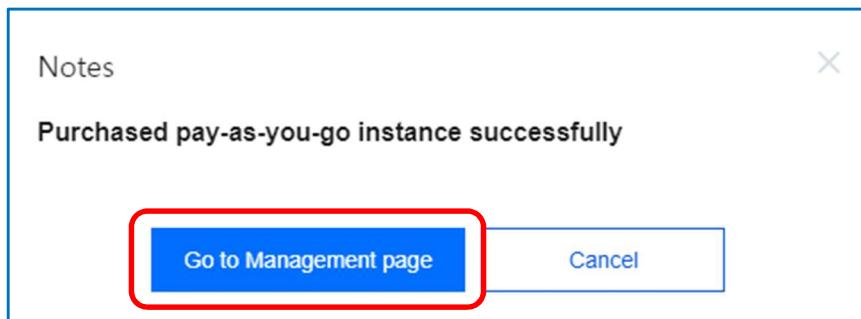
Network and Database Configuration

Network	lab7-vpc-00 - lab7-vpc-db-subnet-00	Custom Port	3306	Edit
Project	Default Project	Tag		
Instance Name	lab7-mysql-00	Data Replication	Async Replication	
Character Set	UTF8 / UTF8_GENERAL_CI	Mode		
Security Group	1 View Details	Table Name	Disable	
Alarm Policy	1 View Details	Case Sensitivity		

25. [I have read and agreed to ...] 체크 박스를 체크하고 [Buy Now] 버튼을 클릭하여 Database를 생성한다.

The screenshot shows a step in the database creation process. At the top, there's a checkbox labeled "I have read and agreed to Database TencentDB Service Level Agreement, Service Level Agreement and Refund" with a checked box. Below it, there are fields for "Selected" (General-1-core 1000 MB memory), "Quantity" (set to 1), and "Configuration Fees" (0.10277956 USD/hour). To the right, there are "Backup Fees" (0.000127 USD/GB/hour) and a "Buy Now" button. A red box highlights the "Buy Now" button.

26. 잠시 후, 아래 그림과 같이 설치 성공 다이얼로그가 나타나면 [Go to Management page] 버튼을 클릭하여 MySQL – Instance List 페이지로 이동하자.



27. [Seoul] Region에 MySQL Instance가 생성되었다.

The screenshot shows the "MySQL - Instance List" page. At the top, it says "Seoul 1 Other regions 0". There are buttons for "Create", "Comparative Monitoring", "Restart", "Renew", and "More". A search bar says "Separate keywords with '|'; press Enter to separate filter tags". The main table lists instances:

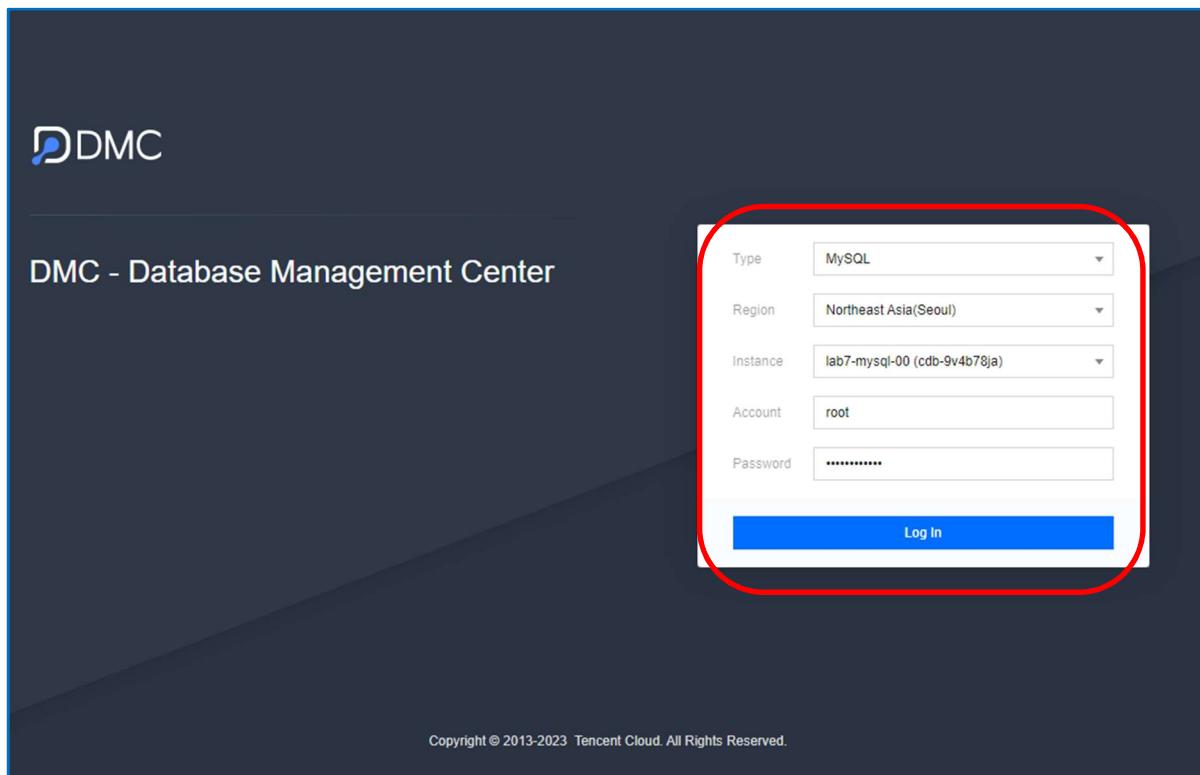
Instance ID/Name	Monitoring/Status/Tas	AZ	Configuration	Database Version	Engine	Private Network Address
cdb-ej2brb30 lab7-mysql-00	Running	Seoul Zone 2	Two-Node(Local Disk) General-1core1000M... Network: lab7-vpc-00 - lab7-vpc-db-subnet-00	MySQL8.0	InnoDB	172.16.2.2:3306

Task4. TencentDB for MySQL Database Server에 직접 연결하기

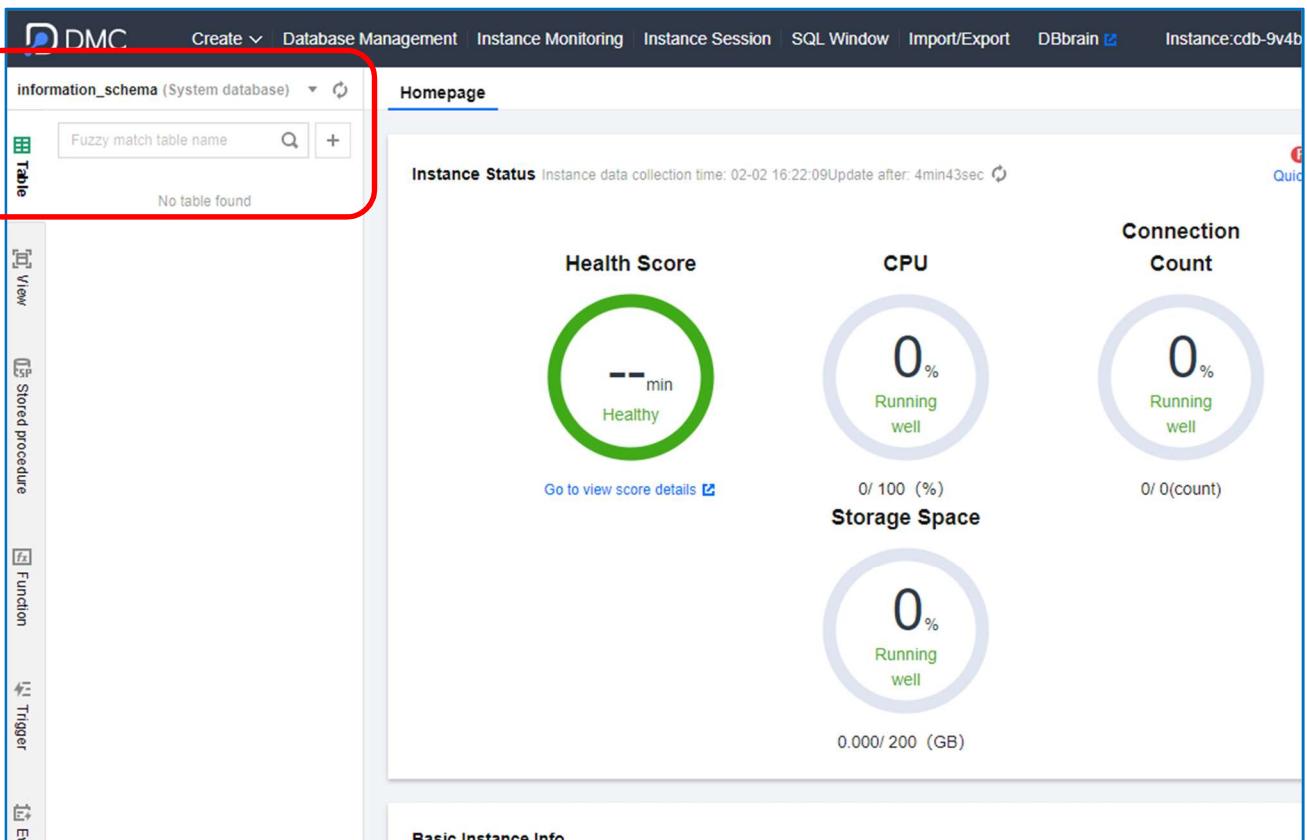
- 방금 생성한 **lab7-mysql-XX(여기서 XX는 계정번호를 의미)**에 연결하기 위해 [MySQL – Instance List]에서 해당 **Server**를 클릭한다. 해당 **Server**의 정보를 알 수 있다. 우측 상단의 [**Login**] 파란색 버튼을 클릭해보자.

The screenshot shows the 'Instance Details' tab for the instance 'lab7-mysql-00'. The 'Log In' button in the top right corner is highlighted with a red box. Other tabs include 'Instance Monitoring', 'Database Management', 'Security Group', 'Backup and Restoration', 'Operation Log', and 'Read-Only Instance'. The instance status is shown as 'Running'. The 'Performance' section displays a green '100 min' rating with a 'Quick Check' button. A 'View Configuration' button is also visible.

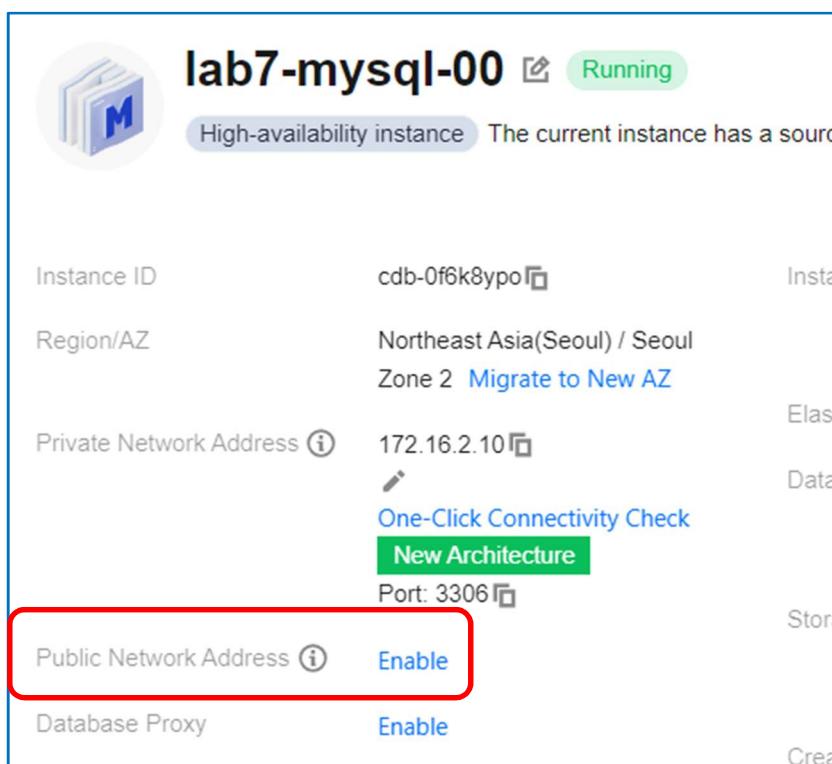
- [DMC]창이 나타난다. [Account]는 root로, [Password]는 이미 설정한 P@\$\$W0rd1234를 입력하고 [**Log In**] 파란색 버튼을 클릭하여 로그인하자.



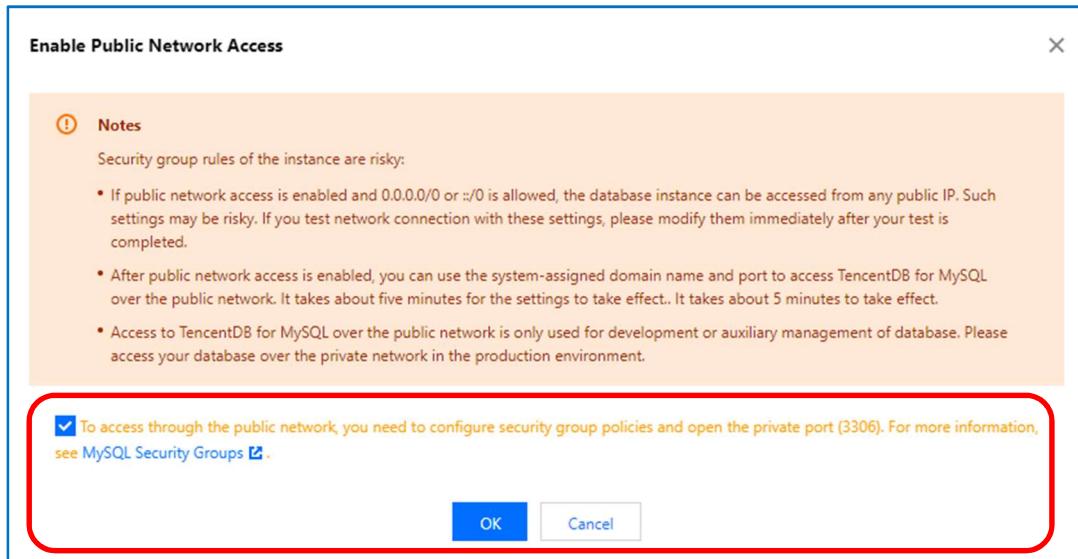
3. 연결에 성공했다. 아직 어떤 Table도 어떤 Data도 없는 것을 확인할 수 있다.



4. 이번에는 일반 개발자들이 연결할 수 있도록 MySQL을 Public Network를 통해 연결하는 방법을 사용하도록 한다. 앞에서 생성한 MySQL Instance의 상세 페이지의 [Basic Info] 섹션에서 [Public Network Address]를 보면 현재 [Enable]로 확인된다.



5. [Enable] 링크를 클릭하면, [Enable Public Network Access] 팝업창이 나온다. 계속 진행하려면 체크 후, [OK]를 클릭한다.



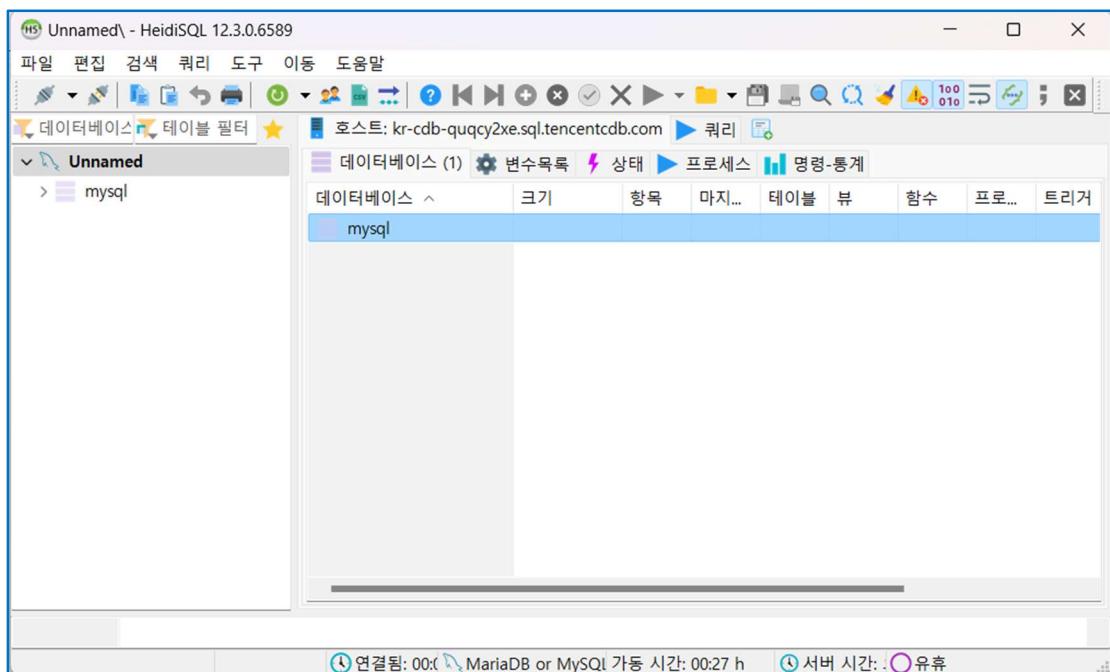
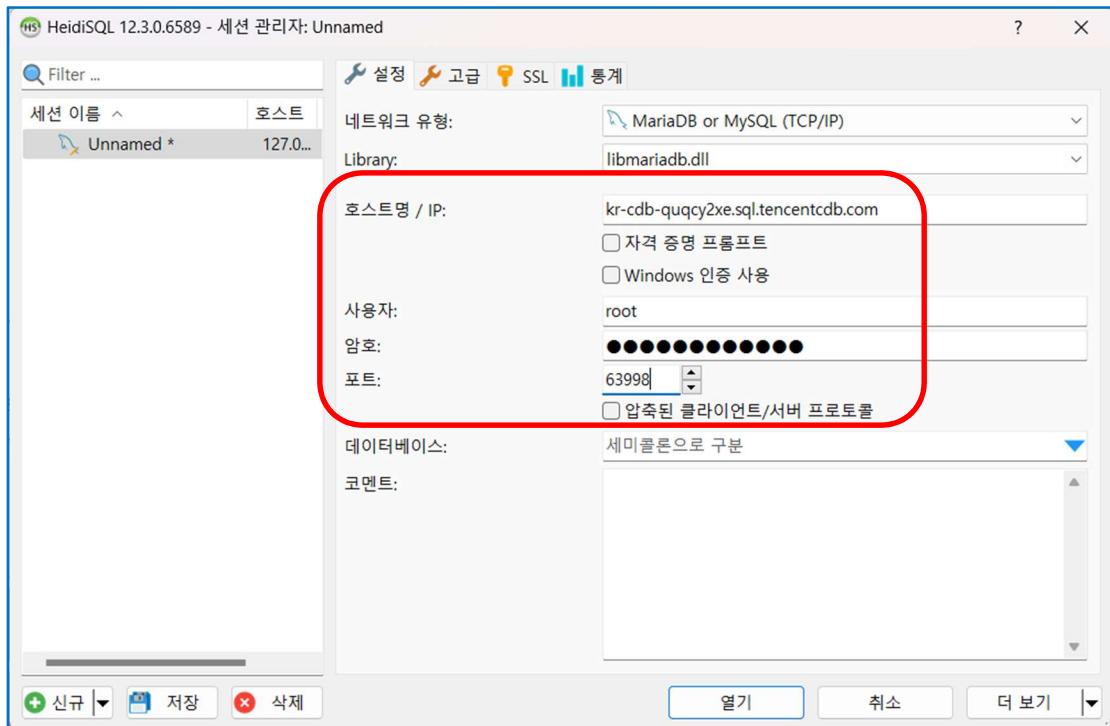
6. 외부에서 Public으로 접근할 수 있는 주소와 포트가 설정되었다.

The screenshot shows the configuration page for the MySQL instance 'lab7-mysql-00'. Key details include:

- Instance ID: cdb-0f6k8ypo
- Region/AZ: Northeast Asia(Seoul) / Seoul Zone 2 [Migrate to New AZ](#)
- Private Network Address: 172.16.2.10
- Public Network Address: kr-cdb-0f6k8ypo.sql.tencentcdb.com
- Port: 3306
- Database Proxy: Enable

A red box highlights the 'Public Network Address' section, which includes a 'One-Click Connectivity Check' button and a port value of 63993.

7. 다음 그림은 Database 연결 프로그램 중 하나인 HeidiSQL로 연결하는 방법을 보여주고 있다. 이렇게 MySQL 인스턴스의 Public Network Address를 사용하면 Database 연결 프로그램을 통해 Hostname과 포트를 가지고 쉽게 연결할 수 있다.



Task5. Web Server에서 Private Network으로 Database Server에 연결하기

1. CVM 인스턴스를 사용하여 MySQL 인스턴스에 연결하려면 CVM 인스턴스의 보안 그룹에서 **Outbound rule**을 구성해야 한다. MySQL 인스턴스를 **Private Network**으로 접근하려는 **Web Server**는 현재 **lab5-sgXX(여기서 XX는 계정번호를 의미)**을 사용하고 있다. 먼저, **lab5-sgXX(여기서 XX는 계정번호를 의미)** 설정페이지로 이동한다.

The screenshot shows the AWS Security Groups Inbound rules configuration page for a security group named 'sg-n16ldnkv(lab5-sg00)'. The page has tabs for 'Inbound rules' and 'Outbound rules', with 'Inbound rules' selected. There are buttons for 'Add rule', 'Import rule', 'Sort', 'Delete', 'Open all common ports', and 'How to Set'. The table lists the following inbound rules:

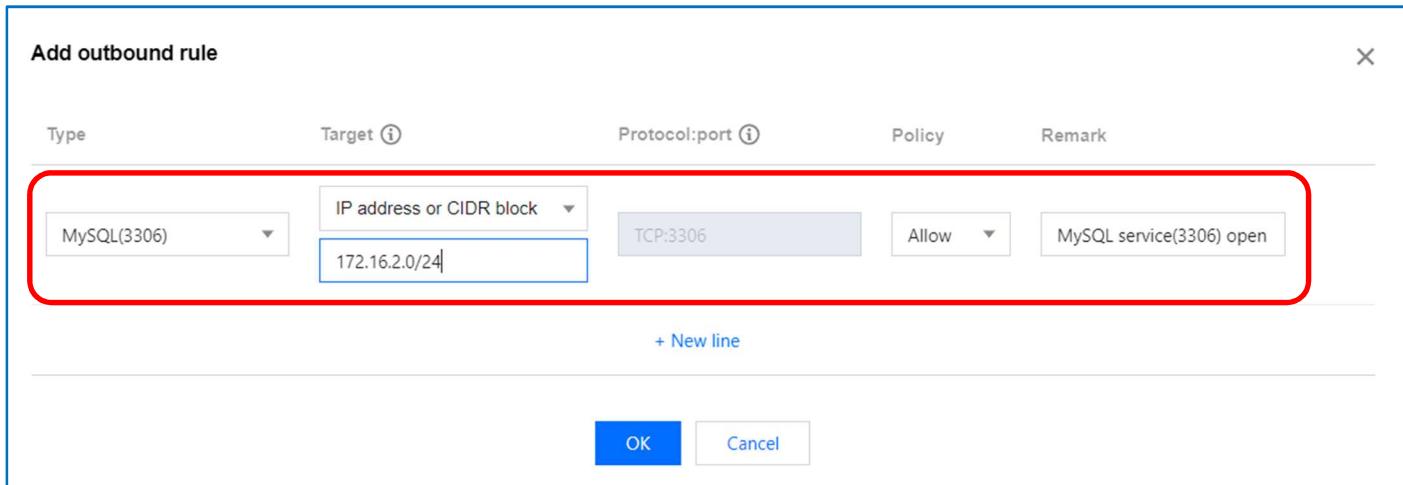
Source	Protocol+port	Policy	Notes
0.0.0.0/0	ICMP	Allow	Ping service open.
::/0	ICMPv6	Allow	Ping service open.
0.0.0.0/0	TCP:22	Allow	TCP port 22 open for Linux CVMs.
::/0	TCP:22	Allow	TCP port 22 open for Linux CVMs.
0.0.0.0/0	TCP:80	Allow	Web service HTTP(80) open.
::/0	TCP:80	Allow	Web service HTTP(80) open.
0.0.0.0/0	TCP:443	Allow	Web service HTTPS(443) open.
::/0	TCP:443	Allow	Web service HTTPS(443) open.

Total items: 8

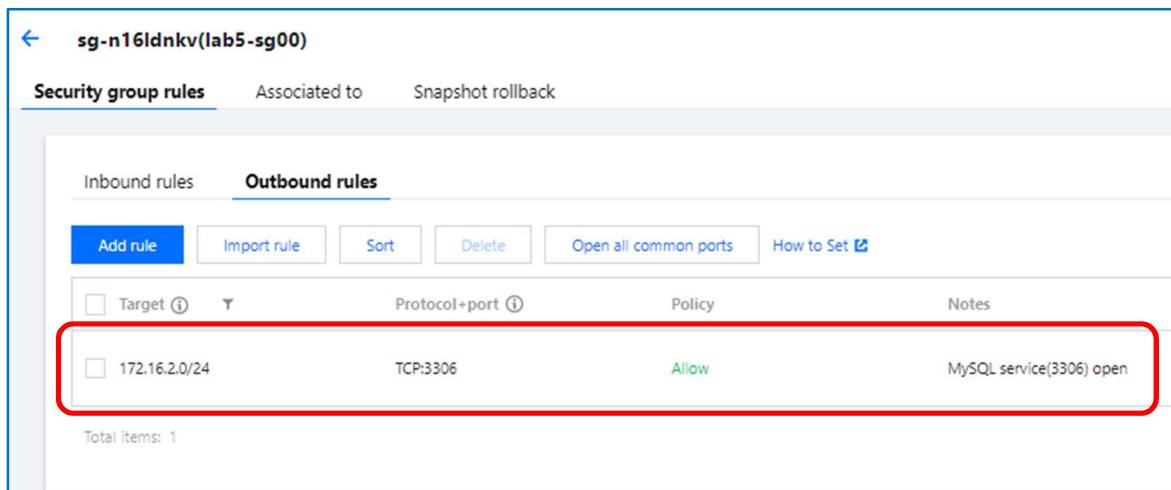
2. [Outbound rules] 탭의 [Add rule] 파란색 버튼을 클릭한다.

The screenshot shows the AWS Security Groups Outbound rules configuration page for the same security group 'sg-n16ldnkv(lab5-sg00)'. The 'Outbound rules' tab is selected. There are buttons for 'Add rule', 'Import rule', 'Sort', 'Delete', 'Open all common ports', and 'How to Set'. The table is currently empty with the note 'If no rules are set, all traffic is rejected by default.' The 'Add rule' button is highlighted with a red box.

3. [Add outbound rule] 팝업창에서, [Type]은 MySQL(3306)을 선택하고, [Target]은 MySQL 인스턴스 Subnet 주소인 172.16.2.0/24를 입력하고 [Policy]는 Allow를 선택한 후, [OK] 파란색 버튼을 클릭한다.



4. 다음 그림과 같이 Outbound 규칙이 설정되었다.



5. 이전 Task에서 생성한 MySQL 인스턴스의 상세 페이지로 이동한다. [Basic Info] 섹션에서 [Private Network Address]에 보면 MySQL 인스턴스의 Private IP가 확인된다. Private IP 옆에 있는 [One-Click Connectivity Check] 링크를 클릭한다.

The screenshot shows the 'lab7-mysql-00' MySQL instance details page. The 'One-Click Connectivity Check' button for the private network address is highlighted with a red box.

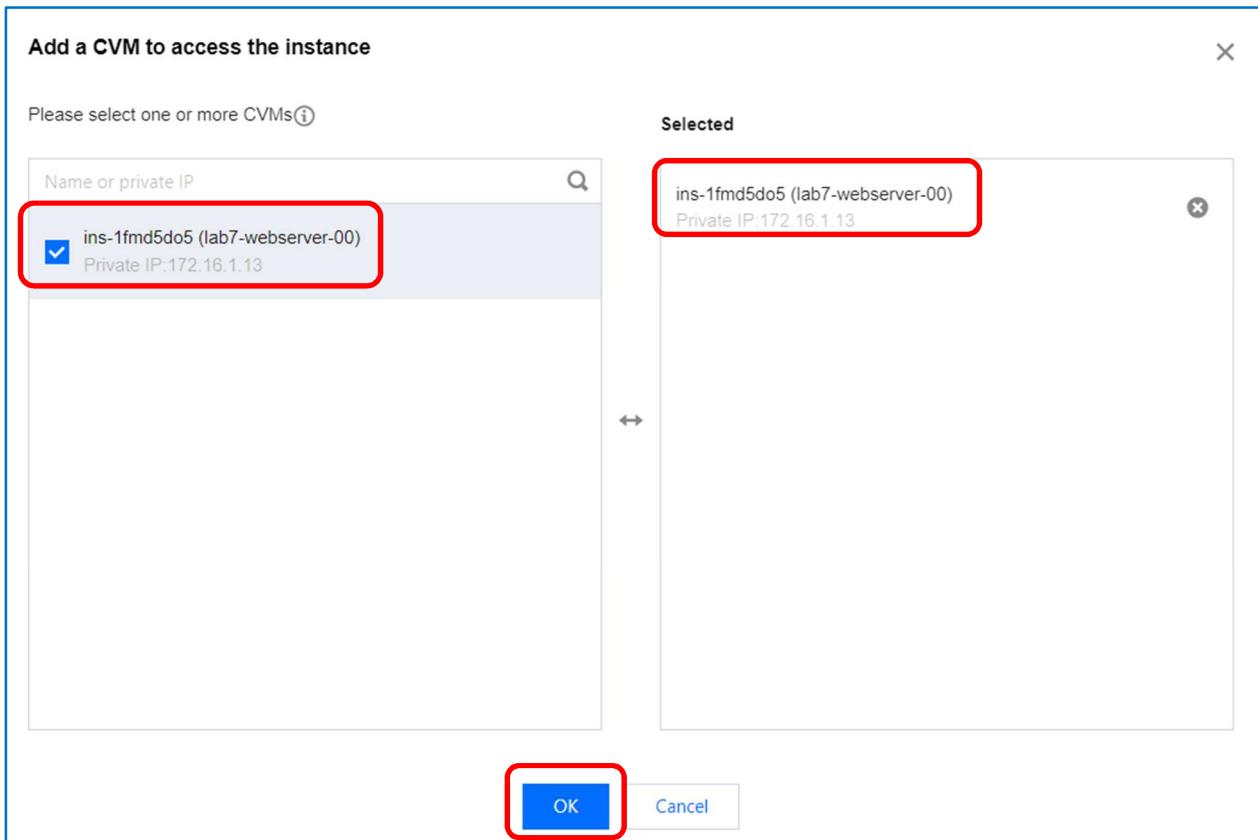
lab7-mysql-00	
Instance ID	cdb-0f6k8ypo
Region/AZ	Northeast Asia(Seoul) / Seoul Zone 2 Migrate to New AZ
Private Network Address	172.16.2.10 Edit One-Click Connectivity Check New Architecture Port: 3306 Edit
Public Network Address	kr-cdb-0f6k8ypo.sql.tencentcdb.com Edit Close One-Click Connectivity Check Port: 63993 Edit
Database Proxy	Enable

6. MySQL 인스턴스의 [Connection Check] 페이지이다. [Private Network Check] 메뉴에서 [Add CVMs to Access This Instance] 파란색 버튼을 클릭하여 MySQL 인스턴스에 연결할 Web Server를 지정하기로 한다.

The screenshot shows the 'Connection Check' page for the MySQL instance. The 'Add a CVM to access the instance' button is highlighted with a red box.

Private Network Check	Public Network Check			
Instance ID: cdb-0f6k8ypo	Instance Name: lab7-mysql-00	Private IP: 172.16.2.10	Private Port: 3306	Network: lab7-vpc-00 - lab7-vpc-db-subnet-00
<p>You have not added a CVM to access this instance.</p> <p>The connection check will help you in detecting potential database connection and access problems. After the check, solutions will be suggested to ensure that your database can be accessed properly.</p> <p>Start Check</p> <p>Add a CVM to access the instance</p>				
CVM Name	Private IP	Network	Status	

7. [Add CVMs to Access This Instance] 팝업창에서 [Please select one or more CVMs] 목록에서 앞 Task에서 생성한 Web Server인 lab7-webserver-XX(여기서 XX는 계정번호를 의미)를 체크한다. 체크한 Web Server가 [Selected] 목록에 있는 것을 확인하고 [OK] 버튼을 클릭한다.



8. 목록에 Web Server가 등록되었다. 이제 [Start Check] 파란색 버튼을 클릭한다.

CVM Name	Private IP	Network	Status	Operation
ins-1fmd5do5 lab7-webserver-00	172.16.1.13	lab7-vpc-00 - lab7-vpc-web-subnet-00	Not checked	Delete

9. 정상적으로 연결할 수 있음을 확인할 수 있다.

Private Network Check Public Network Check

Instance ID: cdb-0f6k8ypo Instance Name: lab7-mysql-00 Private IP: 172.16.2.10 Private Port: 3306 Network: lab7-vpc-00 - lab7-vpc-db-subnet-00

 No problem found

The connection check will help you in detecting potential database connection and access problems.
After the check, solutions will be suggested to ensure that your database can be accessed properly.

Start Check Last Check Time: 2024-01-23 21:01:24

Add a CVM to access the instance

CVM Name	Private IP	Network	Status	Operation
ins-1fmd5do5 lab7-webserver-00	172.16.1.13	lab7-vpc-00 - lab7-vpc-web-subnet-00	Normal	Delete View Report

10. 다시 Tabbby를 가지고 Web-Server를 연결한다.

```
Welcome to Ubuntu 22.04 LTS (GNU/Linux 5.15.0-91-generic x86_64)

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

System information as of Tue Jan 23 08:11:35 PM CST 2024

System load: 0.04296875      Processes: 123
Usage of /: 7.8% of 49.10GB   Users logged in: 0
Memory usage: 14%            IPv4 address for eth0: 172.16.1.13
Swap usage: 0%

* Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
just raised the bar for easy, resilient and secure K8s cluster deployment.

https://ubuntu.com/engage/secure-kubernetes-at-the-edge

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo\_root" for details.

ubuntu@lab7-webserver-00:~$
```

11. lab7-webserver-XX(여기서 XX는 계정번호를 의미)에 연결 후, 먼저 `apt list update`부터 시작한다.

```
$ sudo apt update
```

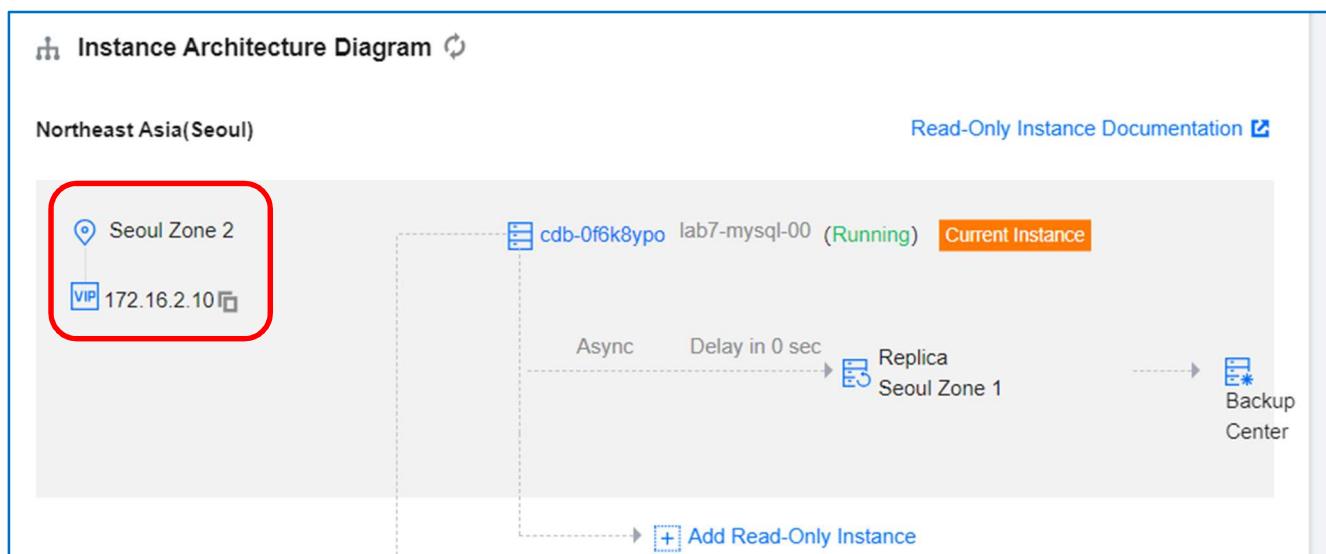
```
ubuntu@lab7-webserver-00:~$ sudo apt update
Hit:1 http://mirrors.tencentyun.com/ubuntu jammy InRelease
Hit:2 http://mirrors.tencentyun.com/ubuntu jammy-updates InRelease
Hit:3 http://mirrors.tencentyun.com/ubuntu jammy-security InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
138 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@lab7-webserver-00:~$
```

12. lab7-webserver-XX(여기서 XX는 계정번호를 의미)에서 lab7-mysql-XX(여기서 XX는 계정번호를 의미)에 연결하기 위해 MySQL Client Tool을 설치한다.

```
$ sudo apt install -y mysql-client
```

```
ubuntu@lab7-webserver-00:~$ sudo apt install -y mysql-client
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  mysql-client-8.0 mysql-client-core-8.0 mysql-common
The following NEW packages will be installed:
  mysql-client mysql-client-8.0 mysql-client-core-8.0 mysql-common
0 upgraded, 4 newly installed, 0 to remove and 138 not upgraded.
Need to get 2,722 kB of archives.
After this operation, 62.1 MB of additional disk space will be used.
Get:1 http://mirrors.tencentyun.com/ubuntu jammy-updates/main amd64 mysql-client-core-8.0 amd64 8.0.35-0ubuntu0.22.04.1 [2,682 kB]
Get:2 http://mirrors.tencentyun.com/ubuntu jammy/main amd64 mysql-common all 5.8+1.0.8 [7,212 B]
Get:3 http://mirrors.tencentyun.com/ubuntu jammy-updates/main amd64 mysql-client-8.0 amd64 8.0.35-0ubuntu0.22.04.1 [22.7 kB]
Get:4 http://mirrors.tencentyun.com/ubuntu jammy-updates/main amd64 mysql-client all 8.0.35-0ubuntu0.22.04.1 [9,354 B]
Fetched 2,722 kB in 1s (2,033 kB/s)
Selecting previously unselected package mysql-client-core-8.0.
```

13. 이제 Tabby에서 MySQL Client Tool을 통해 lab7-webserver-XX(여기서 XX는 계정번호를 의미)에서 lab7-mysql-XX(여기서 XX는 계정번호를 의미)에 연결해 보자. 현재 이 실습에서의 lab7-mysql-XX(여기서 XX는 계정번호를 의미)의 Private IP는 172.16.2.10이다.



14. 비밀번호 P@\$\$W0rd1234를 입력하면 lab7-webserver-XX(여기서 XX는 계정번호를 의미)에서 lab7-mysql-XX(여기서 XX는 계정번호를 의미)에 접속되는 것을 볼 수 있다.

```
$ mysql -h 172.16.2.10 -u root -p
```

```
ubuntu@lab7-webserver-XX:~$ mysql -h 172.16.2.10 -u root -p
Enter password:
```

```
Welcome to the MySQL monitor. Commands end with ; or \g.
```

```
Your MySQL connection id is 973
```

```
Server version: 8.0.30-txsql 20221221
```

```
Copyright (c) 2000, 2023, Oracle and/or its affiliates.
```

```
Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.
```

```
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
```

```
mysql> █
```

15. Database를 조회하니까 root권한으로 볼 수 있는 Database 목록이 보인다.

```
mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
+-----+
4 rows in set (0.00 sec)

mysql> █
```

Task6. TencentDB for MySQL Data 관리하기

- MySQL 인스턴스의 상세 페이지로 들어간다. 그리고 페이지 상단 메뉴 중 [Database Management] 메뉴를 클릭한다.

The screenshot shows the 'Instance Details' page for an instance named 'lab7-mysql-00'. The top navigation bar includes tabs for 'Instance Details', 'Instance Monitoring', 'Database Management' (which is highlighted with a red box), and 'Security Group'. The left sidebar contains sections for 'Instance Info' (Project: Default Project, GTID: Enabled, Character Set/Collation: UTF8 / UTF8_GENERAL_CI, Network: lab7-vpc-00 - lab7-vpc-db-subnet-00, Tag: Edit) and 'Instance Architecture Diagram' (Northeast Asia (Seoul) region, Seoul Zone 2, VIP address 172.16.2.10).

- 계정정보를 보기 위해 [Account Management] 메뉴를 클릭한다.

The screenshot shows the 'Database Management' page for the same instance. The top navigation bar includes tabs for 'Instance Details', 'Instance Monitoring', 'Database Management' (which is highlighted with a red box), and 'Security Group'. Below the tabs, there are buttons for 'Import Data' and 'Create Database'. The main content area displays a table with columns for 'Database Name' and 'Status'. The status message indicates 'No databases found.' and shows '0 in total'.

3. root 계정을 확인할 수 있다. 새 계정을 생성하기 위해 [Create Account] 파란색 버튼을 클릭한다.

The screenshot shows the 'Database Management' tab selected in the top navigation bar. Below it, the 'Account Management' sub-tab is also selected. A red box highlights the 'Account Name' column for the 'root' entry. The table has columns for Account Name, Host, Maximum Connections, and Remarks. The 'root' entry has 'root' in the Account Name column, '%' in the Host column, '--' in the Maximum Connections column, and '--' in the Remarks column. A note at the bottom says '1 in total'.

4. [Create Account] 창이 나타난다. 다음의 각 값을 설정한 후, [OK] 파란색 버튼을 클릭한다.

- ① [Account Name] : scott
- ② [Host] : %
- ③ [Set Password] : P@\$\$W0rd1234
- ④ [Confirm Password] : P@\$\$W0rd1234

The screenshot shows the 'Create Account' dialog box. A red box highlights the input fields for Account Name, Host, Set Password, and Confirm Password. The 'Account Name' field contains 'scott'. The 'Host' field contains '%'. The 'Set Password' and 'Confirm Password' fields both contain 'P@\$\$W0rd1234'. Below these fields, there are other optional settings: 'Maximum Connections' set to 'Up to 10240', and a 'Remarks' section with a placeholder 'Enter remarks.' and character limit '0 / 255'. At the bottom are 'OK' and 'Cancel' buttons.

5. 방금 생성한 계정을 확인할 수 있다. 권한 설정을 위해 해당 **scott** 계정의 제일 오른쪽 메뉴인 [Operation] > [Modify Permissions]를 클릭한다.

Database List Parameter Settings Account Management				
Create Account	Export Account	Password Complexity: [Disable]	Use Dynamic Credentials ⓘ	Enter account name
Account Name	Host	Maximum Connections	Remarks	Operation
root	%	--	--	Reset Password Reset Permissions
scott	%	--	--	Modify Permissions Clone Account More ▾

6. [Set Permissions] 창이 나타난다. 필요한 권한을 설정할 수 있는데, 실습 목적상 ALL 을 선택한다. 그리고 [Preview] 버튼을 클릭한다.

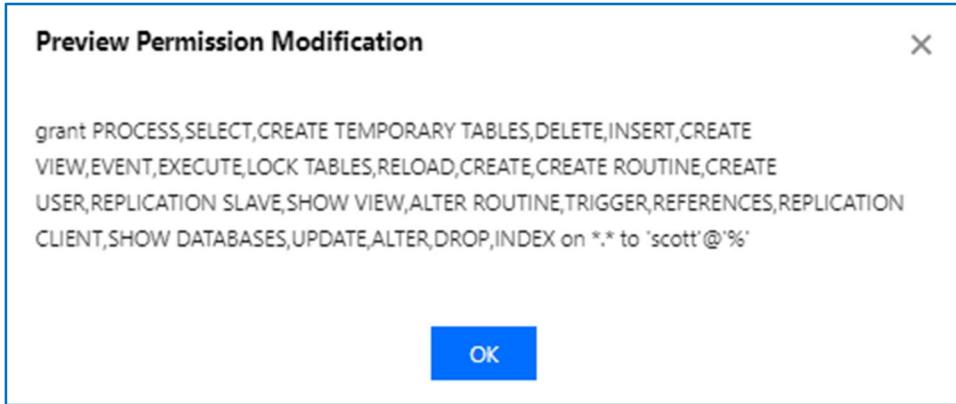
Set Permissions

You have selected 1 account., scott@% [View Details ▾](#)

Set Database Permissions		Batch Authorize/Deauthorize	Reset
Global Privileges ●	<input checked="" type="checkbox"/> ALTER ● <input checked="" type="checkbox"/> ALTER ROUTINE ●	<input checked="" type="checkbox"/> ALTER ROUTINE ●	
▶ <input type="checkbox"/> Object-Level Privileges	<input checked="" type="checkbox"/> CREATE ● <input checked="" type="checkbox"/> CREATE ROUTINE ●	<input checked="" type="checkbox"/> CREATE ROUTINE ●	
	<input checked="" type="checkbox"/> CREATE TEMPORARY TABLES ●	<input checked="" type="checkbox"/> CREATE USER ●	
	<input checked="" type="checkbox"/> CREATE VIEW ●	<input checked="" type="checkbox"/> DELETE ●	
	<input checked="" type="checkbox"/> DROP ●	<input checked="" type="checkbox"/> EVENT ●	
	<input checked="" type="checkbox"/> EXECUTE ●	<input checked="" type="checkbox"/> INDEX ●	
	<input checked="" type="checkbox"/> INSERT ●	<input checked="" type="checkbox"/> LOCK TABLES ●	
	<input checked="" type="checkbox"/> PROCESS ●	<input checked="" type="checkbox"/> REFERENCES ●	
	<input checked="" type="checkbox"/> RELOAD ●	<input checked="" type="checkbox"/> REPLICATION CLIENT ●	
	<input checked="" type="checkbox"/> REPLICATION SLAVE ●	<input checked="" type="checkbox"/> SELECT ●	
	<input checked="" type="checkbox"/> All		

OK **Preview** **Cancel**

7. [Preview permission Modification] 팝업창에서 **GRANT Query** 를 확인할 수 있다.



8. 그리고 [OK] 파란색 버튼을 클릭하여 [Set Permissions] 창을 닫는다. Tabby 창으로 돌아와서, 다음의 명령을 통해 방금 생성한 scott 계정을 확인한다.

```
mysql>use mysql;  
mysql>show tables;  
mysql>SELECT host, user FROM user;
```

```
mysql> SELECT host, user FROM user;  
+-----+-----+  
| host | user |  
+-----+-----+  
| % | root |  
| % | scott |  
| localhost | mysql.infoschema |  
| localhost | mysql.session |  
| localhost | mysql.sys |  
+-----+-----+  
5 rows in set (0.01 sec)
```

mysql> █

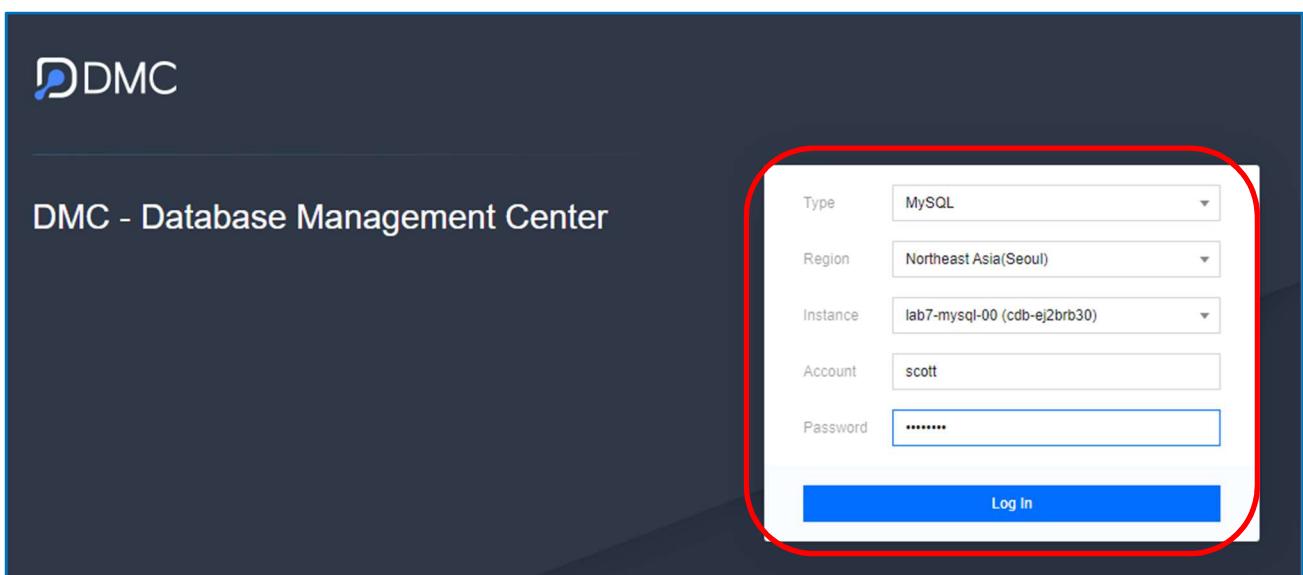
9. MySQL 인스턴스 상세 페이지에서 **Database Server**에 접속하기 위해 **[Login]** 버튼을 클릭한다. 앞에서 이미 연결되어 있는 창이 있다면 창을 닫고 다시 연결한다.

The screenshot shows the 'Instance Details' tab selected in the navigation bar. The main area displays 'Basic Info' with the following details:

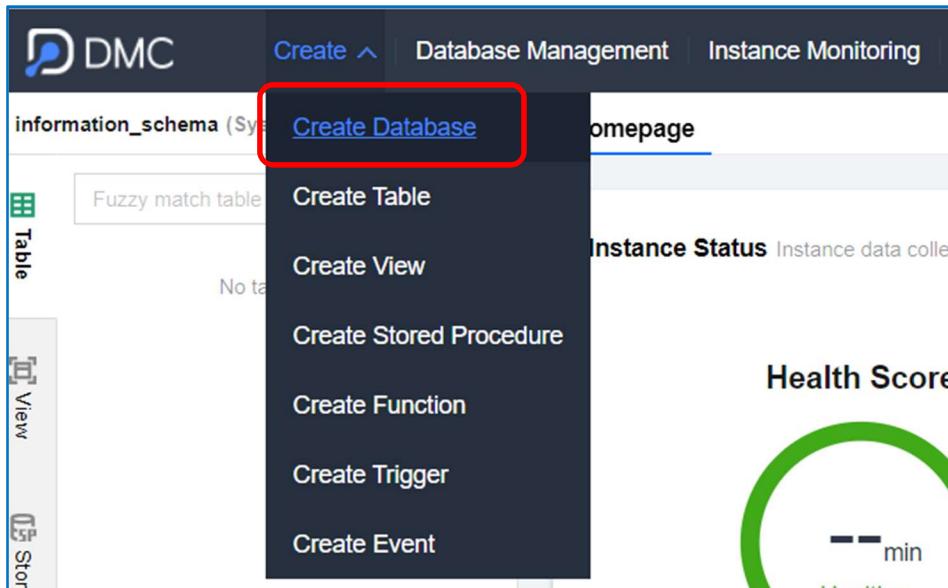
- Instance Name: lab7-mysql-00
- Instance ID: cdb-ej2brb30
- Status/Task: Running / --
- Region/AZ: Northeast Asia(Seoul)/ Seoul Zone 2 Migrate to New AZ
- Project: Default Project [Switch to Another Project](#)
- GTID: Enabled
- Character Set/Collation: UTF8 / UTF8_GENERAL_CI

To the right, there is an 'Instance Architecture Diagram' showing the setup in Northeast Asia(Seoul). It includes nodes for Seoul Zone 2 (IP 172.16.2.2) and Seoul Zone 1, with an 'Async' connection between them. The current instance, 'cdb-ej2brb30 lab7-mysql-00 (Running)', is highlighted with a red border and labeled as 'Current Instance'. A 'Read-Only Instance' button is also visible.

10. [DMC]창에서 방금 생성한 계정인 **scott** 의 비밀번호 **P@\$\$W0rd1234** 로 **[Log In]** 파란색 버튼을 클릭하여 로그인해보자.



11. scott 계정으로 로그인에 성공한 다음, 먼저 새 Database를 생성하기 위해 상단 메뉴 중 [Create] > [Create Database] 메뉴를 클릭한다. 또는 상단 메뉴 중 [Database Management] 메뉴를 직접 클릭한다.



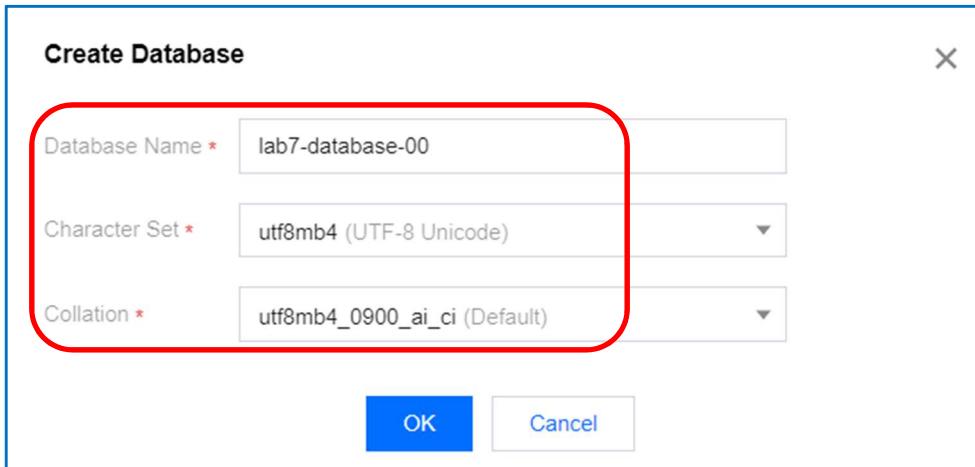
12. 현재 Database는 여러 개 보인다. 새 Database를 생성하기 위해 [Create Database] 파란색 버튼을 클릭한다.

The screenshot shows the 'Database Management' page. The 'Create Database' button is highlighted with a red box. Below it, there is a table listing existing databases: information_schema, performance_schema, mysql, sys, and __cdb_recycle_bin__. Each database entry includes its name, character set, and collation. A search bar at the top right says 'Please enter database name'.

Database Name	Character Set	Collation
information_schema (System database)	utf8 (UTF-8 Unicode)	utf8_general_ci (Default)
performance_schema (System database)	utf8mb4 (UTF-8 Unicode)	utf8mb4_0900_ai_ci (Default)
mysql (System database)	utf8mb4 (UTF-8 Unicode)	utf8mb4_0900_ai_ci (Default)
sys (System database)	utf8mb4 (UTF-8 Unicode)	utf8mb4_0900_ai_ci (Default)
__cdb_recycle_bin__ (System database)	utf8mb4 (UTF-8 Unicode)	utf8mb4_0900_ai_ci (Default)

13. [Create Database] 창이 나타난다. 다음의 각 값을 설정한 후, [OK] 파란색 버튼을 클릭한다.

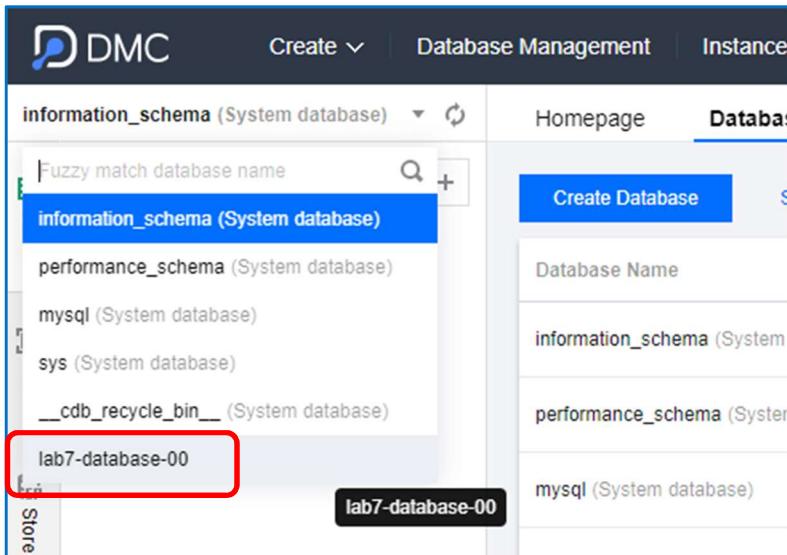
- ① [Database Name] : lab7-database-XX(여기서 XX는 계정번호를 의미)
- ② [Character Set] : utf8mb4
- ③ [Collation] : utf8mb4_0900_ai_ci(Default)



14. 새 Database lab7-database-XX(여기서 XX는 계정번호를 의미) 생성되었다.

Database Management			
Database Name	Character Set	Collation	Operation
information_schema (System database)	utf8 (UTF-8 Unicode)	utf8_general_ci (Default)	--
performance_schema (System database)	utf8mb4 (UTF-8 Unicode)	utf8mb4_0900_ai_ci (Default)	--
mysql (System database)	utf8mb4 (UTF-8 Unicode)	utf8mb4_0900_ai_ci (Default)	--
sys (System database)	utf8mb4 (UTF-8 Unicode)	utf8mb4_0900_ai_ci (Default)	--
__cdb_recycle_bin__ (System database)	utf8mb4 (UTF-8 Unicode)	utf8mb4_0900_ai_ci (Default)	--
lab7-database-00	utf8 (UTF-8 Unicode)	utf8_general_ci (Default)	Edit Delete

15. 새 TABLE 을 생성하기 위해 먼저 현재의 Database 인 information_schema 를 변경해야 한다. Database 드롭다운을 클릭해서 목록 중 lab7-database-XX(여기서 XX는 계정번호를 의미)를 선택한다.



16. 현재의 Database 가 lab7-database-XX(여기서 XX 는 계정번호를 의미)임을 확인하고, 페이지 상단 메뉴 중 [Create] > [Create Table] 메뉴를 클릭한다.



17. [Create Table] 페이지의 [Basic Info]에서 다음의 각 값을 설정한다.

- ① [Table name] : Employees
- ② [Storage engine] : InnoDB
- ③ [Character Set] : utf8mb4
- ④ [Check Rules] : utf8mb4_0900_ai_ci

Database: lab7-database-00

Basic Info	Column Info	Index	Foreign Key	Partition
Basic Info				
Table name *	Employees			
Remarks				
Storage engine	InnoDB			
Character Set	utf8mb4			
Check Rules	utf8mb4_0900_ai_ci			

18. 다음으로 [Column Info] 탭을 클릭하여 [Add] 버튼을 클릭하여 다음의 각 값을 설정 후, [Submit] 파란색 버튼을 클릭하여 새 TABLE 을 생성한다.

- ① [Column Name] : empno, [Type] : smallint, [Length] : 2, Primary Key
- ② [Column Name] : ename, [Type] : varchar, [Length] : 10, [Set to Null] : Uncheck, [Character Set] : utf8, [Check Rules] : utf8_general_ci
- ③ [Column Name] : job, [Type] : varchar, [Length] : 9, [Set to Null] : Uncheck, [Character Set] : utf8, [Check Rules] : utf8_general_ci
- ④ [Column Name] : mgr, [Type] : smallint, [Length] : 2, [Set to Null] : Check
- ⑤ [Column Name] : hiredate, [Type] : date, [Set to Null] : Uncheck
- ⑥ [Column Name] : sal, [Type] : float, [Length] : 7, [Decimal Place] : 2, [Set to Null] : Uncheck
- ⑦ [Column Name] : comm, [Type] : float, [Length] : 7, [Decimal Place] : 2 [Set to Null] : Check
- ⑧ [Column Name] : deptno, [Type] : tinyint, [Length] : 1, [Set to Null] : Uncheck

Homepage Database Management **Create Table** Exception alert

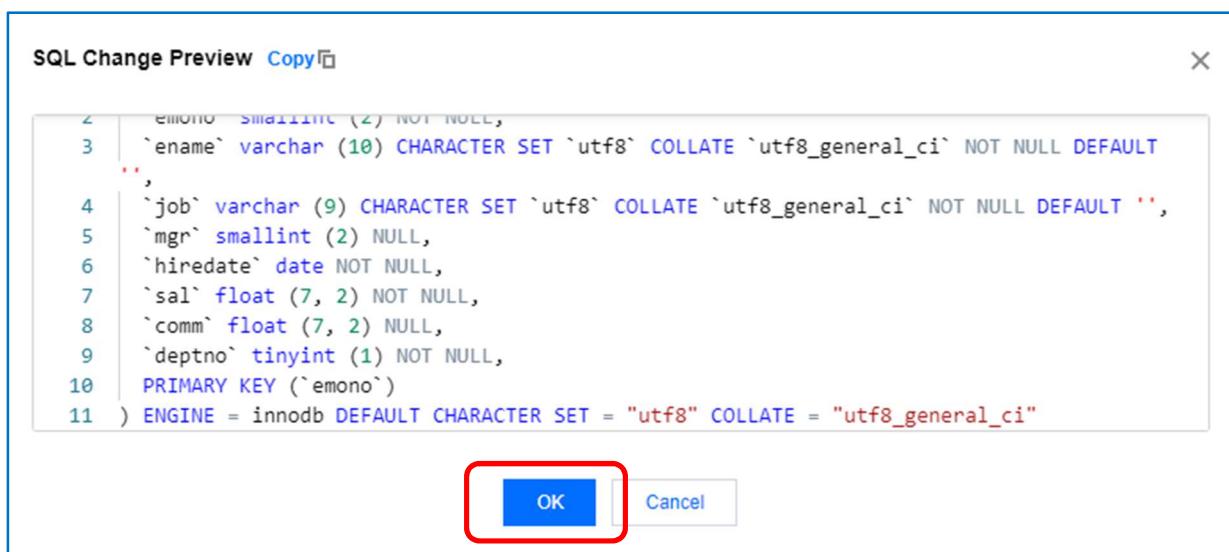
Basic Info **Column Info** Index Foreign Key Partition

Add Delete Insert Move up Move down

	Column Name	Type	Length	Remarks	Set to Null	Primary Key	Index
1	emono	smallint	2		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2	ename	varchar	10		<input type="checkbox"/>	<input type="checkbox"/>	
3	job	varchar	9		<input type="checkbox"/>	<input type="checkbox"/>	
4	mgr	smallint	2		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5	hiredate	date			<input type="checkbox"/>	<input type="checkbox"/>	
6	sal	float	7		<input type="checkbox"/>	<input type="checkbox"/>	
7	comm	float	7		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8	deptno	tinyint	1		<input type="checkbox"/>	<input type="checkbox"/>	

19. [Submit] 파란색 버튼을 클릭하면 [SQL Change Preview] 창이 나타난다. Query 확인 후 이상이 없으면 [OK] 파란색 버튼을 클릭한.

```
CREATE TABLE `Employees` (
  `empno` smallint (2) NOT NULL,
  `ename` varchar (10) CHARACTER SET `utf8` COLLATE `utf8_general_ci` NOT NULL DEFAULT '',
  `job` varchar (9) CHARACTER SET `utf8` COLLATE `utf8_general_ci` NOT NULL DEFAULT '',
  `mgr` smallint (2) NULL,
  `hiredate` date NOT NULL,
  `sal` float (7, 2) NOT NULL,
  `comm` float (7, 2) NULL,
  `deptno` tinyint (1) NOT NULL,
  PRIMARY KEY (`empno`)
) ENGINE = innodb DEFAULT CHARACTER SET = "utf8" COLLATE = "utf8_general_ci"
```



20. TABLE 이 정상적으로 생성되면 좌측 프레임에서 테이블을 확인할 수 있고, [Employees| Table Structure] 탭도 생성된다.

The screenshot shows the MySQL Workbench interface with the database 'lab7-database-00' selected. On the left, there's a tree view with 'employees' expanded. In the center, the 'Employees | Table Structure' tab is active, showing the columns of the 'employees' table:

	Column Name	Type	Length	Remarks	Set to Null	Primary Key	Index
1	emono	smallint			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	ename	varchar	10		<input type="checkbox"/>	<input type="checkbox"/>	
3	job	varchar	9		<input type="checkbox"/>	<input type="checkbox"/>	
4	mgr	smallint			<input type="checkbox"/>	<input type="checkbox"/>	
5	hiredate	date			<input type="checkbox"/>	<input type="checkbox"/>	
6	sal	float	7		<input type="checkbox"/>	<input type="checkbox"/>	
7	comm	float	7		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
8	deptno	tinyint	1		<input type="checkbox"/>	<input type="checkbox"/>	

21. Tabby 를 이용해서 lab7-webserver-XX(여기서 XX 는 계정번호를 의미)에서도 방금 생성한 Database 와 Table 을 확인해 보자.

```
mysql> show databases;
```

```
mysql> show databases;
+-----+
| Database      |
+-----+
| information_schema |
| lab7-database-00 |
| mysql          |
| performance_schema |
| sys            |
+-----+
5 rows in set (0.01 sec)

mysql>
```

```
mysql> use lab7-database-XX(여기서 XX는 계정번호를 의미);
```

```
mysql> show tables;
```

```
mysql> DESC Employees;
```

```
mysql> use lab7-database-00;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> show tables;
+-----+
| Tables_in_lab7-database-00 |
+-----+
| employees
+-----+
1 row in set (0.01 sec)

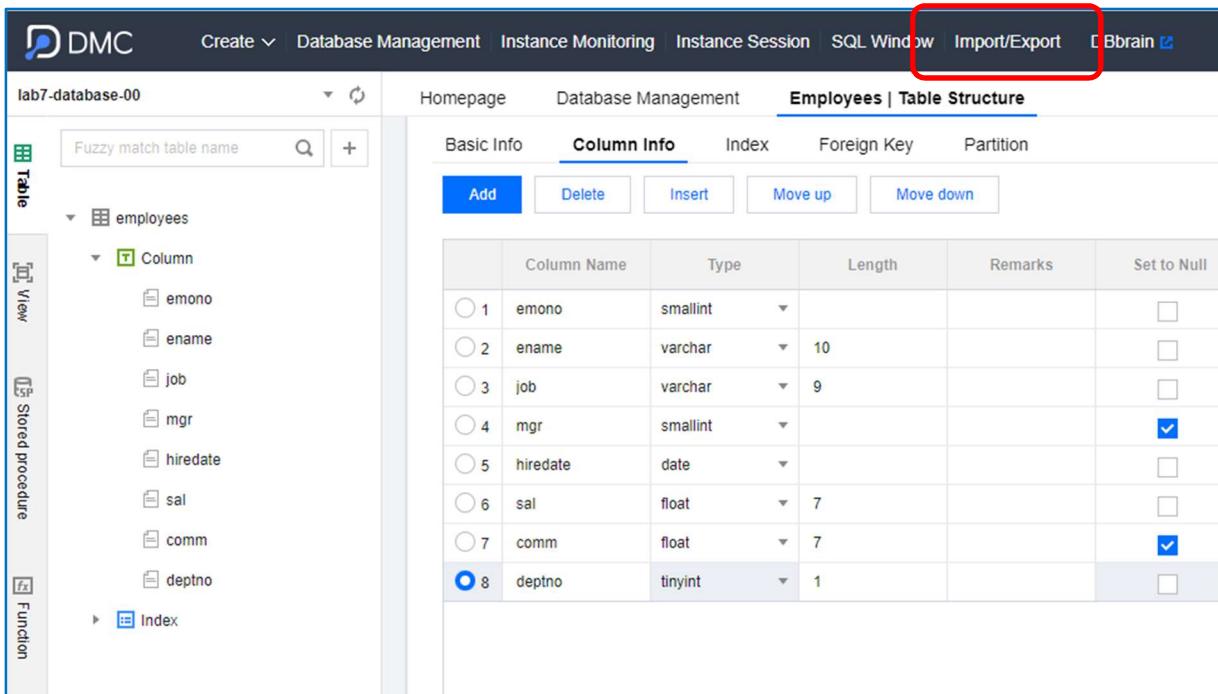
mysql> desc employees;
+-----+
| Field      | Type       | Null | Key | Default | Extra |
+-----+
| empno      | smallint   | NO   | PRI | NULL    |       |
| ename      | varchar(10) | NO   |     | NULL    |       |
| job        | varchar(9)  | NO   |     | NULL    |       |
| mgr        | smallint   | YES  |     | NULL    |       |
| hiredate   | date       | NO   |     | NULL    |       |
| sal         | float(7,2) | NO   |     | NULL    |       |
| comm       | float(7,2) | YES  |     | NULL    |       |
| deptno    | tinyint(1) | NO   |     | NULL    |       |
+-----+
8 rows in set (0.00 sec)

mysql>
```

22. 다시 [DMC] 페이지로 돌아와서, 좌측의 [Table] 탭에서 **Employees Table** 을 클릭한다. 그러면 오른쪽 프레임에 **[Employees | Edit Table]** 탭이 나타난다.

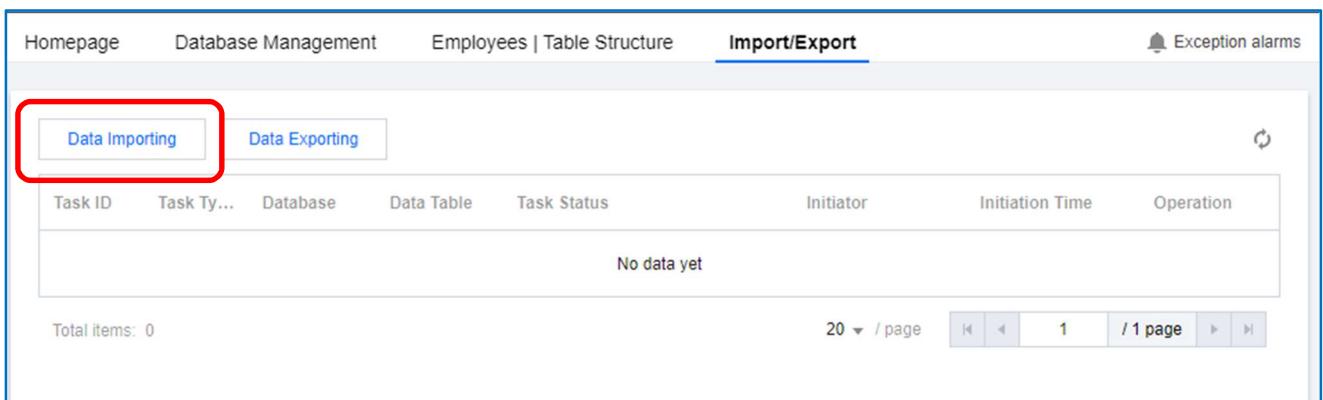
The screenshot shows the DMC interface with the 'lab7-database-00' database selected. On the left, there is a sidebar with tabs for Table, View, Stored procedure, and Function. Under the Table tab, the 'employees' table is expanded, showing its columns: emono, ename, job, mgr, hiredate, sal, comm, and deptno. The 'Column Info' tab is currently active, displaying a table structure with columns for Column Name, Type, Length, Remarks, and Set to Null. The 'deptno' column is selected, indicated by a blue border around the row. The 'Basic Info', 'Index', 'Foreign Key', and 'Partition' tabs are also visible at the top of the right panel.

23. 페이지 상단의 메뉴 중 [Import/Export]를 클릭한다.



The screenshot shows the DMC (Data Management Center) interface. The top navigation bar includes 'Create', 'Database Management', 'Instance Monitoring', 'Instance Session', 'SQL Window', 'Import/Export' (which is highlighted with a red box), and 'Dbbrain'. Below the navigation bar, the title 'lab7-database-00' is displayed. The main content area is titled 'Employees | Table Structure'. On the left, there's a sidebar with tabs for 'Table', 'View', 'Stored procedure', and 'Function'. Under 'Table', the 'employees' table is selected, showing its columns: emono, ename, job, mgr, hiredate, sal, comm, and deptno. The 'Column Info' tab is active, showing a table with columns: Column Name, Type, Length, Remarks, and Set to Null. The 'deptno' column is selected (radio button is blue). The 'Index' tab is also visible. At the bottom of the table structure section, there are buttons for 'Add', 'Delete', 'Insert', 'Move up', and 'Move down'.

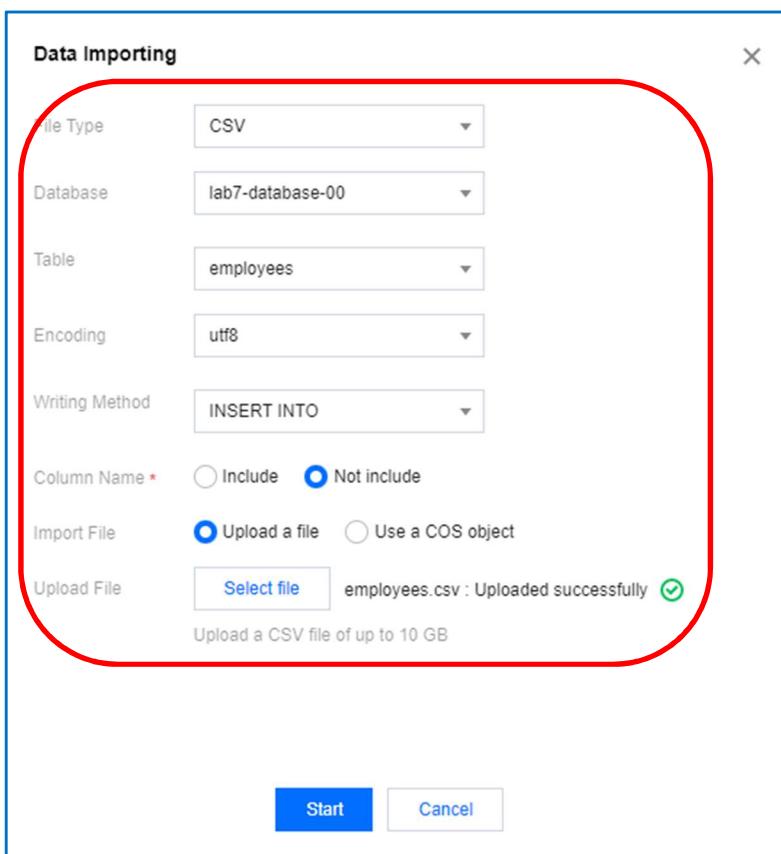
24. [Data Importing] 버튼을 클릭한다.



The screenshot shows the DMC interface with the 'Import/Export' tab selected. The top navigation bar includes 'Homepage', 'Database Management', 'Employees | Table Structure', 'Import/Export' (highlighted with a red box), and 'Exception alarms'. Below the navigation bar, there are two buttons: 'Data Importing' (highlighted with a red box) and 'Data Exporting'. The main content area displays a table with columns: Task ID, Task Ty..., Database, Data Table, Task Status, Initiator, Initiation Time, and Operation. The message 'No data yet' is shown below the table. At the bottom, it says 'Total items: 0' and '20 / page' with a page navigation bar.

25. [Data Importing] 창이 나타난다. 다음의 각 값을 설정하고 [Start] 링크를 클릭한다.

- ① [File Type] : CSV
- ② [Database] : lab7-database-XX(여기서 XX는 계정번호를 의미)
- ③ [Table] : employees
- ④ [Encoding] : utf8
- ⑤ [Writing Method] : INSERT INTO
- ⑥ [Column name] : Not include
- ⑦ [Import File] : Upload a file
- ⑧ [Upload File] : [Select file]을 클릭하여 employees.csv 파일을 선택한다.



26. 파일에 있던 데이터들이 정상적으로 **Employees TABLE**에 Import 되었다.

Data Importing		Data Exporting				
Task ID	Task Type	Database	Data Table	Task Status	Initiator	Initiation Time
204784	Data Import...	lab7-database-00	employees	Executed successfully	200034981062 (henry)	2024-01-23 21:37:29
Total items: 1						
20	/ page					1

Homepage		Import/Export		employees Table Structure		employees Edit Table		Exception alarms	
Add	Delete	Export	Copy ▾	Submit	↻	Quick Operation <<			
<input type="checkbox"/> emono ↴		ename ↴		job ↴		mgr ↴		hiredate ↴	
<input type="checkbox"/> 7369		SMITH		CLERK		7902		1980-12-17	
<input type="checkbox"/> 7499		ALLEN		SALESMAN		7698		1981-02-20	
<input type="checkbox"/> 7521		WARD		SALESMAN		7698		1981-02-03	
<input type="checkbox"/> 7566		JONES		MANAGER		7839		1981-03-02	
<input type="checkbox"/> 7654		MARTIN		SALESMAN		7698		1981-10-22	
<input type="checkbox"/> 7698		BLAKE		MANAGER		7839		1981-05-01	
<input type="checkbox"/> 7782		CLARK		MANAGER		7839		1981-09-06	
<input type="checkbox"/> 7788		SCOTT		ANALYST		7566		1982-12-08	
<input type="checkbox"/> 7839		KING		PRESIDENT		0		1981-11-17	
<input type="checkbox"/> 7844		TURNER		SALESMAN		7698		1984-10-08	
<input type="checkbox"/> 7876		ADAMS		CLERK		7788		1983-01-12	
<input type="checkbox"/> 7900		JAMES		CLERK		7698		1981-12-03	
<input type="checkbox"/> 7902		FORD		ANALYST		7566		1981-12-13	
<input type="checkbox"/> 7934		MILLER		CLERK		7782		1982-01-25	

27. 간단하게 Query 스크립트를 작성할 수 있다. 좌측의 **Employees** 테이블 오른쪽 [Operation] > [SQL operation] 을 클릭한다.

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Employees' table structure is displayed with columns: empno, ename, job, mgr, hiredate, sal, comm, deptno, and PRIMARY. A red box highlights the 'Operation' dropdown menu for the table. The menu is open, showing options: View Table Info, Drop Table, Truncate Table, Rename, and Create. Below the table structure, a list of employee IDs (7782, 7788, 7839, 7844, 7876) is visible.

28. 다음과 같이 Query 스크립트를 작성하고 [Execute] 파란색 버튼을 클릭하여 스크립트를 실행한다.

```
SELECT empno, ename, hiredate, sal  
FROM employees  
WHERE deptno IN(10, 20);
```

The screenshot shows the Oracle SQL Developer interface. At the top, there are tabs for 'Homepage', 'Import/Export', 'employees | Table Structure', 'employees | Edit Table', and 'lab7-database-00 | SQL'. A red box highlights the 'Execute' button, which is blue and has the text 'Execute' in white. To the right of the execute button are 'Format Optimization', 'Execution Plan', 'Save', and a dropdown menu set to 'lab7-database-00'. On the far right, there are 'Exception alarms' and 'SQL Optimization' buttons. Below the toolbar, the SQL editor contains the following code:

```
1 SELECT empno, ename, hiredate, sal  
2 FROM employees  
3 WHERE deptno IN(10, 20);
```

The 'Execution Result 1' tab is selected, indicated by a blue underline. Below it are 'Info' and 'Execution Result 1' buttons. Under 'Execution Result 1', there are 'Export data' and 'Refresh' buttons. The result grid displays the following data:

empno	ename	hiredate	sal
7369	SMITH	1980-12-17	800.00
7566	JONES	1981-03-02	2975.00
7782	CLARK	1981-09-06	2450.00
7788	SCOTT	1982-12-08	3000.00
7839	KING	1981-11-17	5000.00
7876	ADAMS	1983-01-12	1100.00
7902	FORD	1981-12-13	3000.00
7934	MILLER	1982-01-25	1300.00

At the bottom left, it says 'Page 1'. At the bottom right, it says '10 条 / 页' with navigation arrows.

29. Tabby 프로그램 즉 lab7-webserver-XX(여기서 XX 는 계정번호를 의미)에서 연결한 터미널에서도 결과가
같게 나온다.

```
mysql> SELECT empno, ename, hiredate, sal
-> FROM employees
-> WHERE deptno IN(10, 20);
+-----+-----+-----+-----+
| empno | ename  | hiredate    | sal   |
+-----+-----+-----+-----+
| 7369  | SMITH  | 1980-12-17  | 800.00 |
| 7566  | JONES  | 1981-03-02  | 2975.00|
| 7782  | CLARK  | 1981-09-06  | 2450.00|
| 7788  | SCOTT  | 1982-12-08  | 3000.00|
| 7839  | KING    | 1981-11-17  | 5000.00|
| 7876  | ADAMS  | 1983-01-12  | 1100.00|
| 7902  | FORD   | 1981-12-13  | 3000.00|
| 7934  | MILLER | 1982-01-25  | 1300.00|
+-----+-----+-----+-----+
8 rows in set (0.01 sec)
```

```
mysql>
```