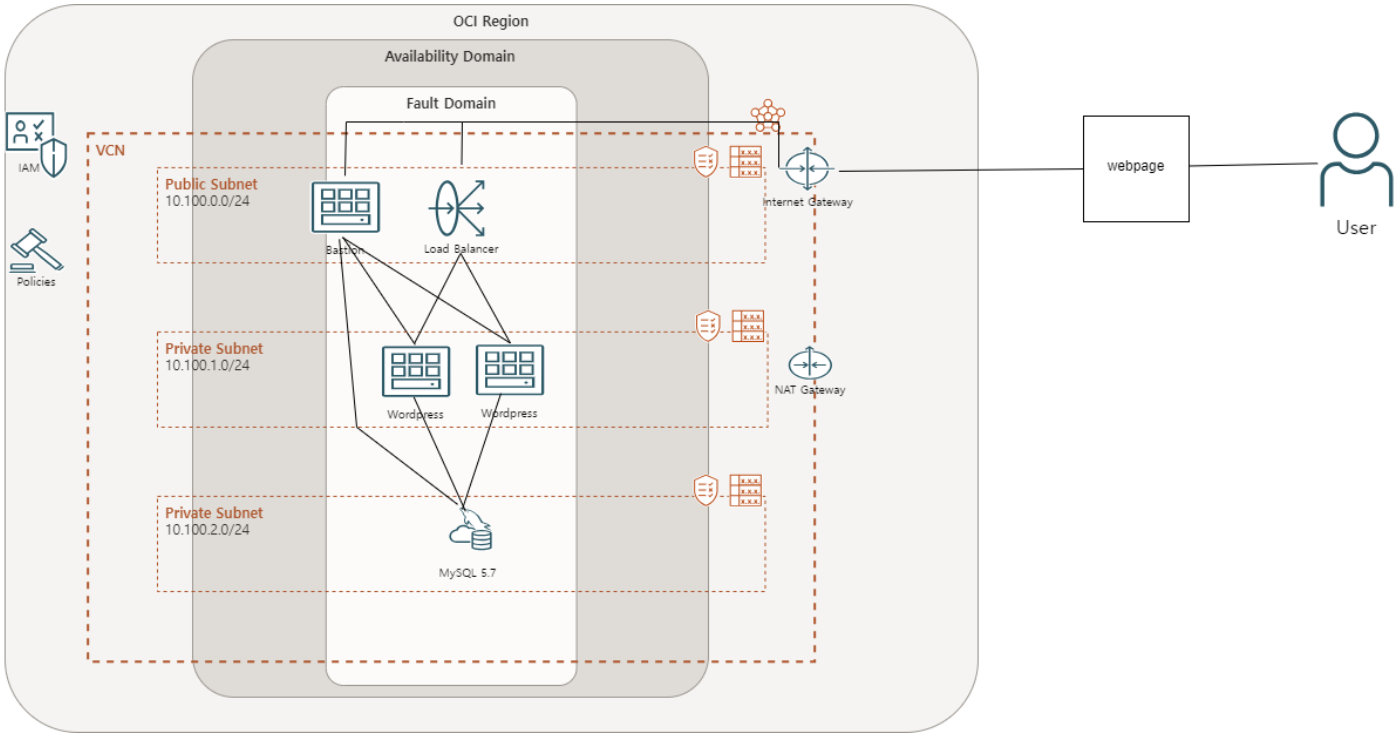
3-Tire 구성 테스트

구성도



각각의 역할

Bastion : wordpress 및 mysql 서버 접속 및 관리

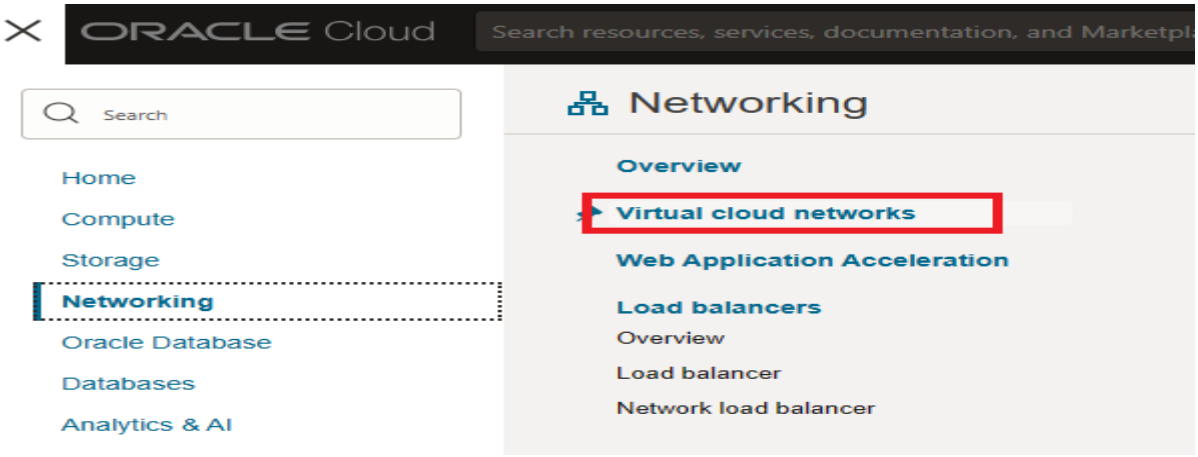
Wordpress : Web Service 서버

MySQL 5.7 : 설치 SOL DB 서버

구성

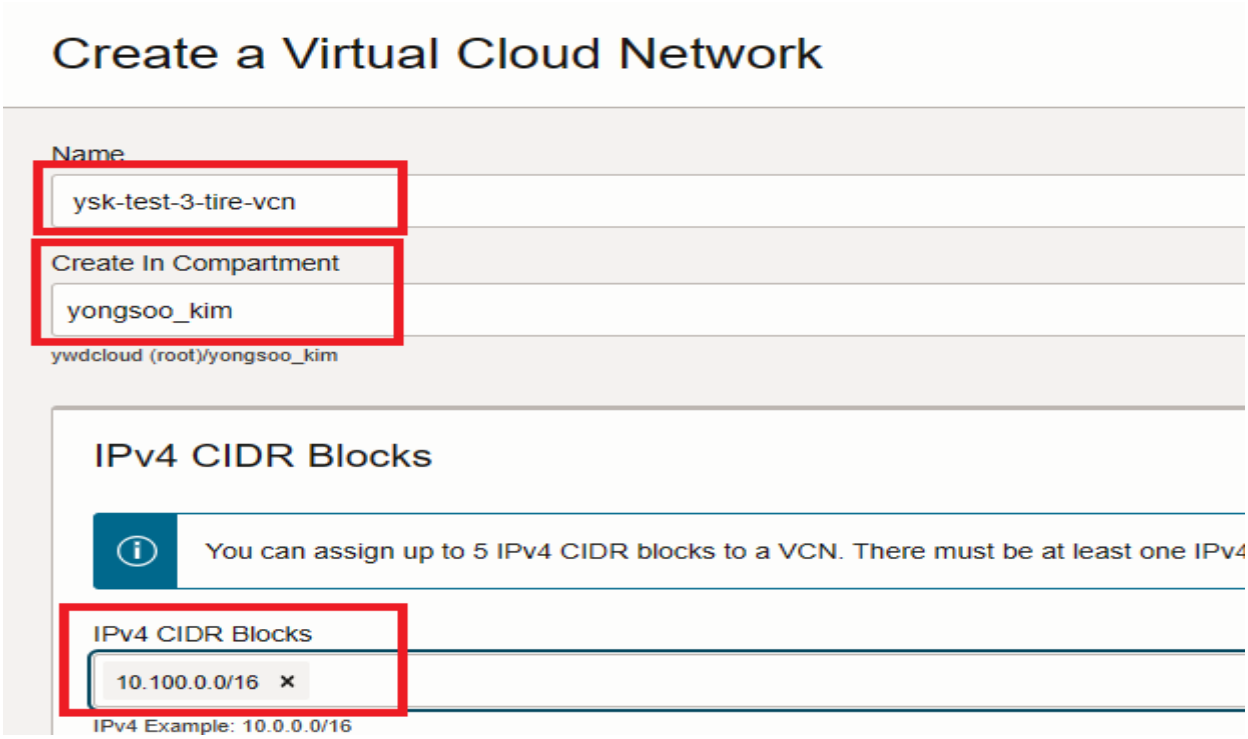
1. VCN 구성
   - 필요사항, Public Subnet, Private subnet 2ea
   - Internet gw, NAT gw, Service gw
   - Security list 작성 필요

1.1. 메뉴의 VCN 클릭

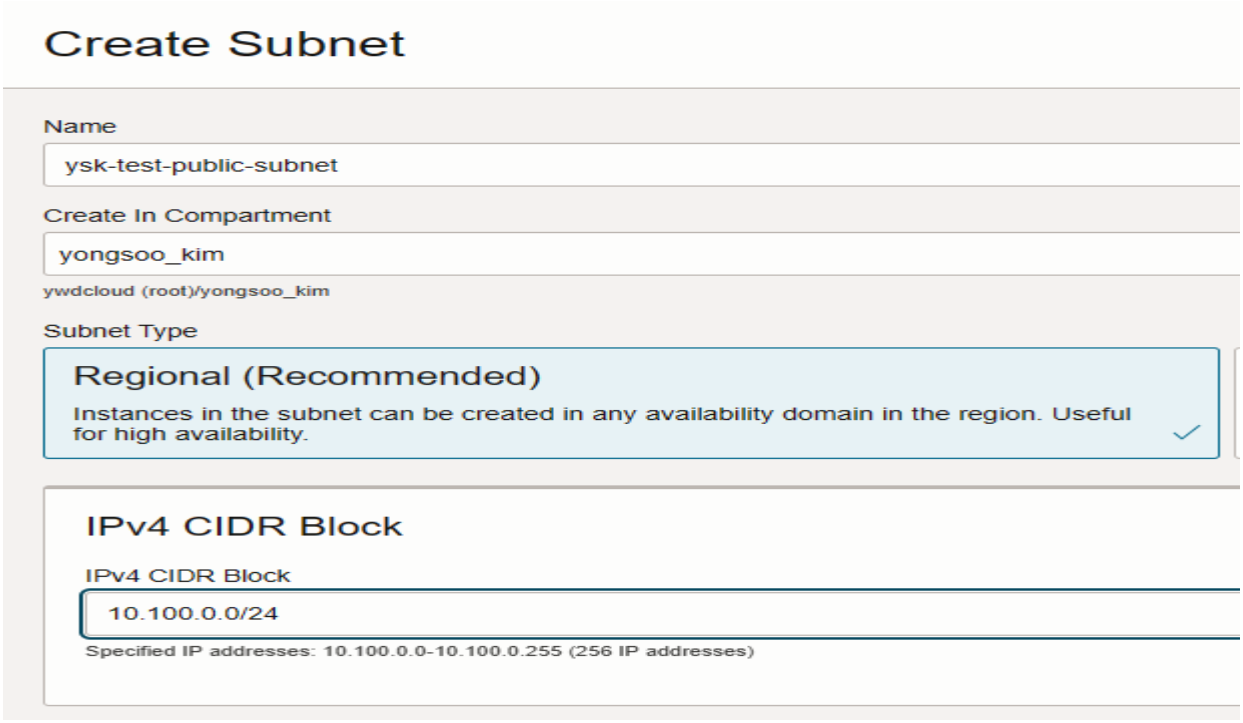


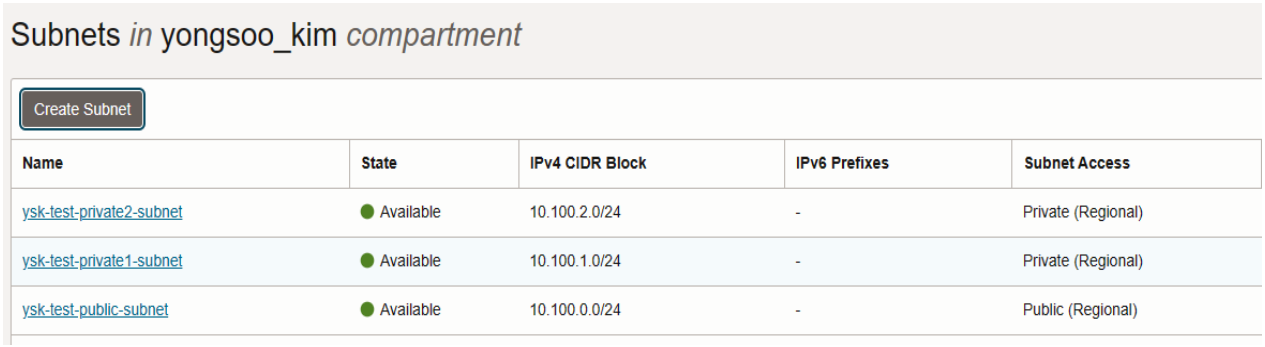
1.2. Create VCN 클릭

1.3. Name, Compartment, CIDR Block 설정

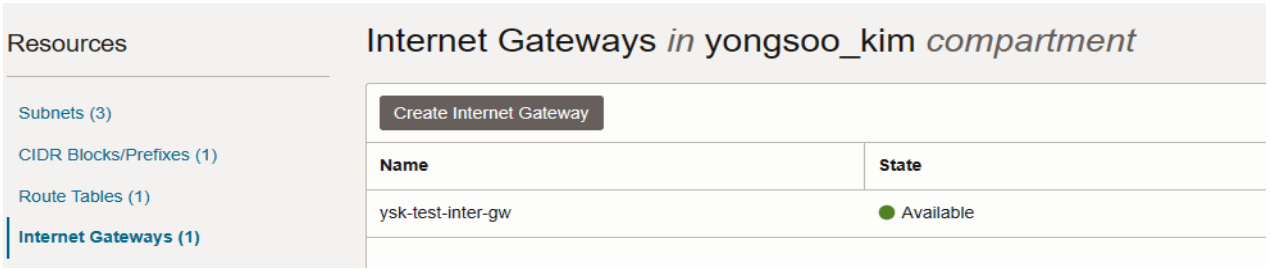


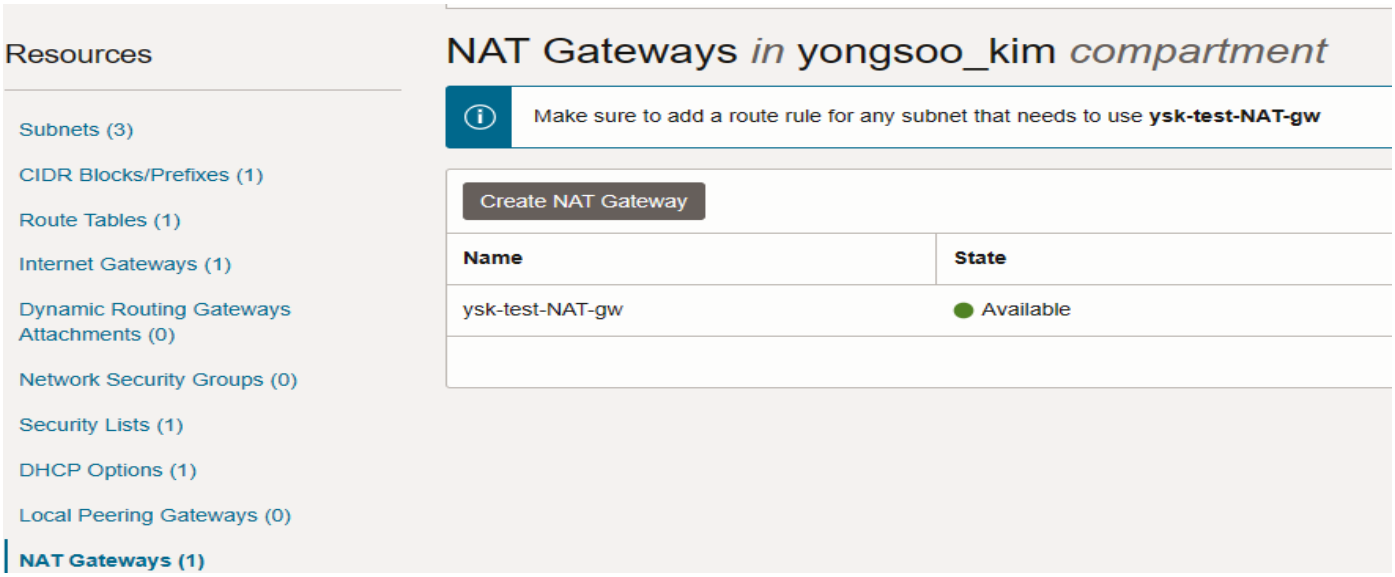
1.4. Subnet 생성 (public 1개, private 2개)

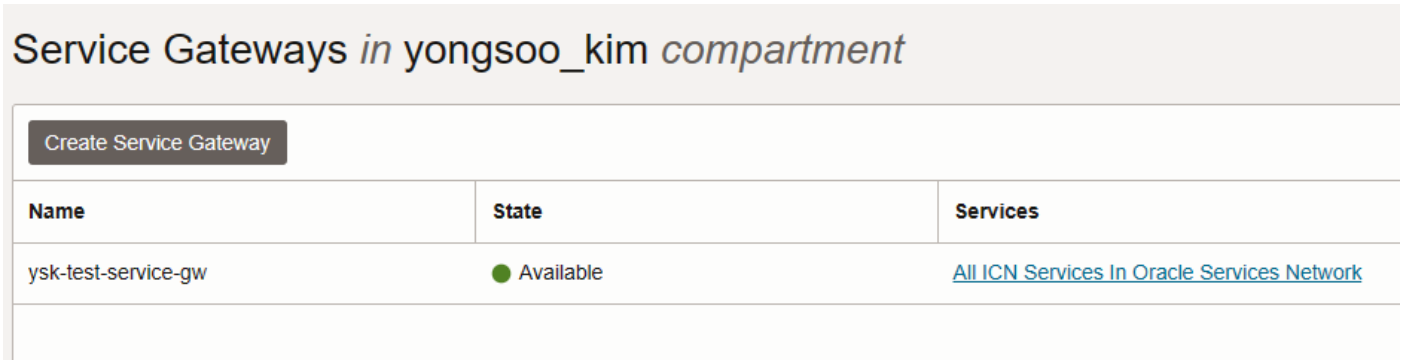




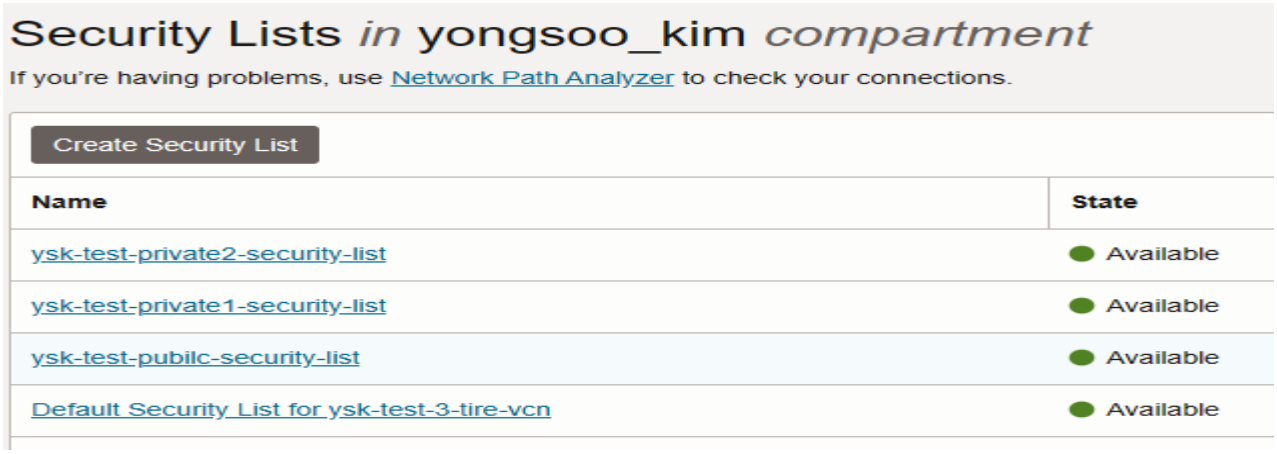
1.5. Gateway 생성 – Internet, NAT, Service



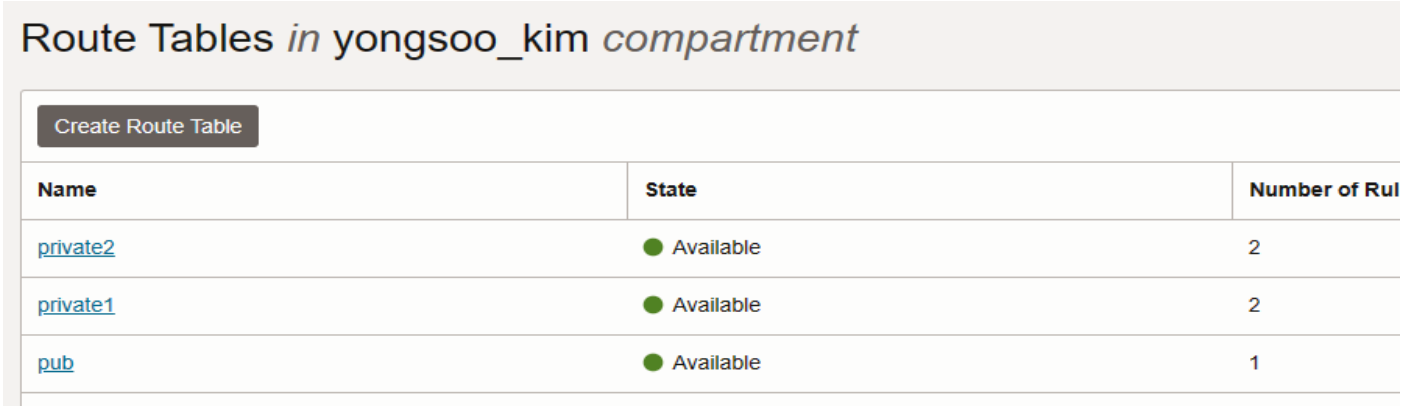




1.6. Security list 생성 및 subnet 매칭

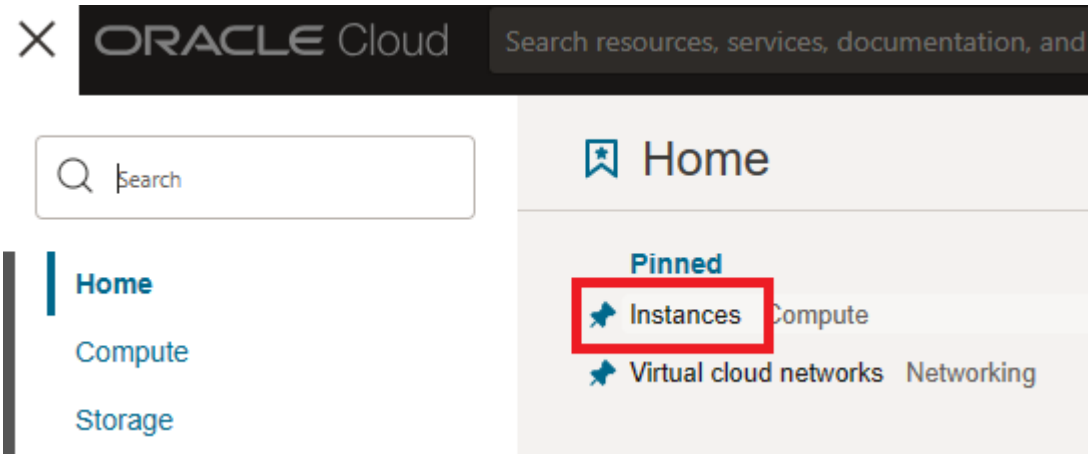


1.7. Route table 추가



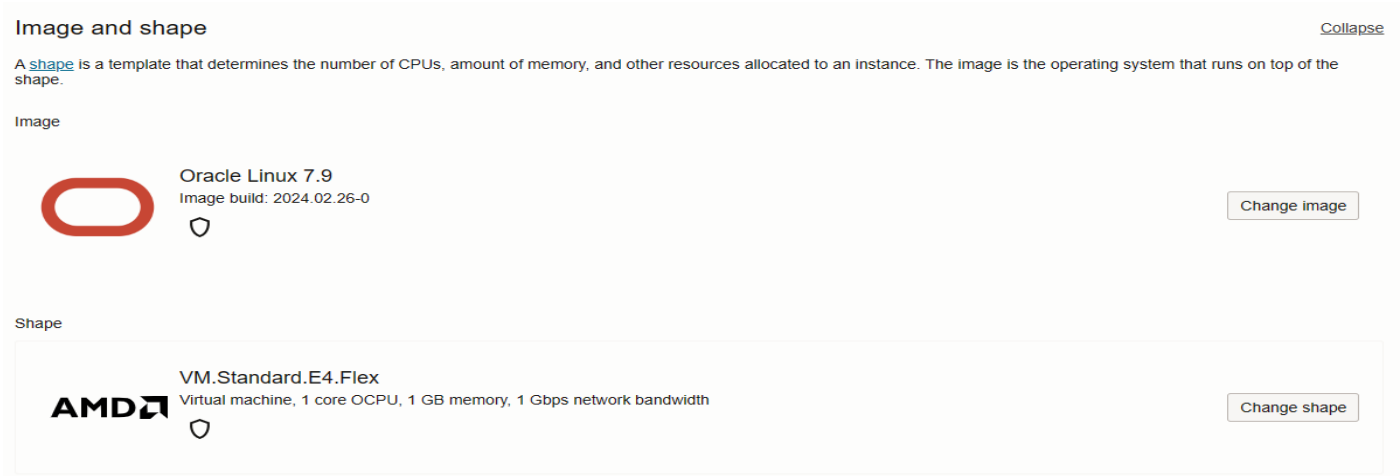
2. Instance 생성

2.1. Bation 생성 -compute – instances – create instance



- Instance name, compartment 확인

- Shape 설정



- VNC 매칭

Primary VNIC information

A virtual network interface card (VNIC) connects your instance to a virtual cloud network (VCN) and endpoints in and outside the VCN instance accessible from the internet.

VNIC name *Optional*

Primary network

(•) Select existing virtual cloud network ( ) Create new virtual cloud network ( ) Enter subnet OCID

VCN in **yongsoo_kim** (Change compartment)

ysk-test-3-tire-vcn

Subnet

An IP address from a public subnet and an internet gateway on the VCN are required to make this instance accessible from the interr

(•) Select existing subnet ( ) Create new public subnet

Subnet in **yongsoo_kim** (Change compartment)

ysk-test-public-subnet (regional)

- SSH Key 보관

Add SSH keys

Generate an SSH key pair to connect to the instance using a Secure Shell (SSH) connection, or upload a public key that you a

(•) Generate a key pair for me ( ) Upload public key files (.pub) ( ) Paste public keys ( ) No SSH keys

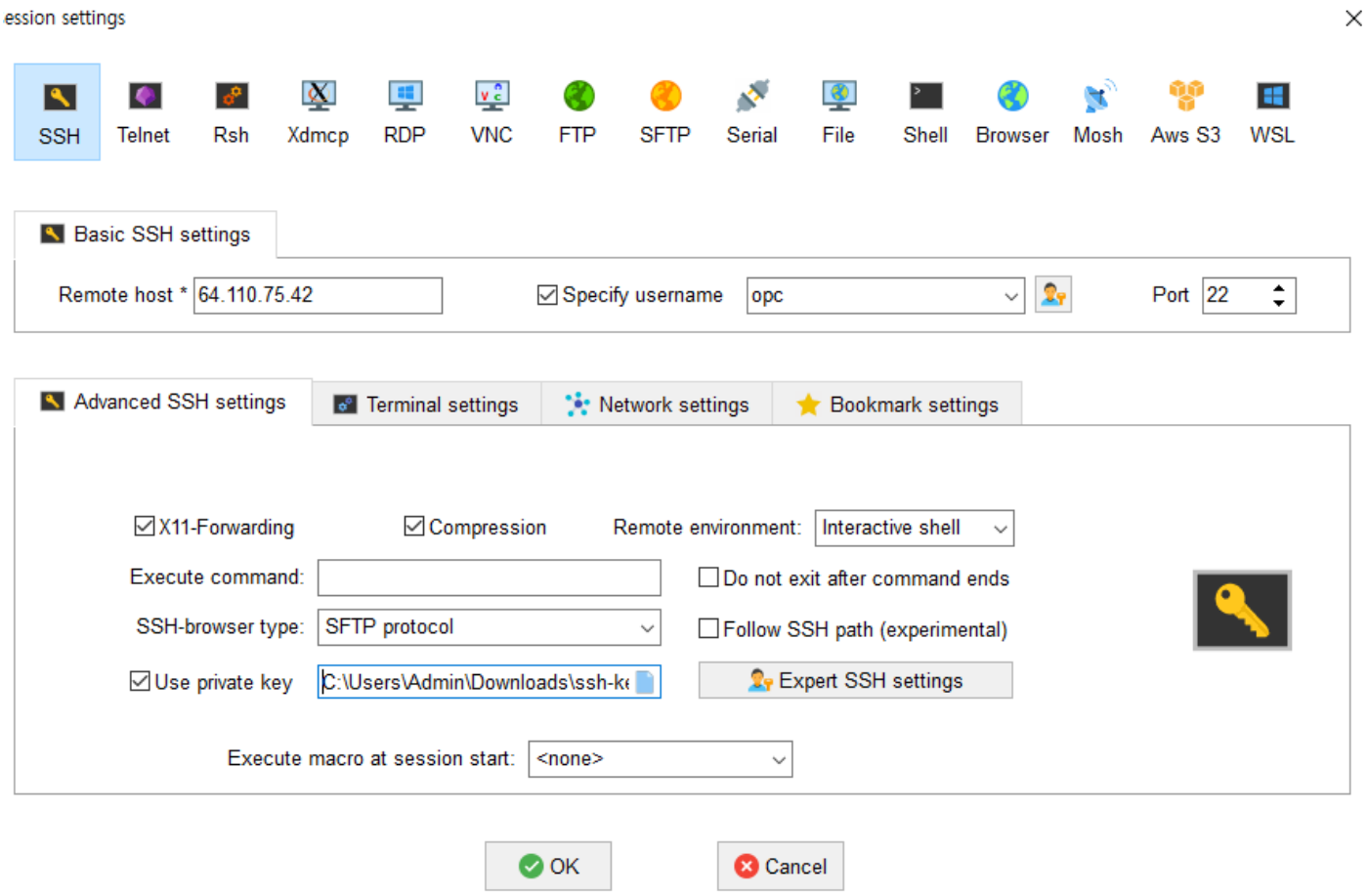
Download the private key so that you can connect to the instance using SSH. It will not be shown again.

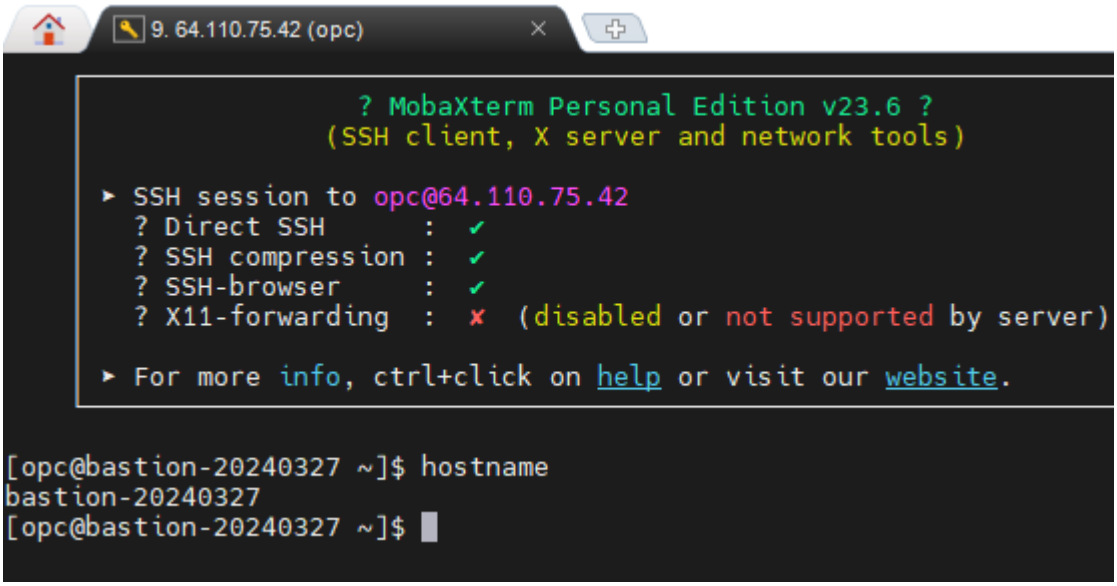
✓ Save private key ✓ Save public key

- 생성확인

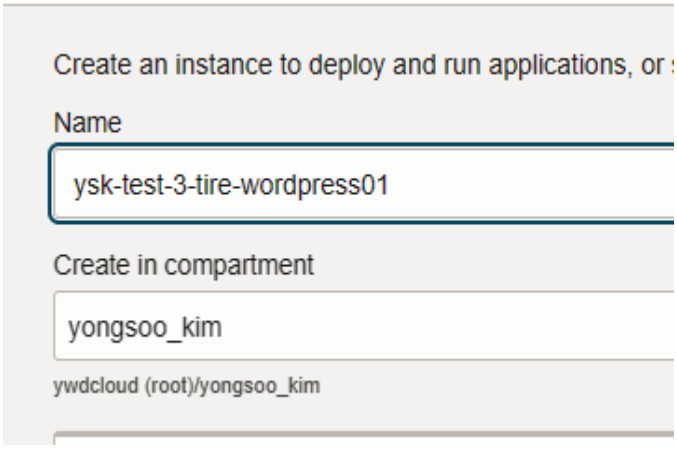
Name	State	Public IP	Private IP	Shape	OCPU count	Memory (GB)	Availability domain
bastion-20240327	Running	64.110.75.42	10.100.0.54	VM.Standard.E4.Flex	1	1	AD-1

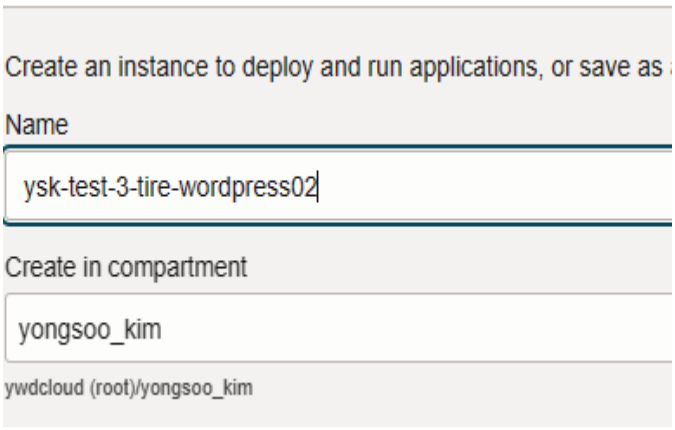
- Ssh 접속(Mobaxterm), public ip 입력, 계정 opc, port 22, 다운받은 private key 삽입

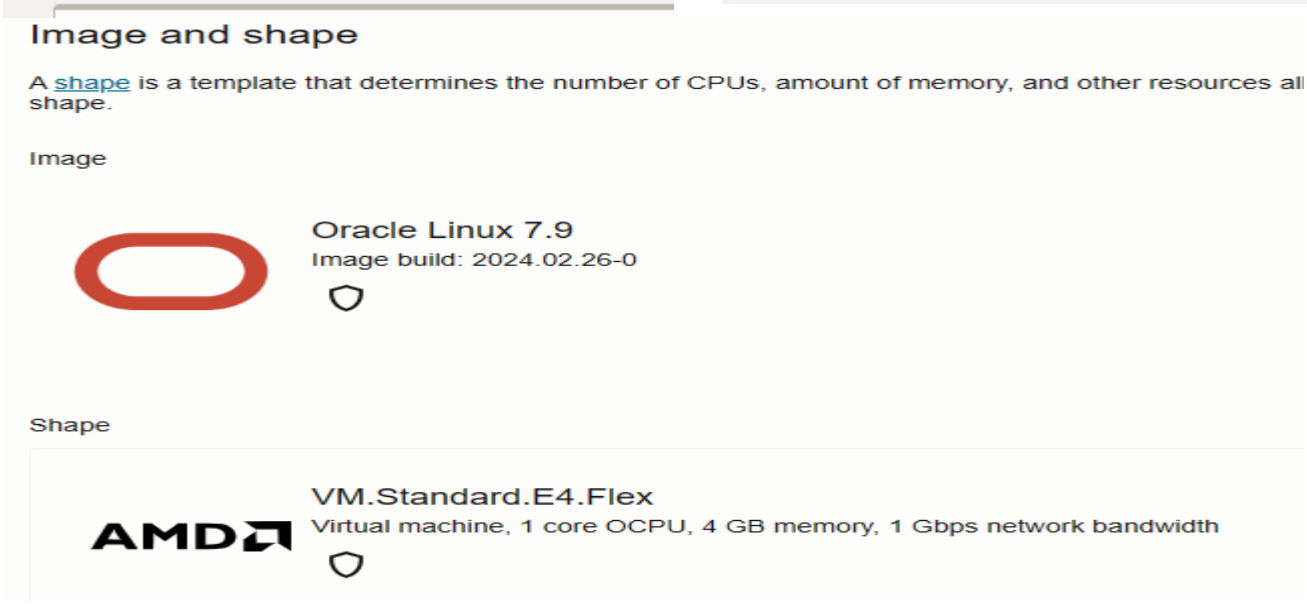


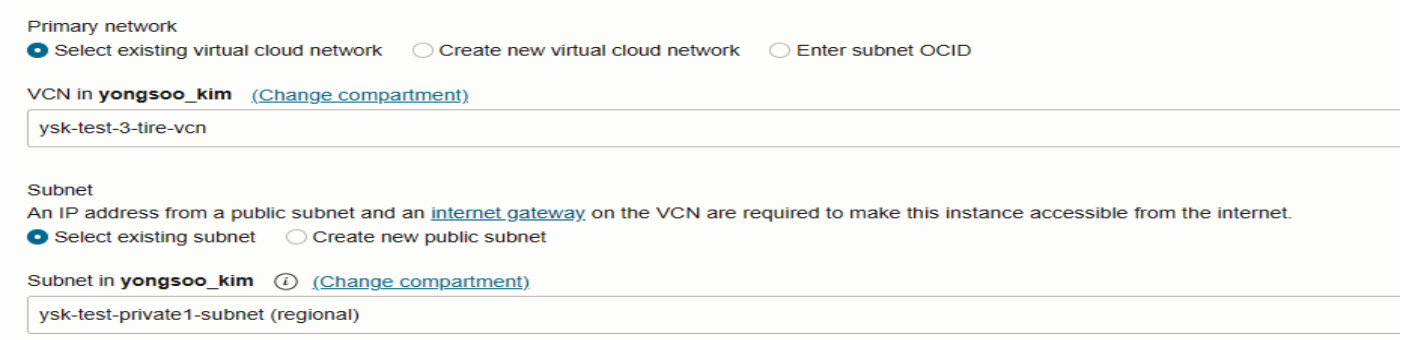


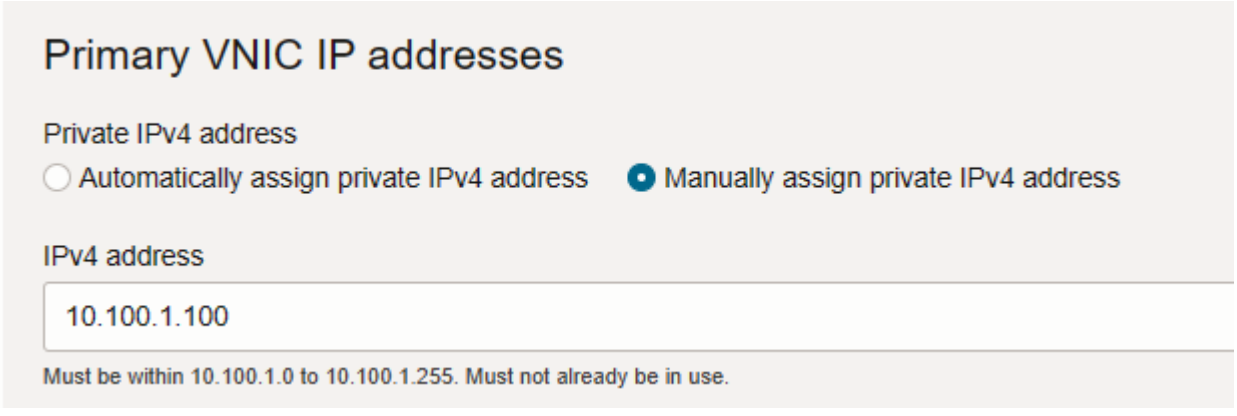
2.2. Wordpress instance 구성

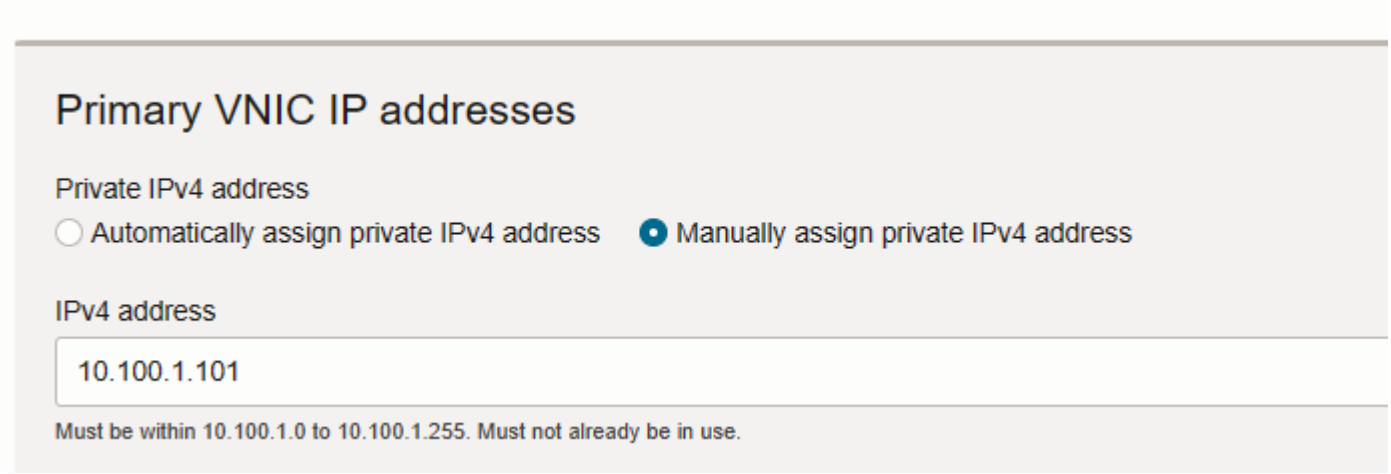


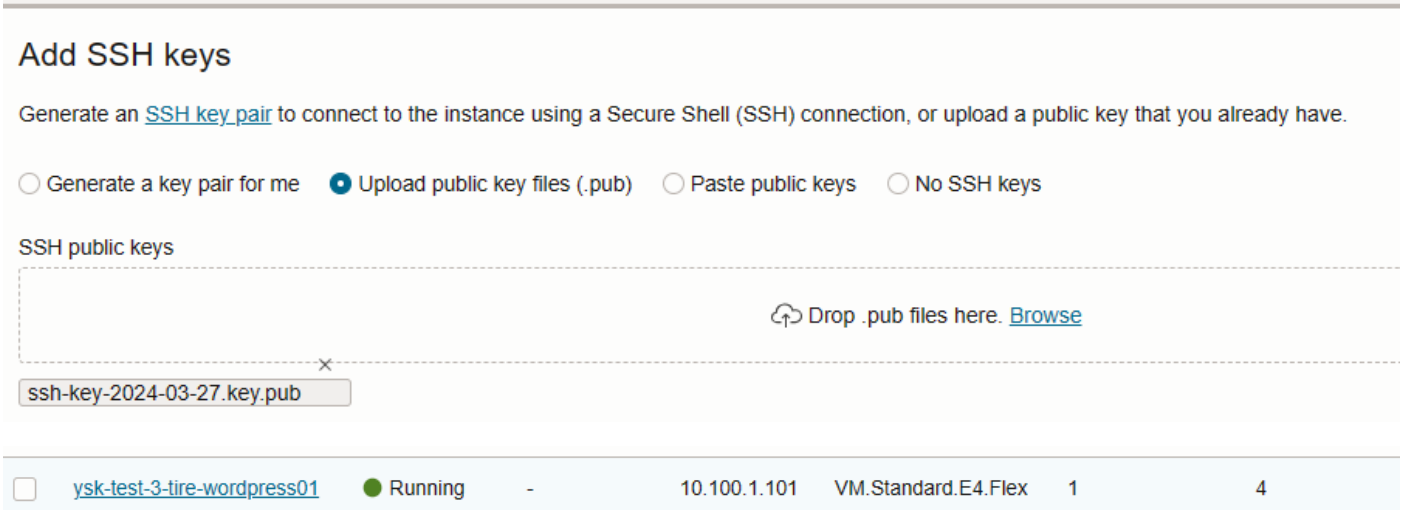












- bastion에서 접속

퍼플릭, 프리바이트 키 모두 업로드 한뒤 소유권을 400으로 변경 후

ssh -i "/home/opc/ssh-key-2022-03-17.key" opc@<instance IP> 로 접속

```
[opc@bastion-20240327 ~]$ pwd
/home/opc
[opc@bastion-20240327 ~]$ ls
ssh-key-2024-03-27.key  ssh-key-2024-03-27.key.pub
[opc@bastion-20240327 ~]$ chmod 400 ssh-key-2024-03-27.key*
[opc@bastion-20240327 ~]$
[opc@bastion-20240327 ~]$ ll
total 8
-r--------. 1 opc opc 1679 Mar 27 02:10 ssh-key-2024-03-27.key
-r--------. 1 opc opc  399 Mar 27 02:10 ssh-key-2024-03-27.key.pub
[opc@bastion-20240327 ~]$
[opc@bastion-20240327 ~]$ ssh -i "/home/opc/ssh-key-2024-03-27.key" opc@10.100.1.101
The authenticity of host '10.100.1.101 (10.100.1.101)' can't be established.
ECDSA key fingerprint is SHA256:hNjdAB/JMHAlg0Q7fQllYsKKPax2+J4Gu8UGJ/uYg9E.
ECDSA key fingerprint is MD5:1e:a6:6b:3b:9a:d7:c2:65:e8:cf:52:f3:7d:cd:eb:88.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.100.1.101' (ECDSA) to the list of known hosts.
[opc@ysk-test-3-tire-wordpress01 ~]$
[opc@ysk-test-3-tire-wordpress01 ~]$
```

```
[opc@bastion-20240327 ~]$ ssh -i "/home/opc/ssh-key-2024-03-27.key" opc@10.100.1.100
The authenticity of host '10.100.1.100 (10.100.1.100)' can't be established.
ECDSA key fingerprint is SHA256:/k3fqMFETflCVFz2XiVnXghL7Ee2gGc2Lq66VNhuEN0.
ECDSA key fingerprint is MD5:4d:e7:61:f6:42:cd:09:63:ab:7b:4f:6a:20:74:b9:b5.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.100.1.100' (ECDSA) to the list of known hosts.
[opc@ysk-test-3-tire-wordpress02 ~]$
```

- DB(MySQL57) instance 생성

☐	ysk-test-3-tire-mysql	Running	-	10.100.2.50	VM.Standard.E4.Flex	1

```
[opc@bastion-20240327 ~]$ ssh -i "/home/opc/ssh-key-2024-03-27.key" opc@10.100.2.50
The authenticity of host '10.100.2.50 (10.100.2.50)' can't be established.
ECDSA key fingerprint is SHA256:khPHN8fesUjow6AKzRonhu4YMr1P3QgkvVH7gbTz48c.
ECDSA key fingerprint is MD5:05:66:e9:a6:44:36:a4:a5:a4:7f:ce:85:0c:e7:8e:b6.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.100.2.50' (ECDSA) to the list of known hosts.
[opc@ysk-test-3-tire-mysql ~]$
```

2.3. 각 instance 별 VCN의 Security list에 필요 port 설정하기

- Wordpress instance : 80, 443
- MySQL57 : 3306, 33060

Ingress Rules

Add Ingress Rules | Edit | Remove

Stateless	Source	IP Protocol	Source Port Range	Destination Port Range	Type and Code	Allows	Description
No	0.0.0.0/0	TCP	All	22		TCP traffic for ports: 22 SSH Remote Login Protocol	
No	0.0.0.0/0	ICMP			3, 4	ICMP traffic for: 3, 4 Destination Unreachable: Fragmentation Needed and Don't Fragment was Set	
No	10.100.0.0/16	ICMP			3	ICMP traffic for: 3 Destination Unreachable	
No	10.100.1.0/24	ICMP			3	ICMP traffic for: 3 Destination Unreachable	
No	0.0.0.0/0	TCP	All	80		TCP traffic for ports: 80	
No	0.0.0.0/0	TCP	All	443		TCP traffic for ports: 443 HTTPS	

Ingress Rules

Add Ingress Rules | Edit | Remove

Stateless	Source	IP Protocol	Source Port Range	Destination Port Range	Type and Code	Allows	Description
No	0.0.0.0/0	TCP	All	22		TCP traffic for ports: 22 SSH Remote Login Protocol	
No	10.100.0.0/16	ICMP			3	ICMP traffic for: 3 Destination Unreachable	
No	10.100.2.0/24	ICMP			3	ICMP traffic for: 3 Destination Unreachable	
No	0.0.0.0/0	ICMP			3, 4	ICMP traffic for: 3, 4 Destination Unreachable: Fragmentation Needed and Don't Fragment was Set	
No	10.100.1.0/24	TCP	All	3306		TCP traffic for ports: 3306	
No	10.100.1.0/24	TCP	All	33060		TCP traffic for ports: 33060	

3. Apache and PHP 설치

참고 Page

Install WordPress CMS on Oracle Linux with MySQL database

https://docs.oracle.com/en/learn/wrdprs_mysqldbs_wrkshp/index.html#install-and-configure-apache-http-server-with-php

---

- Wordpress01/02 서버 접속 및 다음 내용 실행
- Httpd 설치
  - ✓ sudo yum install -y httpd
- 서비스 enable
  - ✓ sudo yum install -y httpd
- 방화벽 허용 설정

  sudo firewall-cmd --permanent --add-port=80/tcp
  - ✓ sudo firewall-cmd --permanent --add-port=443/tcp
  - ✓ sudo firewall-cmd –reload
- Repository 추가
  - ✓ sudo yum -y install https://dl.fedoraproject.org/pub/epel/epel-release-latest-7.noarch.rpm
  - ✓ sudo yum -y install https://rpms.remirepo.net/enterprise/remi-release-7.rpm
  - ✓ sudo yum-config-manager --enable remi-php74
- PHP 설치
  - ✓ sudo yum install -y php
  - ✓ sudo systemctl restart httpd
- php 페이지 생성
  - ✓ echo -e '<?php ₩nphpinfo();' | sudo tee /var/www/html/test.php

4. MySQL5.7 설치

참고 Page

https://serverok.in/how-to-install-mysql-5-7-on-oracle-linux-7

- Mysql Repository 활성 확인

```
[opc@ysk-test-3-tire-mysql ~]$ sudo yum repolist all | grep -i mysql
ol7_MySQL55/x86_64                      MySQL 5.5 for Oracle Lin disabled
ol7_MySQL56/x86_64                      MySQL 5.6 for Oracle Lin disabled
ol7_MySQL57/x86_64                      MySQL 5.7 for Oracle Lin disabled
ol7_MySQL80/x86_64                      MySQL 8.0 for Oracle Lin enabled:    440
ol7_MySQL80_connectors_community/x86_64 MySQL 8.0 Connectors Com enabled:    111
ol7_MySQL80_tools_community/x86_64      MySQL 8.0 Tools Communit enabled:     37
```

- MySQL 8 비활성 및 MySQL5.7 활성
  - ✓ yum install -y yum-utils
  - ✓ yum-config-manager --disable ol7_MySQL80 ol7_MySQL80_connectors_community ol7_MySQL80_tools_community
  - ✓ yum-config-manager --enable ol7_MySQL57

```
[opc@ysk-test-3-tire-mysql ~]$ sudo yum repolist all | grep -i mysql
ol7_MySQL55/x86_64                      MySQL 5.5 for Oracle Lin disabled
ol7_MySQL56/x86_64                      MySQL 5.6 for Oracle Lin disabled
ol7_MySQL57/x86_64                      MySQL 5.7 for Oracle Lin enabled:    683
ol7_MySQL80/x86_64                      MySQL 8.0 for Oracle Lin disabled
ol7_MySQL80_connectors_community/x86_64 MySQL 8.0 Connectors Com disabled
ol7_MySQL80_tools_community/x86_64      MySQL 8.0 Tools Communit disabled
```

- 기존 설치된 MySQL 8의 RPM 확인 후 삭제

```
[opc@ysk-test-3-tire-mysql ~]$ sudo rpm -qa | grep mysql
mysql-community-libs-compat-8.0.36-1.el7.x86_64
mysql-community-client-plugins-8.0.36-1.el7.x86_64
mysql-community-libs-8.0.36-1.el7.x86_64
mysql-release-el7-1.0-5.el7.x86_64
mysql-community-common-8.0.36-1.el7.x86_64
```

```
sudo rpm -e --nodeps mysql-community-libs-compat-8.0.36-1.el7.x86_64
sudo rpm -e --nodeps mysql-community-client-plugins-8.0.36-1.el7.x86_64
sudo rpm -e --nodeps mysql-community-libs-8.0.36-1.el7.x86_64
sudo rpm -e --nodeps mysql-community-common-8.0.36-1.el7.x86_64
```

- Mysql-release-el7-~~ RPM은 삭제하지 않도록 한다

- MySQL 5.7 설치

```
[opc@ysk-test-3-tire-mysql ~]$ sudo rpm -qa | grep mysql
mysql-release-el7-1.0-5.el7.x86_64
[opc@ysk-test-3-tire-mysql ~]$
[opc@ysk-test-3-tire-mysql ~]$ sudo yum install mysql-community-server
Loaded plugins: langpacks, ulninfo
Resolving Dependencies
--> Running transaction check
---> Package mysql-community-server.x86_64 0:5.7.44-1.el7 will be installed
--> Processing Dependency: mysql-community-common(x86-64) = 5.7.44-1.el7 for package: mysql-community-server-5.7.44-1
.el7.x86_64
--> Processing Dependency: mysql-community-client(x86-64) >= 5.7.9 for package: mysql-community-server-5.7.44-1.el7.x
86_64
--> Running transaction check
---> Package mysql-community-client.x86_64 0:5.7.44-1.el7 will be installed
--> Processing Dependency: mysql-community-libs(x86-64) >= 5.7.9 for package: mysql-community-client-5.7.44-1.el7.x86
_64
---> Package mysql-community-common.x86_64 0:5.7.44-1.el7 will be installed
--> Running transaction check
---> Package mysql-community-libs.x86_64 0:5.7.44-1.el7 will be installed
--> Finished Dependency Resolution

Dependencies Resolved

================================================================================================================
 Package                         Arch              Version                   Repository                Size
================================================================================================================
Installing:
 mysql-community-server          x86_64            5.7.44-1.el7              ol7_MySQL57              184 M
Installing for dependencies:
 mysql-community-client          x86_64            5.7.44-1.el7              ol7_MySQL57               31 M
 mysql-community-common          x86_64            5.7.44-1.el7              ol7_MySQL57              313 k
 mysql-community-libs            x86_64            5.7.44-1.el7              ol7_MySQL57              2.9 M

Transaction Summary
================================================================================================================
Install  1 Package (+3 Dependent packages)

Total download size: 219 M
Installed size: 930 M
Is this ok [y/d/N]: y
```

```
Downloading packages:
(1/4): mysql-community-common-5.7.44-1.el7.x86_64.rpm                                    | 313 kB  00:00:00
(2/4): mysql-community-libs-5.7.44-1.el7.x86_64.rpm                                      | 2.9 MB  00:00:00
(3/4): mysql-community-client-5.7.44-1.el7.x86_64.rpm                                    |  31 MB  00:00:00
(4/4): mysql-community-server-5.7.44-1.el7.x86_64.rpm                                    | 184 MB  00:00:01
----------------------------------------------------------------------------------------------------------------
Total                                                                  114 MB/s | 219 MB  00:00:01
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
Warning: RPMDB altered outside of yum.
** Found 2 pre-existing rpmdb problem(s), 'yum check' output follows:
2:postfix-2.10.1-9.el7.x86_64 has missing requires of libmysqlclient.so.18()(64bit)
2:postfix-2.10.1-9.el7.x86_64 has missing requires of libmysqlclient.so.18(libmysqlclient_18)(64bit)
  Installing : mysql-community-common-5.7.44-1.el7.x86_64                                                  1/4
  Installing : mysql-community-libs-5.7.44-1.el7.x86_64                                                    2/4
  Installing : mysql-community-client-5.7.44-1.el7.x86_64                                                  3/4
  Installing : mysql-community-server-5.7.44-1.el7.x86_64                                                  4/4
  Verifying  : mysql-community-server-5.7.44-1.el7.x86_64                                                  1/4
  Verifying  : mysql-community-client-5.7.44-1.el7.x86_64                                                  2/4
  Verifying  : mysql-community-libs-5.7.44-1.el7.x86_64                                                    3/4
  Verifying  : mysql-community-common-5.7.44-1.el7.x86_64                                                  4/4

Installed:
  mysql-community-server.x86_64 0:5.7.44-1.el7

Dependency Installed:
  mysql-community-client.x86_64 0:5.7.44-1.el7              mysql-community-common.x86_64 0:5.7.44-1.el7
  mysql-community-libs.x86_64 0:5.7.44-1.el7

Complete!
```

- MySQL5.7 서비스 활성 화

```
[opc@ysk-test-3-tire-mysql ~]$
[opc@ysk-test-3-tire-mysql ~]$ sudo systemctl enable mysqld --now
```

- 임시 PASSWORD 확인

```
[opc@ysk-test-3-tire-mysql ~]$ sudo grep 'temporary password' /var/log/mysqld.log
2024-03-28T02:15:53.731219Z 1 [Note] A temporary password is generated for root@localhost: _pg50u-kKmu>
```

- MySQL 보안 설정

```
## MySQL 보안 설정
sudo mysql_secure_installation
```

```
# root 계정 임시 비밀번호 입력
Enter password for user root:

# root 계정 새 비밀번호 입력
New password:
Re-enter new password:

# root 계정 비밀번호 변경 여부 (Y 권장)
Change the password for root?
Do you wish to continue with the password provided?

# 익명 사용자 삭제 여부 (Y 권장)
Remove anonymous users?

# 원격 접속 차단 여부 (N 권장)
Disallow root login remotely?

# test DB 및 접속 정보 삭제 여부 (Y 권장)
Remove test database and access to it?

# root 비밀번호 및 권한 적용 여부 (Y 권장)
Reload privilege tables now?
```

- 접속 확인

```
[opc@ysk-test-3-tire-mysql ~]$ sudo mysql -uroot -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 5
Server version: 5.7.44 MySQL Community Server (GPL)

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owners.

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

mysql>
```

5. Wordpress CMS 설치

```
sudo yum install -y php-mysqlnd php-zip php-gd php-mcrypt php-mbstring php-xml php-json
sudo systemctl restart httpd
curl -O https://wordpress.org/latest.tar.gz
sudo curl -O https://wordpress.org/latest.tar.gz
sudo tar zxf latest.tar.gz -C /var/www/html/ --strip 1
sudo chown apache. -R /var/www/html/
sudo mkdir /var/www/html/wp-content/uploads
sudo chown apache:apache /var/www/html/wp-content/uploads
sudo chcon -t httpd_sys_rw_content_t /var/www/html -R
```

6. MySQL database and user 생성

```
create database wordpress;
create user wordpress IDENTIFIED BY 'ComplexPass0rd!';
GRANT ALL PRIVILEGES ON wordpress.* To wordPress;
\quit;
```

7. Network Load Balancer 생성

참고 docs.oracle.com/ko/learn/oci-network-lb-with-instances/index.html#task-4-create-a-new-oci-flexible-network-load-balancer

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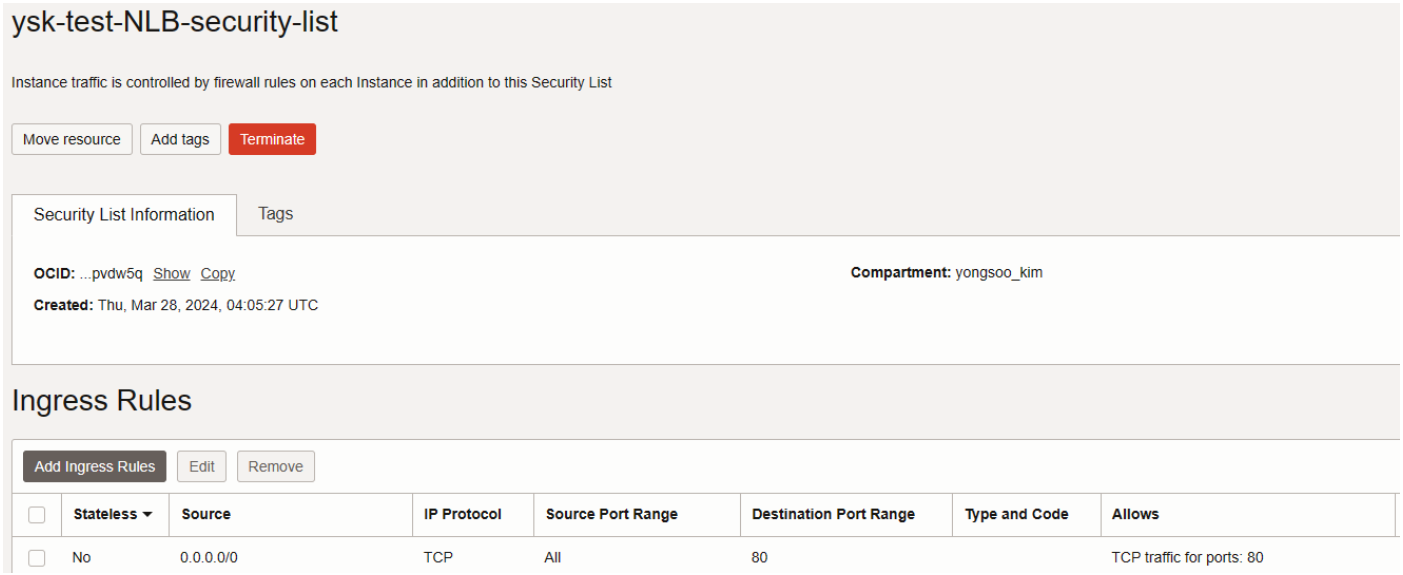
- Security-list 추가



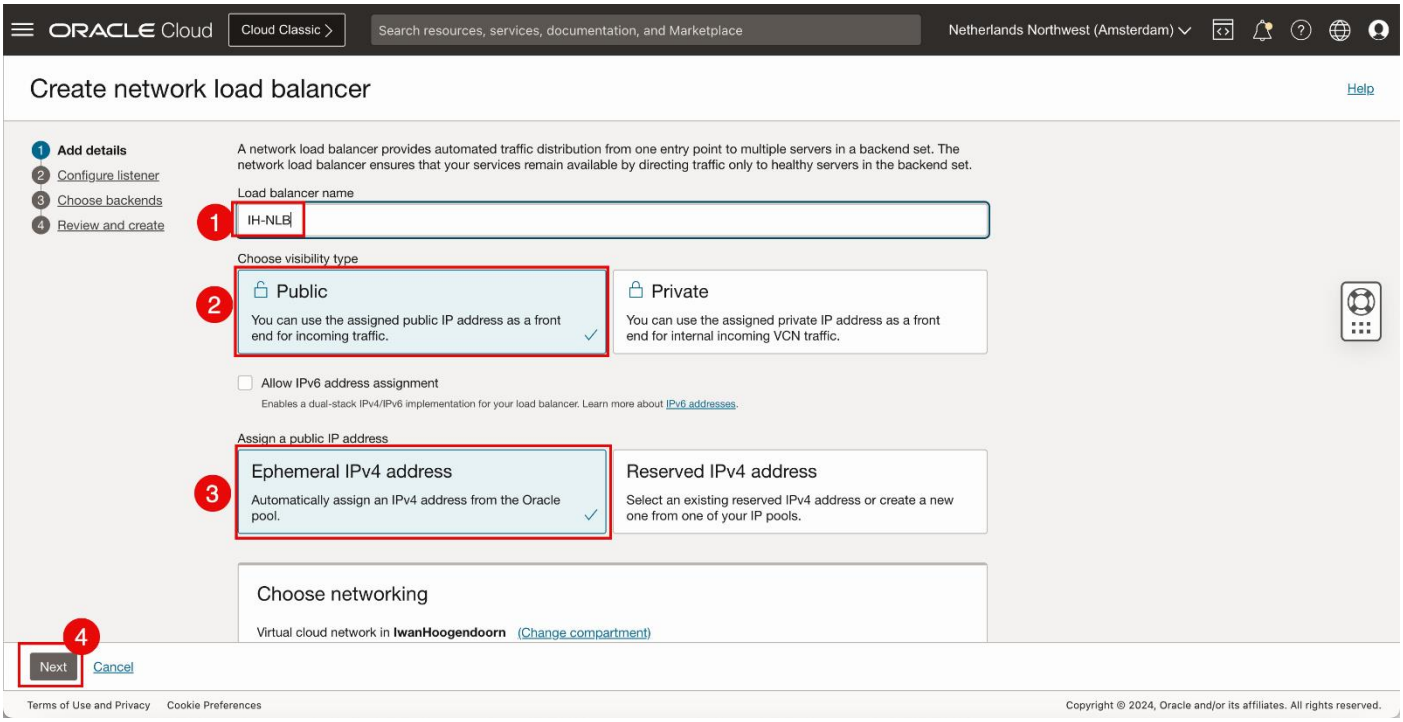
- Subnet 생성

Subnets *in* yongsoo_kim *compartment*

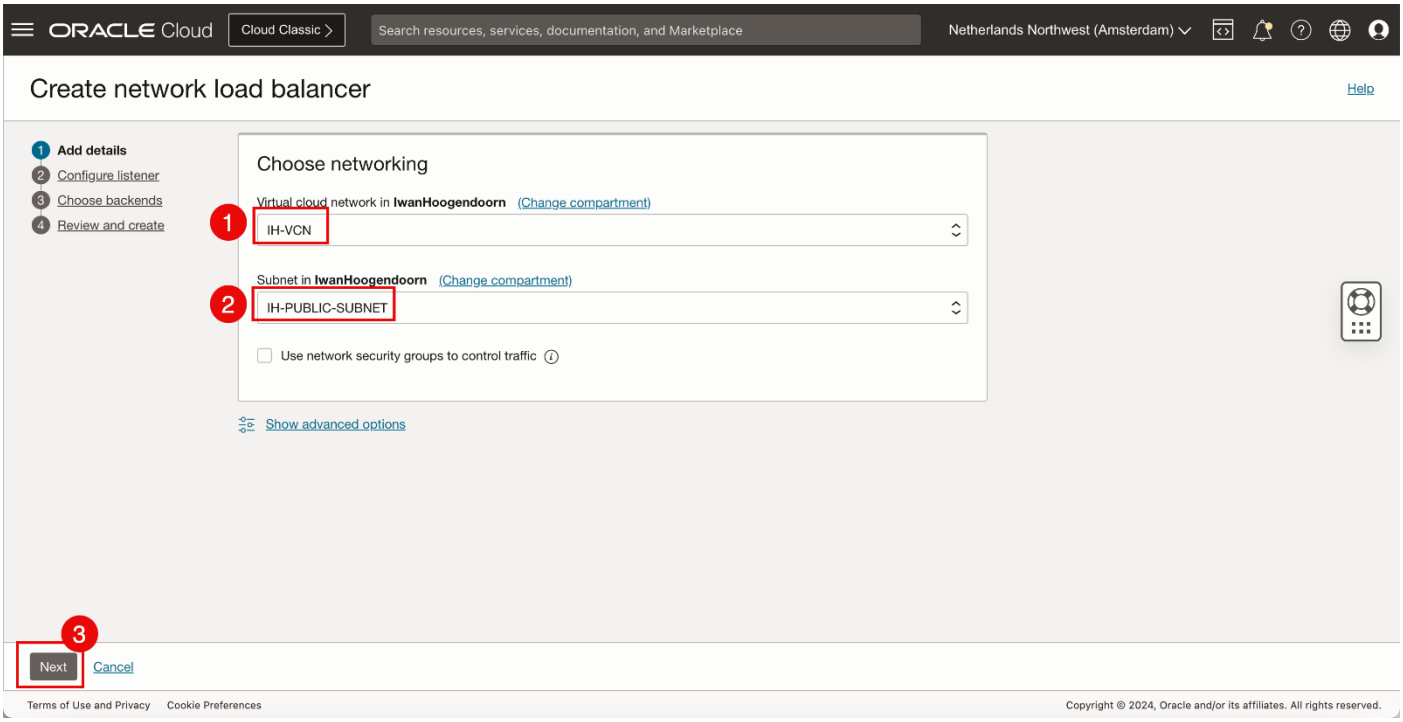
Create Subnet

Name	State	IPv4 CIDR Block	IPv6 Prefixes	Subnet Access
ysk-test-nlb-subnet	Available	10.100.3.0/24	-	Public (Regional)

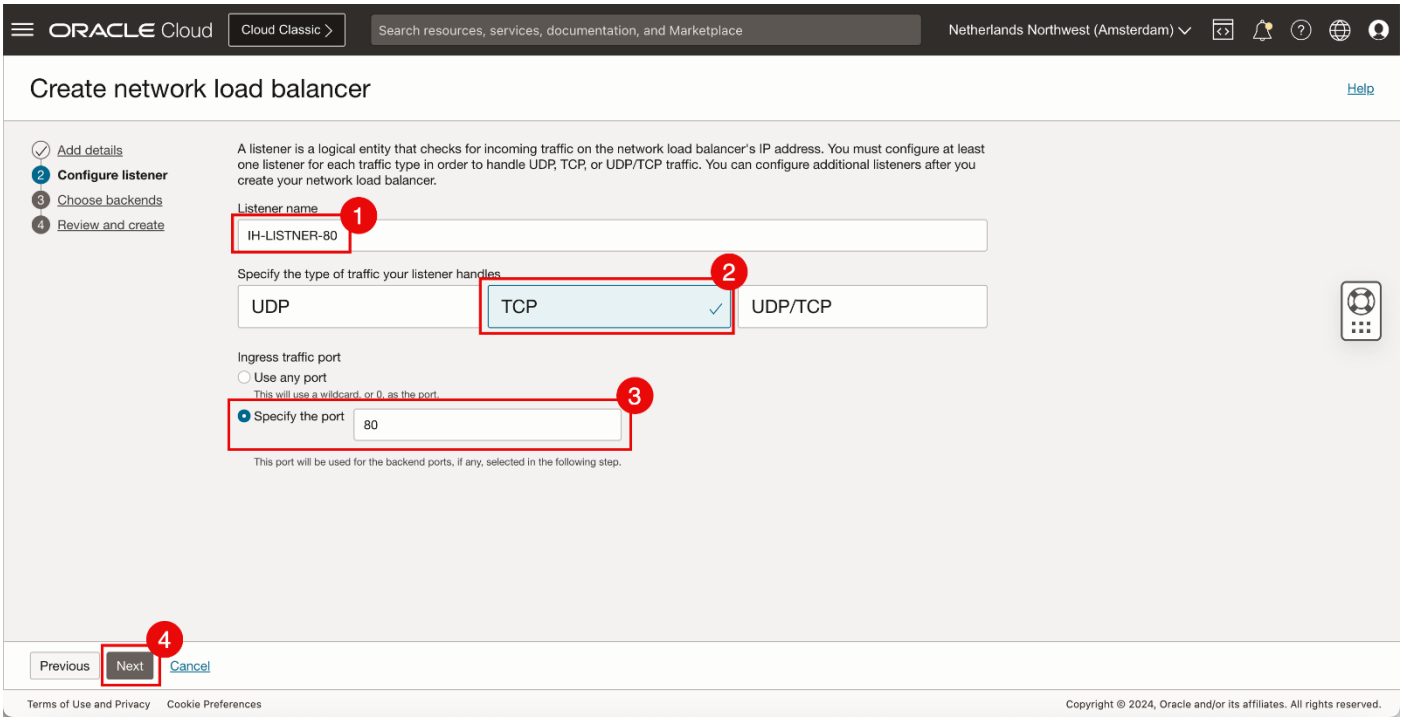
- Network Load Balancer 생성 (스크린샷을 찍지못해서 기존 문서의 스크린샷으로 대체합니다)



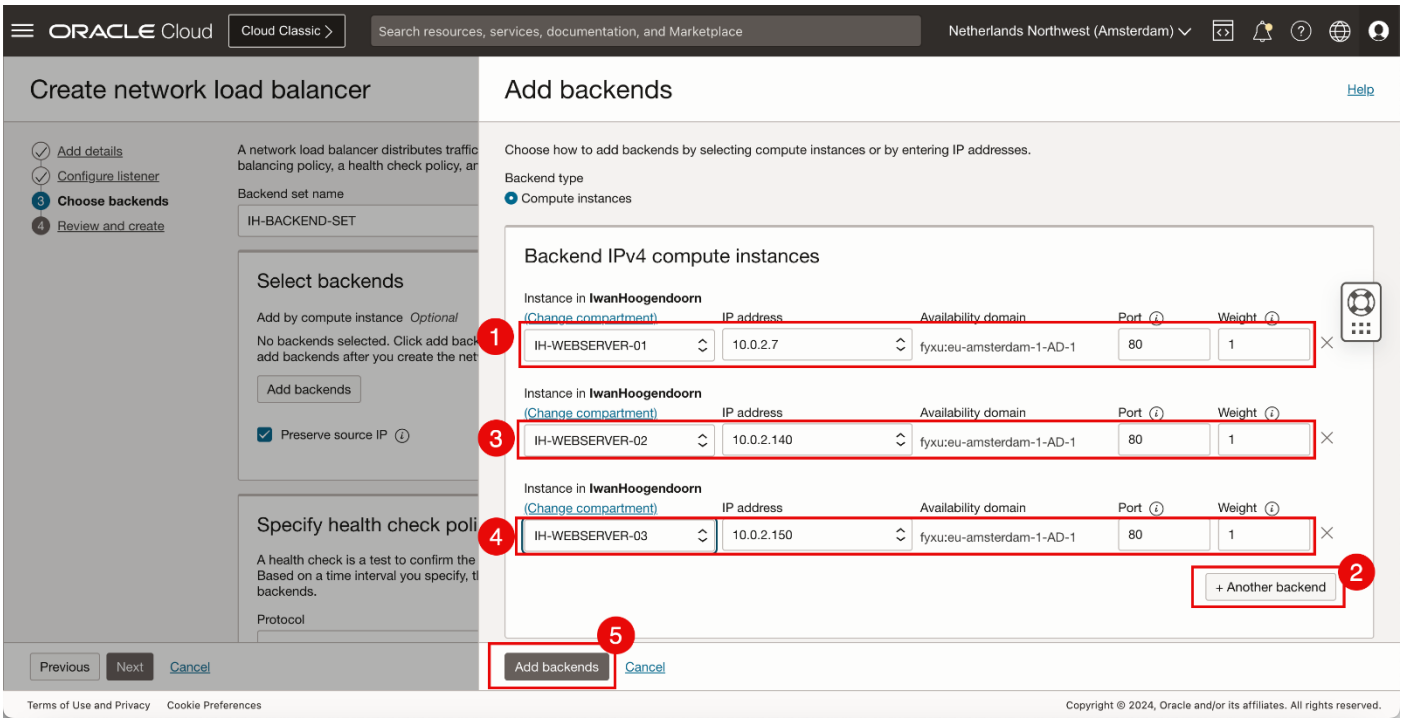
- 앞에서 추가한 subnet 선택



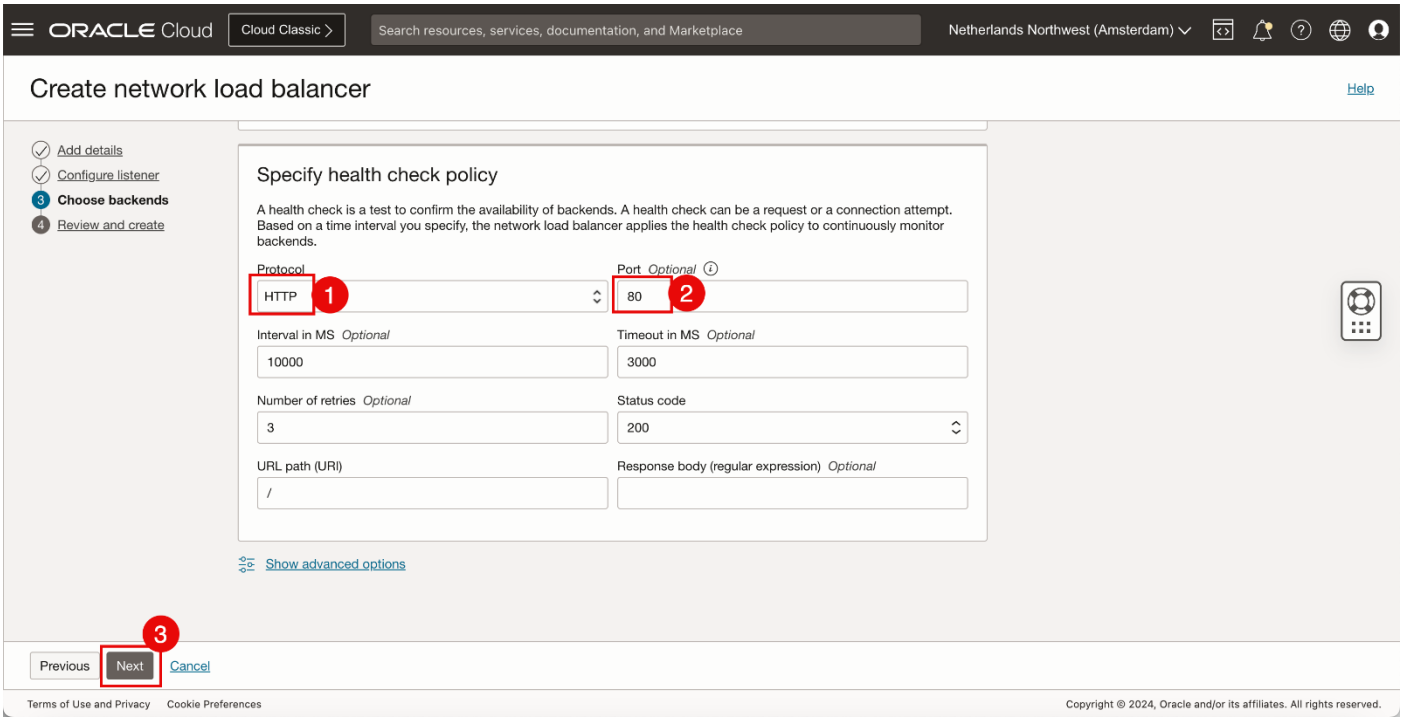
- 리스너 Name 설정 및 80 port 오픈



- Backend name 설정 및 Backends 서버 추가 (기존 생성한 compute instance 2대)



- 헬스체크 port 설정



- NLB 생성

8. Wordpress 실행(스크린샷을 찍지 못하여 검색 사진을 첨부합니다.)

- NLB pubilc ip를 browser 접속 확인

- Database 이름 : wordpress
- 사용자명 : wordpress
- 비밀번호 :

- 데이터베이스 호스트 : mysql5.7 linux server ip
- 테이블 접두어 : wordpress1 instance – wp_, wordpress2 instance – wp2_
- 설치시 각각의 instance를 하나씩 stop 시킨 후에 설치 후에 다시 start

◈ 설치시 database 연결이 실패하여 Test 에서는 다음의 사항을 추가하였습니다.

- Database instance 에 대한 security_list Ingress Rules

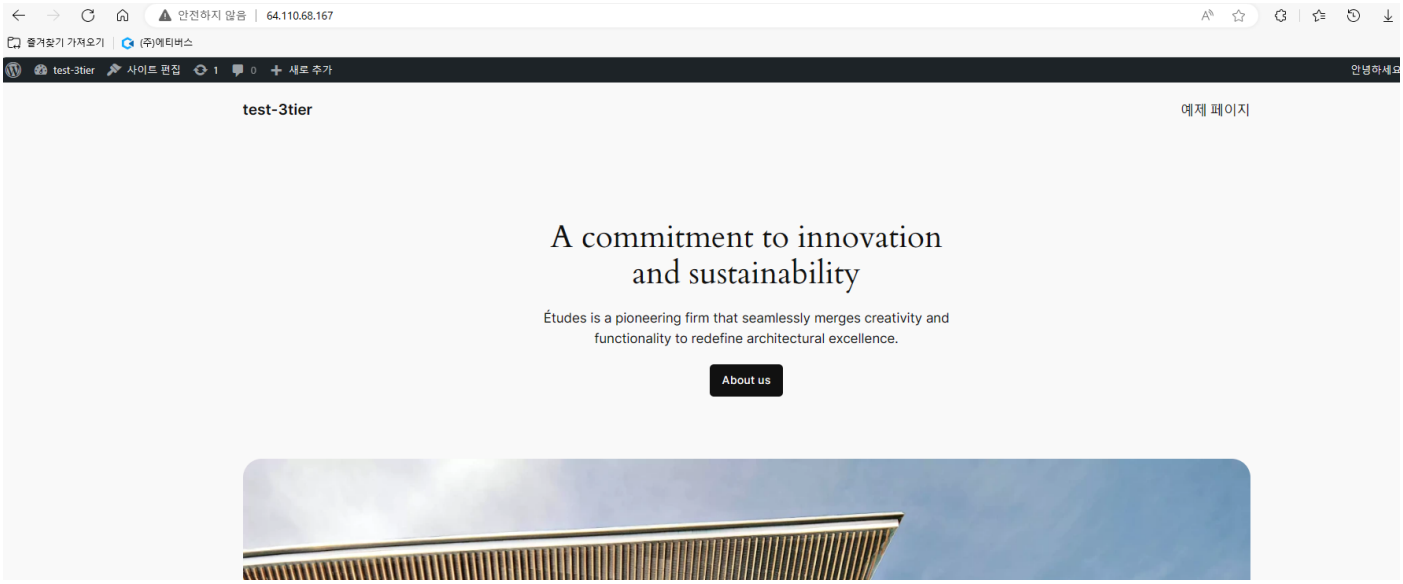
☐	No	10.100.1.0/24	TCP	All	3306	TCP traffic for ports: 3306
☐	No	10.100.1.0/24	TCP	All	33060	TCP traffic for ports: 33060
☑	No	0.0.0.0/0	TCP	All	3306	TCP traffic for ports: 3306

- 서버 방화벽 disable 및 selinux stop

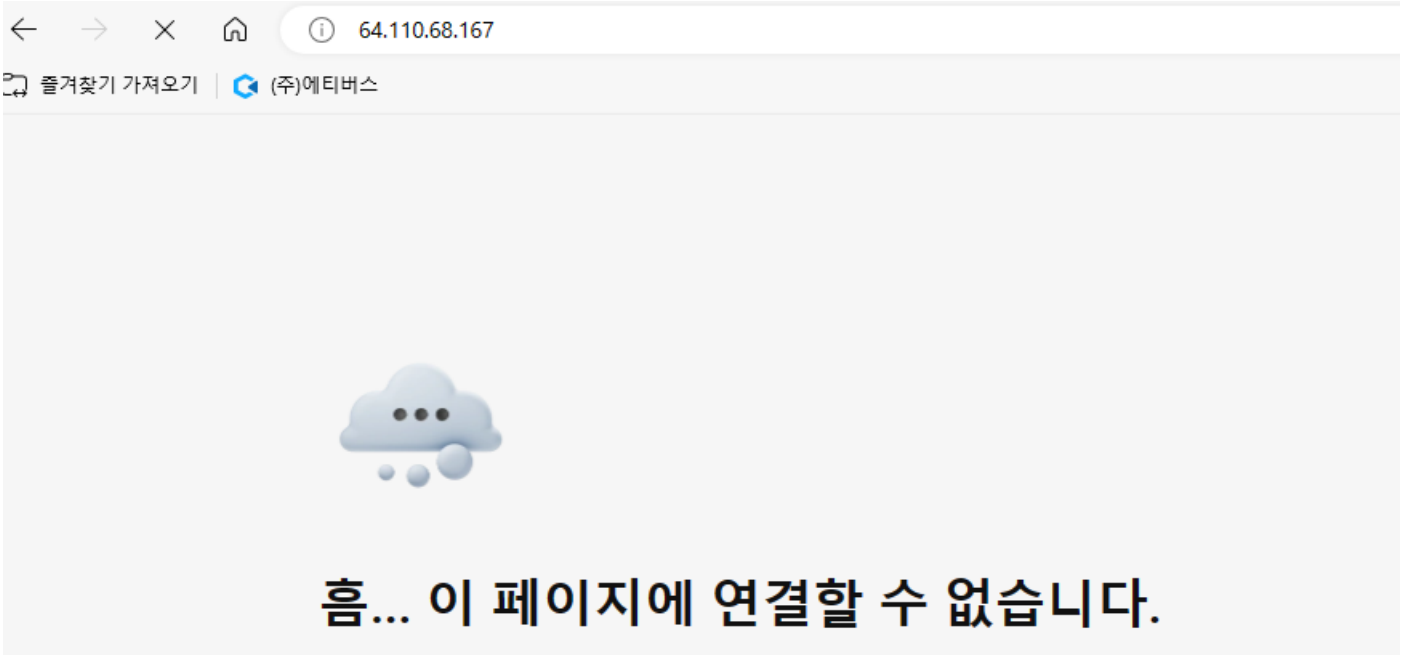
```
[opc@ysk-test-3-tire-mysql ~]$ sudo systemctl status firewalld
● firewalld.service - firewalld - dynamic firewall daemon
   Loaded: loaded (/usr/lib/systemd/system/firewalld.service; disabled; vendor preset: enabled)
   Active: inactive (dead)
     Docs: man:firewalld(1)
[opc@ysk-test-3-tire-mysql ~]$
[opc@ysk-test-3-tire-mysql ~]$ getenforce
Disabled
```

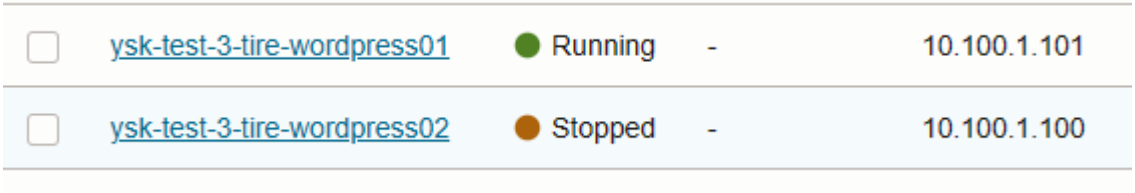
9. Web 접속 test

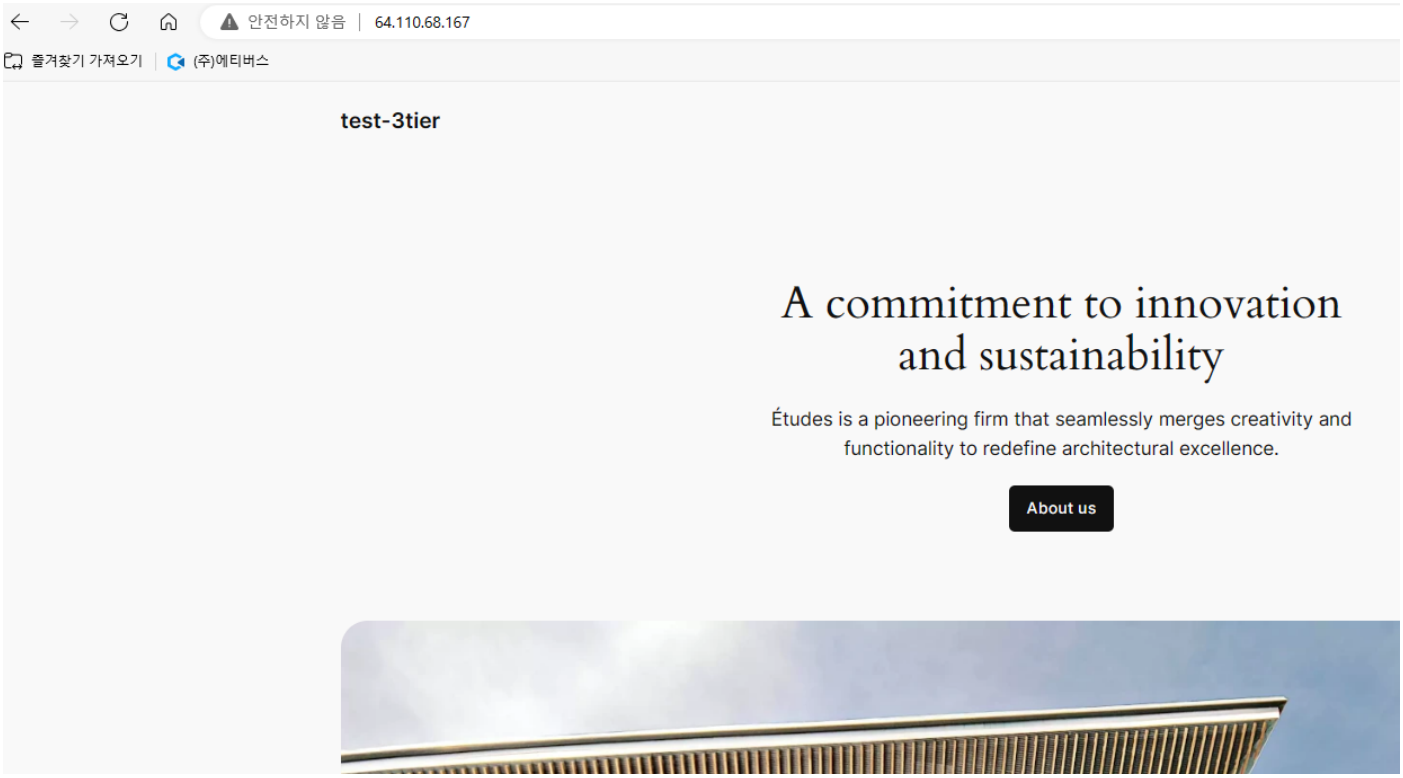
☐	ysk-test-3-tire-wordpress01	Stopped	-	10.100.1.101
☐	ysk-test-3-tire-wordpress02	Running	-	10.100.1.100




ysk-test-3-tire-wordpress01 Stopped - 10.100.1.101 VM.Standard.E4.Flex
ysk-test-3-tire-wordpress02 Stopped - 10.100.1.100 VM.Standard.E4.Flex


64.110.68.167
즐겨찾기 가져오기
(주)에티버스
흠... 이 페이지에 연결할 수 없습니다.


ysk-test-3-tire-wordpress01 Running - 10.100.1.101
ysk-test-3-tire-wordpress02 Stopped - 10.100.1.100


안전하지 않음 | 64.110.68.167
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test-3tier
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