

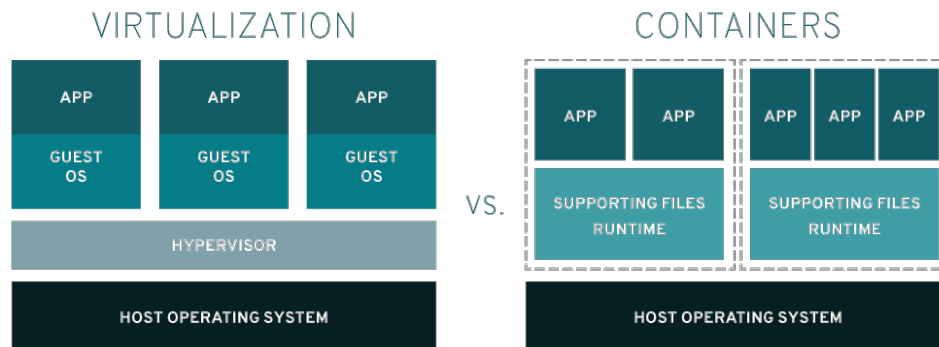
LINUX INSTALLATION

CSLAB
`23.12.25.
Jo, Minwoo

Virtual Machine

가상머신(Virtual Machine) VS. 컨테이너(Container)

- 가상머신은 하이퍼바이저(Hypervisor)기술을 이용해 물리적 시스템을 디지털로 구현
 - 물리적 환경을 가상화
 - GiB 단위
- 컨테이너는 격리(Isolation)개념을 이용하여 호스트 OS의 자원을 격리시켜 개별적으로 사용
 - 운영체제를 가상화 // Micro Service Architecture 개념
 - MiB 단위



<https://www.redhat.com/en/topics/containers/containers-vs-vms>

Virtual Machine (Cont.)

가상머신(Virtual Machine) 선택

- Oracle Virtual Box
 - <https://www.virtualbox.org/>
- VMware workstation Player(Free) (Windows Only)
 - <https://www.vmware.com/products/workstation-player/workstation-player-evaluation.html>
- Hyper-V (Windows Only)
 - <https://learn.microsoft.com/ko-kr/virtualization/hyper-v-on-windows/quick-start/enable-hyper-v>

주의사항

- Hyper-V 사용시 호스트 OS CPU 병목현상 발생 가능
 - GPU가 좋으면 좋을수록 병목현상 발생
- 디스크 할당시 동적디스크를 사용 시 Guest OS에서 문제 발생 가능
 - 웬만하면 고정용량 할당할 것

LINUX 배포판

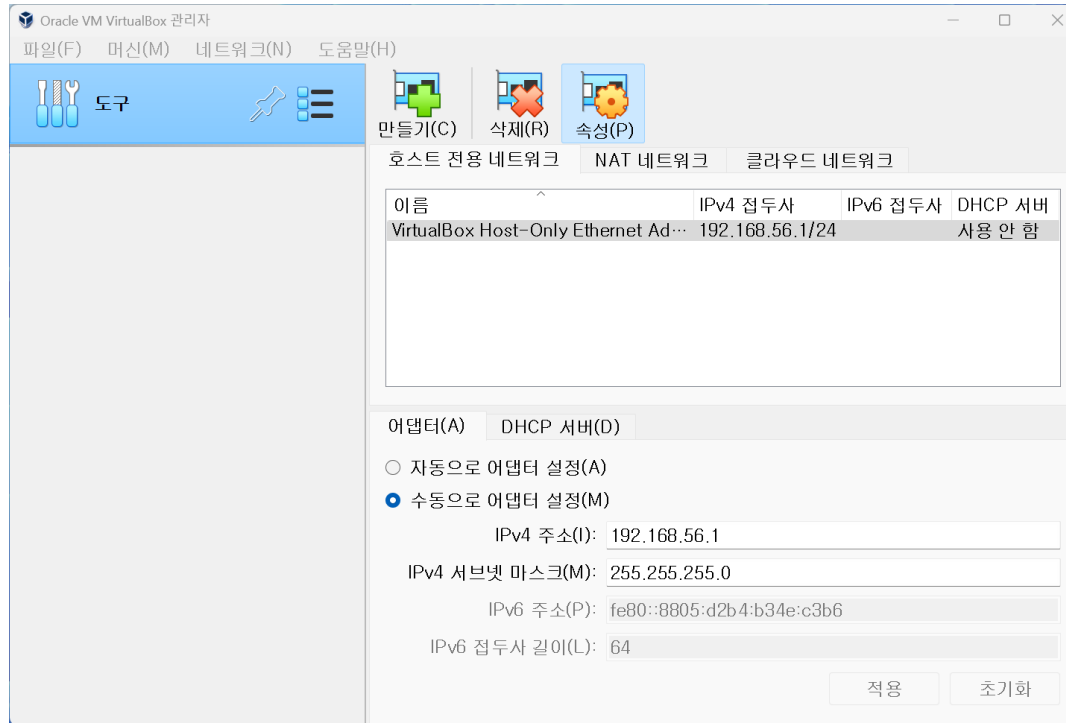
- Debian Based
 - UBUNTU Server LTS 22.04.3
 - <https://ubuntu.com/download/server>
- RedHat Based
 - Rocky LINUX 9.3 minimal(x86_64, if IntelCPU else ARM64)
 - <https://rockylinux.org/download/>

특징

- Debian Based
 - 점유율 높음 (개발자 개인 점유율 높음)
 - 개인 데스크톱 운용률 높음
- RedHat Based
 - 점유율 낮음 (기업 점유율 높음)
 - 서버 운용률 높음
 - 그러나 요즘은 Mint, Ubuntu를 포함한 Debian 계열에 밀리는 추세

LINUX Installation via VirtualBox

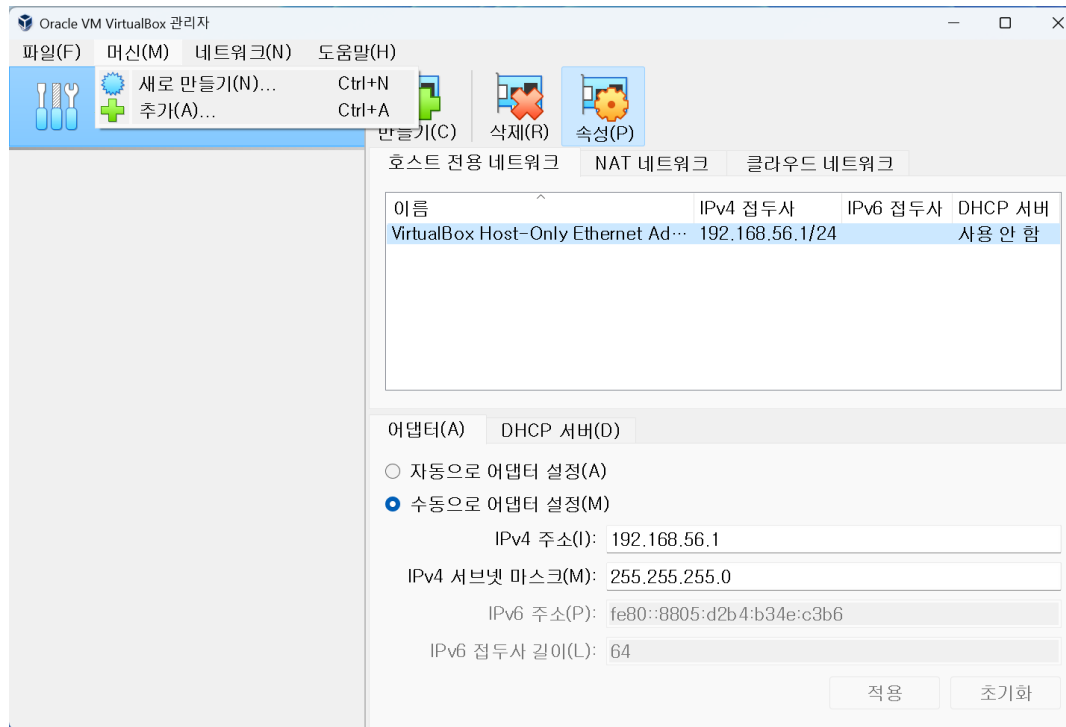
0. Network Interface



만약 VirtualBox Host-Only Ethernet Adapter가 없다면,
만들기 버튼 클릭시 자동으로 생성됨

LINUX Installation via VirtualBox (Cont.)

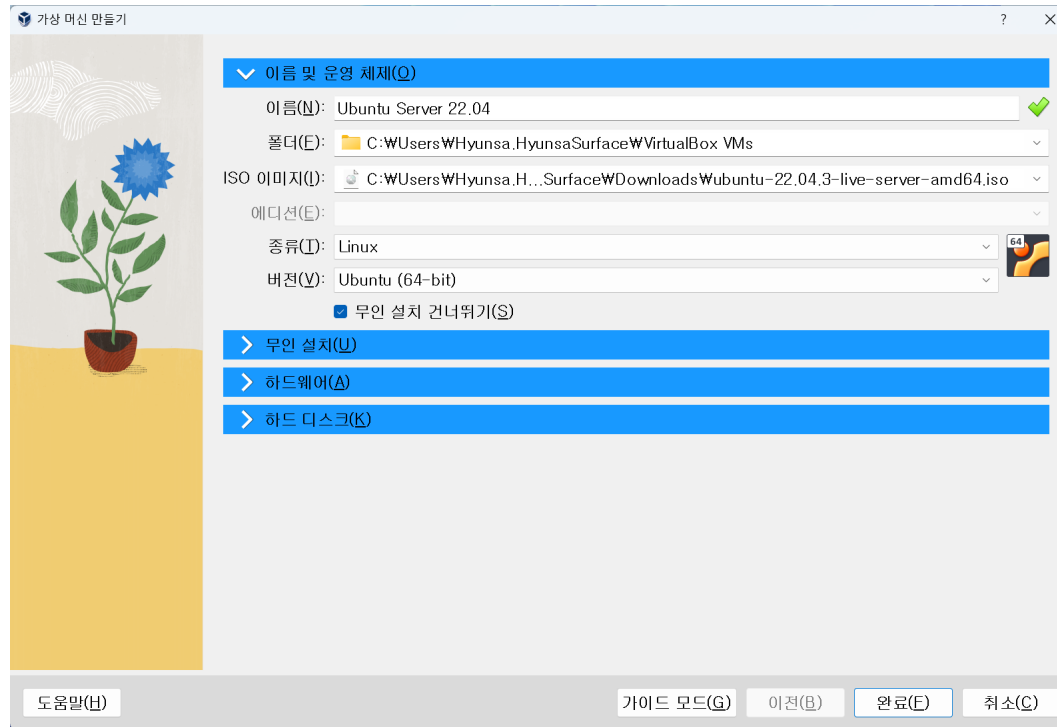
1. Create Virtual Machine



상단바 머신 -> 새로 만들기

LINUX Installation via VirtualBox (Cont.)

1. Create Virtual Machine (Cont.)



이름 : (자신이 원하는 머신 이름, 영어로 작성)

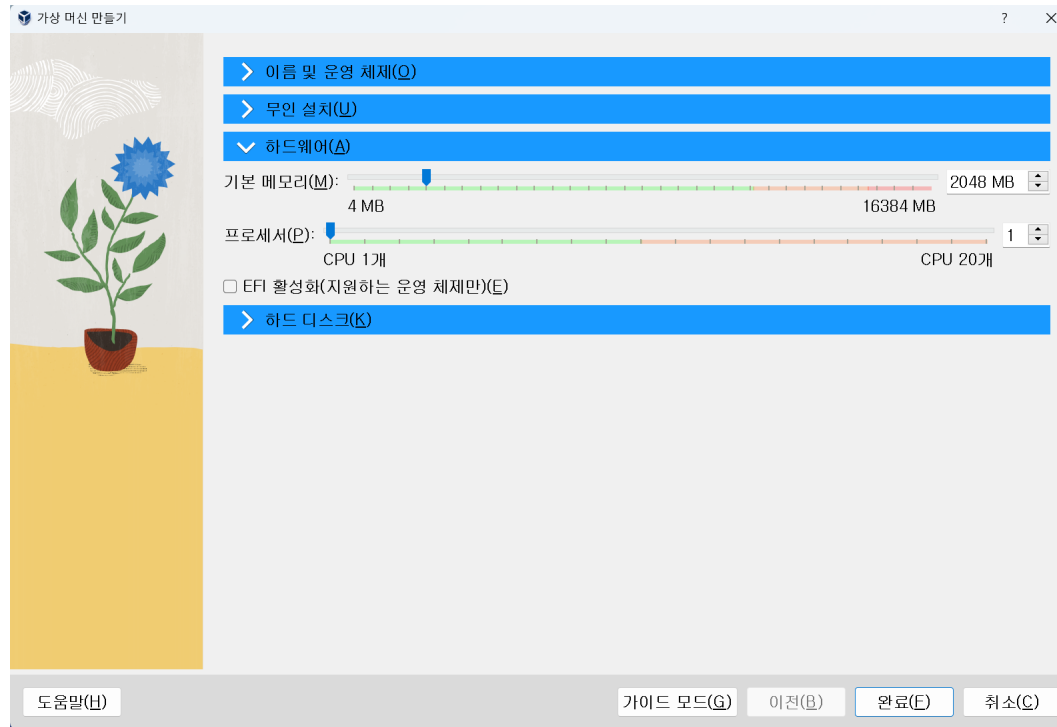
폴더 : 기본지정 (만약 다른 디스크를 사용할 것이라면, 수동지정)

ISO 이미지 : 다운로드 받은 이미지 선택

무인 설치 건너뛰기 체크할 것

LINUX Installation via VirtualBox (Cont.)

1. Create Virtual Machine (Cont.)



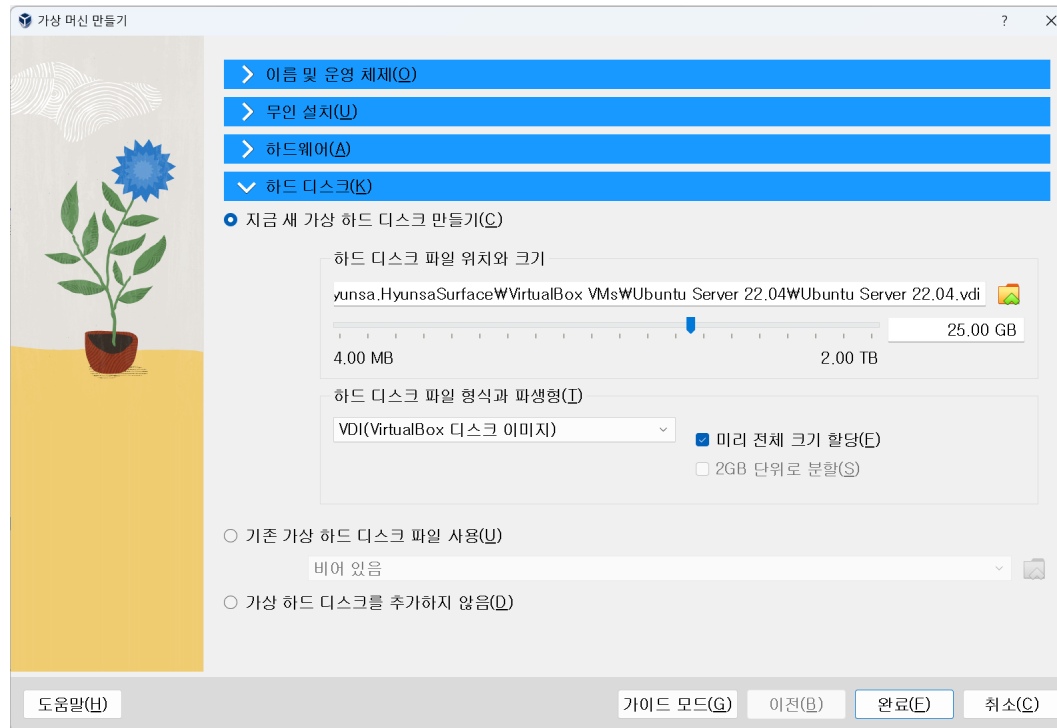
기본 메모리 : 호스트 기기의 25% (16GB RAM 이라면, 4GB) 이상

프로세서 : 호스트 기기의 25%에서 홀수일시 + 1 이상
(20 Core(가상 Thread 포함)라면, 6Core)

make 작업 등 고사양 필요 작업시 코어 수를 높게 할당

LINUX Installation via VirtualBox (Cont.)

1. Create Virtual Machine (Cont.)



폴더 : 기본지정 (만약 다른 디스크를 사용할 것이라면, 수동지정)

용량 : 25GB

make 작업 등 고사양 필요 작업시 용량을 40GB 이상으로 할당
미리 전체 크기 할당 체크할 것

LINUX Installation via VirtualBox (Cont.)

2. Run Virtual Machine



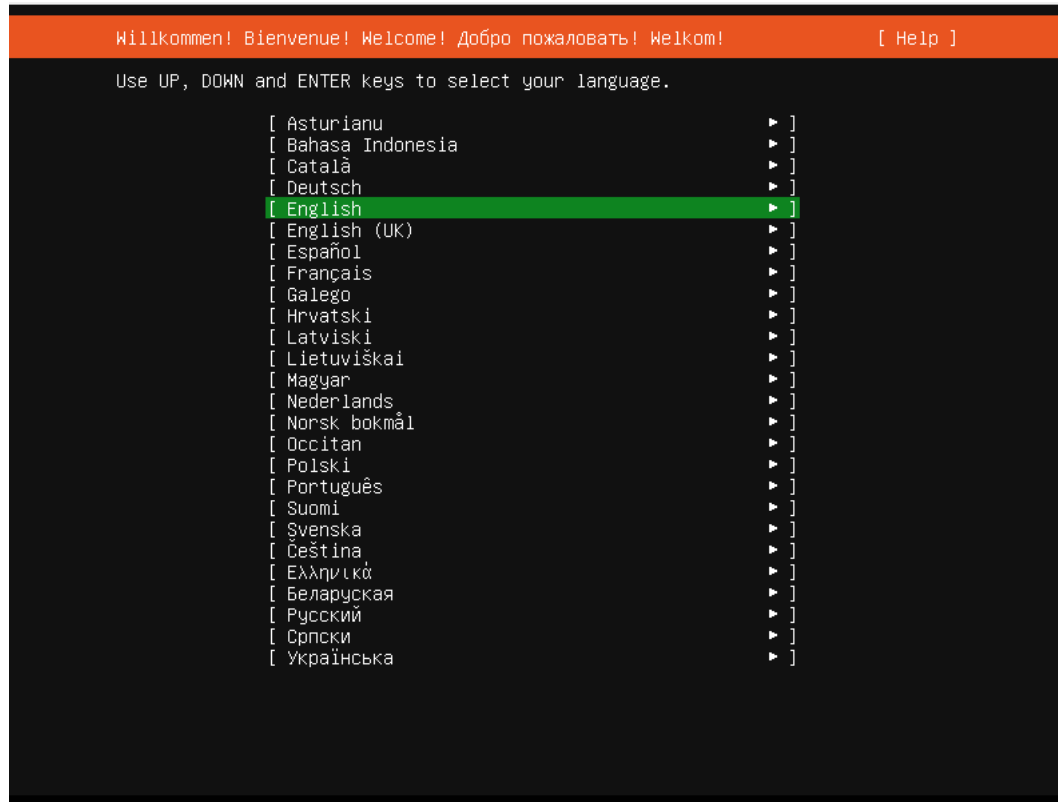
가상머신을 더블클릭하여 머신을 실행

Install Ubuntu -> p11

Install RockyLinux -> p24

Ubuntu Installation via VirtualBox

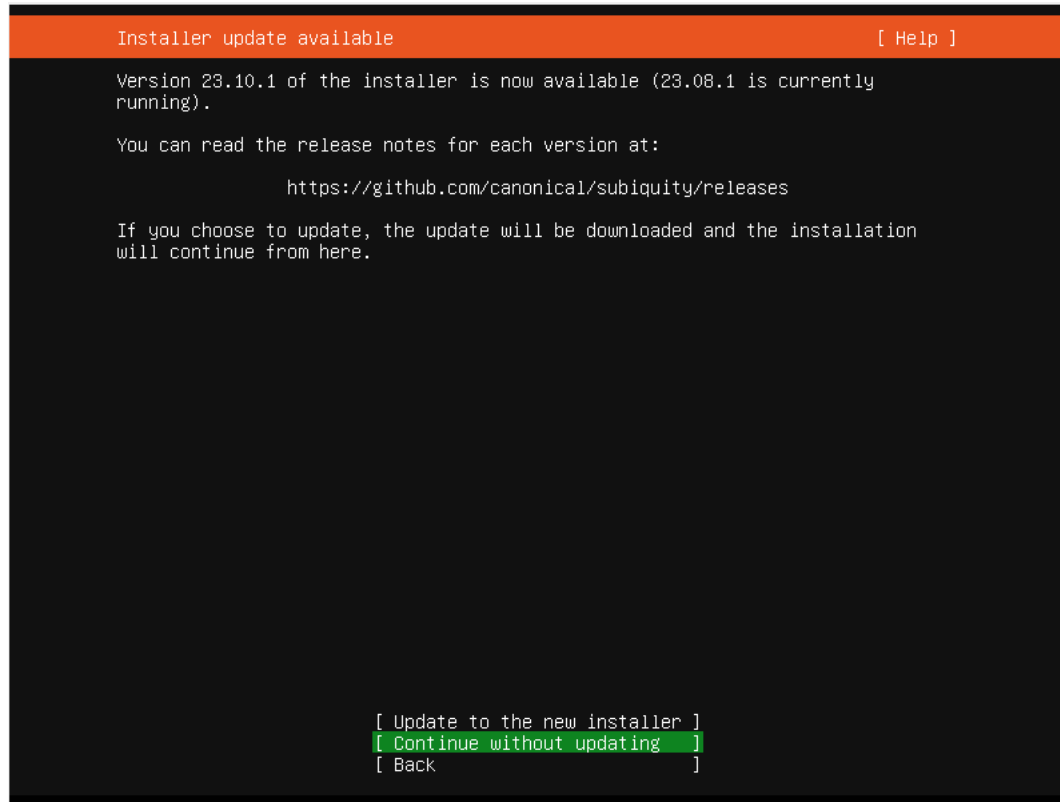
1. Install & Initialization Ubuntu



English 선택

Ubuntu Installation via VirtualBox (Cont.)

1. Install & Initialization Ubuntu (Cont.)

A screenshot of the Ubuntu installer window. The title bar is orange and contains the text "Installer update available" on the left and "[Help]" on the right. The main content area has a black background with white text. It says: "Version 23.10.1 of the installer is now available (23.08.1 is currently running).", "You can read the release notes for each version at:", followed by the URL "https://github.com/canonical/subiquity/releases", and "If you choose to update, the update will be downloaded and the installation will continue from here." At the bottom, there are three options in brackets: "[Update to the new installer]", "[Continue without updating]" (which is highlighted in green), and "[Back]".

```
Installer update available [ Help ]

Version 23.10.1 of the installer is now available (23.08.1 is currently
running).

You can read the release notes for each version at:

    https://github.com/canonical/subiquity/releases

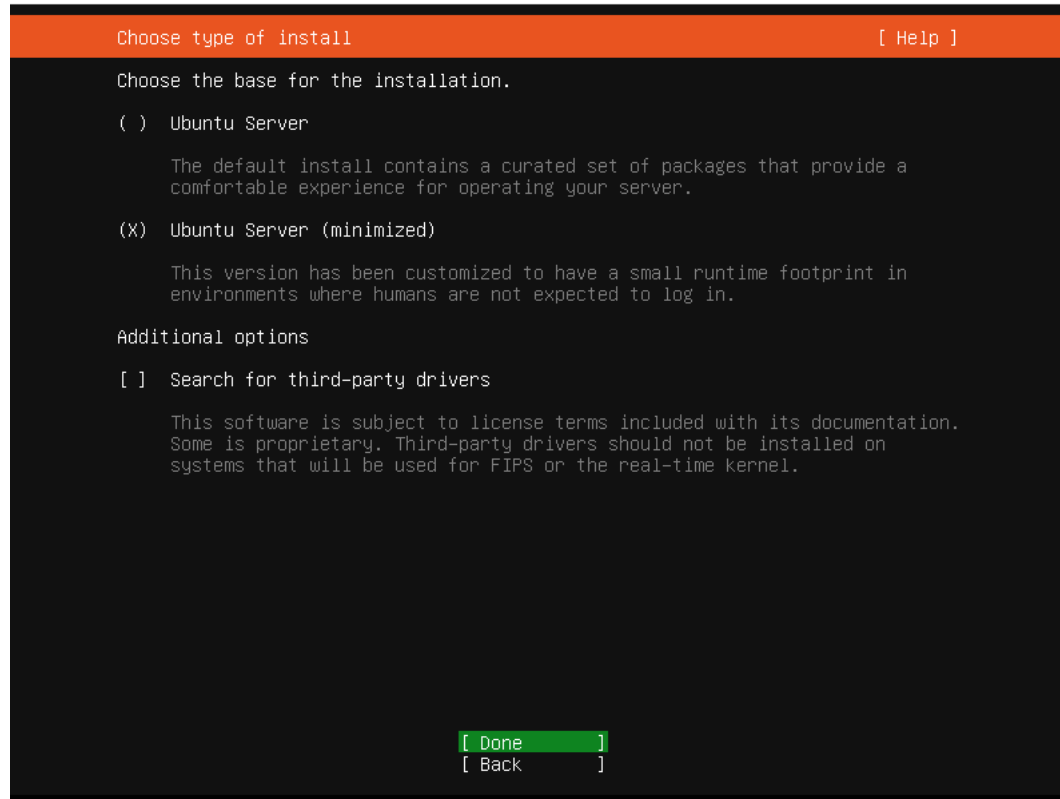
If you choose to update, the update will be downloaded and the installation
will continue from here.

[ Update to the new installer ]
[ Continue without updating ]
[ Back ]
```

Continue without updating 선택

Ubuntu Installation via VirtualBox (Cont.)

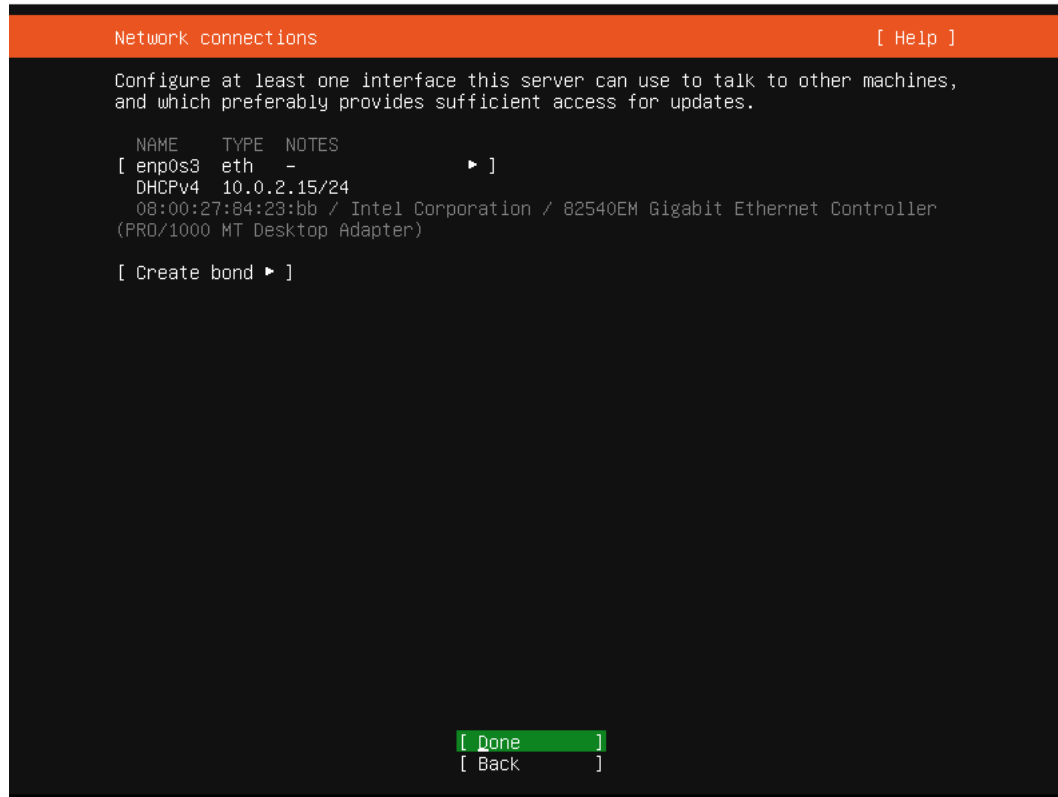
1. Install & Initialization Ubuntu (Cont.)



Ubuntu Server (Minimized) 선택

Ubuntu Installation via VirtualBox (Cont.)

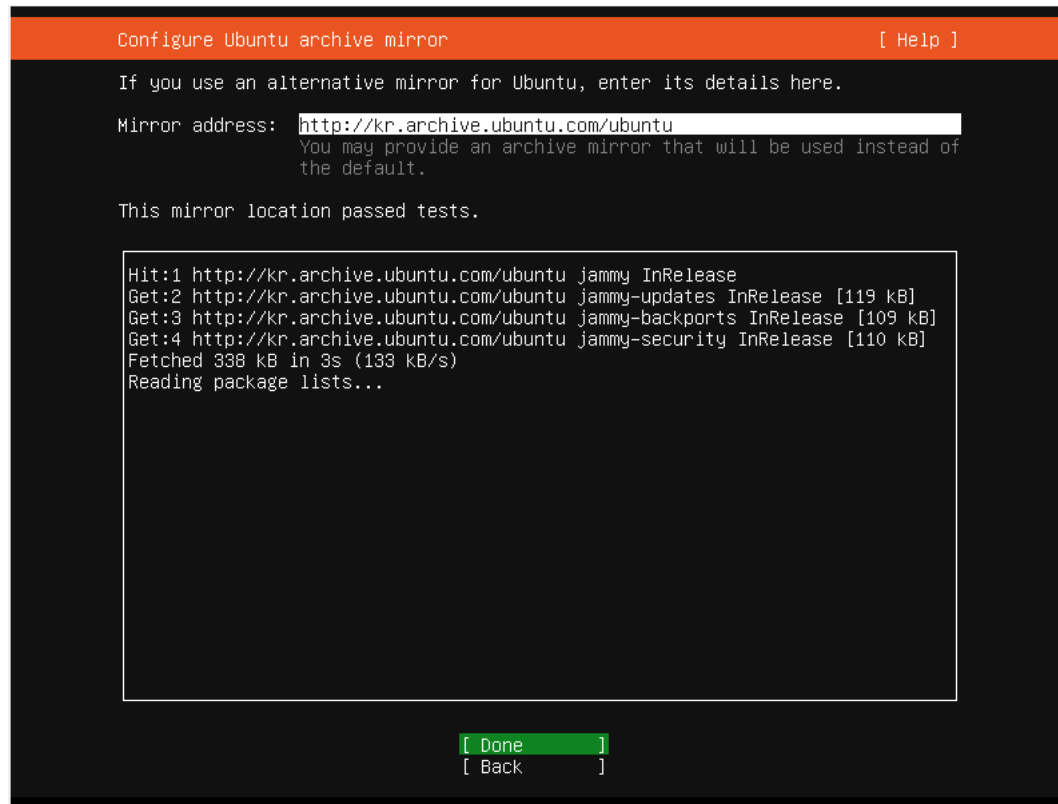
1. Install & Initialization Ubuntu (Cont.)



enp0s3(Default) 선택
이후 Proxy 입력 안함

Ubuntu Installation via VirtualBox (Cont.)

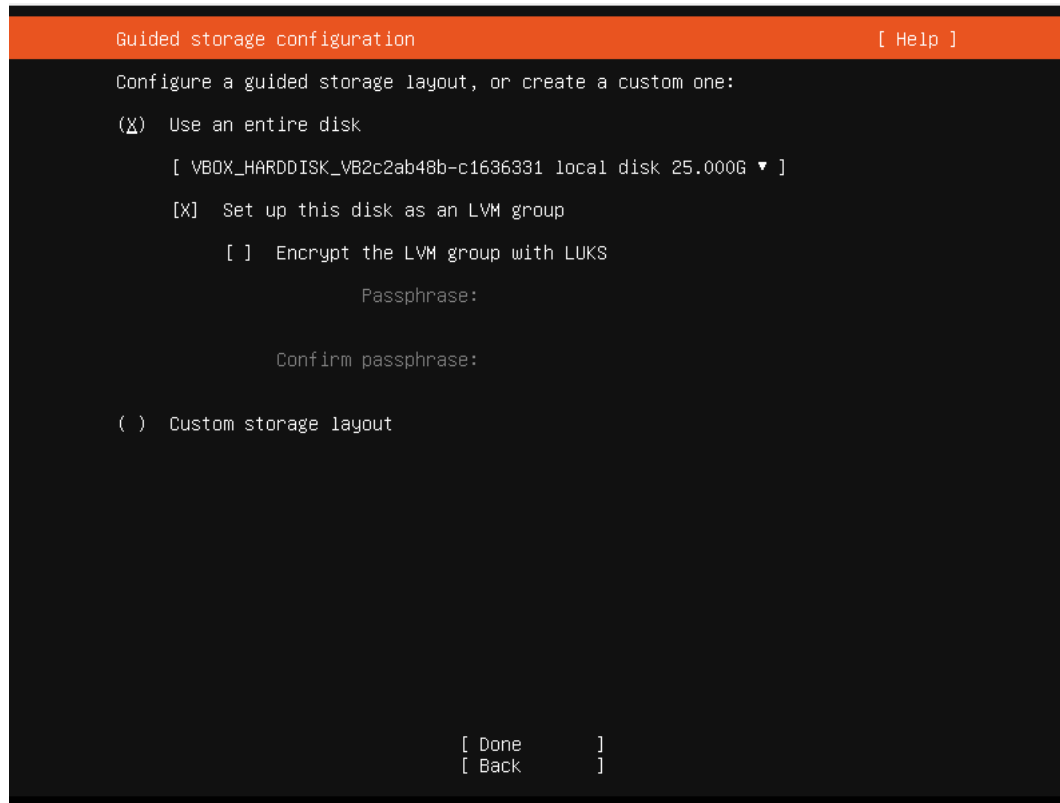
1. Install & Initialization Ubuntu (Cont.)



Mirror 필요시 변경, 없다면 Pass

Ubuntu Installation via VirtualBox (Cont.)

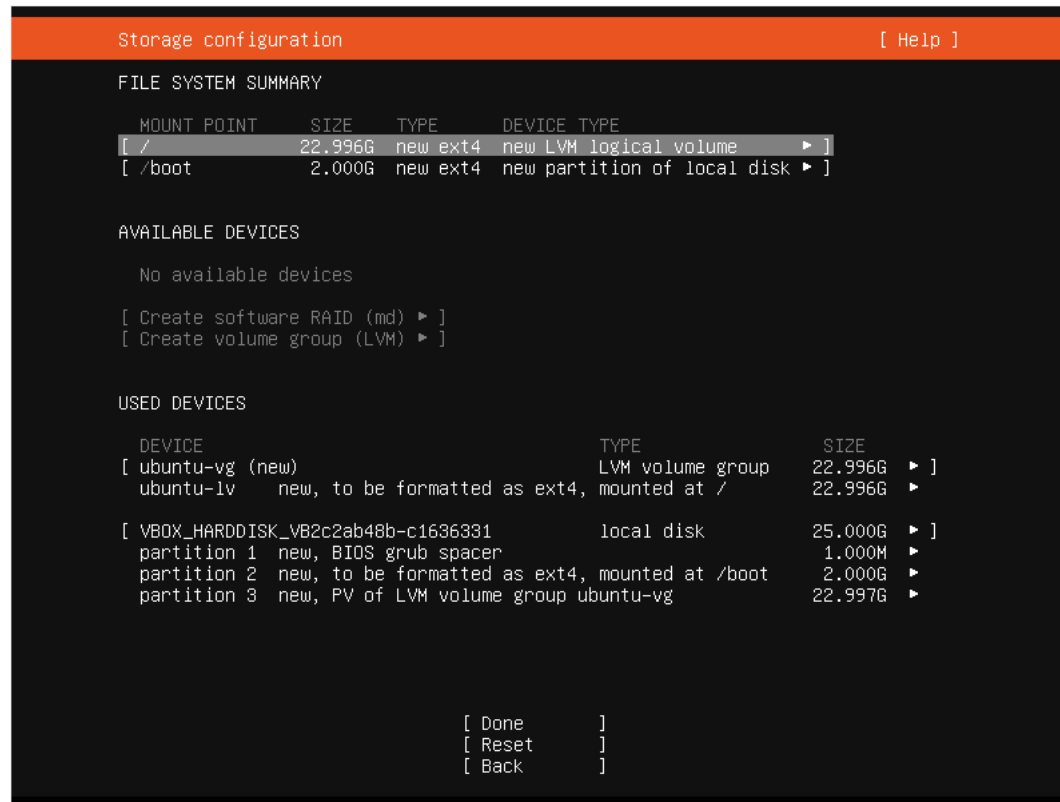
1. Install & Initialization Ubuntu (Cont.)



Use entire disk(Default) 선택

Ubuntu Installation via VirtualBox (Cont.)

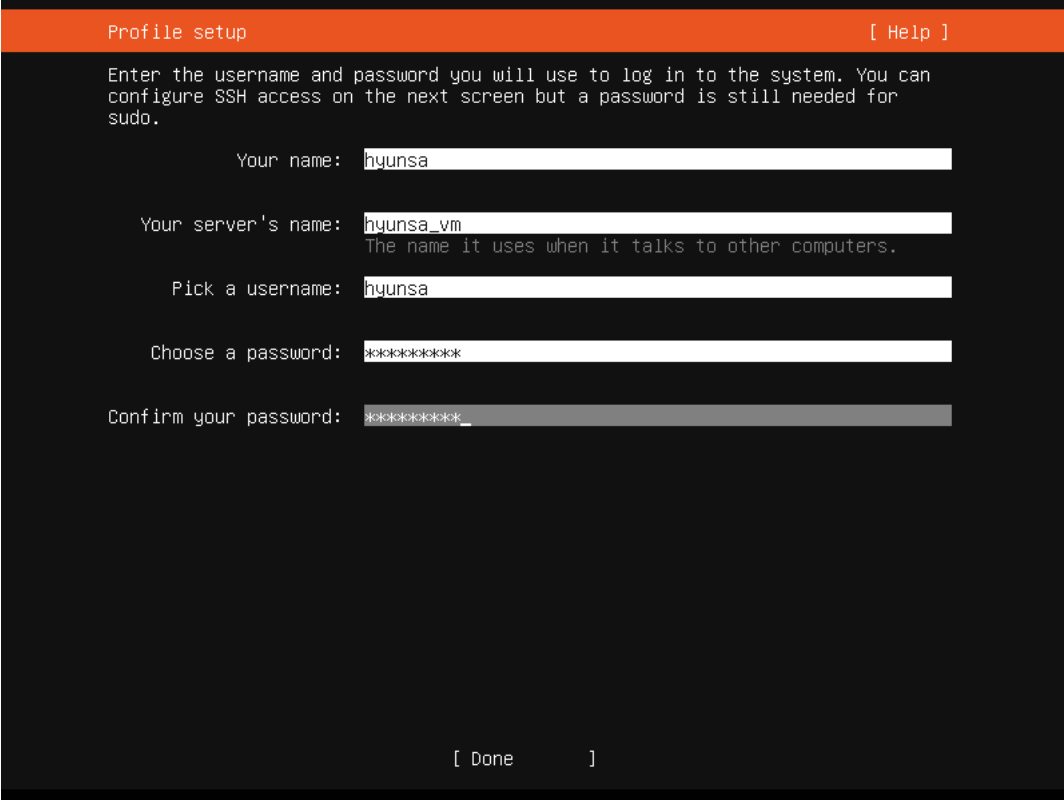
1. Install & Initialization Ubuntu (Cont.)



ubuntu-lv 의 Size에서 Edit 선택 후 MAX 값으로 수정
이후 Done 후 Continue

Ubuntu Installation via VirtualBox (Cont.)

1. Install & Initialization Ubuntu (Cont.)



The screenshot shows the 'Profile setup' window with an orange header bar containing '[Help]'. The main area has a dark background with white text. It prompts the user to enter a username and password. The fields are filled with 'hyunsa' for the name, 'hyunsa_vm' for the server name (with a note that it's used for talking to other computers), and 'hyunsa' for the username. The password fields are masked with asterisks. At the bottom, there is a '[Done]' button.

Profile setup [Help]

Enter the username and password you will use to log in to the system. You can configure SSH access on the next screen but a password is still needed for sudo.

Your name: hyunsa

Your server's name: hyunsa_vm
The name it uses when it talks to other computers.

Pick a username: hyunsa

Choose a password: *****

Confirm your password: *****

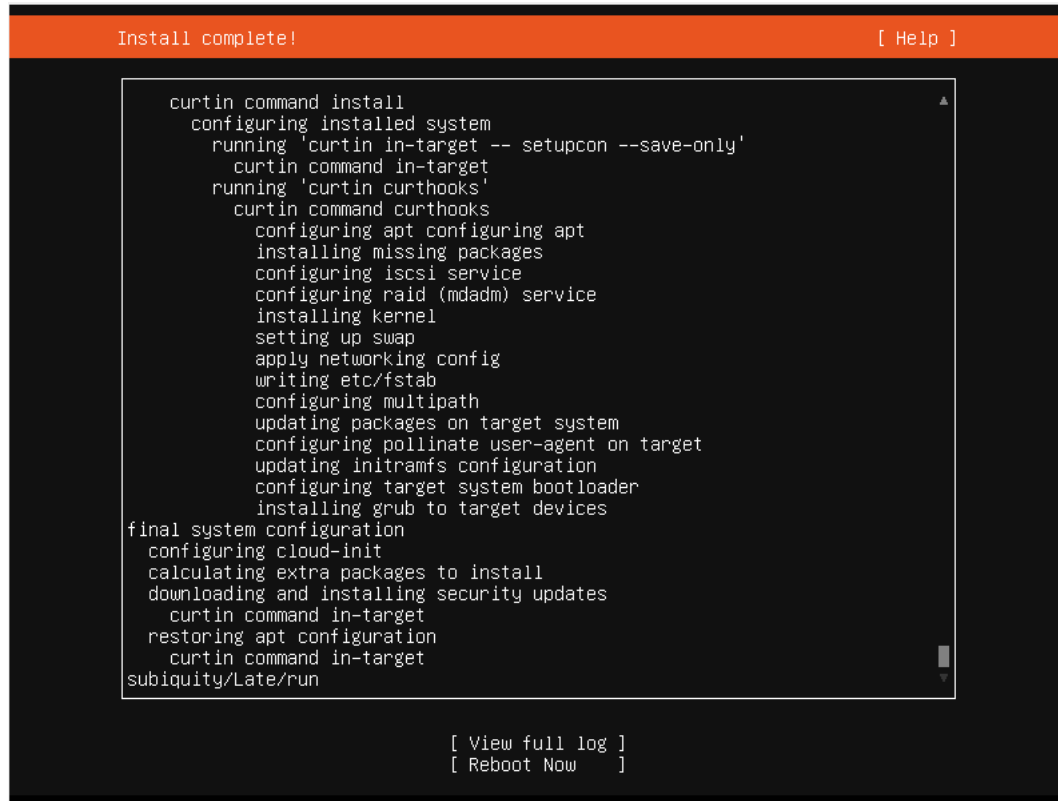
[Done]

자신이 원하는 값으로 입력후 Done
단, 비밀번호는 꼭 기억할 수 있는 것으로 할 것

이후 Ubuntu Pro, Install OpenSSH Server, Server Snap SKIP

Ubuntu Installation via VirtualBox (Cont.)

1. Install & Initialization Ubuntu (Cont.)

A screenshot of a terminal window during the final stages of Ubuntu installation. The window has an orange title bar with the text "Install complete!" on the left and "[Help]" on the right. The terminal text shows a series of commands and their outputs, including configuring the installed system, running setupcon, installing missing packages, configuring services like iSCSI and RAID, installing the kernel and swap, setting up networking, writing the fstab, configuring multipath, updating packages, configuring the target system bootloader, and installing GRUB. At the bottom, there are two options: "[View full log]" and "[Reboot Now]".

```
Install complete! [ Help ]

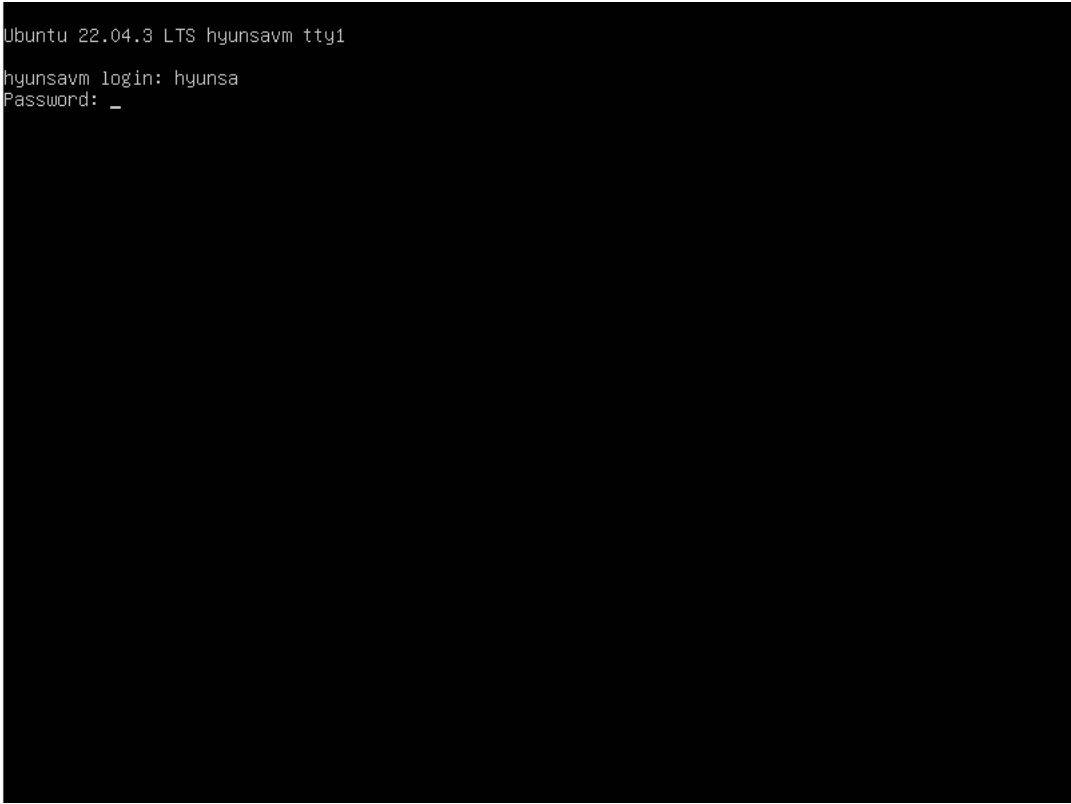
curtin command install
configuring installed system
  running 'curtin in-target -- setupcon --save-only'
  curtin command in-target
  running 'curtin curthooks'
  curtin command curthooks
    configuring apt configuring apt
    installing missing packages
    configuring iSCSI service
    configuring raid (mdadm) service
    installing kernel
    setting up swap
    apply networking config
    writing etc/fstab
    configuring multipath
    updating packages on target system
    configuring pollinate user-agent on target
    updating initramfs configuration
    configuring target system bootloader
    installing grub to target devices
final system configuration
  configuring cloud-init
  calculating extra packages to install
  downloading and installing security updates
  curtin command in-target
  restoring apt configuration
  curtin command in-target
subiquity/Late/run

[ View full log ]
[ Reboot Now ]
```

기다림 후 설치 완료시 Reboot Now (Cancel 하지 말것)

Ubuntu Installation via VirtualBox (Cont.)

2. Boot Ubuntu

A terminal window with a black background and white text. The text shows the Ubuntu version and LTS release, followed by a login prompt for the user 'hyunsavm'. The user has entered 'hyunsa' and a password, indicated by underscores.

```
Ubuntu 22.04.3 LTS hyunsavm tty1
hyunsavm login: hyunsa
Password: _
```

자신이 생성한 계정과 비밀번호로 로그인

만약 에러로그가 발생하여 화면을 가린다면, 엔터를 한번 눌러서

[hostname] login :

이라는 것이 출력되는지 확인할 것

Ubuntu Installation via VirtualBox (Cont.)

3. After Installation

- 1. Root 계정 활성화

- `sudo passwd root` 입력 후 비밀번호를 입력

- 2. 기본 패키지 설치

- `sudo apt update`
- `sudo apt install build-essential vim openssh-server net-tools`

- 3. SSH 활성화

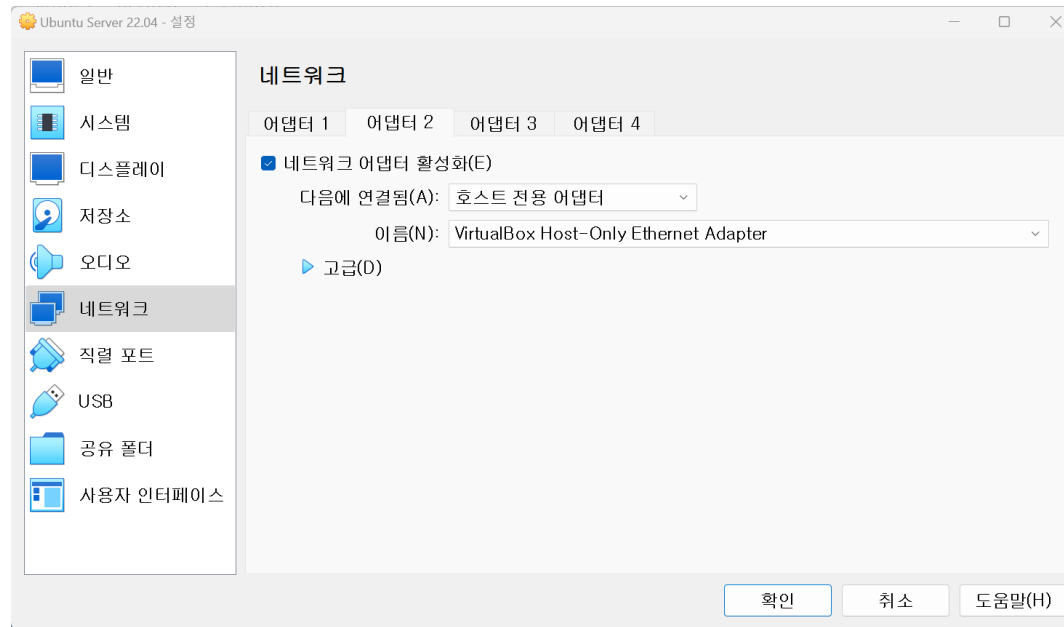
- `sudo systemctl enable ssh`
- `sudo systemctl start ssh`
- `vi /etc/ssh/sshd_config`
 - `#Port 22` -> #제거
 - `#PermitRootLogin prohibit-password` -> #제거, 값을 `yes`로 변경

Ubuntu Installation via VirtualBox (Cont.)

3. After Installation (Cont.)

- 4. Host-Only Adapter 활성화

- 가상 머신 전원 off
- Virtual Box에서 가상머신 -> 설정 -> 네트워크
- 어댑터 2 선택 후 활성화



- 이후 가상머신 부팅 후 `ip addr show` 명령어로 인터페이스 활성화 확인

Ubuntu Installation via VirtualBox (Cont.)

3. After Installation (Cont.)

- 4. Host-Only Adapter 활성화

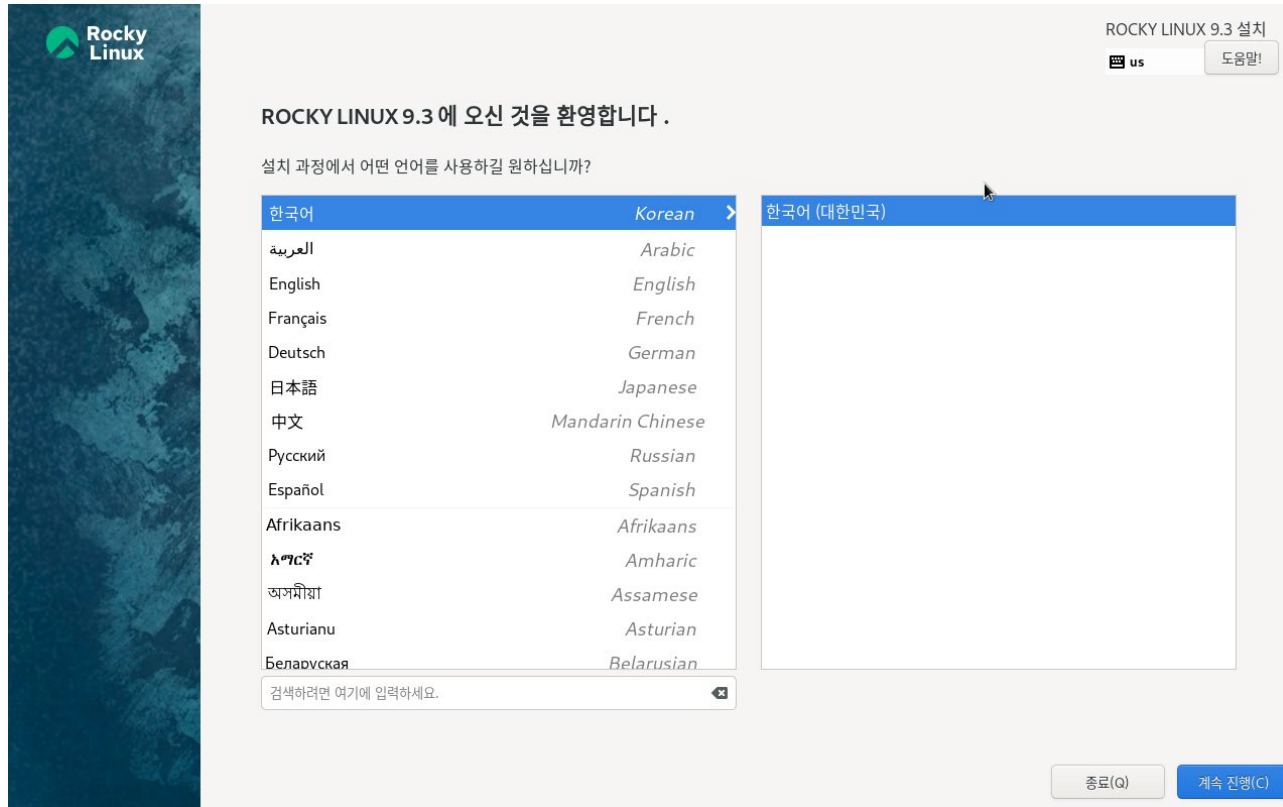
- `sudo vi /etc/netplan/00-installer-config.yaml`

```
# This is the network config written by 'subiquity'
network:
  ethernets:
    enp0s3:
      dhcp4: true
    enp0s8:
      addresses:
        - 192.168.56.101/24
  version: 2
```

- 다음과 같이 수정 후 netplan apply 입력
- ip addr show 명령으로 enp0s8이 정상적으로 나오는지 확인

RockyLinux Installation via VirtualBox

1. Install & Initialization RockyLinux



한국어 선택

RockyLinux Installation via VirtualBox (Cont.)

1. Install & Initialization RockyLinux (Cont.)



설정해야 할 것

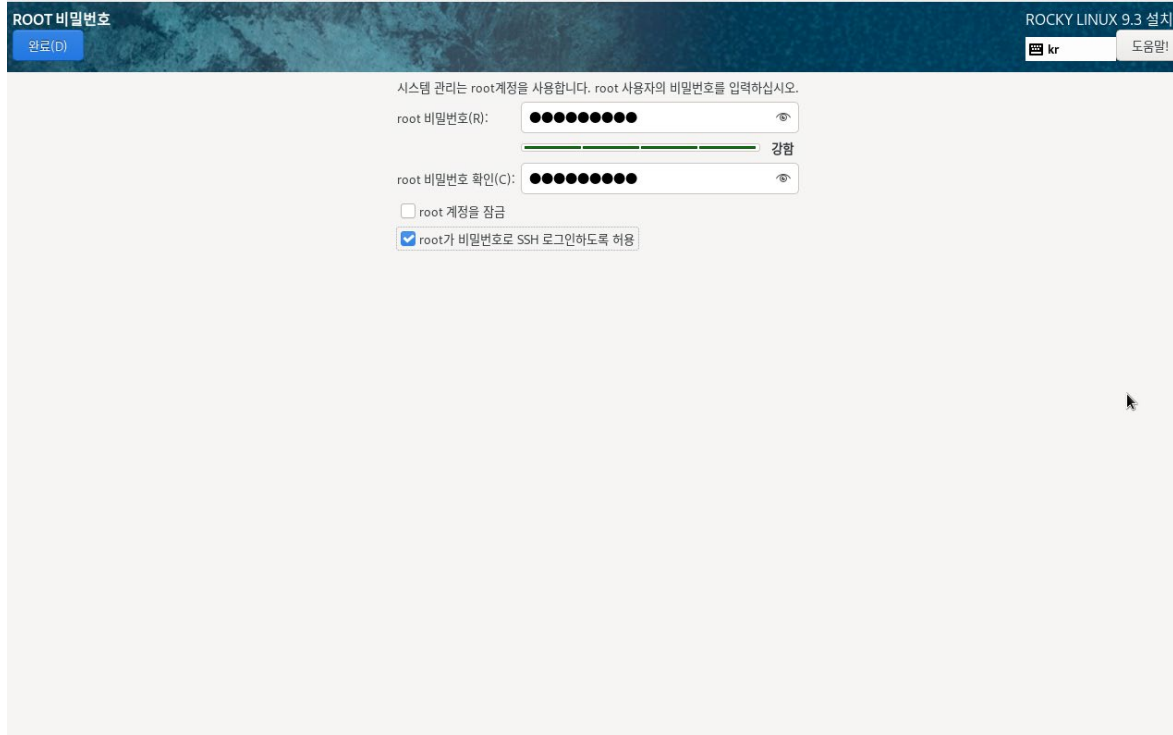
Root 비밀번호 (Root 계정 활성화)

사용자 생성 (일반 사용자 계정 생성)

설치 목적지

RockyLinux Installation via VirtualBox (Cont.)

1. Install & Initialization RockyLinux (Cont.)

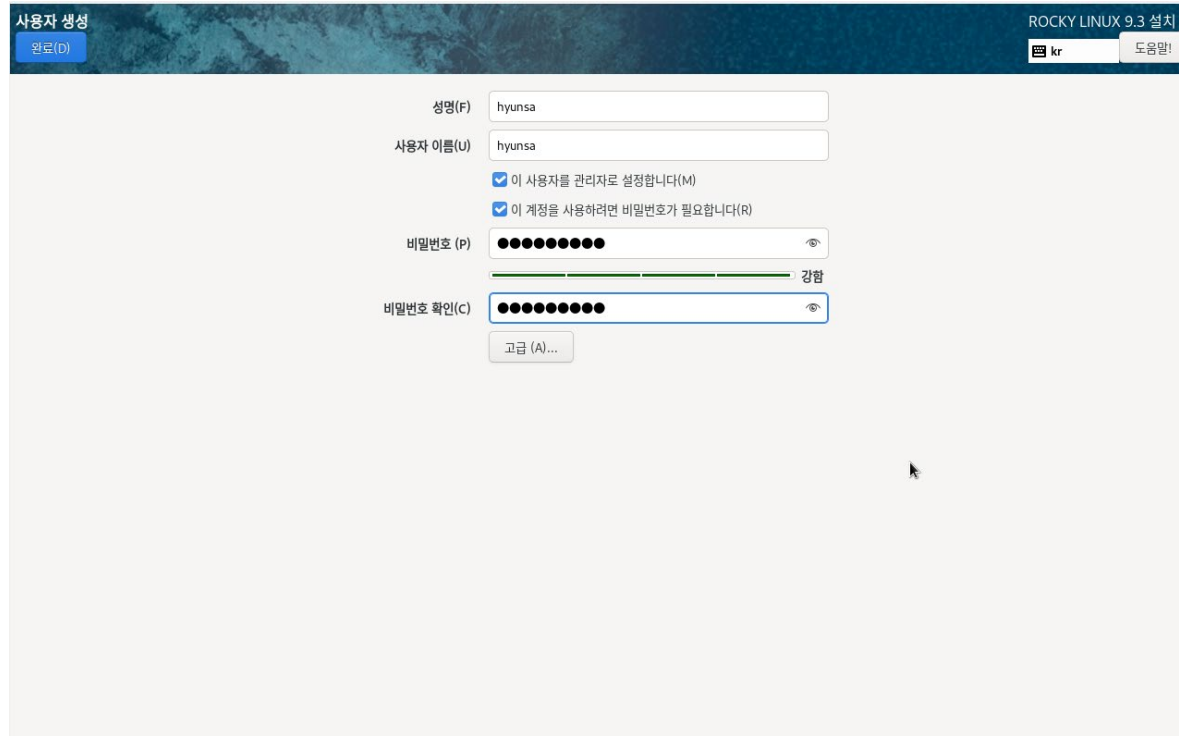


The image shows the Rocky Linux 9.3 installation window. The title bar says 'ROOT 비밀번호' (Root Password) and 'ROCKY LINUX 9.3 설치' (Rocky Linux 9.3 Installation). There is a '완료(D)' (Done) button on the left and a '다음!' (Next!) button on the right. The main content area has a message: '시스템 관리는 root계정을 사용합니다. root 사용자의 비밀번호를 입력하십시오.' (System management uses the root account. Enter the password for the root user.). Below this are two password input fields: 'root 비밀번호(R):' and 'root 비밀번호 확인(C):'. The first field has a strength indicator bar and a '강함' (Strong) label. Below the fields are two checkboxes: 'root 계정을 잠금' (Lock root account) and 'root가 비밀번호로 SSH 로그인하도록 허용' (Allow root login with password). The second checkbox is checked.

자신이 원하는 값으로 입력후 Done
단, 비밀번호는 꼭 기억할 수 있는 것으로 할 것
Root의 SSH 로그인 체크

RockyLinux Installation via VirtualBox (Cont.)

1. Install & Initialization RockyLinux (Cont.)



The image shows the '사용자 생성' (User Creation) screen during the Rocky Linux 9.3 installation. The window has a dark blue header with the title '사용자 생성' and a '완료(D)' (Done) button. The main area is light gray and contains the following fields and options:

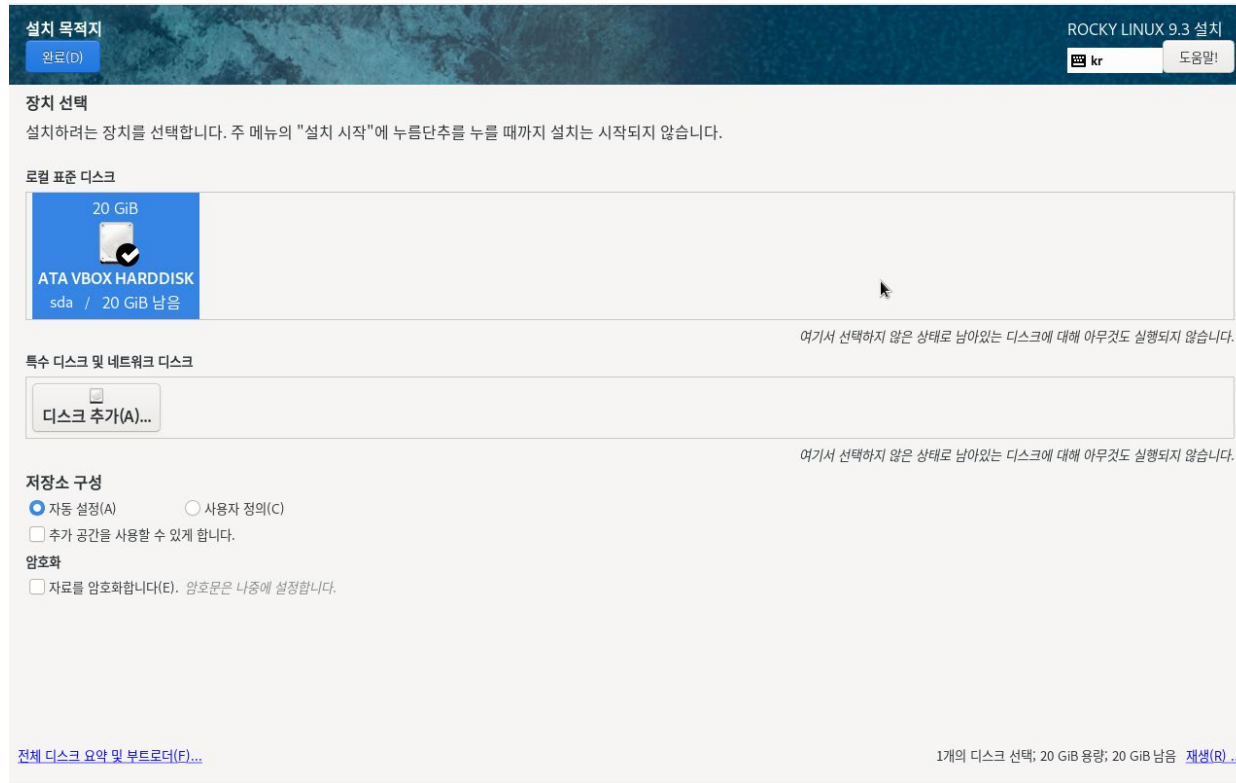
- 성명(F)** (Full Name): hyunsa
- 사용자 이름(U)** (Username): hyunsa
- ☒ 이 사용자를 관리자로 설정합니다(M) (Set this user as administrator)
- ☒ 이 계정을 사용하려면 비밀번호가 필요합니다(R) (A password is required for this account)
- 비밀번호 (P)** (Password): [masked with dots] with a strength indicator showing '강함' (Strong)
- 비밀번호 확인(C)** (Confirm Password): [masked with dots]
- 고급 (A)...** (Advanced options)

In the top right corner, there is a 'ROCKY LINUX 9.3 설치' (Rocky Linux 9.3 Installation) label, a language dropdown set to 'kr', and a '도움말!' (Help!) button.

자신이 원하는 값으로 입력후 Done
단, 비밀번호는 꼭 기억할 수 있는 것으로 할 것
이 사용자를 관리자로 설정합니다 체크 (sudo 권한 부여)

RockyLinux Installation via VirtualBox (Cont.)

1. Install & Initialization RockyLinux (Cont.)

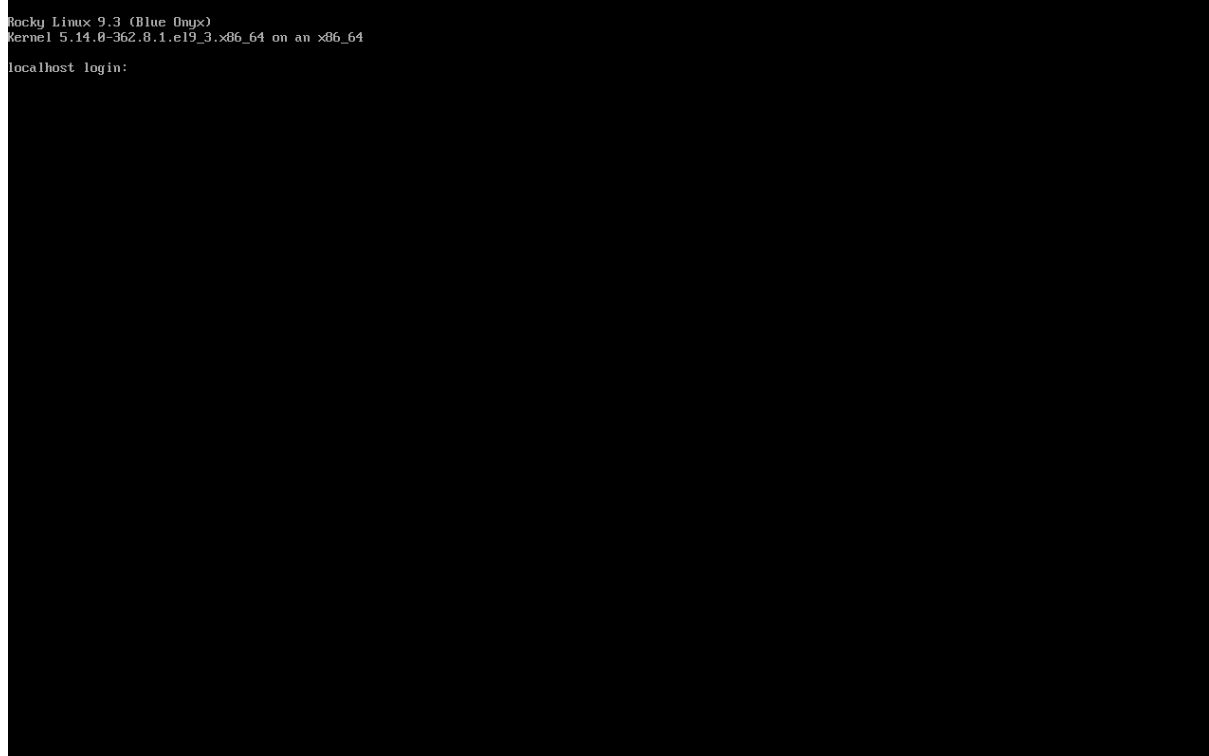


vbox harddisk 더블 체크

이후 설치 시작하면 자동진행

RockyLinux Installation via VirtualBox (Cont.)

2. Boot RockyLinux

A screenshot of a terminal window showing the boot process of Rocky Linux. The text displayed is: "Rocky Linux 9.3 (Blue Onyx)", "Kernel 5.14.0-362.8.1.el9_3.x86_64 on an x86_64", and "localhost login:". The rest of the screen is black.

```
Rocky Linux 9.3 (Blue Onyx)
Kernel 5.14.0-362.8.1.el9_3.x86_64 on an x86_64
localhost login:
```

자신이 생성한 계정과 비밀번호로 로그인

만약 에러로그가 발생하여 화면을 가린다면, 엔터를 한번 눌러서

localhost login :

이라는 것이 출력되는지 확인할 것

RockyLinux Installation via VirtualBox (Cont.)

3. After Installation

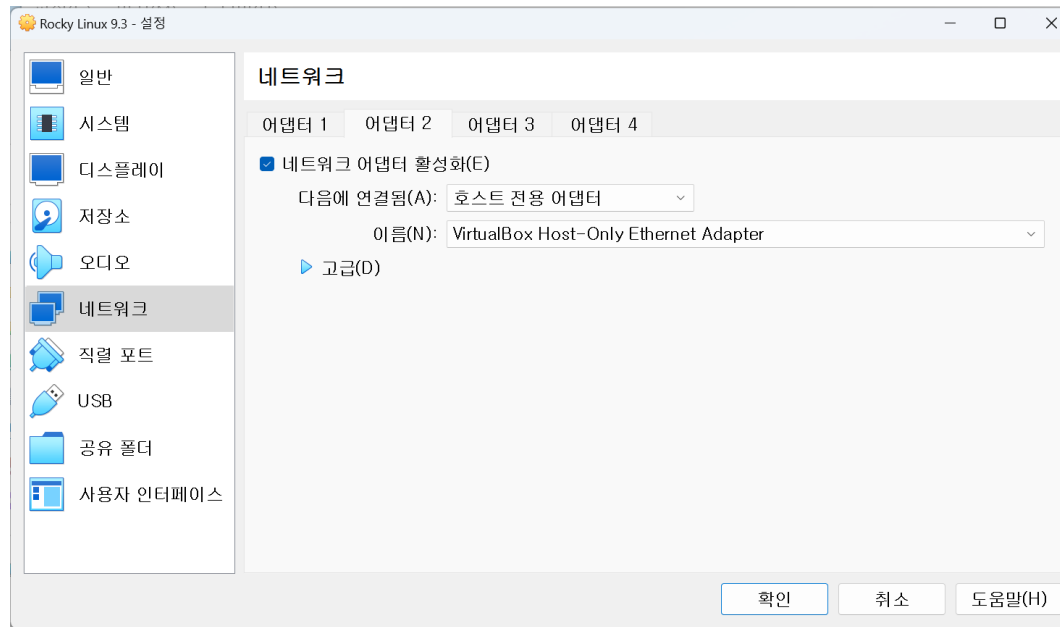
- 1. 기본 패키지 설치
 - `sudo dnf update`
 - `sudo dnf group install "Development Tools"`
- 2. 방화벽 비활성화
 - `sudo systemctl disable firewalld`
- 3. SELinux 허용모드 변경
 - `vi /etc/selinux/config`
 - SELINUX=permissive 로 변경

RockyLinux Installation via VirtualBox (Cont.)

3. After Installation (Cont.)

- 4. Host-Only Adapter 활성화

- 가상 머신 전원 off
- Virtual Box에서 가상머신 -> 설정 -> 네트워크
- 어댑터 2 선택 후 활성화

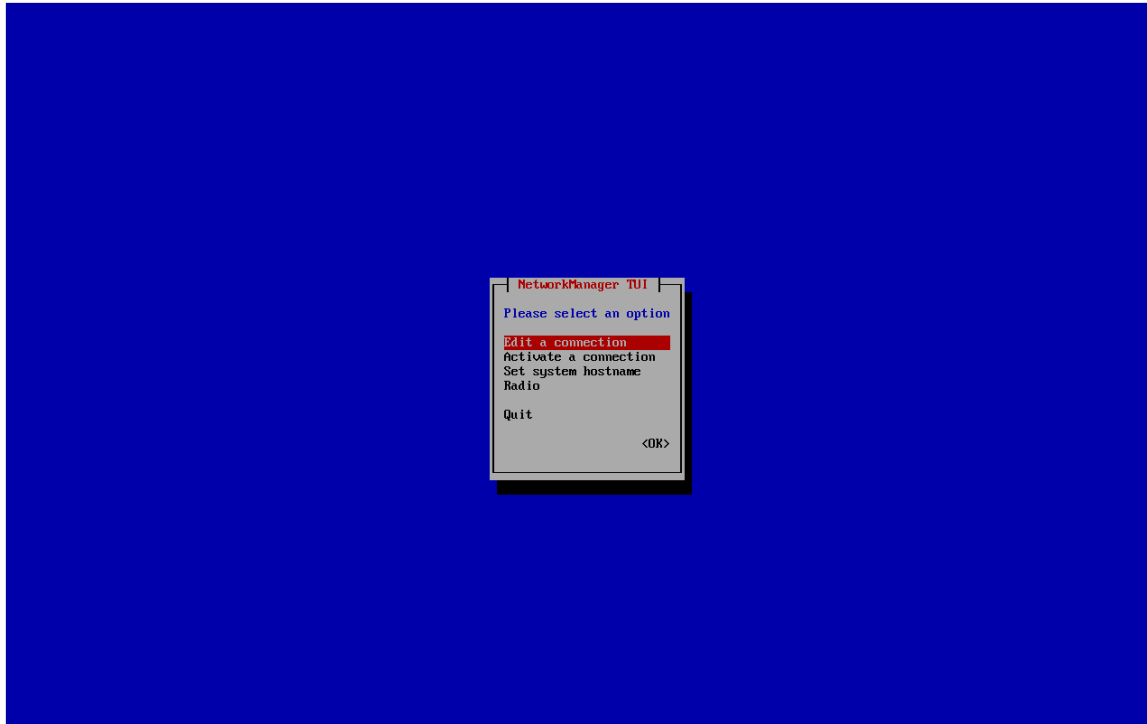


- `ip addr show`로 인터페이스 활성화 확인

RockyLinux Installation via VirtualBox (Cont.)

3. After Installation (Cont.)

- 4. Host-Only Adapter 활성화
 - nmtui

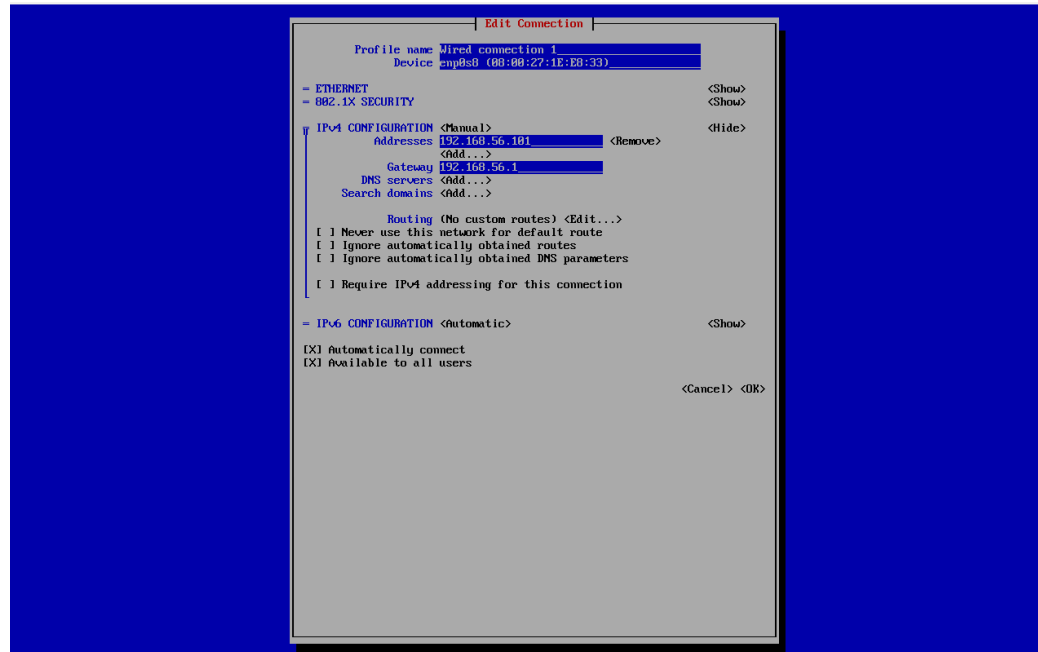


- Edit a connection -> Wired Connection 1(enp0s8) -> Edit

RockyLinux Installation via VirtualBox (Cont.)

3. After Installation (Cont.)

- 4. Host-Only Adapter 활성화
 - 다음과 같이 설정

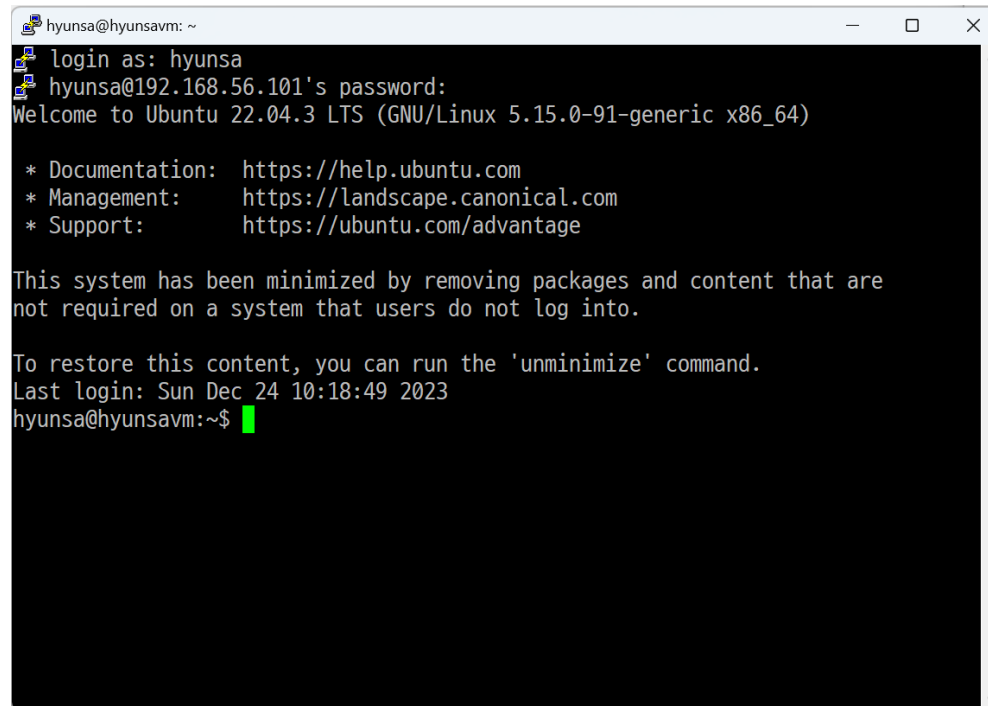


- 이후 `systemctl restart NetworkManager` 입력
- `ip addr show` 명령으로 `enp0s80`이 정상적으로 나오는지 확인

After Installation

SSH 접속 확인

- ssh 프로그램 혹은 명령을 이용해 접속 확인
- ip : 192.168.56.101 Port : 22



```
hyunsa@hyunsavm: ~  
login as: hyunsa  
hyunsa@192.168.56.101's password:  
Welcome to Ubuntu 22.04.3 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  
  
This system has been minimized by removing packages and content that are  
not required on a system that users do not log into.  
  
To restore this content, you can run the 'unminimize' command.  
Last login: Sun Dec 24 10:18:49 2023  
hyunsa@hyunsavm:~$
```

- 관리자를 제외한 어떤 개발자도 Native 환경으로 작업하지 않음
(웬만하면 SSH 이용할 것)

If you want physical machine

하드웨어 준비물 : USB

USB 부팅 디스크 생성을 위한 프로그램 1종 선택

- [Ventoy](https://github.com/ventoy/Ventoy)
 - <https://github.com/ventoy/Ventoy>
- Rufus
 - <https://github.com/pbatard/rufus>

USB를 해당 프로그램으로 부팅디스크로 설정

이후 BIOS(UEFI) 설정으로 Boot Priority를 USB가 가장높게 설정

재부팅 후 USB(Installation)으로 부팅된다면 가상머신에서 설치와 동일하게 진행

DISK Partition은 꼭 고려하고 설치할 것 (설치 영역은 포맷됨)

Thank you