

Block Chain

중급 정규교육

블록체인 개발환경설정

5주차

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리눅스 설치 이미지 다운로드

 <https://releases.ubuntu.com/20.04/>

Server install image










The server install image allows you to install Ubuntu permanently on a computer for use as a server. It will not install a graphical user interface.

64-bit PC (AMD64) server install image

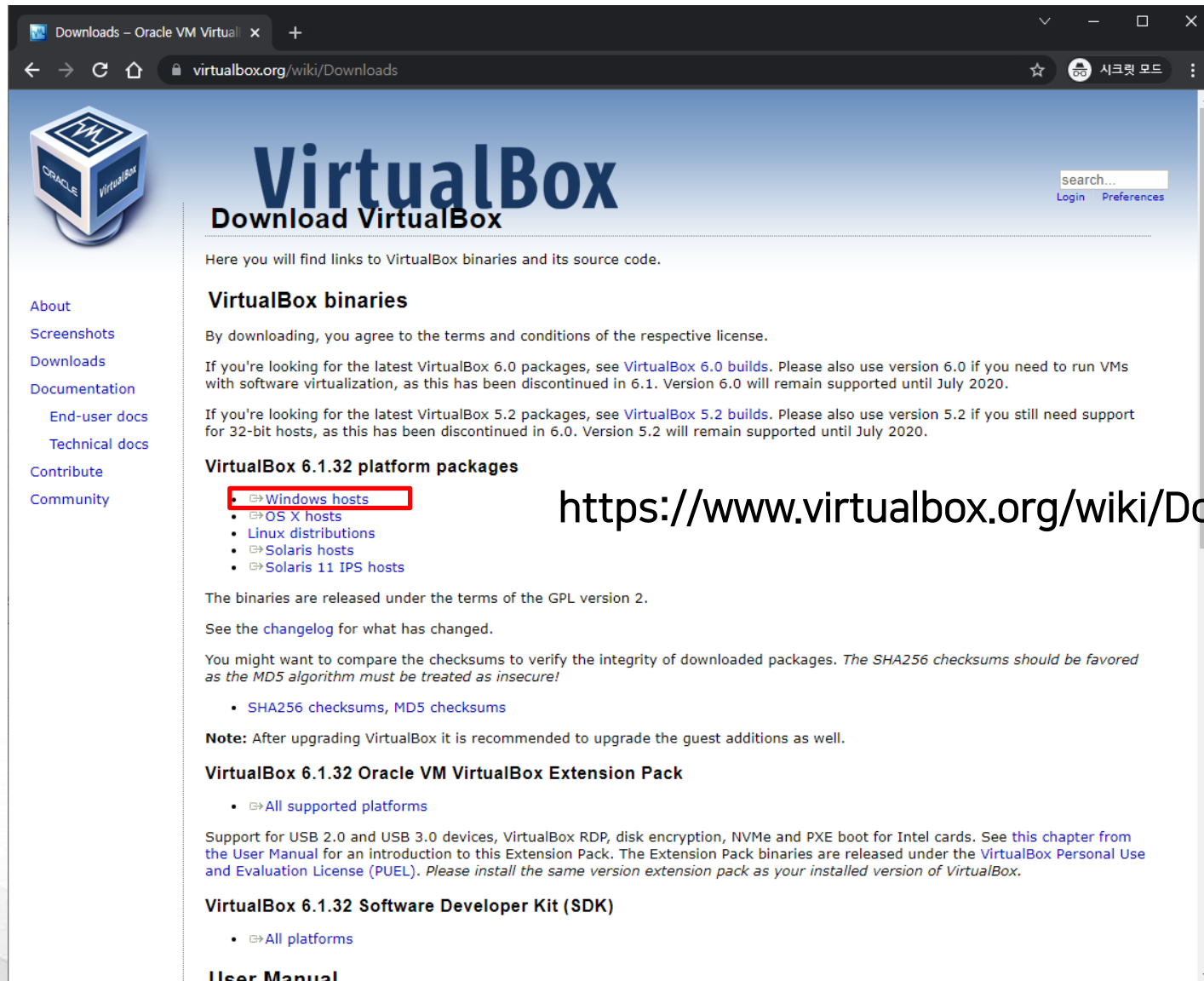
Choose this if you have a computer based on the AMD64 or EM64T architecture (e.g., Athlon64, Opteron, EM64T Xeon, Core 2). Choose this if you are at all unsure.

A full list of available files, including [BitTorrent](#) files, can be found below.

If you need help burning these images to disk, see the [Image Burning Guide](#).

Name	Last modified	Size	Description
 Parent Directory		-	
 SHA256SUMS	2022-02-24 20:36	202	
 SHA256SUMS.gpg	2022-02-24 20:36	833	
 ubuntu-20.04.4-desktop-amd64.iso	2022-02-23 09:10	3.1G	Desktop image for 64-bit PC (AMD64) computers (standard download)
 ubuntu-20.04.4-desktop-amd64.iso.torrent	2022-02-24 20:30	252K	Desktop image for 64-bit PC (AMD64) computers (BitTorrent download)
 ubuntu-20.04.4-desktop-amd64.iso.zsync	2022-02-24 20:30	6.3M	Desktop image for 64-bit PC (AMD64) computers (zsync metafile)
 ubuntu-20.04.4-desktop-amd64.list	2022-02-23 09:10	28K	Desktop image for 64-bit PC (AMD64) computers (file listing)
 ubuntu-20.04.4-desktop-amd64.manifest	2022-02-23 09:03	58K	Desktop image for 64-bit PC (AMD64) computers (contents of live filesystem)
 ubuntu-20.04.4-live-server-amd64.iso	2022-02-23 09:27	1.2G	Server install image for 64-bit PC (AMD64) computers (standard download)

Virtualbox 설치



The screenshot shows the 'Downloads' page of the VirtualBox website. The page has a blue header with the VirtualBox logo and the text 'Download VirtualBox'. A sidebar on the left contains links to 'About', 'Screenshots', 'Downloads', 'Documentation', 'End-user docs', 'Technical docs', 'Contribute', and 'Community'. The main content area is titled 'VirtualBox binaries' and contains the following text:

Here you will find links to VirtualBox binaries and its source code.

VirtualBox binaries

By downloading, you agree to the terms and conditions of the respective license.

If you're looking for the latest VirtualBox 6.0 packages, see [VirtualBox 6.0 builds](#). Please also use version 6.0 if you need to run VMs with software virtualization, as this has been discontinued in 6.1. Version 6.0 will remain supported until July 2020.

If you're looking for the latest VirtualBox 5.2 packages, see [VirtualBox 5.2 builds](#). Please also use version 5.2 if you still need support for 32-bit hosts, as this has been discontinued in 6.0. Version 5.2 will remain supported until July 2020.

VirtualBox 6.1.32 platform packages

- [Windows hosts](#)
- [OS X hosts](#)
- [Linux distributions](#)
- [Solaris hosts](#)
- [Solaris 11 IPS hosts](#)

The binaries are released under the terms of the GPL version 2.

See the [changelog](#) for what has changed.

You might want to compare the checksums to verify the integrity of downloaded packages. *The SHA256 checksums should be favored as the MD5 algorithm must be treated as insecure!*

- [SHA256 checksums, MD5 checksums](#)

Note: After upgrading VirtualBox it is recommended to upgrade the guest additions as well.

VirtualBox 6.1.32 Oracle VM VirtualBox Extension Pack

- [All supported platforms](#)

Support for USB 2.0 and USB 3.0 devices, VirtualBox RDP, disk encryption, NVMe and PXE boot for Intel cards. See [this chapter from the User Manual](#) for an introduction to this Extension Pack. The Extension Pack binaries are released under the [VirtualBox Personal Use and Evaluation License \(PUEL\)](#). Please install the same version extension pack as your installed version of VirtualBox.

VirtualBox 6.1.32 Software Developer Kit (SDK)

- [All platforms](#)

User Manual

<https://www.virtualbox.org/wiki/Downloads>

버추얼박스 가상머신 추가

The screenshot shows the Oracle VM VirtualBox Manager interface. In the foreground, the '가상 머신 만들기' (New VM) dialog box is open, showing the '이름 및 운영 체제' (Name and Operating System) tab. The name is 'fabric2004_new', the folder is 'C:\Users\Wsaarc\VirtualBox VMs', the type is 'Linux', and the version is 'Ubuntu (64-bit)'. In the background, the 'System' settings for a VM named 'ubuntu2004_fabric 2.2LTS' are visible. The system settings include basic memory (4096 MB), processor (3), and boot order (Hard disk, CD/DVD). The display settings show 16 MB of video memory and VMSVGA controller. The storage settings show a SATA controller and a hard disk named 'ubuntu2004_fabric-disk001.vdi' (30.00 GB). The audio settings show Windows DirectSound and ICH AC97 controller. The network settings show an Intel PRO/1000 MT Desktop adapter. The USB settings show OHCI controller and no USB devices attached. The shared folder settings are empty.

Oracle VM VirtualBox 관리자

파일(F) 머신(M) 도움말(H)

도구

ubuntu2004_fabric 1.4 전원 꺼짐

ubuntu2004_fabric 2.2LTS 전원 꺼짐

새로 만들기(N) (Ctrl+N)

이름: ubuntu2004_fabric 2.2LTS
운영 체제: Ubuntu (64-bit)

시스템

기본 메모리: 4096 MB
프로세서: 3
부팅 순서: 광 디스크, 하드 디스크
가속: VT-X/AMD-V, 네스티드 페이징, KVM 반가상화

미리 보기

ubuntu2004_fabric 2.2LTS

가상 머신 만들기

이름 및 운영 체제

새 가상 머신을 나타내는 이름과 저장할 대상 폴더를 입력하고 설치할 운영 체제를 선택하십시오. 입력한 이름은 VirtualBox에서 가상 머신을 식별하는 데 사용됩니다.

이름: fabric2004_new

머신 폴더: C:\Users\Wsaarc\VirtualBox VMs

종류(T): Linux

버전(V): Ubuntu (64-bit)

전문가 모드(E) 다음(N) 취소

디스플레이

비디오 메모리: 16 MB
그래픽 컨트롤러: VMSVGA
확대 데스크톱 서버: 사용 안 함
확대: 사용 안 함

저장소

컨트롤러: IDE
IDE 세컨더리 마스터: [광학 드라이브] 비어 있음
컨트롤러: SATA
ATA 포트 0: ubuntu2004_fabric-disk001.vdi (일반, 30.00 GB)

오디오

소프트 드라이버: Windows DirectSound
컨트롤러: ICH AC97

네트워크

엔터 1: Intel PRO/1000 MT Desktop(82540EM)

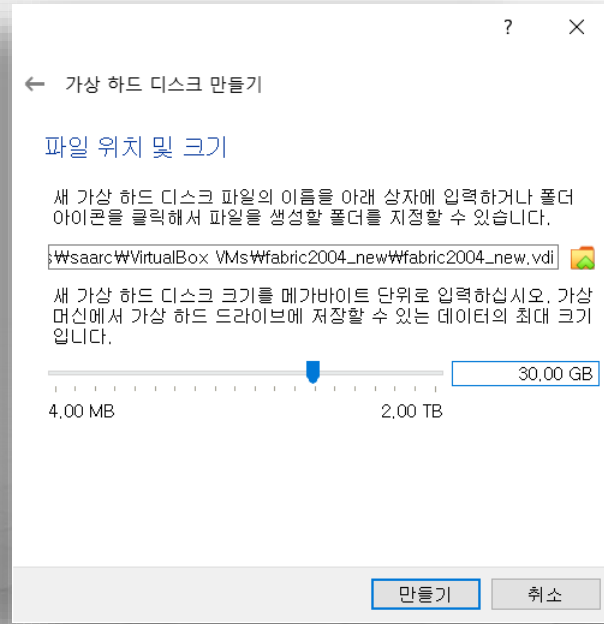
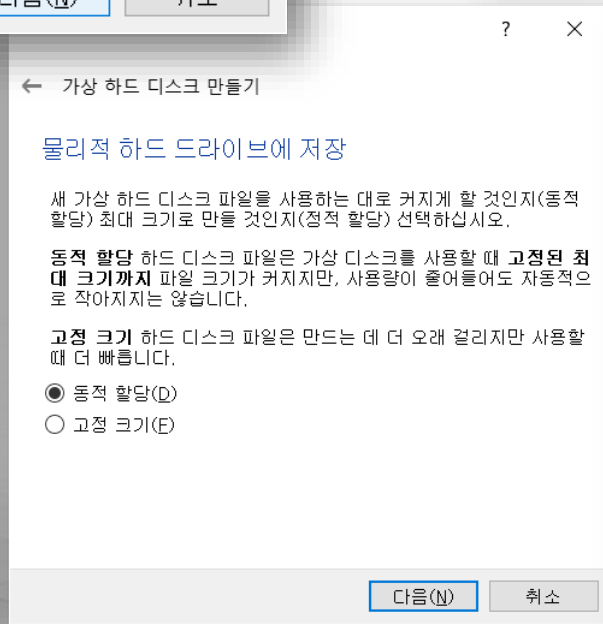
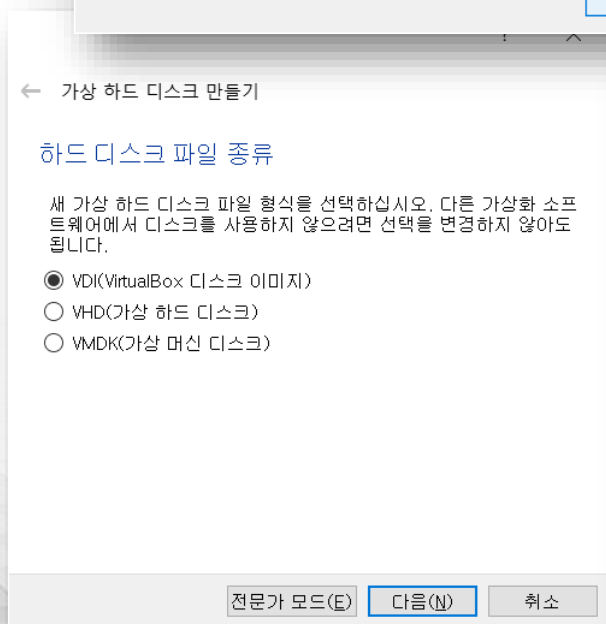
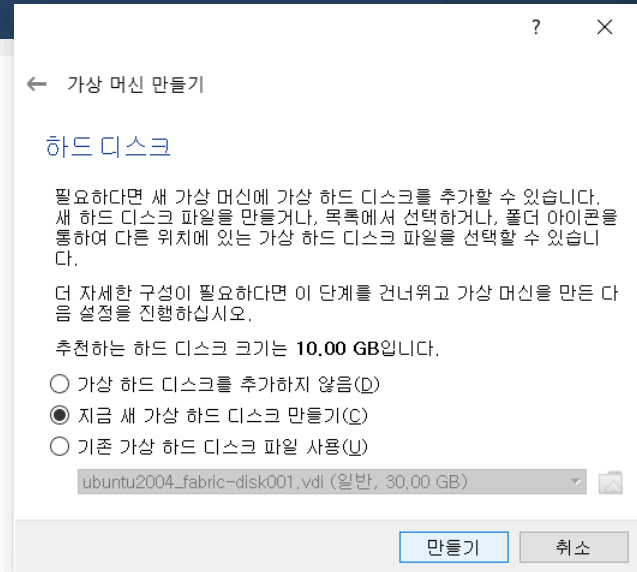
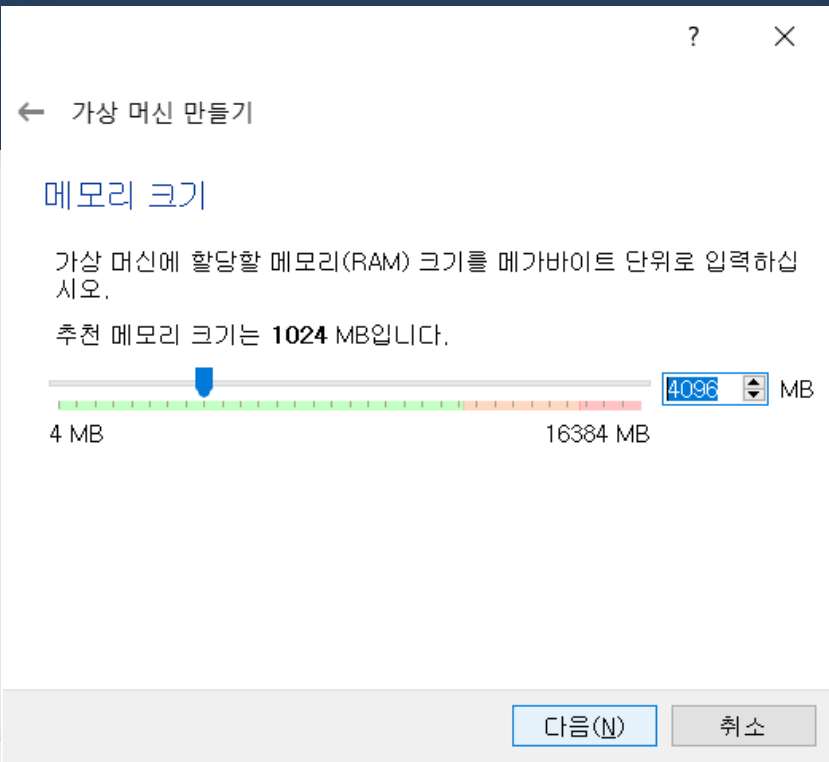
USB

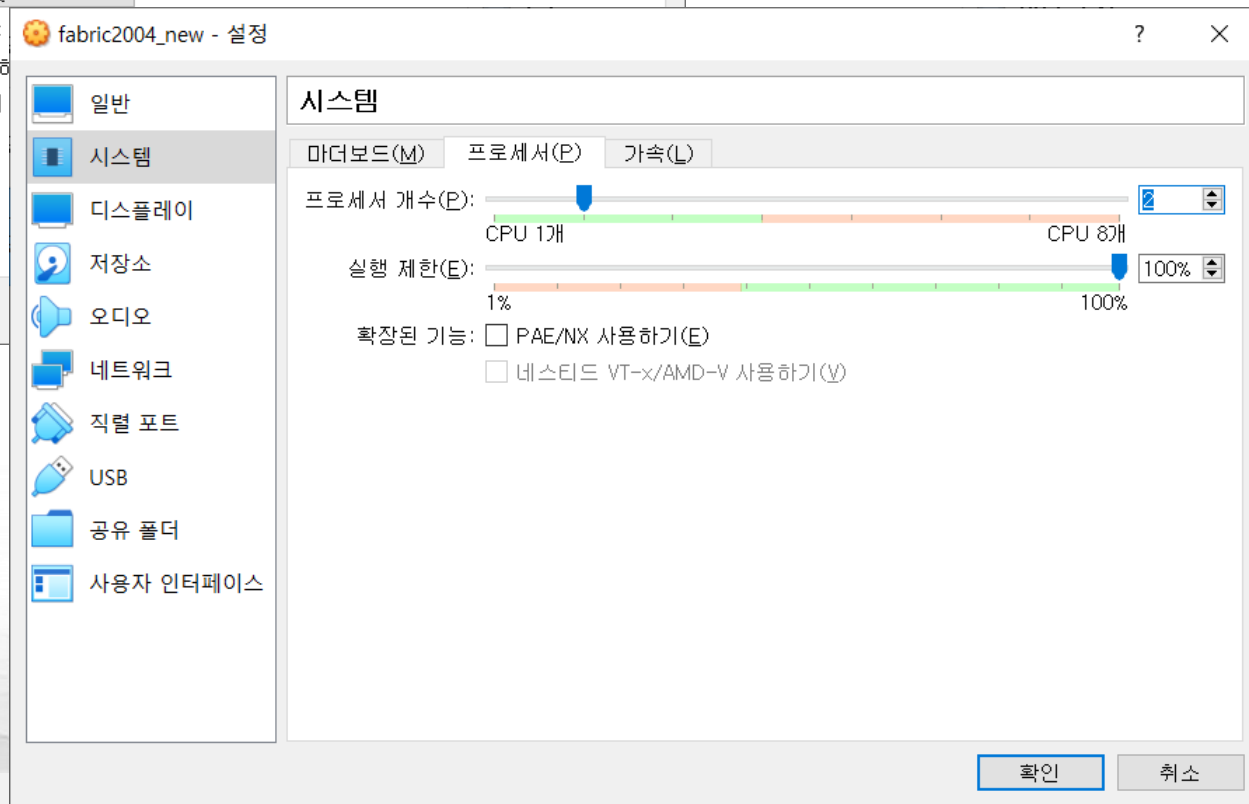
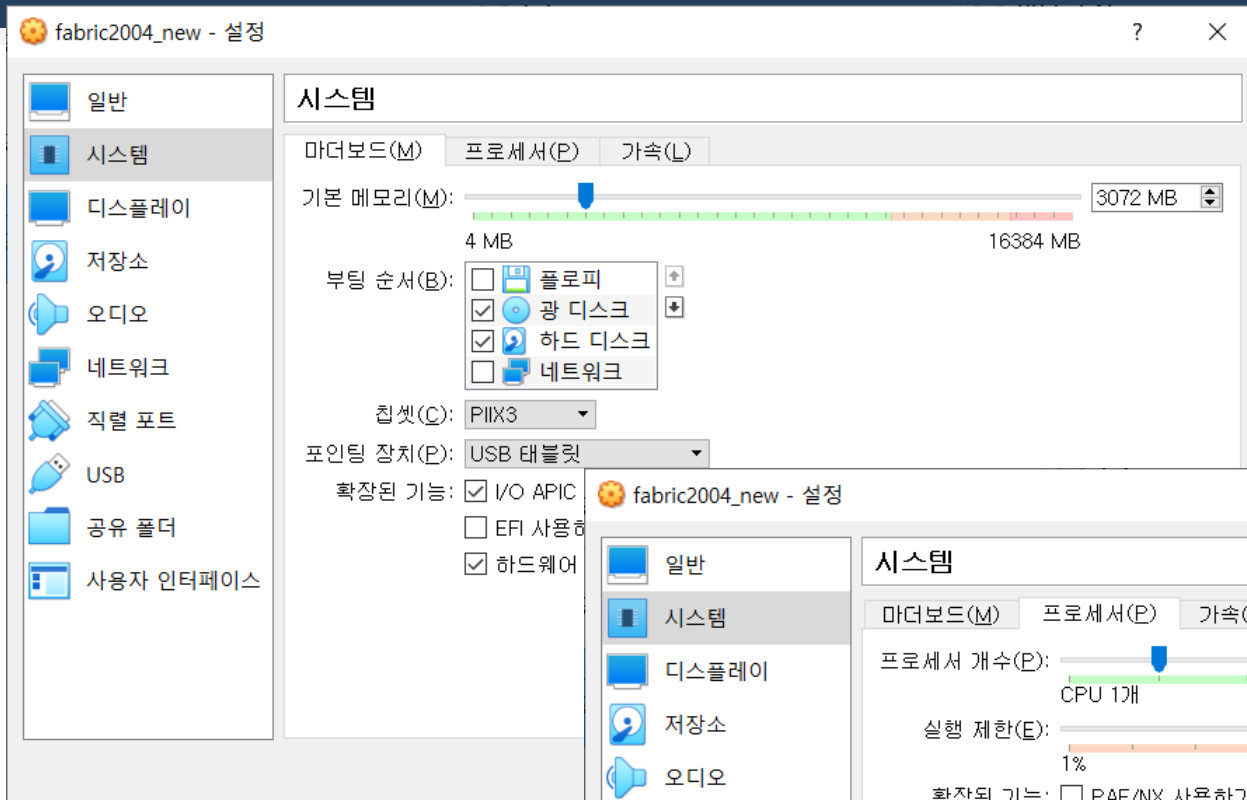
USB 컨트롤러: OHCI
장치 필터: 0(개 활성화됨)

공유 폴더

없음

설명





설치시작

Oracle VM VirtualBox 관리자

파일(F) 머신(M) 도움말(H)

도구

ubuntu2004_fabric 1.4 전원 꺼짐

ubuntu2004_fabric 2.2LTS 전원 꺼짐

fabric2004_new 전원 꺼짐

새로 만들기(N) 설정(S) 삭제 시작(T)

일반

이름: fabric2004_new
운영 체제: Ubuntu (64-bit)

시스템

기본 메모리: 4096 MB
프로세서: 3
부팅 순서: 플로피, 광 디스크, 하드 디스크
가속: VT-X/AMD-V, 네스티드 페이징, KVM 반가상화

미리 보기

fabric2004_new

디스플레이

비디오 메모리: 33 MB
그래픽 컨트롤러: VMSVGA
원격 데스크톱 서버: 사용 안 함
녹화: 사용 안 함

저장소

컨트롤러: IDE
IDE 세컨더리 마스터: [광학 드라이브] 비어 있음
컨트롤러: SATA
SATA 포트 0: fabric2004_new.vdi (일반, 30,00 GB)

오디오

호스트 드라이버: Windows DirectSound
컨트롤러: ICH AC97

네트워크

어댑터 1: Intel PRO/1000 MT Desktop(82540EM)

USB

USB 컨트롤러: OHCI
장치 필터: 0(0개 활성화됨)

공유 폴더

없음

설명

? X

← 시동 디스크 선택

새 가상 머신을 시작할 때 사용할 가상 광 디스크 파일이나 물리적 광학 드라이브를 선택하십시오.

디스크는 부팅 가능해야 하며, 필요한 경우 가상 머신에 운영 체제를 설치할 수 있는 상태여야 합니다. 가상 머신을 끝 때 자동으로 드라이브에서 꺼내지지만, 필요한 경우 장치 메뉴에서 직접 꺼낼 수 있습니다.

비어 있음

시작

취소

? X

← 시동 디스크 선택

새 가상 머신을 시작할 때 사용할 가상 광 디스크 파일이나 물리적 광학 드라이브를 선택하십시오.

디스크는 부팅 가능해야 하며, 필요한 경우 가상 머신에 운영 체제를 설치할 수 있는 상태여야 합니다. 가상 머신을 끝 때 자동으로 드라이브에서 꺼내지지만, 필요한 경우 장치 메뉴에서 직접 꺼낼 수 있습니다.

ubuntu-20.04.4-live-server-amd64.is

시작

취소

광학 디스크 선택기

미디어



추가(A)



만들기(C)



새로 고침

가상 광 디스크 파일을 선택하십시오

< > > 내 PC > 바탕 화면 > 파일공유

이름 가상 크기

구성 새 폴더



문서



사진



2_중급구직자



DoltNodeJs개정



강의교안



블록체인수업공

OneDrive

OneDrive

내 PC

3D 개체

다운로드

동영상

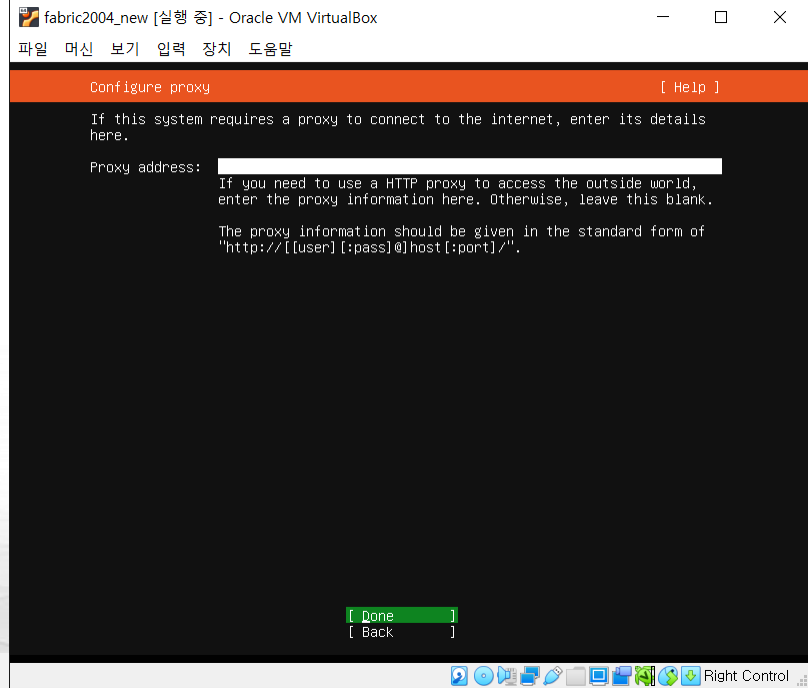
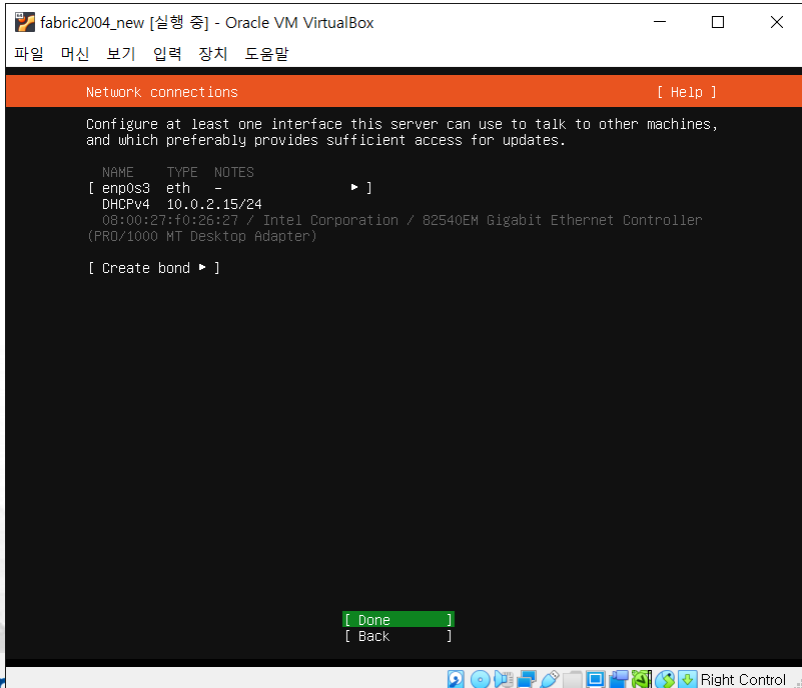
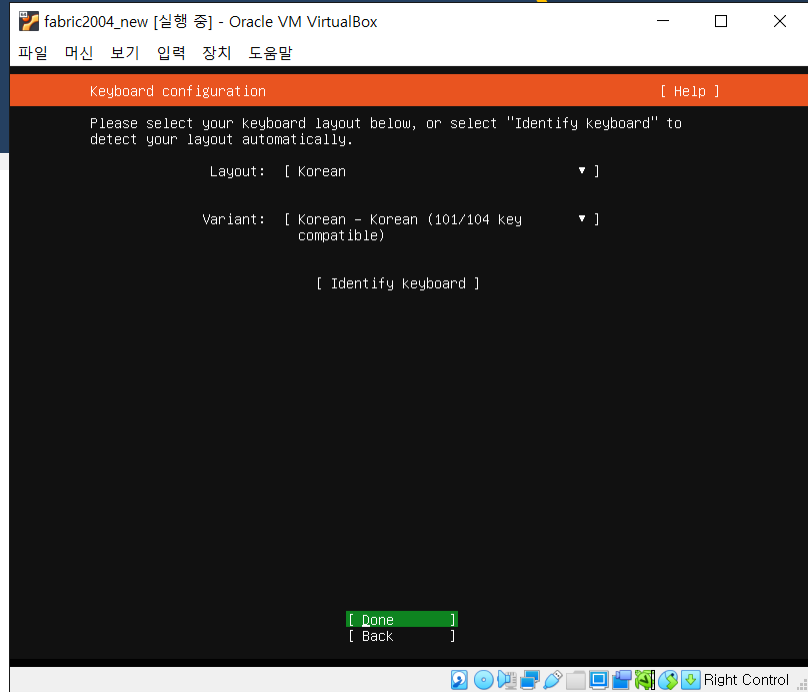
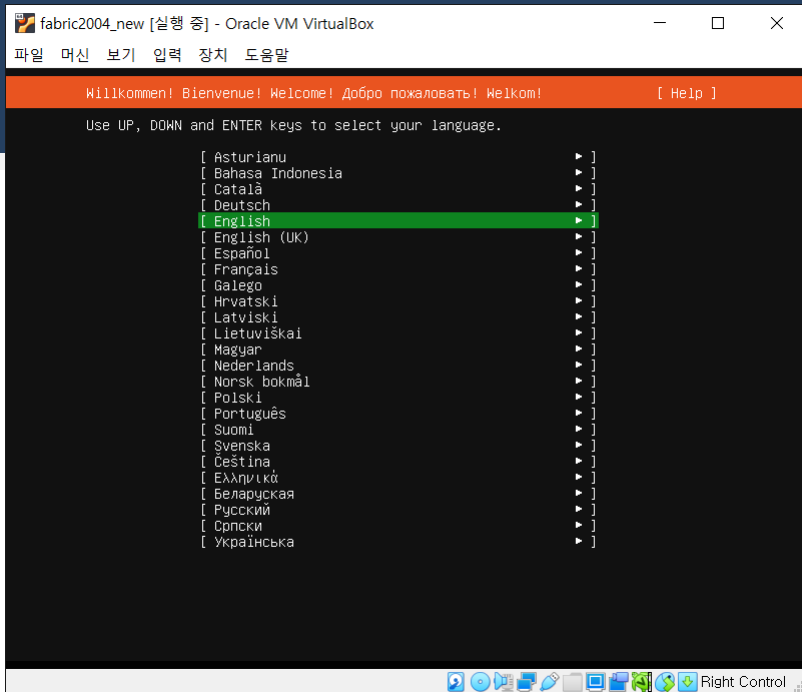
문서

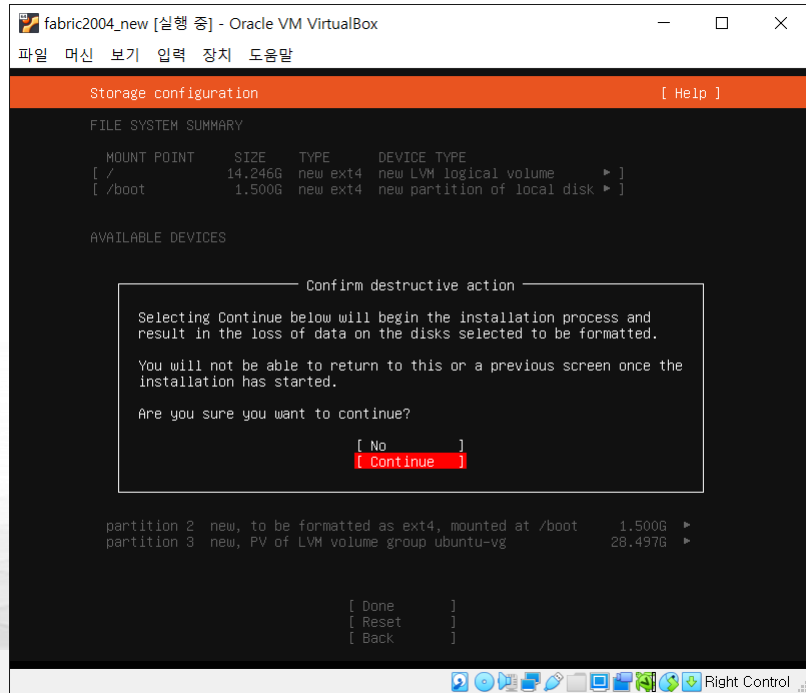
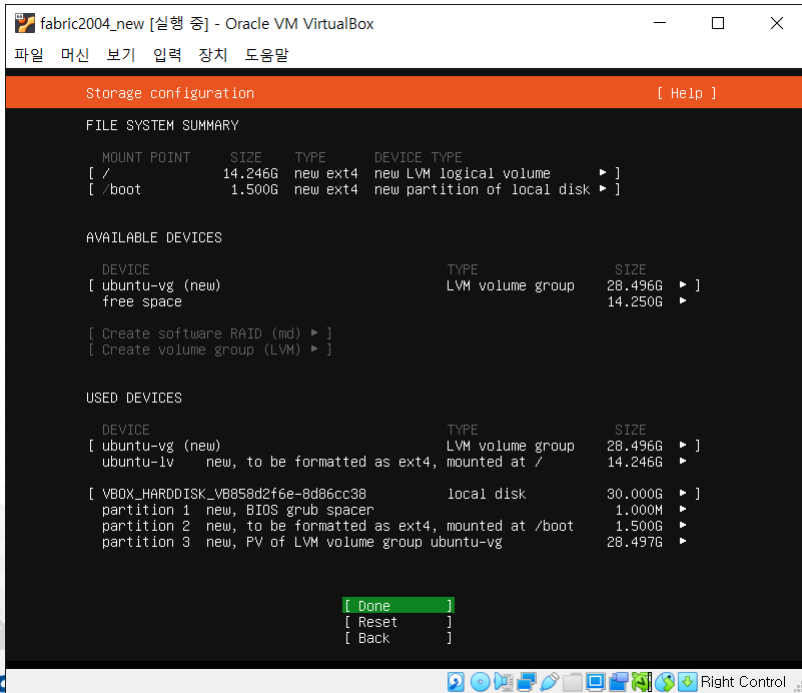
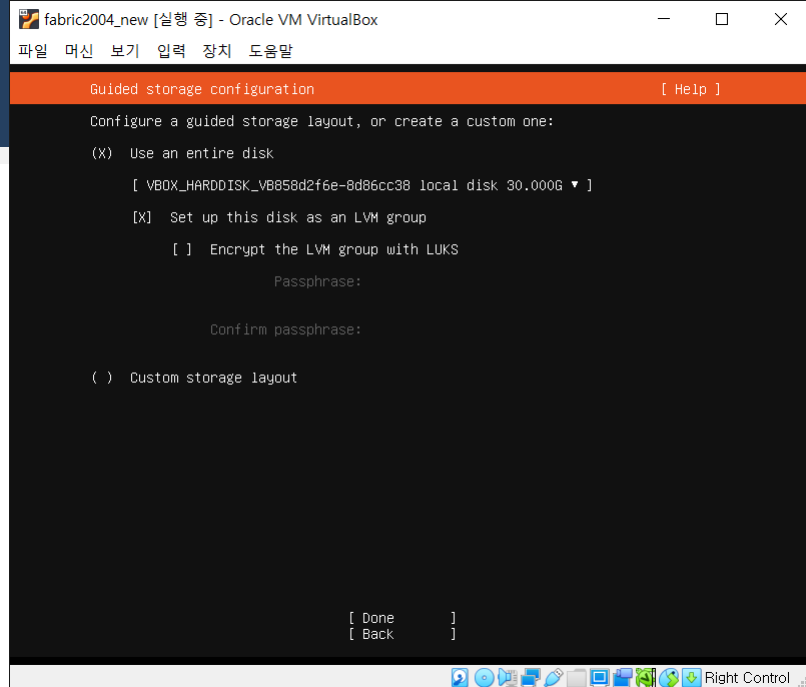
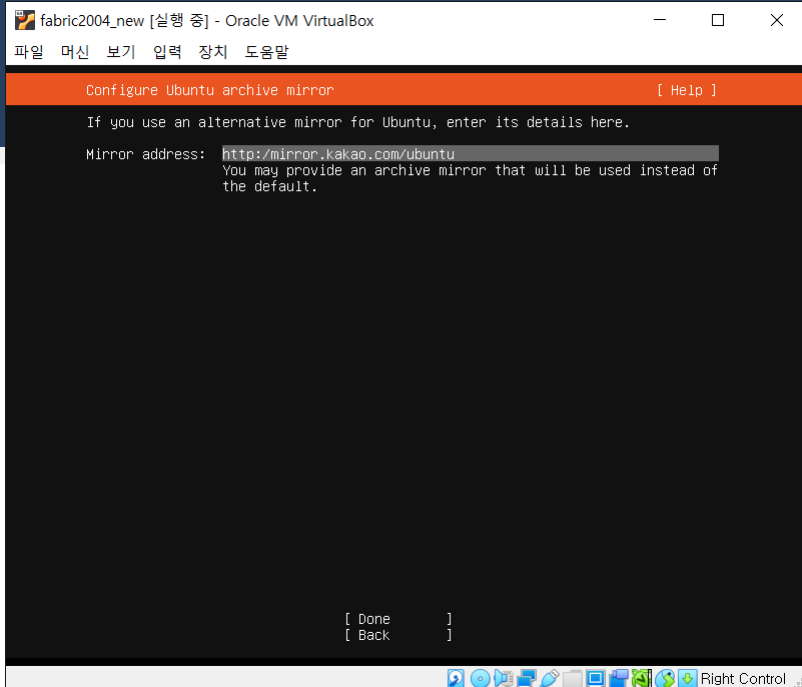
바탕 화면

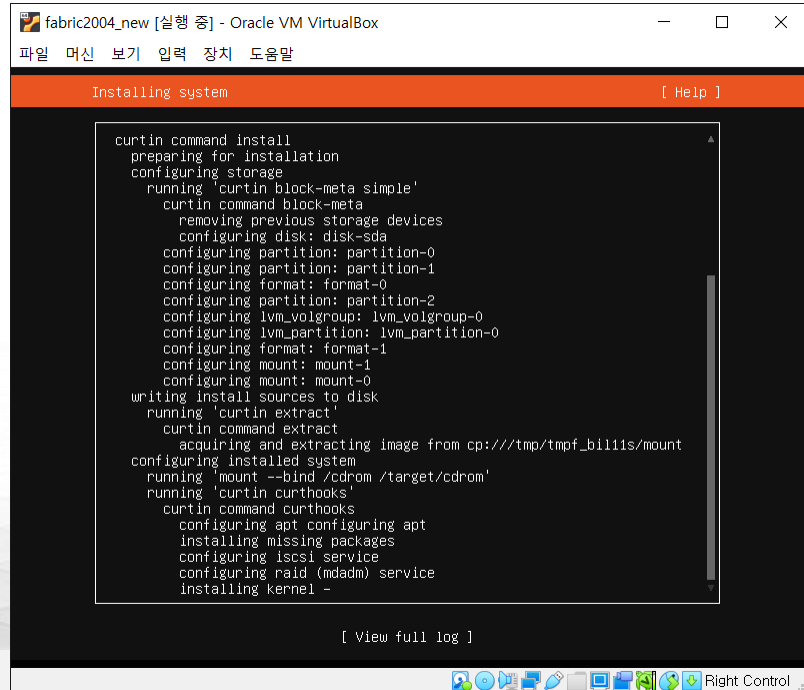
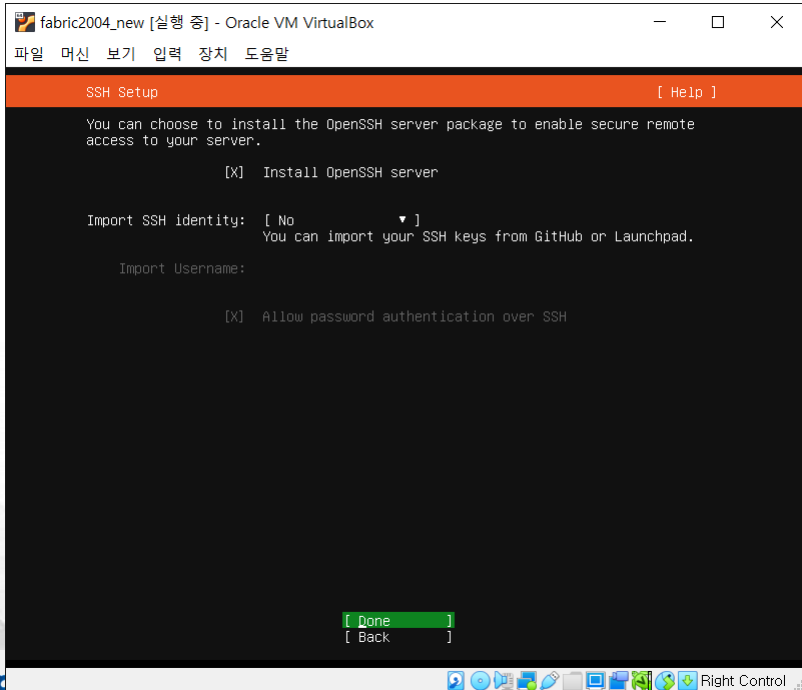
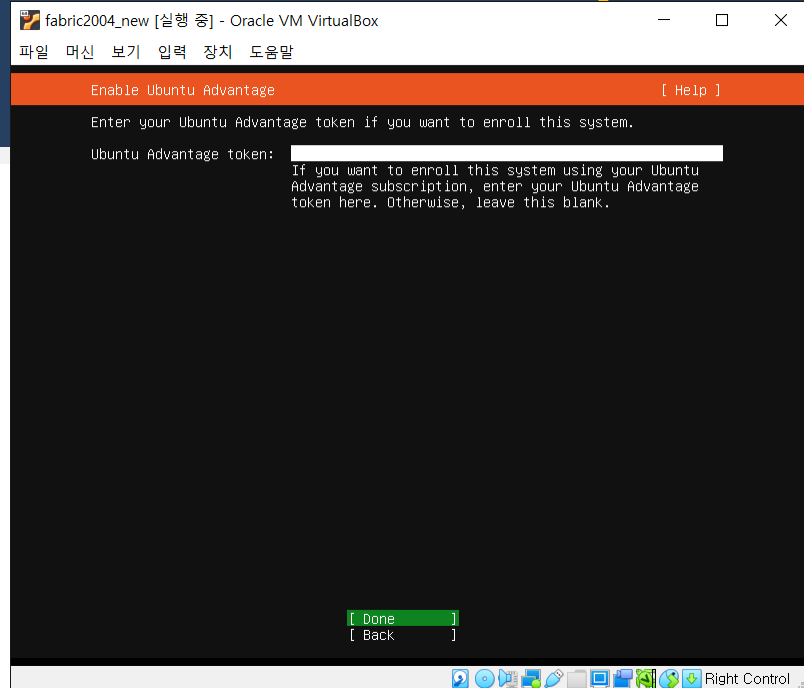
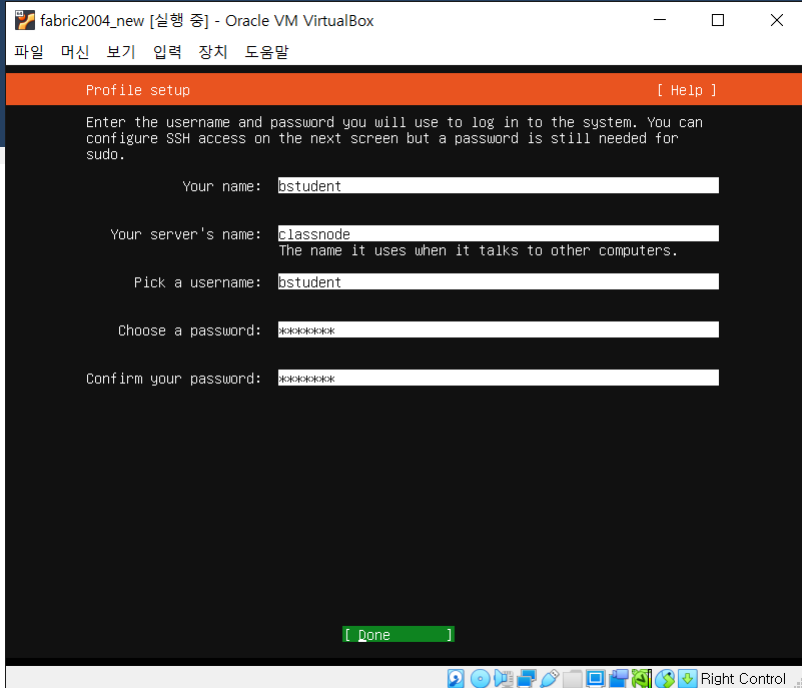
이름	수정된 날짜	유형
ubuntu-20.04.4-live-server-amd64	2022-03-22 오후 6:38	디스크

파일 이름(N): ubuntu-20.04.4-live-server-amd64

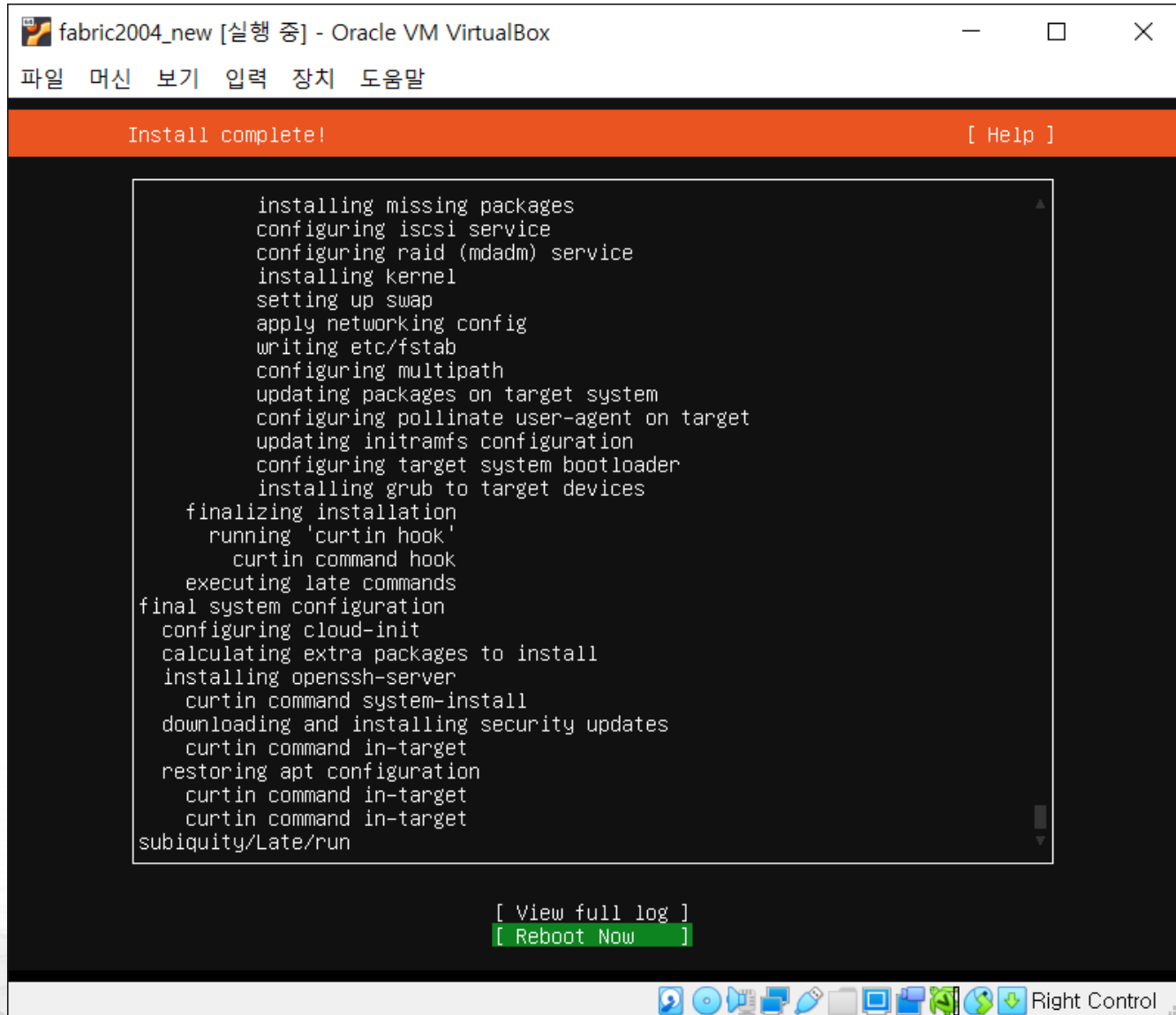
이름으로 검색







설치완료 리부팅



로그인

```
fabric2004_new [실행 중] - Oracle VM VirtualBox
파일  머신  보기  입력  장치  도움말

de (DSA)
<14>Mar 22 11:23:59 cloud-init: 256 SHA256:LzuE0qKpXumbTTi43ypPeKRiIQE2Lx7L9X6myVYD0i4 root@classnode
e (ECDSA)
<14>Mar 22 11:23:59 cloud-init: 256 SHA256:H6Zjc+J4DYGseB9a50Cqofr4bB0FgoIimsHILp/8GsQ root@classnode
e (ED25519)
<14>Mar 22 11:23:59 cloud-init: 3072 SHA256:WNEiq2BDmdfYt8G1nzQMqiEgE417PoaiJUB+sMXNJQg root@classnode
de (RSA)
<14>Mar 22 11:23:59 cloud-init: -----END SSH HOST KEY FINGERPRINTS-----
<14>Mar 22 11:23:59 cloud-init: #####
-----BEGIN SSH HOST KEY KEYS-----
ecdsa-sha2-nistp256 AAAAE2VjZHNhLXNoYTItbmlzdHAyNTYAAAAIbmlzdHAyNTYAAABBBMKAz44u+uqI65BqtVutQt+Vfd5o
3ehThMGH51cmhZpqu2IF26GTRXoa/OiYPwQWLashMJqciTQfV/JLiDoI4WQ= root@classnode
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAICBzH7Cm5UnOHBNAMwbeCPuykrVirY/dY0a2HgIXbIv0 root@classnode
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQGCpz5NBm8yMk2LAeL1KhDCQtrVDPj91UzZ8z5BBMankuTnUiQCpzHPompSY14z
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Bn1Dz2aPbkpScPmy+j/gkdpqZF+eZetDq6Q3RgqXJfzfSomx4A0= root@classnode
-----END SSH HOST KEY KEYS-----
[ 46.841328] cloud-init[1510]: Cloud-init v. 21.4-0ubuntu1~20.04.1 running 'modules:final' at Tue,
22 Mar 2022 11:23:59 +0000. Up 46.63 seconds.
[ 46.842831] cloud-init[1510]: ci-info: no authorized SSH keys fingerprints found for user bstuden
t.
[ 46.844303] cloud-init[1510]: Cloud-init v. 21.4-0ubuntu1~20.04.1 finished at Tue, 22 Mar 2022 11
:23:59 +0000. DataSource DataSourceNone. Up 46.83 seconds
[ 46.845841] cloud-init[1510]: 2022-03-22 11:23:59,925 - cc_final_message.py[WARNING]: Used fallback
datasource
[ OK ] Finished Execute cloud user/final scripts.
[ OK ] Reached target Cloud-init target.

classnode login:
classnode login:
classnode login:
classnode login:
classnode login: bstudent
Password: _
```


설치상세 - 리눅스 설치 이후

① Curl, docker, docker-compose
설치 (apt-get)

package manager

node version manager

② Node.js 설치 (nvm -> node v12)

tar 압축파일

③ Go언어 설치 (tar다운로드 -> 설정)

④ 파이썬, GIT설치 (ubuntu 기본설치)

OS 환경변수
~/.profile
GOPATH 생성
PATH 추가

⑤ fabric-samples 설치 (튜토리얼 설치법)
docker 이미지 설치, 바이너리설치

유틸리티 설치

- ❖ curl, jq, tree, vim 설치
- ❖ build-essential, software-properties-common, libssl-dev 설치
- ❖ docker, docker-compose 설치
- ❖ go 설치
- ❖ node 설치
- ❖ 설치
- ❖ git, python 설치확인
- ❖ ssh 데몬 상태확인

Curl, docker설치

📦 apt 서버 패키지 업데이트 목록 작성

- ❑ `sudo apt update`

📦 curl 외 설치

- ❑ `sudo apt install curl jq tree vim - y`
- ❑ `sudo apt install build-essential software-properties-common libssl-dev -y`

📦 docker 설치

- ❑ `sudo apt install docker.io docker-compose software-properties-common -y`

📦 현재 접속중인 사용자에게 권한주기

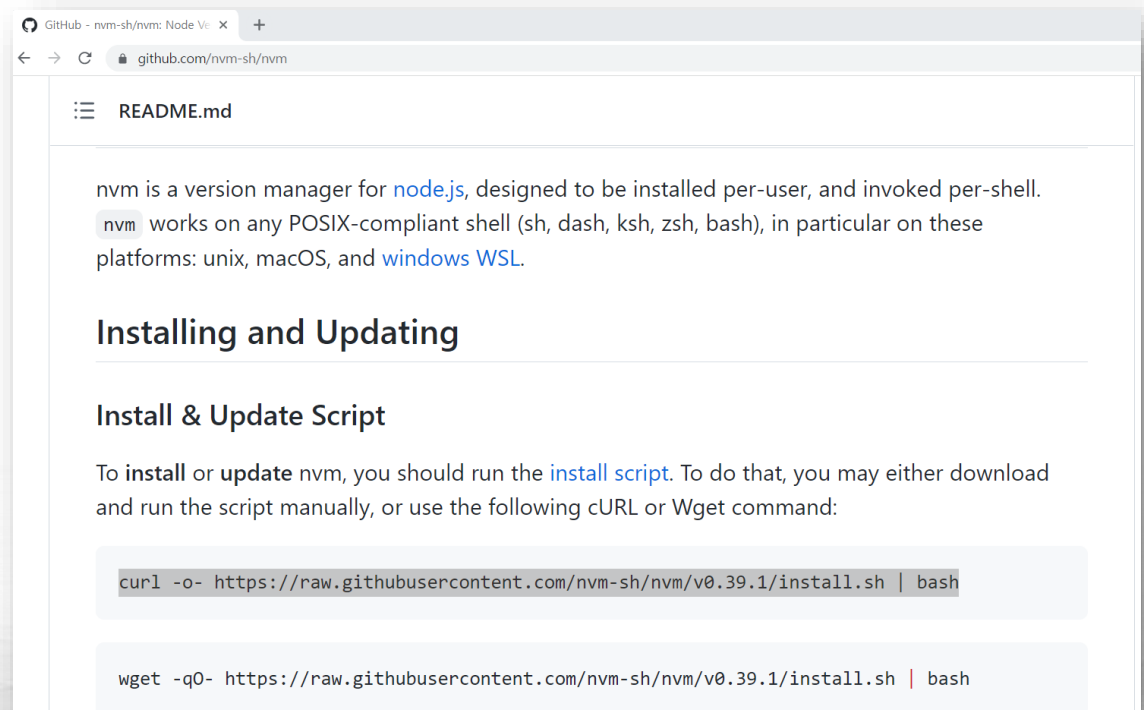
- ❑ `sudo usermod -aG docker $USER`

📦 리부팅

- ❑ `sudo reboot`

Node.js 설치

- ❑ `curl -o- https://raw.githubusercontent.com/nvm-sh/nvm/v0.39.1/install.sh | bash`
- ❑ `source ~/.profile`
- ❑ `nvm install v14`



<https://github.com/nvm-sh/nvm>

GO 언어 설치

- ❑ `curl -OL https://go.dev/dl/go1.15.15.linux-amd64.tar.gz`
- ❑ `tar -xvf go1.15.15.linux-amd64.tar.gz`
- ❑ `sudo mv go /usr/local`
- ❑ `vi ~/.bashrc`
 - `export GOPATH=$HOME/go`
 - `export PATH=$PATH:/usr/local/go/bin:$GOPATH/bin`
- ❑ `source ~/.bashrc`

https://go.dev/dl/

Downloads - The Go Program... x +

go.dev/dl/

go1.16.5 ▾

go1.16.4 ▾

go1.16.3 ▾

go1.16.2 ▾

go1.16.1 ▾

go1.16 ▾

go1.15.15 ▾

File name	Kind	OS	Arch	Size	SHA256 Checksum
go1.15.15.src.tar.gz	Source			22MB	0662ae3813330280d5f1a97a2ee23bbdbe3a5a7cfa6001b24a9873a19
go1.15.15.darwin-amd64.tar.gz	Archive	macOS	x86-64	117MB	2f4c119524450ee94062a1ce7112fb88ce0fe4bb0303a302e002183a550c25c2
go1.15.15.darwin-amd64.pkg	Installer	macOS	x86-64	117MB	f0e1877902ca88001cb768ae0dd8e974e58084ea6e64fb13f46289f84
go1.15.15.freebsd-386.tar.gz	Archive	FreeBSD	x86	96MB	7174078a53e330cf351dc20bed6682033f44066d8aed754139bcae152e53c214
go1.15.15.freebsd-amd64.tar.gz	Archive	FreeBSD	x86-64	115MB	1f80a20419e2618182e15b9615dd990b32b952d81b354b373c6fd304527bb70c
go1.15.15.linux-386.tar.gz	Archive	Linux	x86	96MB	33101b0e48b0907bb52016e3c5dc1f63cc0913b92a76456112980d0eb13b77d4
go1.15.15.linux-amd64.tar.gz	Archive	Linux	x86-64	115MB	0885cf046a9f099e260d98d9ec5d19ea9328f34c8dc4956e1d3cd87da
go1.15.15.linux-arm64.tar.gz	Archive	Linux	ARM64	93MB	714abb01af210473dd5af331094ad6847162ef181a7fc7241d2415a85496c9fa
go1.15.15.linux-armv6l.tar.gz	Archive	Linux	ARMv6	93MB	7192603af50afb23c9d8cd14d2b2c19e095a34d3eca695fa098d17893000d19
go1.15.15.linux-ppc64le.tar.gz	Archive	Linux	ppc64le	92MB	37f3b99e21d0324a5583159e14e42e57e56561abb17bf68bef3d8f57b29e39c0
go1.15.15.linux-s390x.tar.gz	Archive	Linux	s390x	97MB	eeae39d97d15b758536d5427be0b083dbf9d49007b302825ac6c8645de039aabb
go1.15.15.windows-386.zip	Archive	Windows	x86	113MB	4036abdeb36c7db380d0513f1d087b754c34d106b202ae381da77f4c5a44aa58
go1.15.15.windows-386.msi	Installer	Windows	x86	99MB	04d406e45da74f67151ca9b720899d18a8707d77e83107ba11f9e099ced31f1f1
go1.15.15.windows-amd64.zip	Archive	Windows	x86-64	133MB	7d17b1948dccc8ec0a3902e3301d17cbb5c2ebb01297d686ee2302e41f4ac6e10
go1.15.15.windows-amd64.msi	Installer	Windows	x86-64	115MB	c76656a253cc4c7a0ba7ae006cadcd0b12d6d17066acbb8df84460eac94

go1.15.14 ▾

go1.15.13 ▾

go1.15.12 ▾

하이퍼레저 패브릭 설치

2.2 LTS

- ▣ `curl -sSL https://bit.ly/2ysbOFE | bash -s -- 2.2.5 1.5.2`

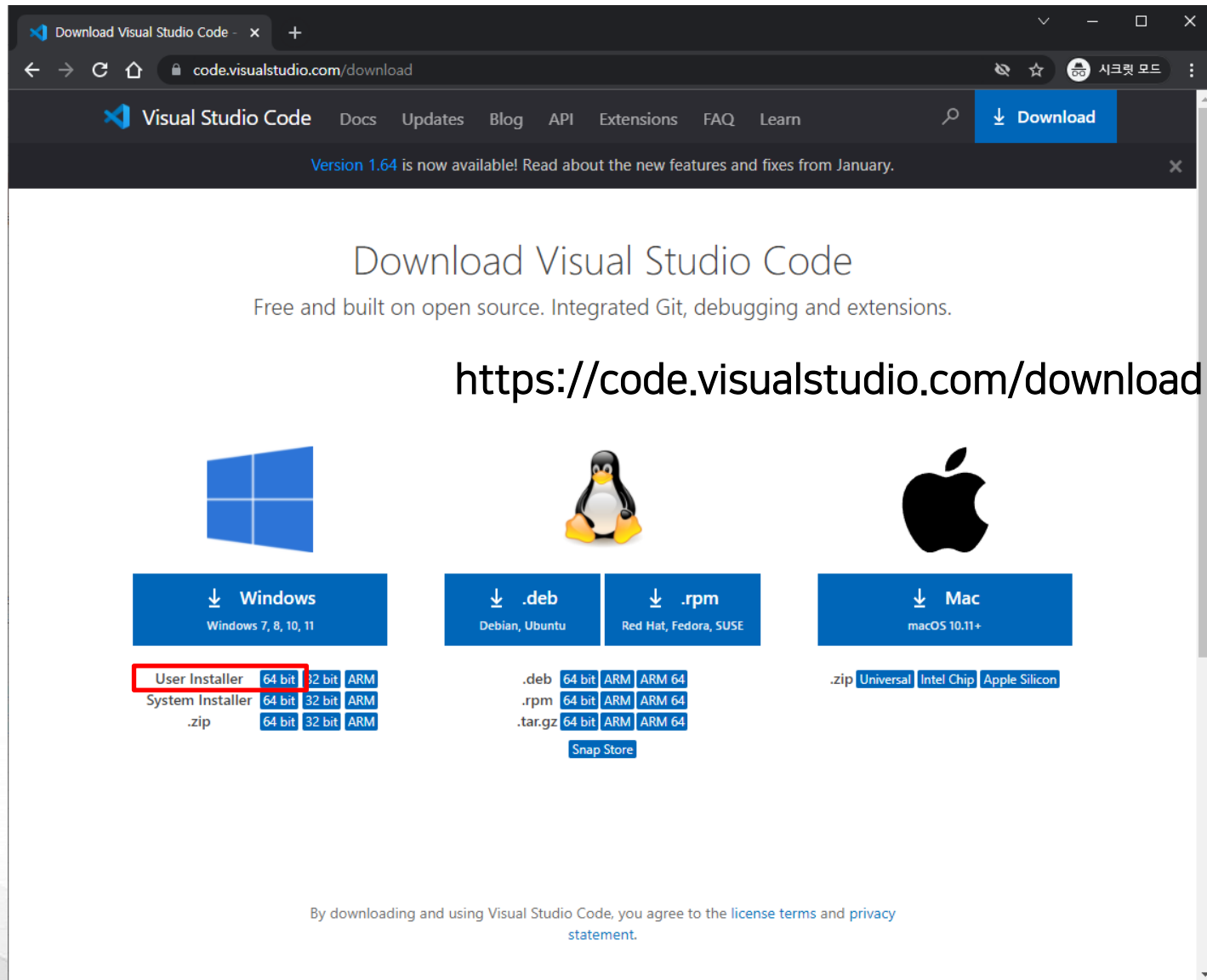
1.4 LTS

- ▣ `curl -sSL http://bit.ly/2ysbOFE | bash -s -- 1.4.12 1.4.9 0.4.22`

<https://hyperledger-fabric.readthedocs.io/en/release-1.4/install.html>

<https://hyperledger-fabric.readthedocs.io/en/release-2.2/install.html>

Visual studio code 설치



The screenshot shows the Visual Studio Code download page in a web browser. The browser's address bar displays `code.visualstudio.com/download`. The page header includes the Visual Studio Code logo and navigation links: Docs, Updates, Blog, API, Extensions, FAQ, and Learn. A prominent blue 'Download' button is located in the top right. Below the header, a banner announces 'Version 1.64 is now available!'. The main heading 'Download Visual Studio Code' is followed by the tagline 'Free and built on open source. Integrated Git, debugging and extensions.' The URL `https://code.visualstudio.com/download` is displayed in large text. The page is organized into three columns for different operating systems: Windows, Linux, and Mac. Each column features a platform icon and a blue download button. Under the Windows button, there are links for 'User Installer' and 'System Installer', each with sub-links for '64 bit', '32 bit', and 'ARM'. The Linux section provides buttons for '.deb' (Debian, Ubuntu) and '.rpm' (Red Hat, Fedora, SUSE), with sub-links for '64 bit', 'ARM', and 'ARM 64'. A 'Snap Store' link is also present. The Mac section includes a button for '.zip' with sub-links for 'Universal', 'Intel Chip', and 'Apple Silicon'. At the bottom, a disclaimer states: 'By downloading and using Visual Studio Code, you agree to the [license terms](#) and [privacy statement](#).'

Download Visual Studio Code

Free and built on open source. Integrated Git, debugging and extensions.

<https://code.visualstudio.com/download>

Windows
Windows 7, 8, 10, 11

User Installer 64 bit 32 bit ARM
System Installer 64 bit 32 bit ARM
.zip 64 bit 32 bit ARM

.deb
Debian, Ubuntu

.rpm
Red Hat, Fedora, SUSE

.deb 64 bit ARM ARM 64
.rpm 64 bit ARM ARM 64
.tar.gz 64 bit ARM ARM 64
Snap Store

Mac
macOS 10.11+

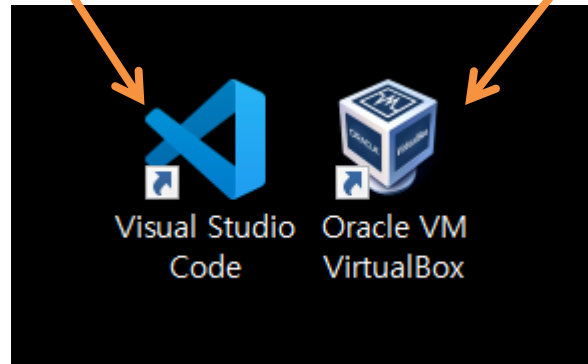
.zip Universal Intel Chip Apple Silicon

By downloading and using Visual Studio Code, you agree to the [license terms](#) and [privacy statement](#).

환경설정

2. 리눅스에 접근하여 개발하는
환경 설정

1. 패브릭이 설치된 리눅스
가상환경 가져오기

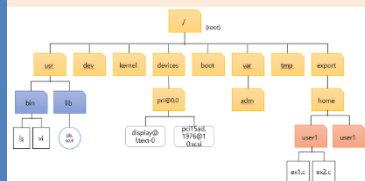


개발환경 시스템 구조



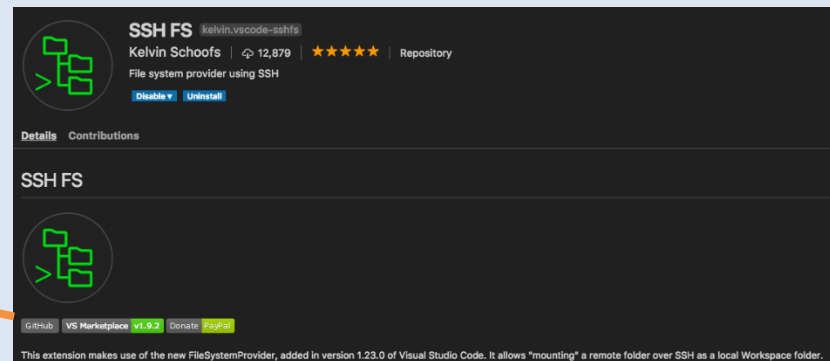
Virtual box 가상 OS
IP: 10.0.2.15

리눅스 디렉토리



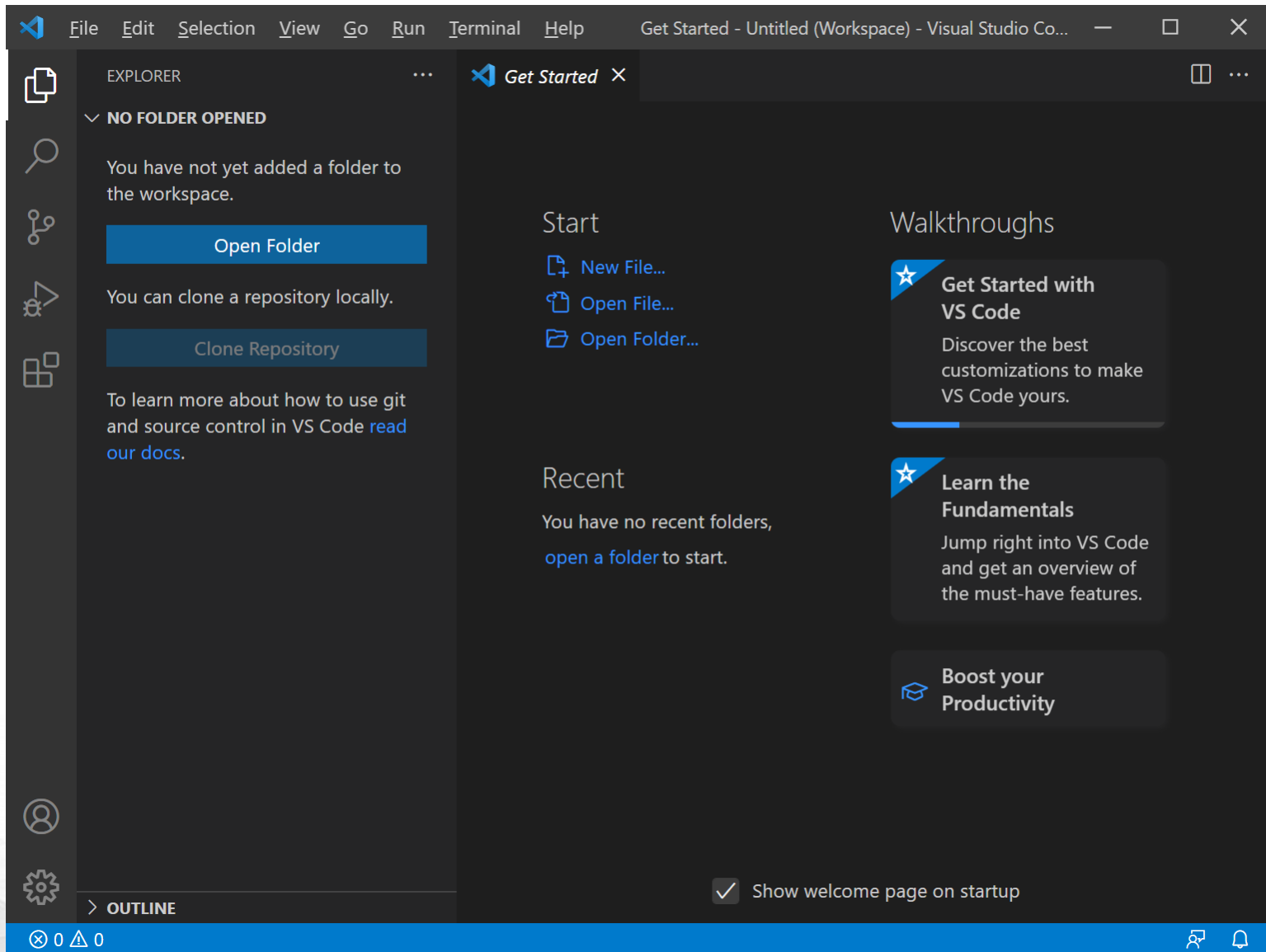
SSH 프로토콜로 외부접근

비주얼 스튜디오 코드 + ssh fs 확장기능

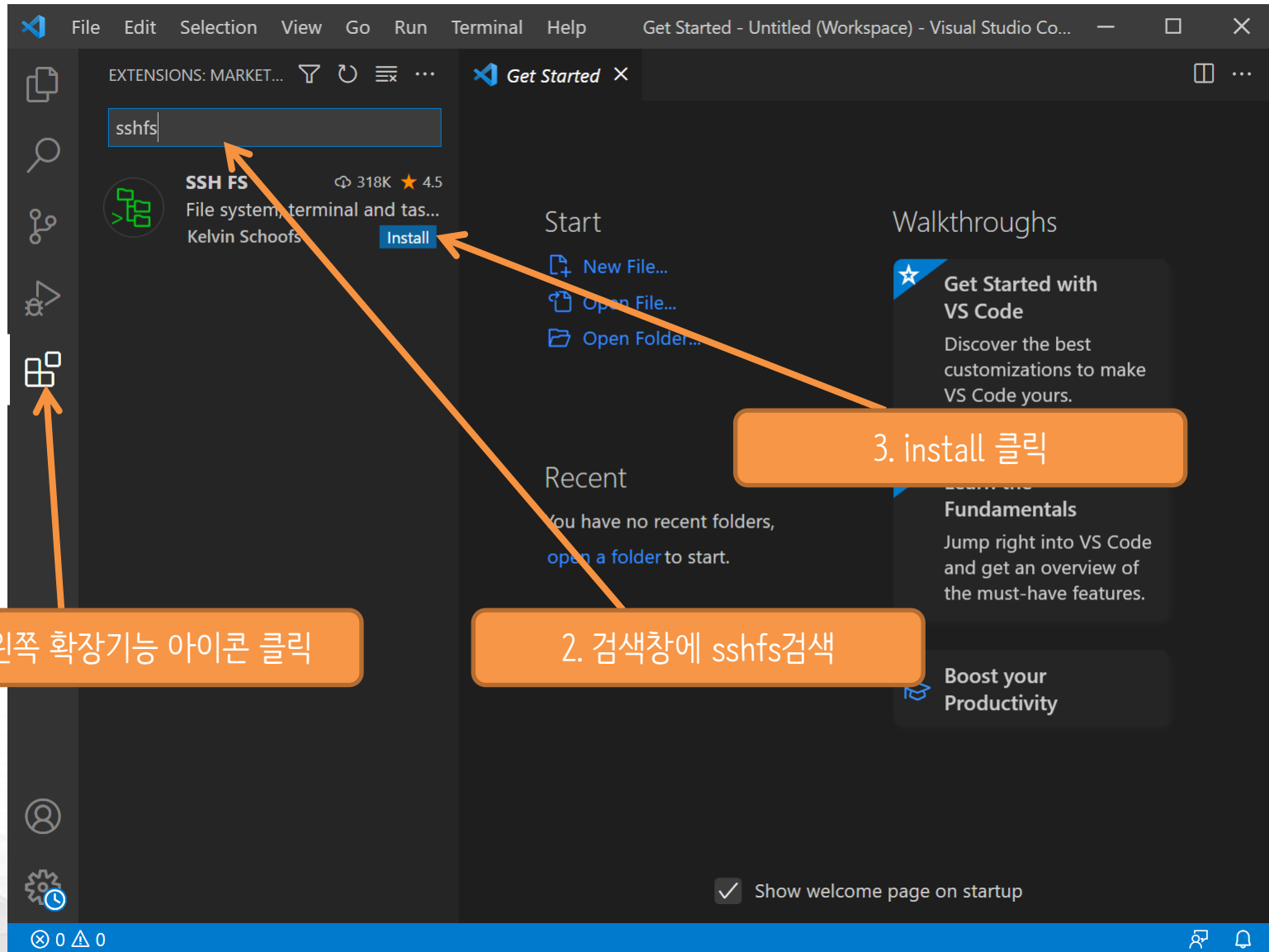


개발자 HOST 운영체제 환경 (보통 윈도우나 맥os)
IP: 192.168.0.12

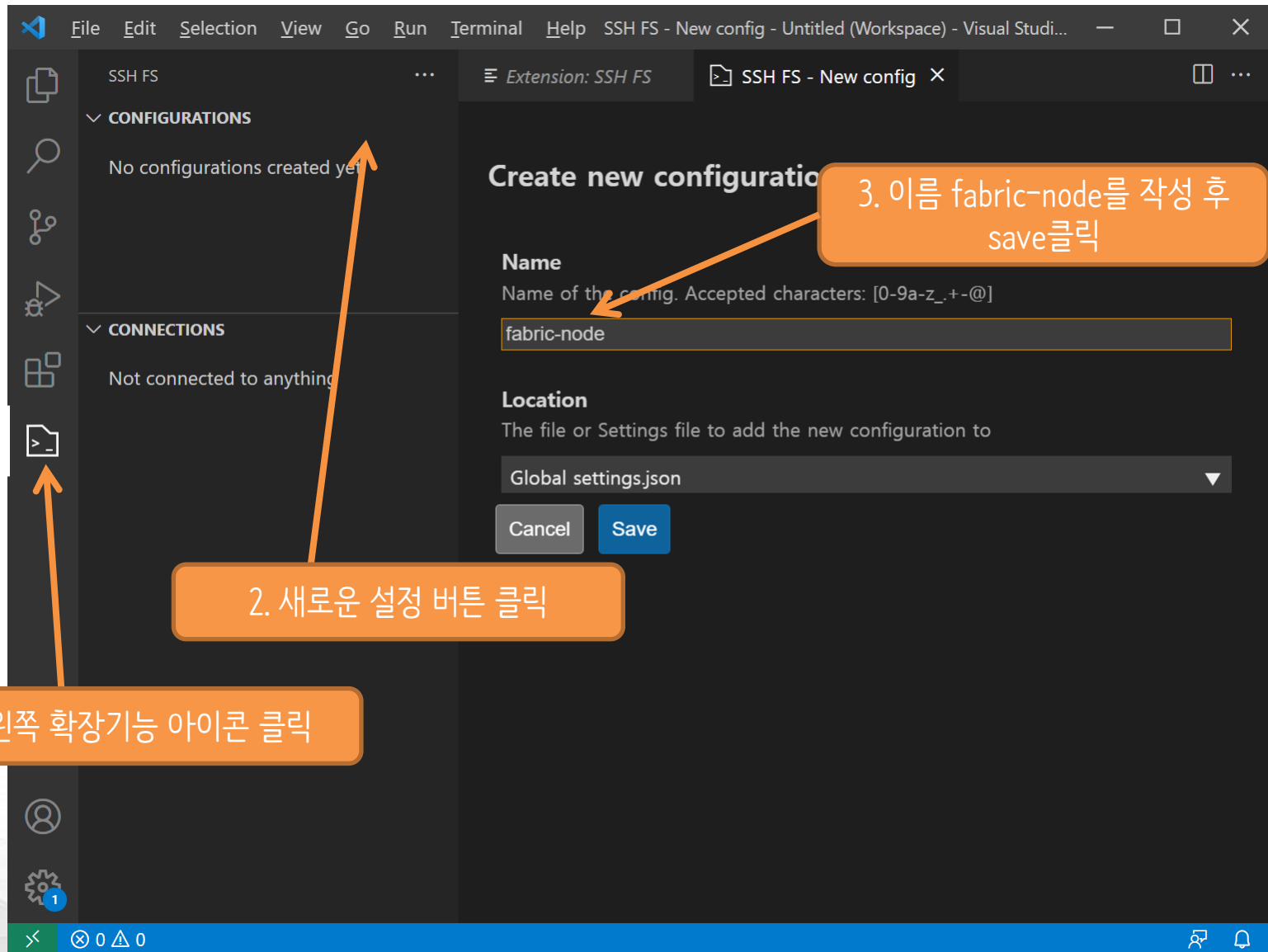
비주얼 스튜디오 코드 설정하기



비주얼 스튜디오 코드 설정하기



비주얼 스튜디오 코드 설정하기



비주얼 스튜디오 코드 설정하기

The screenshot shows the Visual Studio Code interface with the SSH FS configuration window open. The left sidebar shows the 'SSH FS' extension under 'CONFIGURATIONS' and 'CONNECTIONS'. The main panel displays the configuration settings for the SSH FS extension, including 'SFTP Sudo', 'Terminal command', 'Task command', and 'Proxy'. An orange callout box is overlaid on the left side of the window, containing text in Korean that instructs the user to enter the configuration items and click 'save' after completion.

SSH FS

Extension: SSH FS

SSH FS - Edit config

CONFIGURATIONS

fabric-node

CONNECTIONS

Not connected to anything

SFTP Sudo Optional
Whether to use a sudo shell (and for which user) to run the sftpCommand in (if present, gets passed as -u to sudo)

Terminal command Optional
The command(s) to run when a new SSH terminal gets created. Defaults to '\$SHELL'. Internally the command 'cd ...' is run first

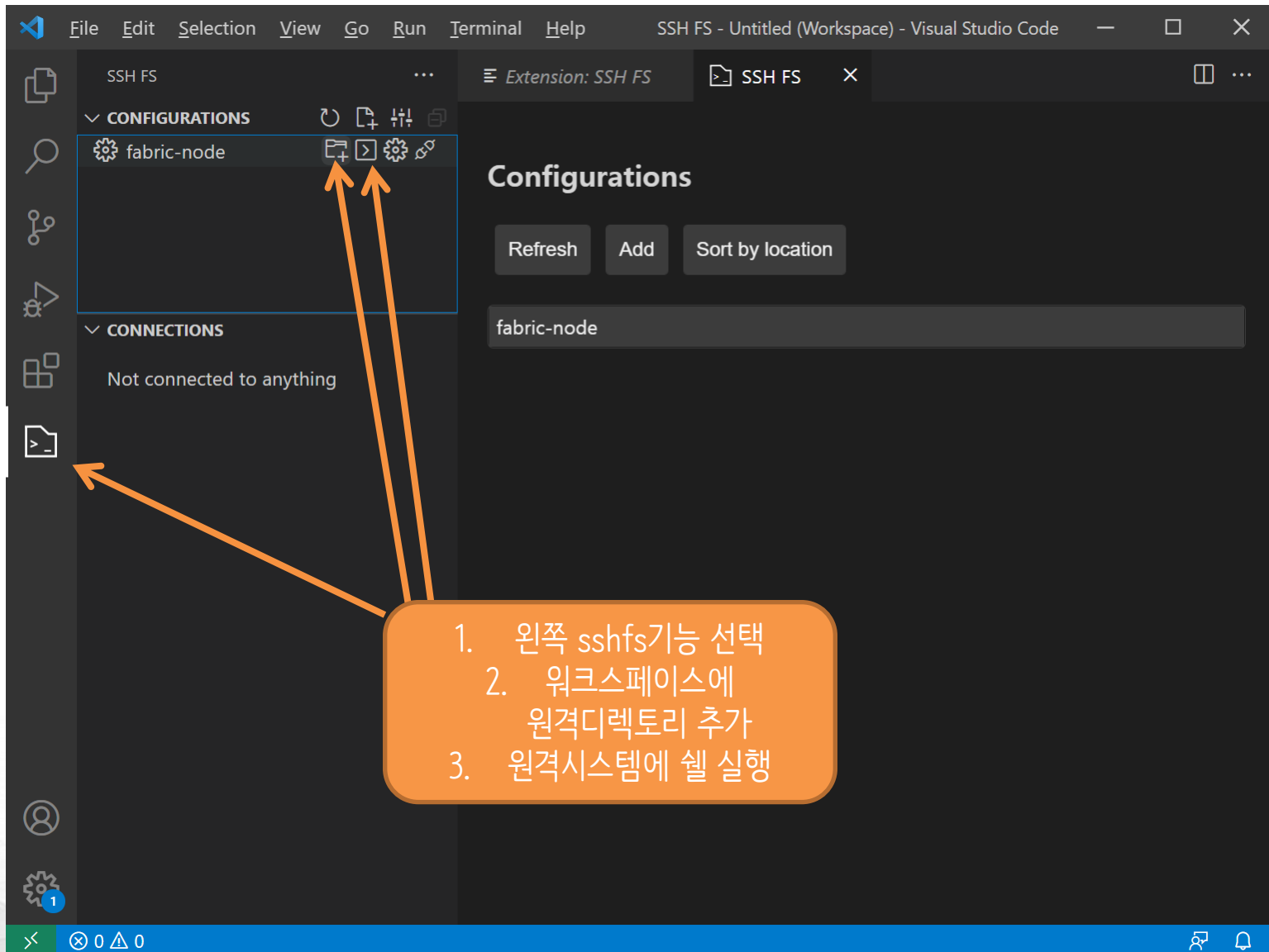
Task command Optional
The command(s) to run when a 'ssh-shell' task gets run. Defaults to the placeholder '\$COMMAND'. Internally the command 'cd ...' is run first

Proxy Optional
The type of proxy to use when connecting to the remote system

Cancel Delete Save

설정 항목 작성
host: localhost
root: /home/bstudent
username: bstudent
password: sys1234
작성 후 save 클릭

비주얼 스튜디오 코드 설정하기



비주얼 스튜디오 코드 설정하기

