



정보보호 Introduction

컴퓨터공학과 장대희



경희대학교
KYUNG HEE UNIVERSITY



PWNJAB
@KYUNGHEE UNIVERSITY

개요

❖ 수업목표

- 정보보호에 관한 다양한 이슈 파악
- 네트워크/암호/웹해킹 등 정보보호 핵심기술 파악
- 실습 병행을 통한 실무적 역량 강화
- 공격자 관점의 기술 학습

❖ 최소 요건

- Linux 기본사용법
- C/Python 기본 코딩능력
- OS/네트워크 기초지식

수업목차 (예상. 변동가능)

수업주차	수업내용	비고
1주차	수업 Introduction	
2주차	TCP/IP 및 네트워크 기초	
3주차	TCP/IP 및 네트워크 기초	
4주차	인터넷 프로토콜과 웹보안	Http실습
5주차	인터넷 프로토콜과 웹보안	Http실습
6주차	정보보호를 위한 암호응용	Crypto실습
7주차	정보보호를 위한 암호응용	Crypto실습
8주차	중간고사	
9주차	악성코드와 해킹	과제공지(학습보고서)
10주차	다양한 웹해킹 기법들	SQLi실습
11주차	다양한 웹해킹 기법들	SQLi실습
12주차	RF 통신 해킹과 SDR	RF 실습
13주차	RF 통신 해킹과 SDR	RF 실습
14주차	무인이동체 및 하드웨어 해킹	
15주차	기말고사	

운영방식

❖실습병행

- 실습용 노트북 지참요망 (Windows 노트북 권장)

❖성적산정 방식

- 출석 10%
- 과제제출 (학기중 학습보고서 1회 제출) 10%
- 중간고사 (필기시험이나 실습을 잘 하면 유리) 40%
- 기말고사 (필기시험이나 실습을 잘 하면 유리) 40%

실습SW 요구사항

❖ 실습 환경: Windows & Linux

- Windows 와 Linux (Ubuntu) 를 모두 활용 예정
- 권장 사항: Windows PC 위에 Vmware를 이용한 Linux 이용
- M1 M2 계열의 애플 맥북 사용시 프로그램 호환문제 등 다소 불편할 수 있음
 - ✓ 실습 진행에 큰 문제는 없으나, 초보라면 번거로울 가능성 있음
 - ✓ Intel/AMD CPU 계열 실습노트북 준비 권장

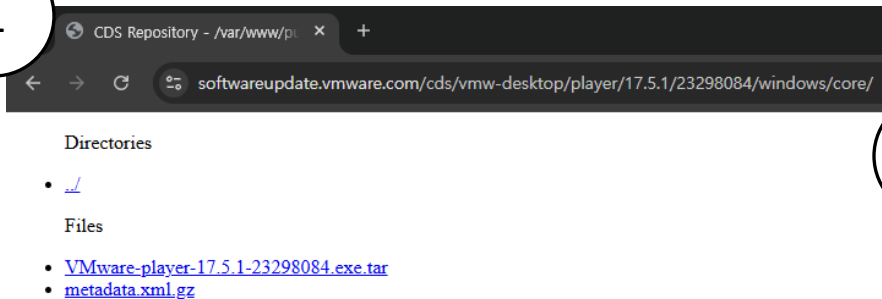
실습SW 요구사항

❖ VMWarePlayer 설치

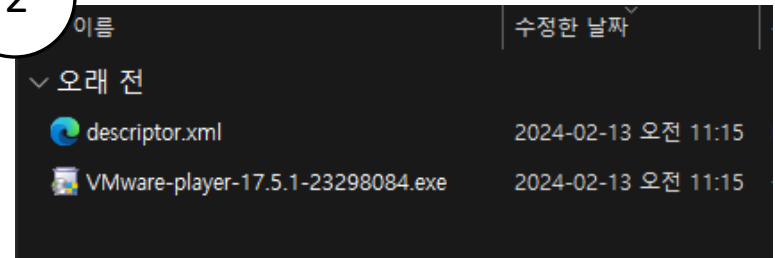
[VMware Windows Download](#)

[VMware Linux Download](#)

1



2

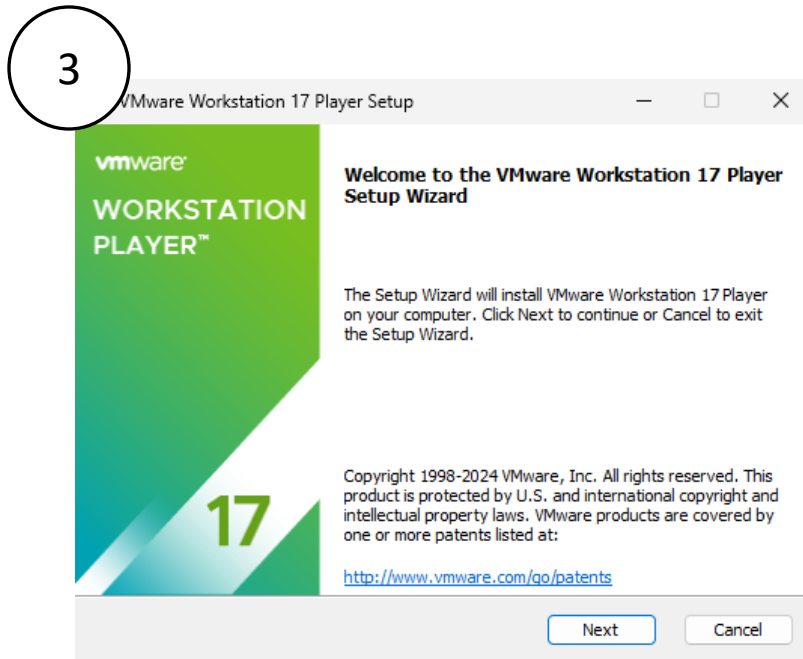


os에 맞게 다운로드 및 압축 해제

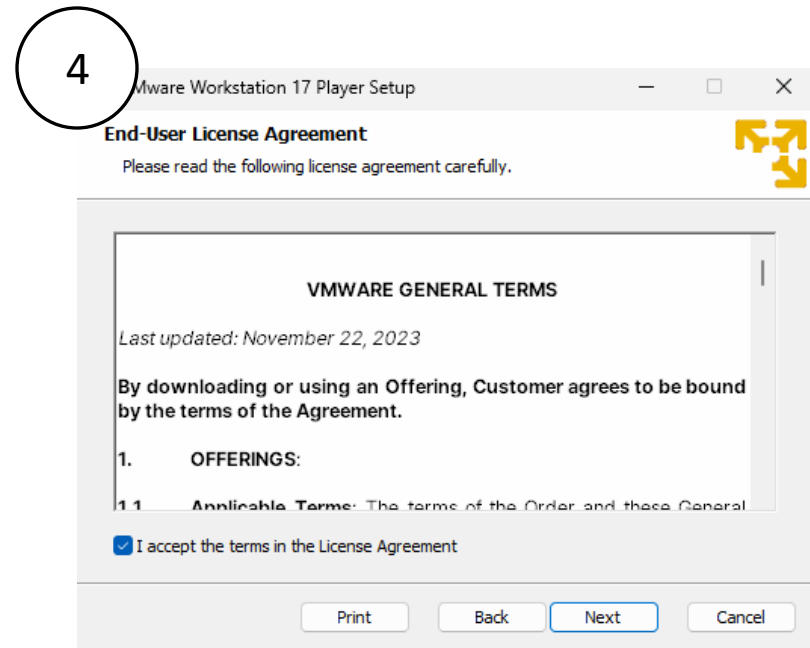
Exe 파일 실행

실습SW 요구사항

❖ VMWarePlayer 설치



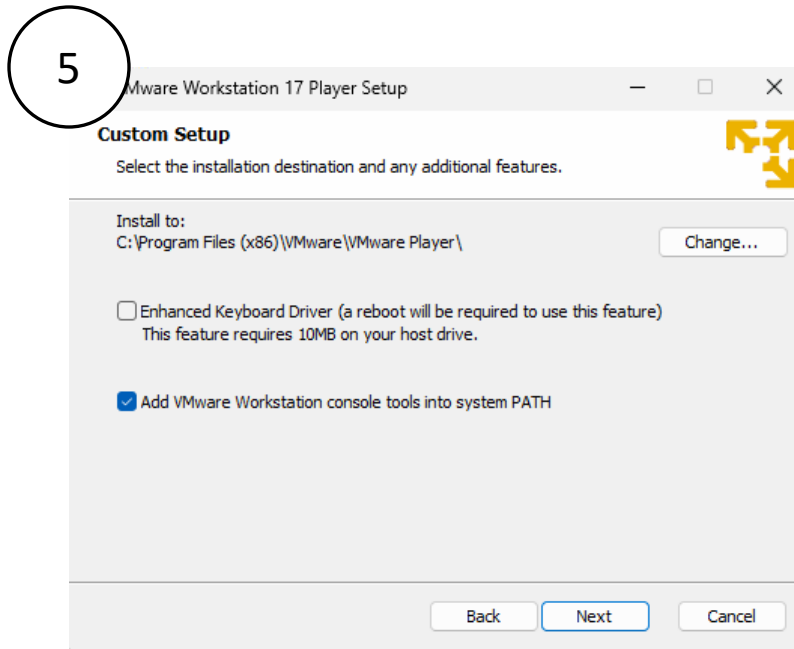
Next



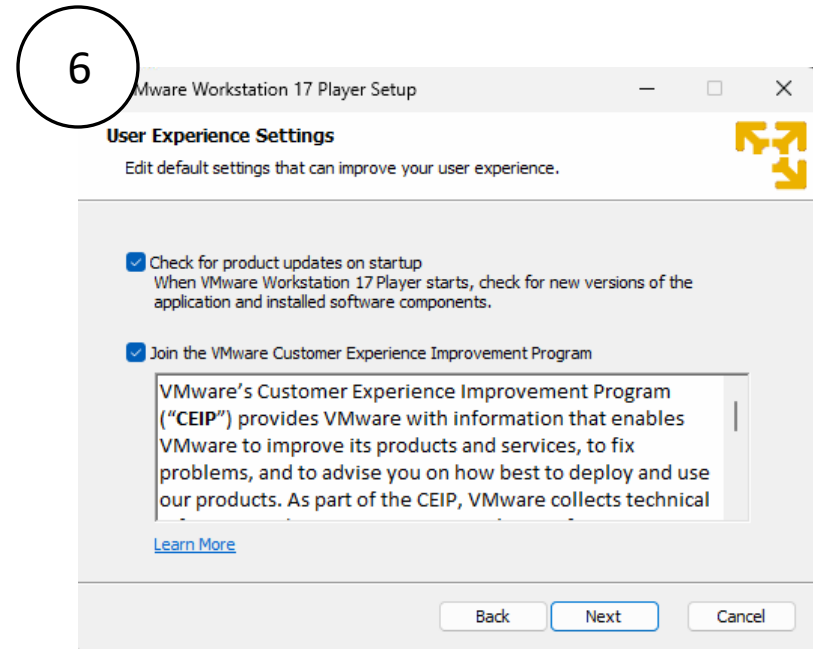
Next

실습SW 요구사항

❖ VMWarePlayer 설치



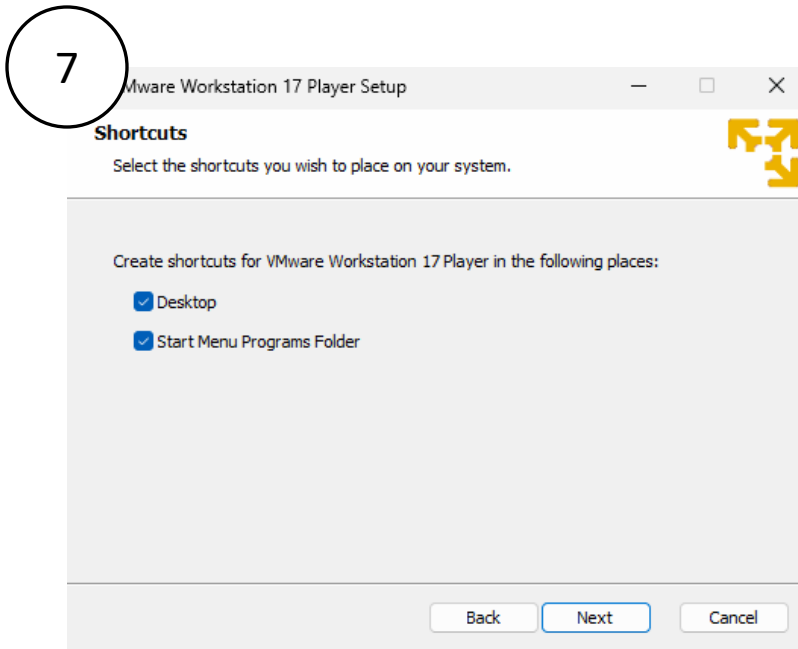
Next



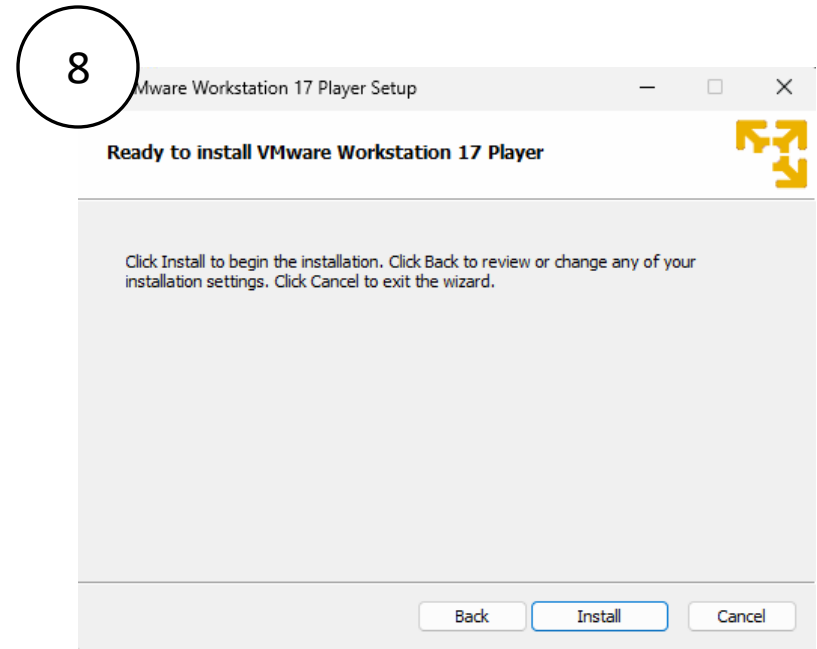
Next

실습SW 요구사항

❖ VMWarePlayer 설치



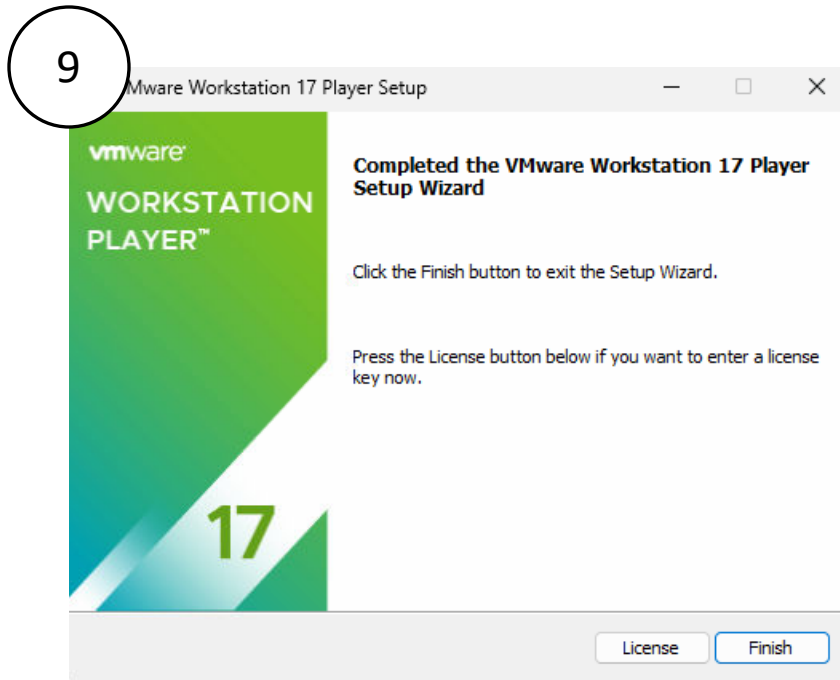
Next



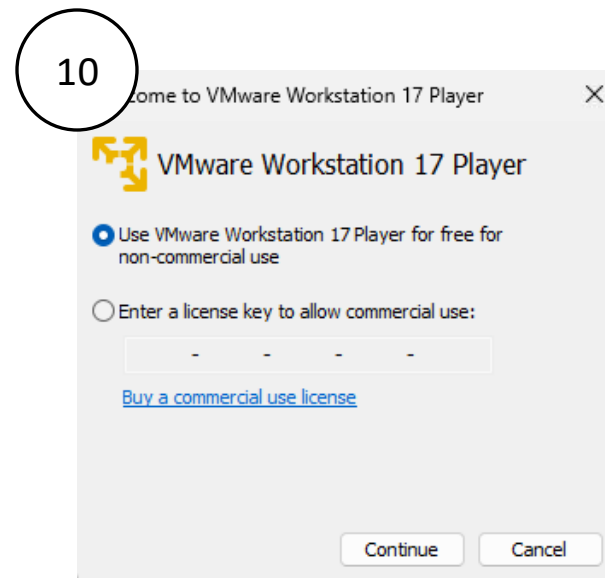
Install

실습SW 요구사항

❖ VMWarePlayer 설치



Finish

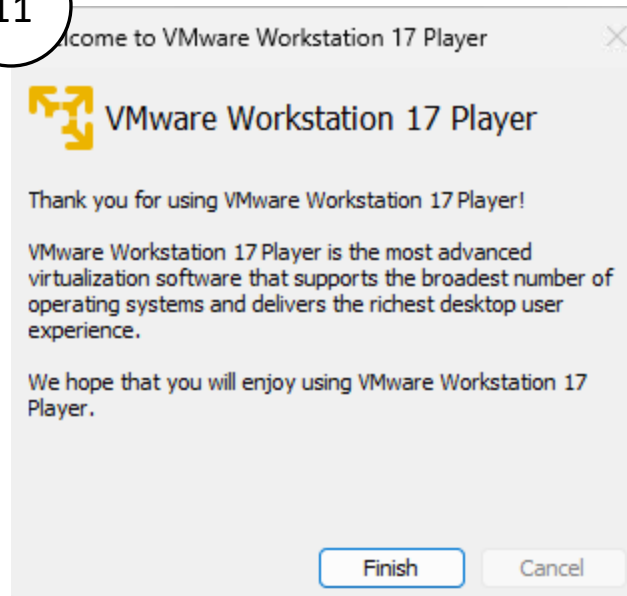


Vmware Player
실행 후
Continue

실습SW 요구사항

❖ VMWarePlayer 설치

11



Finish

실습SW 요구사항

❖Ubuntu 22.04 설치

ubuntu releases

Ubuntu 20.04.4 LTS (Focal Fossa)

Select an image

Ubuntu is distributed on three types of images described below.

Desktop image

The desktop image allows you to try Ubuntu without changing your computer at all, and at your option to install it permanently later. This type of image is what most people will want to use. You will need at least 2048MiB of RAM to install from this image.

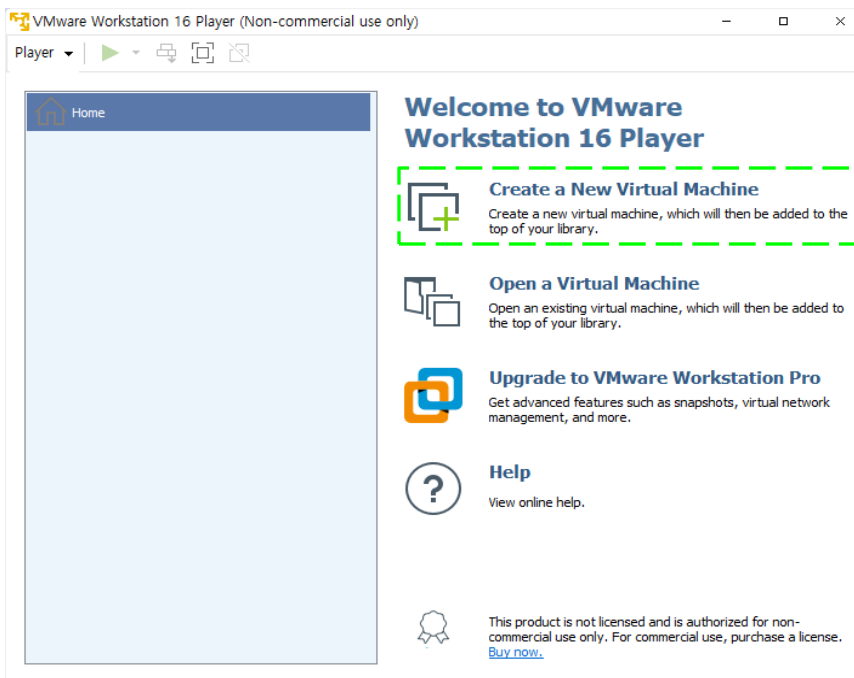
64-bit PC (AMD64) desktop image

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.

실습SW 요구사항

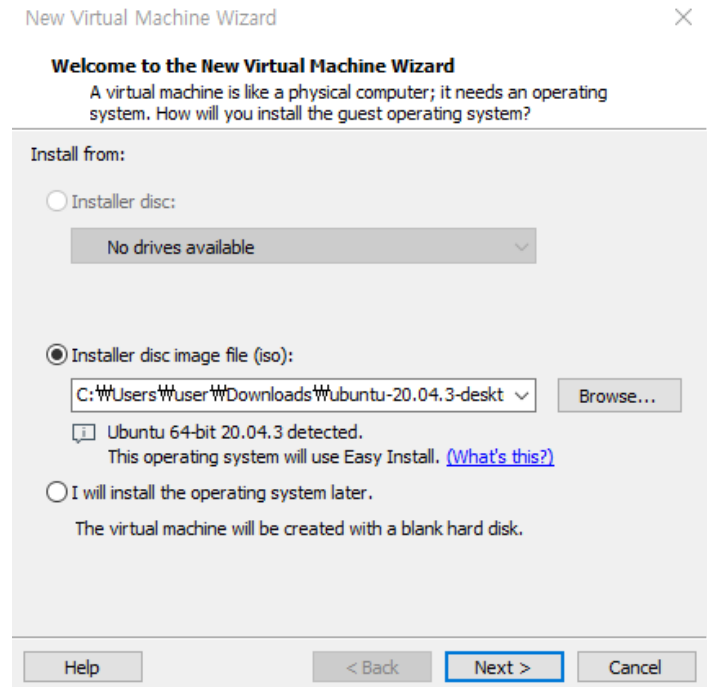
❖ Ubuntu 22.04 설치

1



Create a New
Virtual Machine

2



Ubuntu iso 파일 선택

실습SW 요구사항

❖Ubuntu 22.04 설치

3

New Virtual Machine Wizard

Easy Install Information
This is used to install Ubuntu 64-bit.

Personalize Linux

Full name:

User name:

Password:

Confirm:

Help < Back Next > Cancel

사용자 및 비밀번호 설정

4

New Virtual Machine Wizard

Name the Virtual Machine
What name would you like to use for this virtual machine?

Virtual machine name:

Location: Browse...

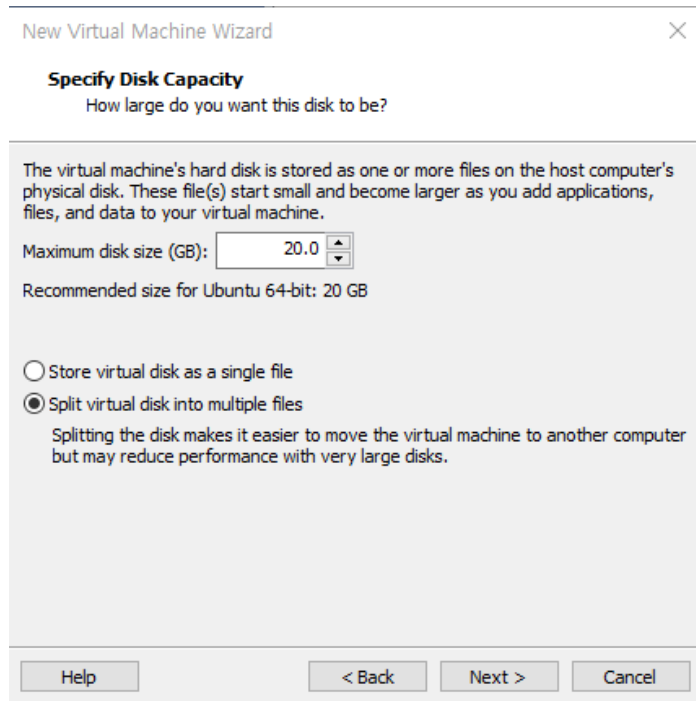
< Back Next > Cancel

용량이 넉넉한 드라이브

실습SW 요구사항

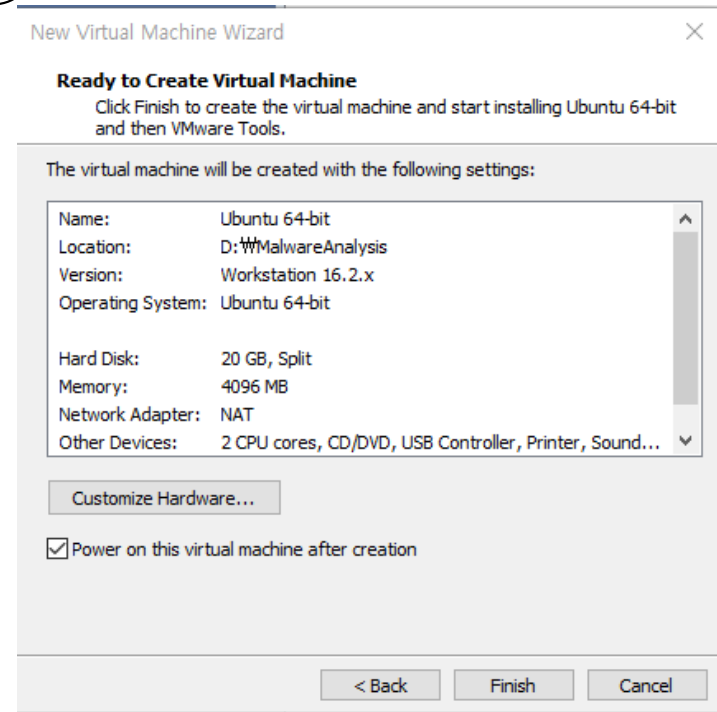
❖Ubuntu 22.04 설치

5



디스크 용량 100GB 권장

6



Finish

실습SW 요구사항

❖ 웹 해킹(http)

- 실습 환경: Windows
- 필요 SW
 - ✓ Python
 - ✓ Burp Suite

❖ 웹 해킹(SQLi)

- 실습 환경: Linux(Ubuntu)
- 필요 SW
 - ✓ Vmware Image

실습SW 요구사항 - 웹 해킹(http)

❖Python 설치 방법

- <https://www.python.org/downloads/release/python-3132/>

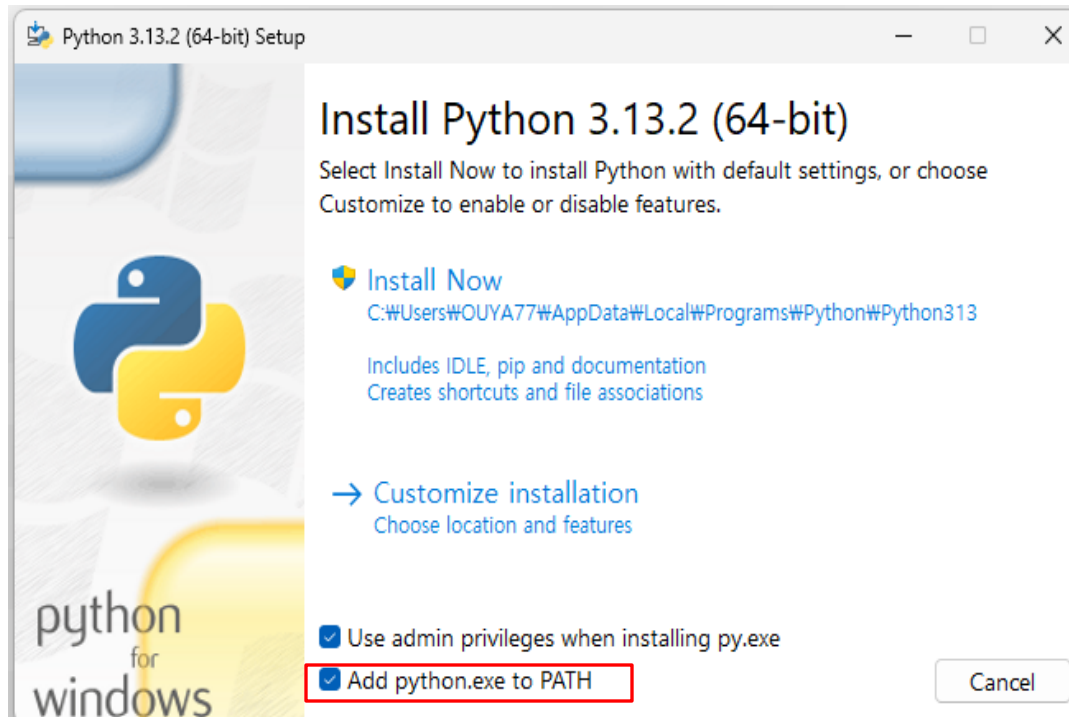
Files

Version	Operating System	Description	MD5 Sum	File Size	GPG	Sigstore	SBOM
Gzipped source tarball	Source release		6192ce4725d9c9fc0e8a1cd38410b417	28.0 MB	SIG	.sigstore	SPDX
XZ compressed source tarball	Source release		4c2d9202ab4db02c9d0999b14655dfe5	21.6 MB	SIG	.sigstore	SPDX
macOS 64-bit universal2 installer	macOS	for macOS 10.13 and later	9916903cff14723bdbc41e3ed5530eeb	67.8 MB	SIG	.sigstore	
Windows installer (64-bit)	Windows	Recommended	40d2c830eedee3dd78f4b707f04fd1d2	27.3 MB	SIG	.sigstore	SPDX
Windows installer (32-bit)	Windows		91941eaa5086d500384cb55ad247be87	26.0 MB	SIG	.sigstore	SPDX
Windows installer (ARM64)	Windows	Experimental	252c8265c8768e14f7e3e3e1fcc39fc	26.6 MB	SIG	.sigstore	SPDX
Windows embeddable package (64-bit)	Windows		4c9d083e2d79c07e8d9e5e2d02127980	10.4 MB	SIG	.sigstore	SPDX
Windows embeddable package (32-bit)	Windows		60bbb372a73146c08702f5513ec2714d	9.2 MB	SIG	.sigstore	SPDX
Windows embeddable package (ARM64)	Windows		6814e678a029bb545e6fb2472ddc1153	9.7 MB	SIG	.sigstore	SPDX

실습SW 요구사항 - 웹 해킹(http)

❖Python 설치 방법

- “Add python.exe to PATH” 체크 필요
- Install Now 후 설치 진행



실습SW 요구사항 - 웹 해킹(http)

❖Python 설치 방법

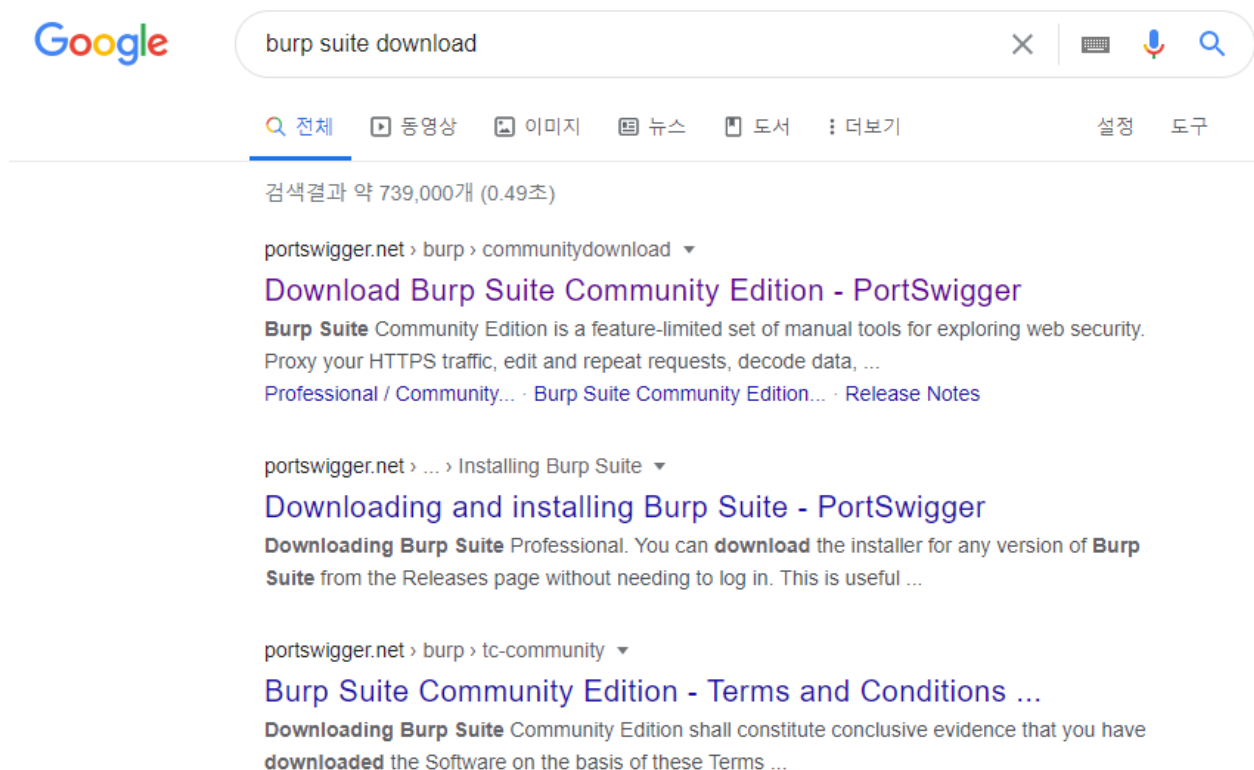
- 설치 후 재부팅
- 명령 프롬프트(cmd) 창에서 python 을 입력해 다음과 같이 뜨면 성공
 - ✓ 실습 제작 버전은 python 3.9.0이나 최신 버전 호환 가능

```
C:\Users\OUYA77>python
Python 3.9.0 (tags/v3.9.0:9cf6752, Oct  5 2020, 15:34:40)
Type "help", "copyright", "credits" or "license" for more :
>>>
```

- 확인 후 ctrl + z 로 명령어 창으로 돌아간 후 실습에 필요한 Flask 모듈 설치
 - ✓ python -m pip install flask

실습SW 요구사항 - 웹 해킹(http)

❖BURP 다운로드



Google

burp suite download

전체 동영상 이미지 뉴스 도서 더보기

설정 도구

검색결과 약 739,000개 (0.49초)

portswigger.net > burp > communitydownload ▾

Download Burp Suite Community Edition - PortSwigger

Burp Suite Community Edition is a feature-limited set of manual tools for exploring web security. Proxy your HTTPS traffic, edit and repeat requests, decode data, ...

Professional / Community... · Burp Suite Community Edition... · Release Notes

portswigger.net > ... > Installing Burp Suite ▾

Downloading and installing Burp Suite - PortSwigger

Downloading Burp Suite Professional. You can **download** the installer for any version of **Burp Suite** from the Releases page without needing to log in. This is useful ...

portswigger.net > burp > tc-community ▾

Burp Suite Community Edition - Terms and Conditions ...

Downloading Burp Suite Community Edition shall constitute conclusive evidence that you have **downloaded** the Software on the basis of these Terms ...

실습SW 요구사항 - 웹 해킹(http)

❖BURP 설치



Products ▾ | Solutions ▾ | Research | Acad

Download Burp Suite Community Edition

Burp Suite Community Edition is a feature-limited set of manual tools for exploring web security. Proxy your HTTPS traffic, edit and repeat requests, decode data, and more. Get the latest version here.

Alternatively, try hacking like the pros do - with a [free trial of Burp Suite Professional](#). It's packed with [power features](#) - including an automated vulnerability scanner, the ability to save your work, and an unthrottled version of burp intruder.

[Download the latest version](#)



실습SW 요구사항 - 웹 해킹(http)

❖BURP 설치



Products ▾ | Solutions ▾ | Research | Academy | Daily Swig

Burp Suite Releases _

Professional / Community 2021.2

Stable

08 February 2021 at 14:53 UTC



Burp Suite Community Edition ▾

Windows (64-bit) ▾

Download

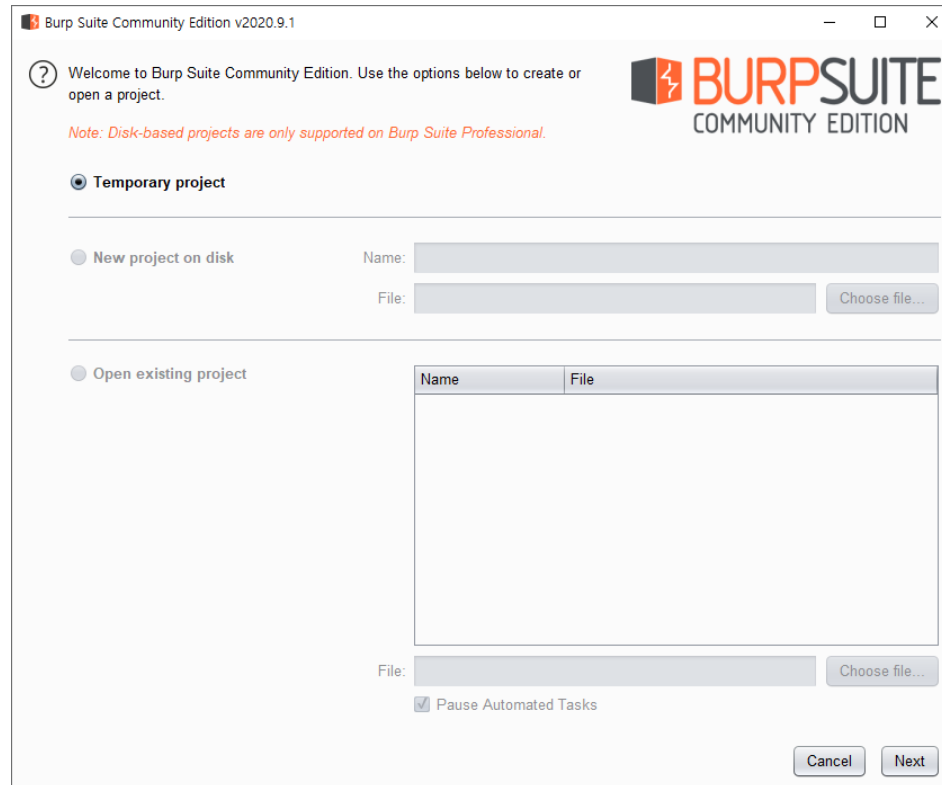
show checksums

This release provides improvements to the message inspector, non-printing character display, platform authentication controls and the embedder. It also provides a new vulnerability definition and several bug fixes.



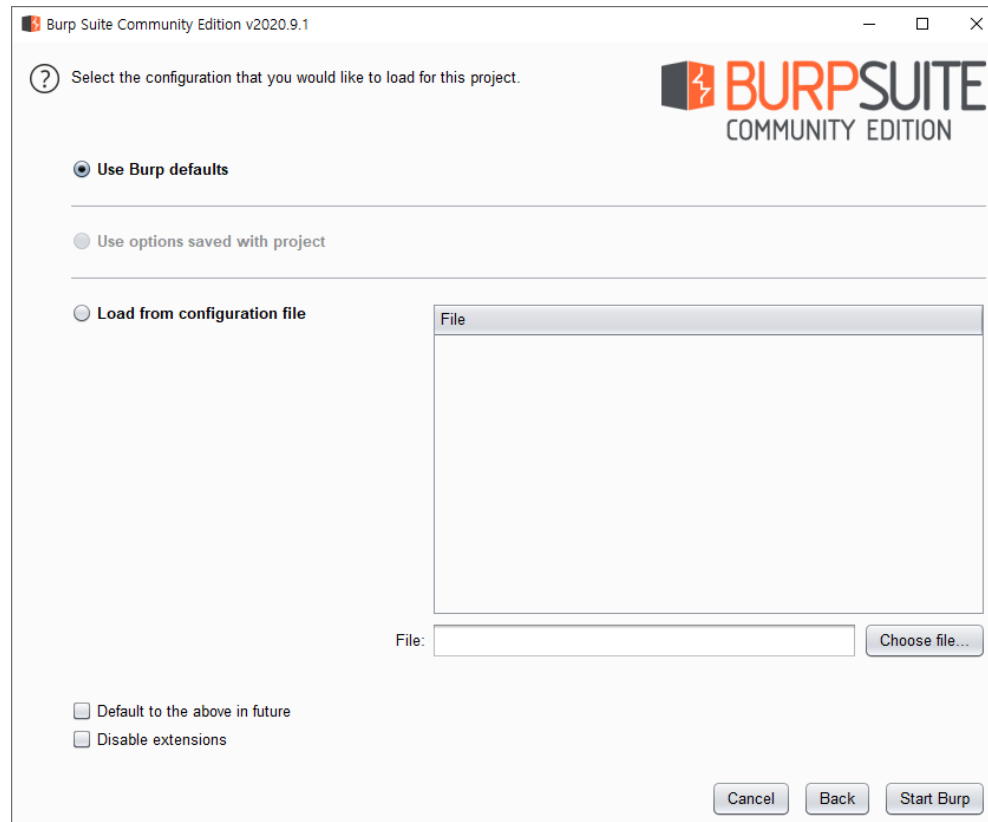
실습SW 요구사항 - 웹 해킹(http)

❖BURP 실행



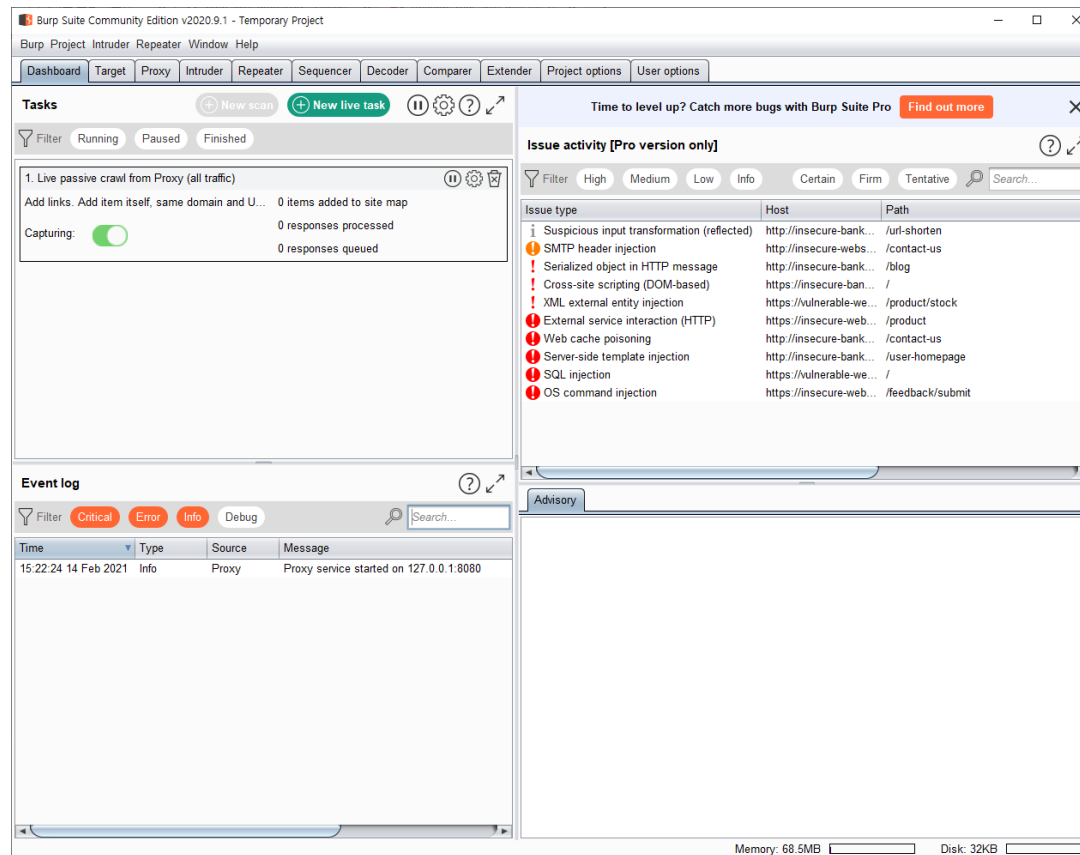
실습SW 요구사항 - 웹 해킹(http)

❖BURP 실행



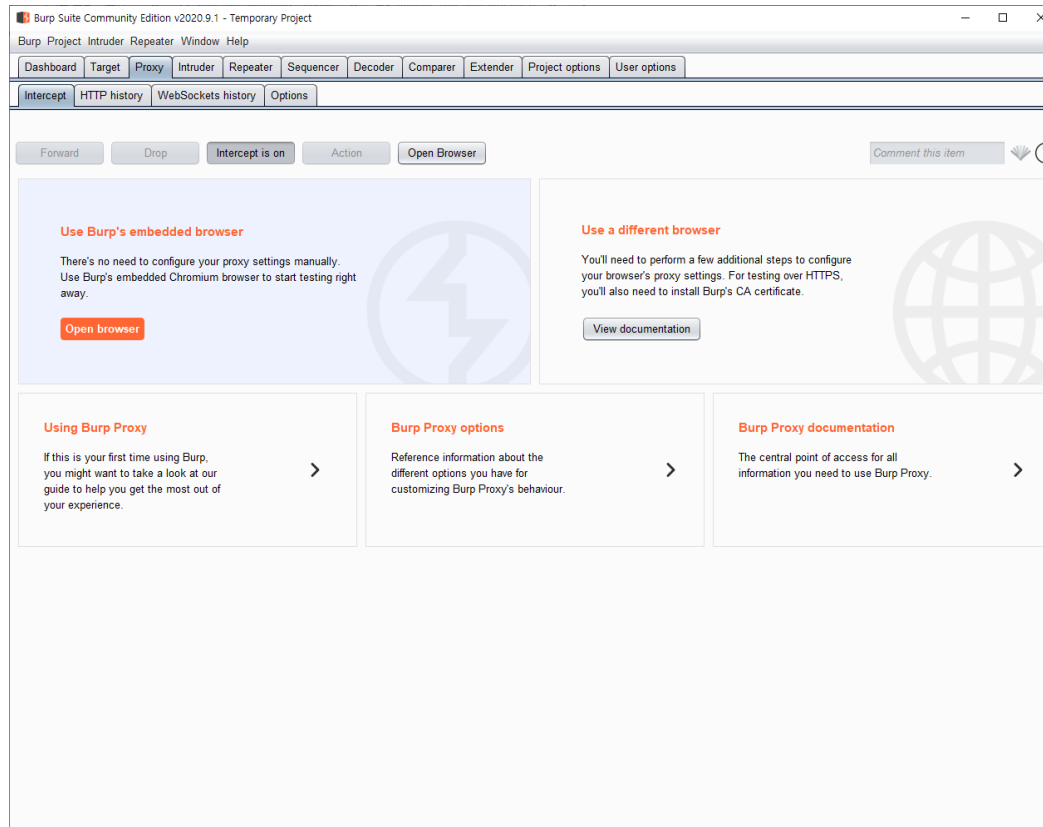
실습SW 요구사항 - 웹 해킹(http)

❖BURP 메인화면



실습SW 요구사항 - 웹 해킹(http)

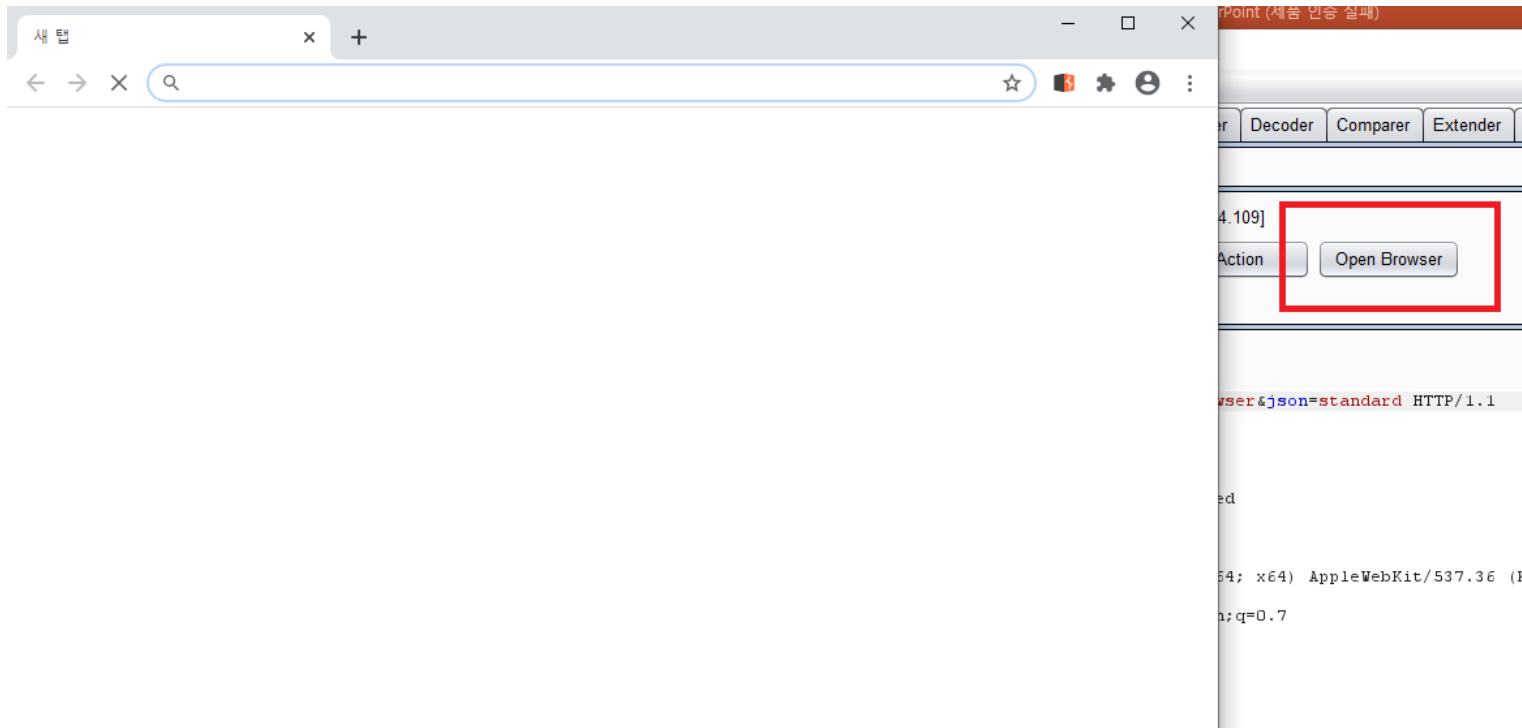
❖프록시 메뉴



실습SW 요구사항 - 웹 해킹(http)

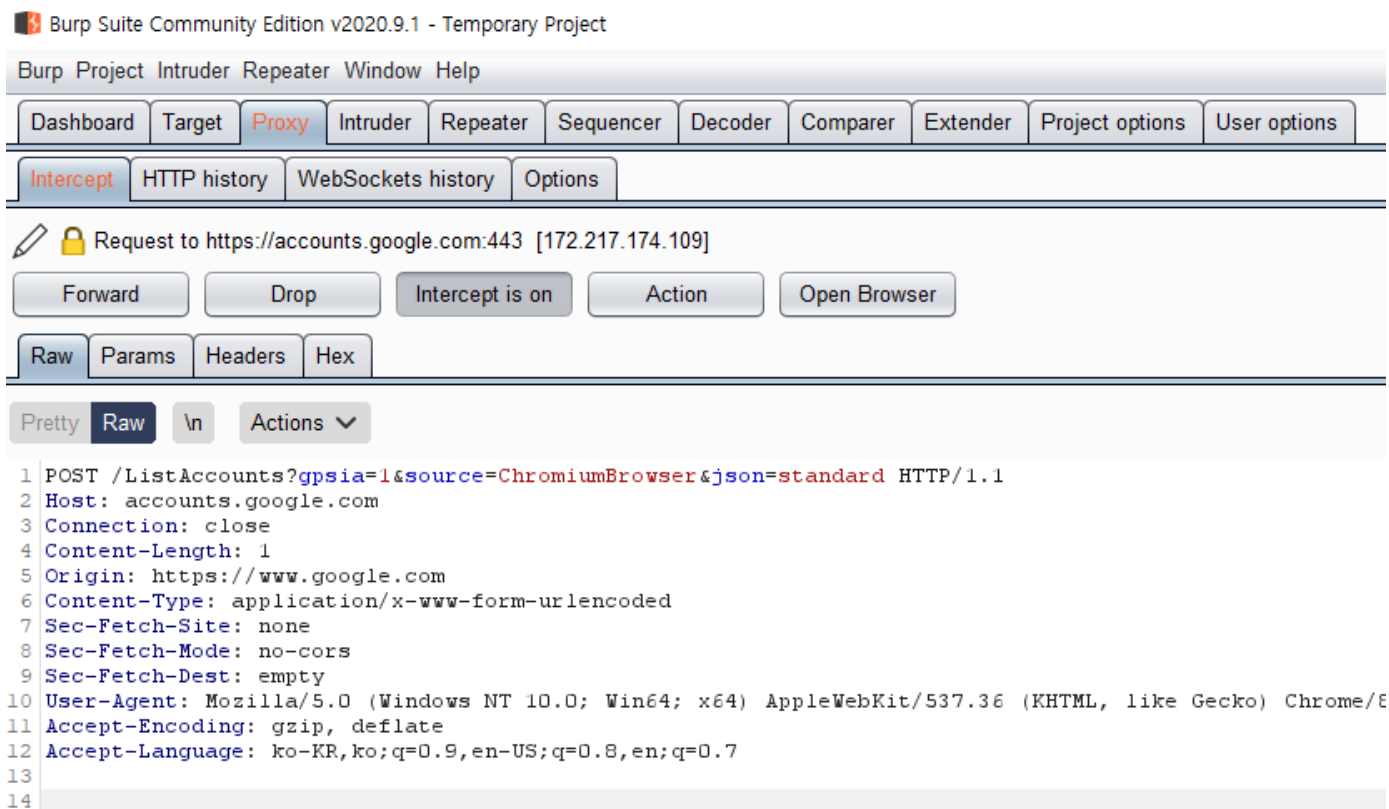
❖빌트인 브라우저 활용

- 최근 Burp 는 브라우저 Proxy 설정 불필요. 자체 브라우저 내장



실습SW 요구사항 - 웹 해킹(http)

❖프록시 작동 확인



실습SW 요구사항 - 웹 해킹(SQLi)

❖ 웹해킹 실습 VM 설치

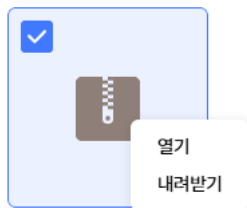
VMware Image

1

NAVER MYBOX

공유 받은 파일

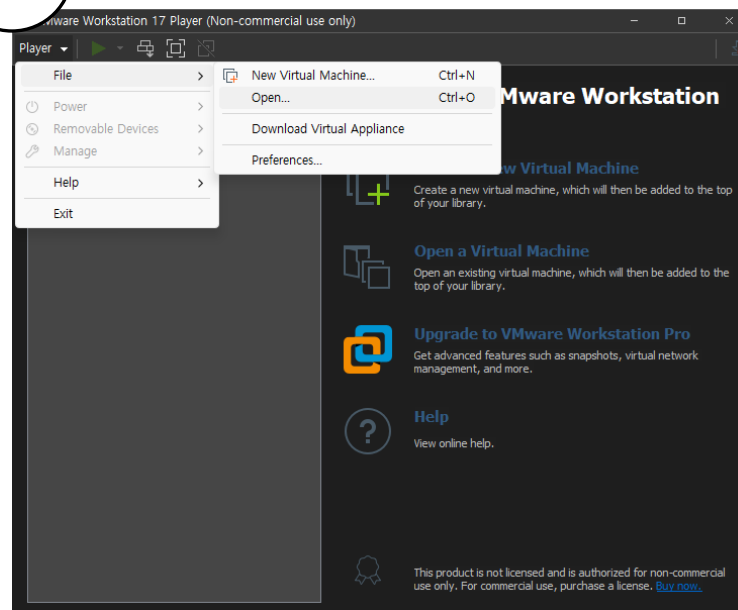
☒ 내려받기 | 네이버 MYBOX에 저장 | 1개 선택 | brw님이 공유한 파일



Ubuntu18.04.zip
7.9GB

파일 다운로드 및 압축해제

2

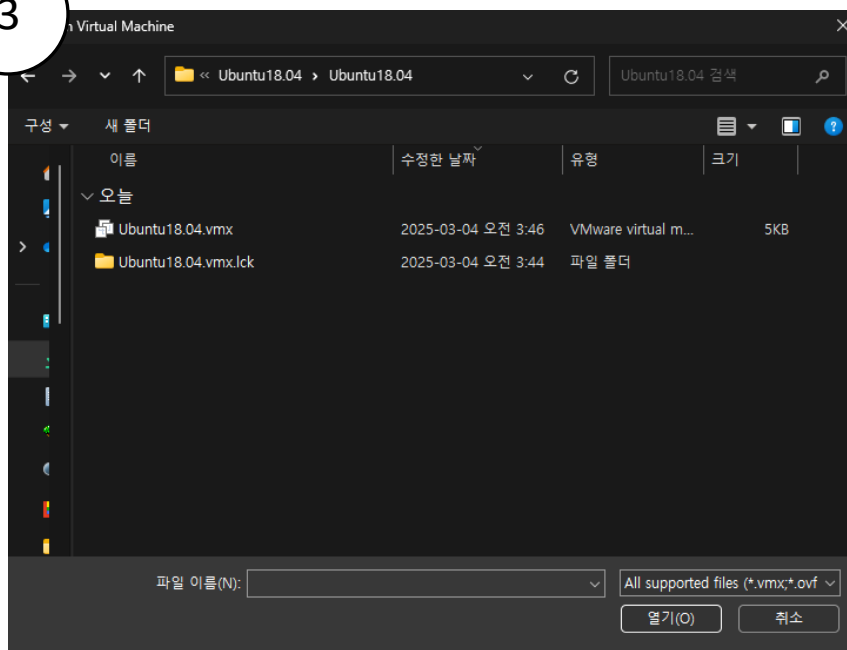


Player > File > Open...

실습SW 요구사항 - 웹 해킹(SQLi)

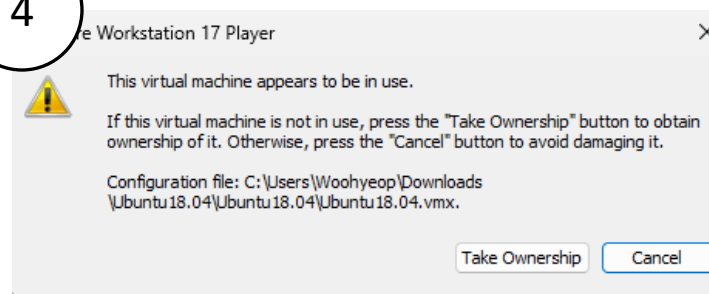
❖웹해킹 실습 VM 설치

3



Ubuntu18.04.vmx
파일 열기

4

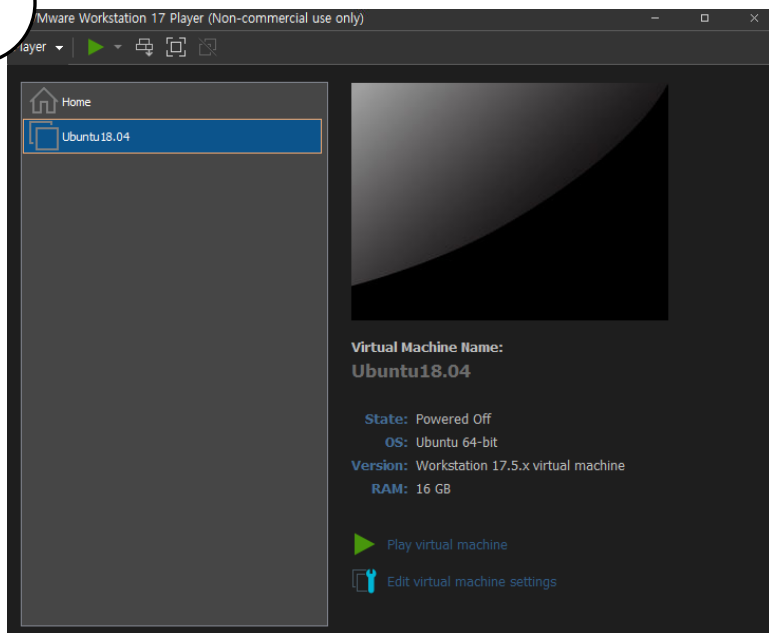


Take Ownership

실습SW 요구사항 - 웹 해킹(SQLi)

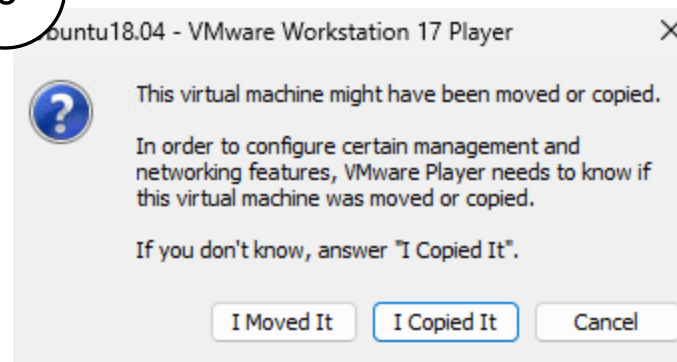
❖웹해킹 실습 VM 설치

5



Play virtual machine

6



I Copied It

실습SW 요구사항

❖RF

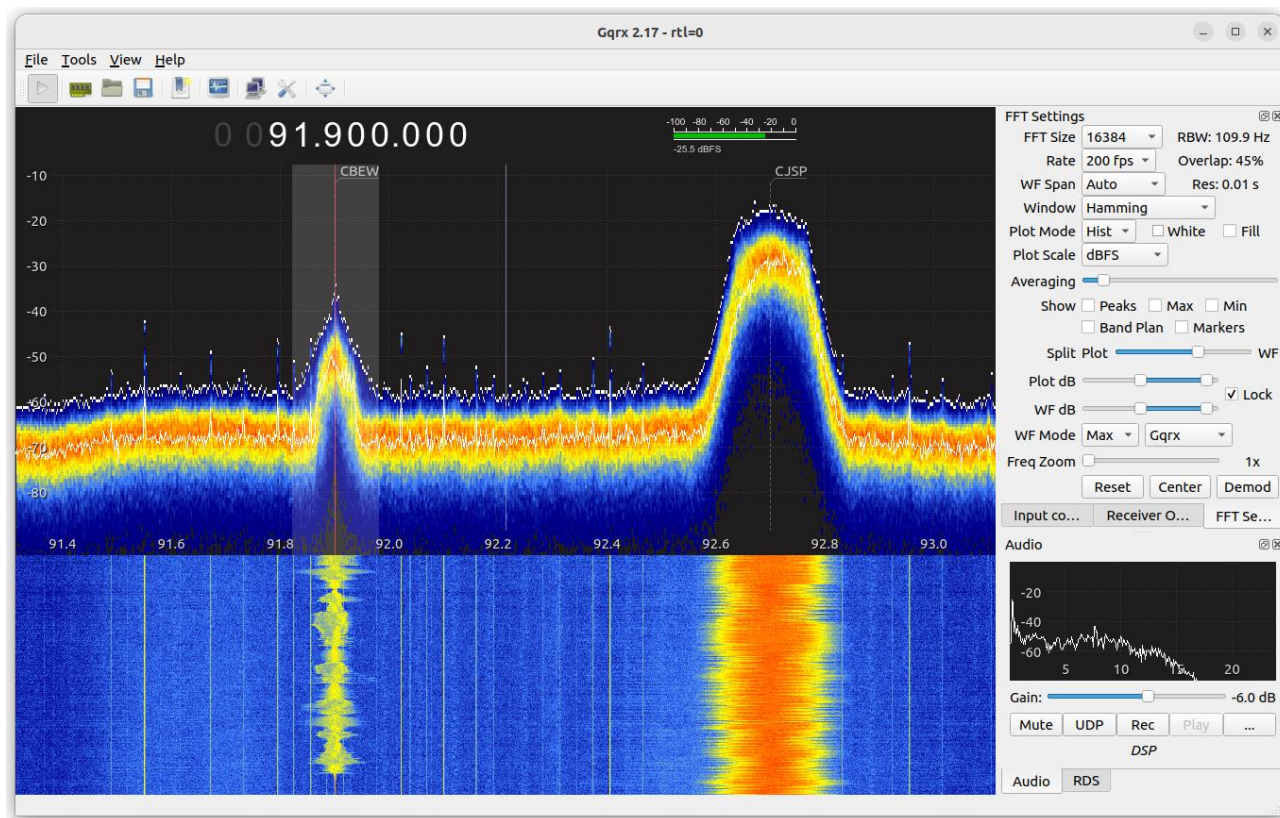
- 실습 환경: Linux & Windows
- 필요 SW
 - ✓ Gqrx
 - ✓ GNU Radio
 - ✓ Universal Radio Hacker

실습SW 요구사항 - RF



❖ Gqrx

- 수신한 RF 신호를 “Waterfall plot”으로 제공하는 SDR 소프트웨어



실습SW 요구사항 - RF







❖Gqrx 설치 방법 #1

- <https://github.com/gqrx-sdr/gqrx/releases>
- .ApplImage 다운로드

Gqrx SDR 2.17.6 Latest

- New: Fetch RDS Program Service & RadioText via remote control.
- New: Set and query audio mute via remote control.
- New: DMG release for ARM-based Macs.
- Improved: Save I/Q recording format to settings.
- Improved: Reduced CPU utilization of plot and waterfall display.
- Improved: Display and formatting of RDS data.
- Fixed: Decoding of RDS flags.
- Fixed: Incorrect channel filter offset, for some devices.
- Changed: x86 DMG release requires macOS 13.7 or later.

▼ Assets 6

 Gqrx-2.17.6-arm64.dmg	51 MB	Nov 30, 2024
 Gqrx-2.17.6-Windows.zip	43 MB	Nov 30, 2024
 Gqrx-2.17.6-x86_64.ApplImage	62.5 MB	Nov 30, 2024
 Gqrx-2.17.6-x86_64.dmg	55.7 MB	Nov 30, 2024
 Source code (zip)		Nov 30, 2024
 Source code (tar.gz)		Nov 30, 2024

실습SW 요구사항 - RF

❖Gqrx 설치 방법 #2

- `apt install` 로 설치

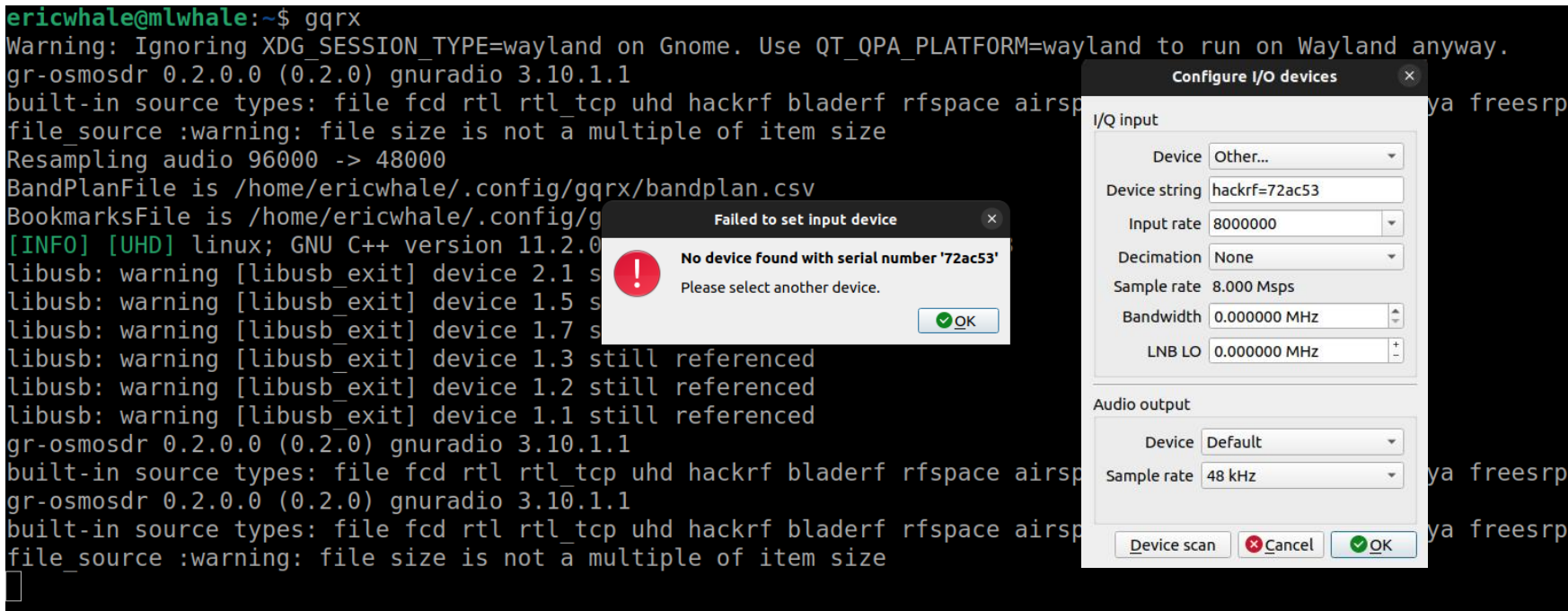
```
sudo apt install gqrx-sdr
```

실습SW 요구사항 - RF

❖Gqrx 작동 테스트

- 방법 #1: .ApplImage 파일 실행
- 방법 #2: CLI에서 `gqrx` 실행

```
ericwhale@mlwhale:~$ gqrx
Warning: Ignoring XDG_SESSION_TYPE=wayland on Gnome. Use QT_QPA_PLATFORM=wayland to run on Wayland anyway.
gr-osmosdr 0.2.0.0 (0.2.0) gnuradio 3.10.1.1
built-in source types: file fcd rtl rtl_tcp uhd hackrf bladerf rfspace airspy ya freesrp
file_source :warning: file size is not a multiple of item size
Resampling audio 96000 -> 48000
BandPlanFile is /home/ericwhale/.config/gqrx/bandplan.csv
BookmarksFile is /home/ericwhale/.config/gqrx/bookmarks.csv
[INFO] [UHD] linux; GNU C++ version 11.2.0
libusb: warning [libusb_exit] device 2.1 still referenced
libusb: warning [libusb_exit] device 1.5 still referenced
libusb: warning [libusb_exit] device 1.7 still referenced
libusb: warning [libusb_exit] device 1.3 still referenced
libusb: warning [libusb_exit] device 1.2 still referenced
libusb: warning [libusb_exit] device 1.1 still referenced
gr-osmosdr 0.2.0.0 (0.2.0) gnuradio 3.10.1.1
built-in source types: file fcd rtl rtl_tcp uhd hackrf bladerf rfspace airspy ya freesrp
gr-osmosdr 0.2.0.0 (0.2.0) gnuradio 3.10.1.1
built-in source types: file fcd rtl rtl_tcp uhd hackrf bladerf rfspace airspy ya freesrp
file_source :warning: file size is not a multiple of item size
```



The image shows a terminal window running the `gqrx` application. The terminal output includes a warning about the XDG_SESSION_TYPE, the version of gr-osmosdr (0.2.0.0) and gnuradio (3.10.1.1), and a list of built-in source types. It also shows a warning about the file size not being a multiple of the item size. Two windows are overlaid on the terminal: a 'Failed to set input device' window with an error message 'No device found with serial number '72ac53'' and a 'Configure I/O devices' window showing settings for I/Q input and audio output.

Failed to set input device

No device found with serial number '72ac53'
Please select another device.

Configure I/O devices

I/Q input

Device: Other...
Device string: hackrf=72ac53
Input rate: 8000000
Decimation: None
Sample rate: 8.000 Msp/s
Bandwidth: 0.000000 MHz
LNB LO: 0.000000 MHz

Audio output

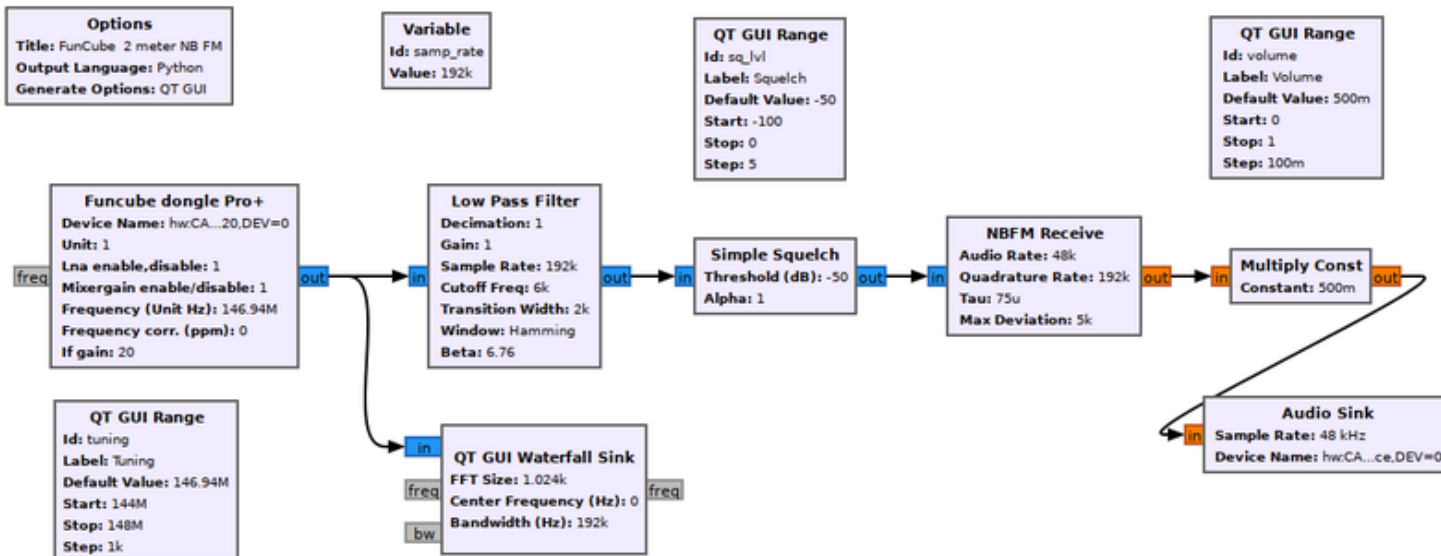
Device: Default
Sample rate: 48 kHz

Device scan Cancel OK

실습SW 요구사항 - RF

❖ GNU Radio

- “Flowgraph”를 개발하여 신호 송수신, 해석, 인코딩/디코딩을 할 수 있는 SDR 소프트웨어



실습SW 요구사항 - RF

❖GNU Radio 설치

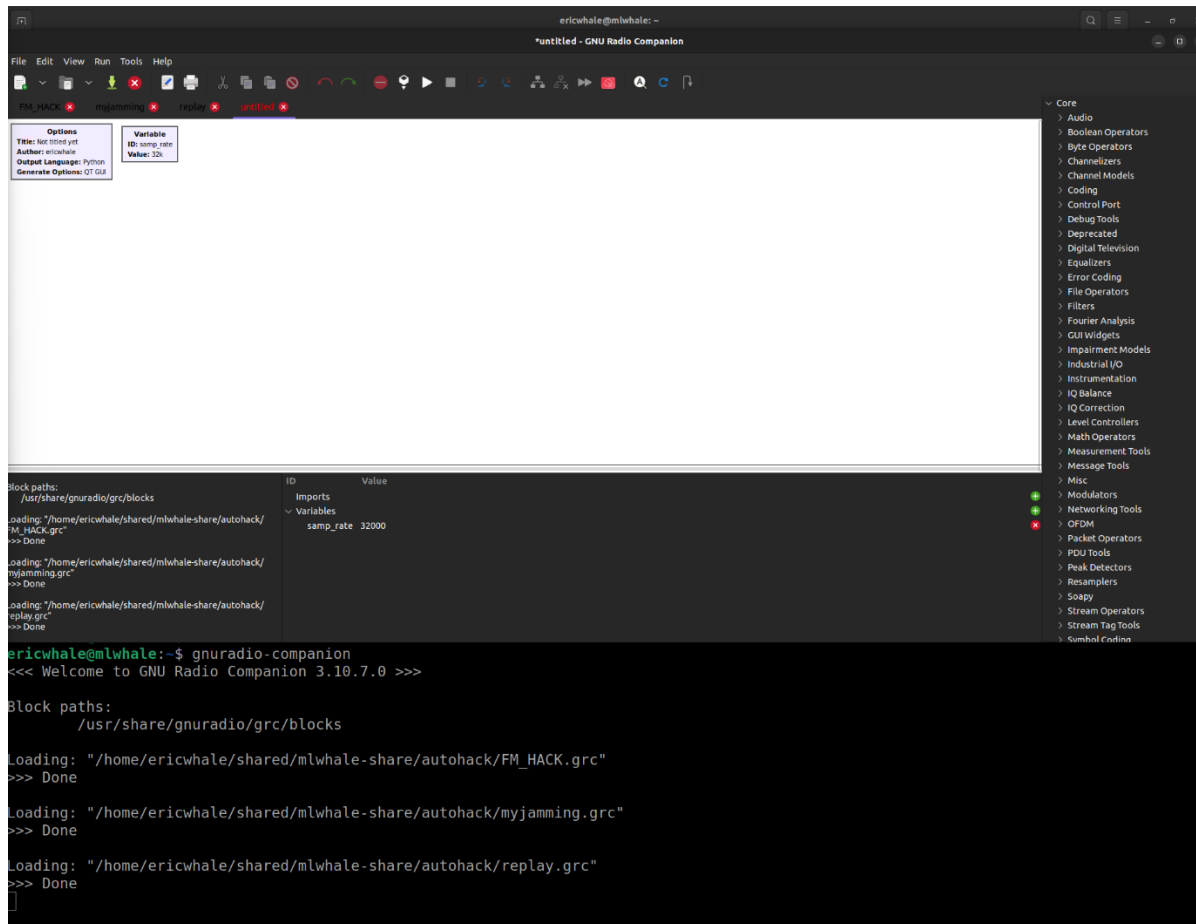
- <https://wiki.gnuradio.org/index.php?title=UbuntuInstall>

```
sudo add-apt-repository ppa:gnuradio/gnuradio-releases  
sudo apt-get update  
sudo apt-get install gnuradio
```

실습SW 요구사항 - RF

❖ GNU Radio 작동 테스트

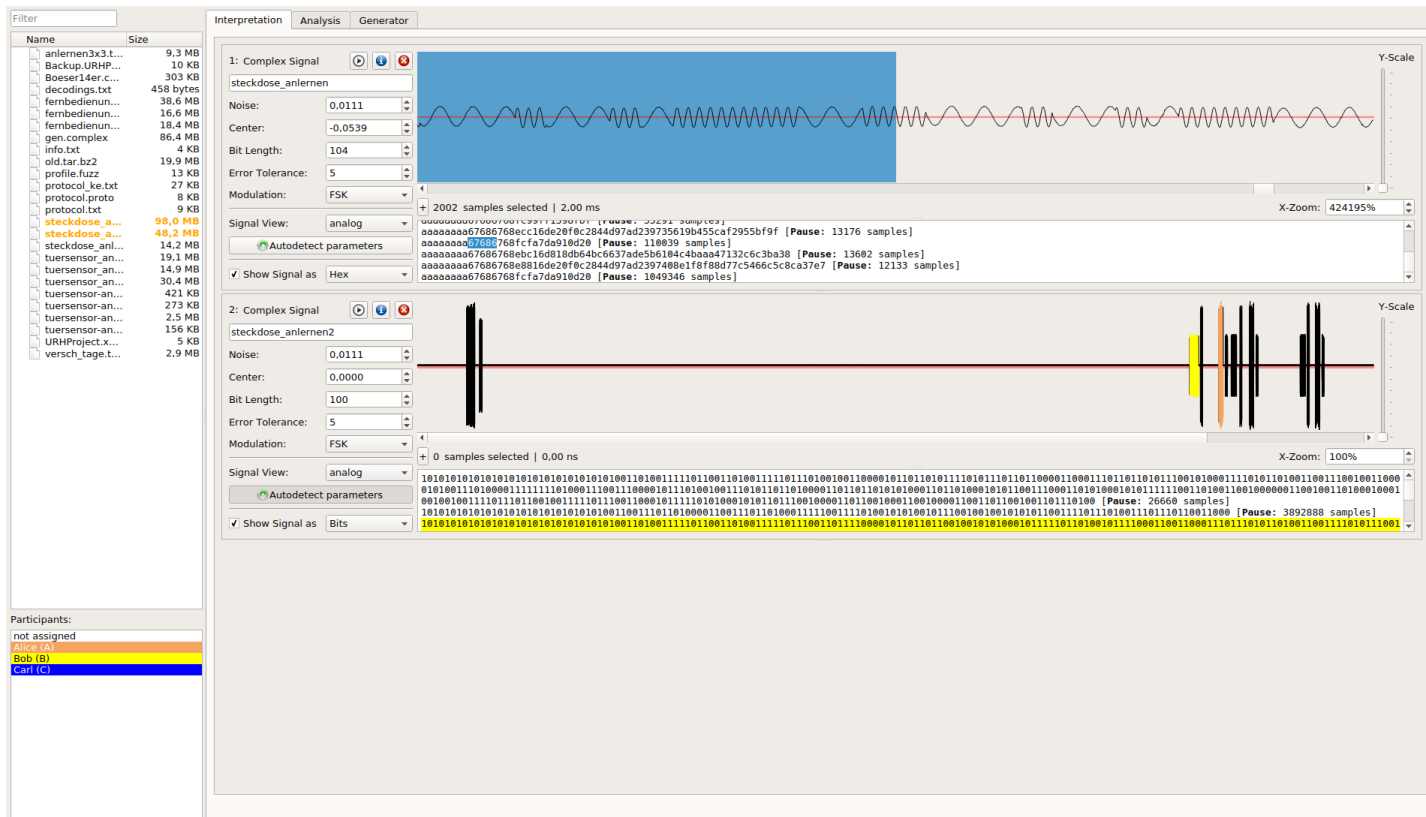
- `gnuradio-companion`



실습SW 요구사항 - RF

❖ Universal Radio Hacker

- 무선 신호 분석, 디코딩, 리버스 엔지니어링을 위한 SDR 소프트웨어.



실습SW 요구사항 - RF

❖ Universal Radio Hacker 설치 (윈도우 기준)




- <https://github.com/jopohl/urh/releases>
- .exe 파일 다운로드 및 설치

New Contributors

- @rffontenelle made their first contribution in [#1108](#)
- @yarda made their first contribution in [#1111](#)

Full Changelog: [v2.9.6...v2.9.8](#)






Contributors





yarda, rffontenelle, and jopohl

Assets

5

 Universal.Radio.Hacker-2.9.8-x64.exe	50.4 MB	Nov 12, 2024
 Universal.Radio.Hacker-2.9.8-x86.exe	40.7 MB	Nov 12, 2024
 Universal.Radio.Hacker-2.9.8.dmg	77.1 MB	Nov 12, 2024
 Source code (zip)		Nov 12, 2024
 Source code (tar.gz)		Nov 12, 2024

  2 people reacted

조교 연락처

❖ 조교 상주 연구실 위치

- 국제경영관 404-2호

❖ HTTP 실습 관련

- 연동현 (dusehdgus12@naver.com)

❖ Crypto 실습 관련

- 오경제 (ogj0824@khu.ac.kr)

❖ 웹해킹 실습 관련

- 임우협 (pwn@khu.ac.kr)

❖ RF 실습 관련

- 황선혁 (buckelwal8979@khu.ac.kr)

