

Systems Programming Lab #0

2022-03-07

sp-tas

Lab Information

- **TA**
 - 302동 319호 (공용연구실)
 - 황인휘/문채원/홍효림/전창민
 - Mail to: sp-ta@googlegroups.com
- **Lecture**
 - Tue, 18:30 – 20:20
 - Offline class
- **Questions**
 - **Class eTL → Q&A**
 - Questions on eTL Q&A board are more than welcome
 - Discussions between students are also encouraged
 - Check & Update your information(Email, phone num., etc.) of yourself in eTL exactly

Lab Session

- Tue 18:30 - 20:20
- 302동 105호 소프트웨어 실습실
- Description about the assignments
- Q&A about your assignments
- No PCs in SW Lab
 - Take your laptop.
- Your laptop → Do your assignments → Connect to lab server and test → Q&A

Assignment

- **5 programming assignments**

- Will be announced in eTL
- about 2-3 weeks per 1 assignment

- **Submission**

- Source code: Evaluate by the lab server
- Report: Description about your source code & execution results.

- **Delay policy**

	+1day	+2day	+3day	+4day	+5day
Max. Score	-20%	-40%	-60%	-80%	0

- **Code copy policy**

- Provider/Copier: **Both will get 0.** (eTL check + manual check)

Evaluation

- 출석/태도: 15%
- 과제: 15%
- 중간고사: 15% + 15%
- 기말고사: 20%
- 실습: 20%

Announcements

- **Questions**

- eTL Q&A Board (O)
- sp-ta@googlegroups.com (O)
- 공개글로 질문해주세요. 비밀글로 작성된 질문에 대해서는 답변을 달지 않습니다
- **DO NOT SEND EMAIL TO TA'S PRIVATE MAIL!! Unless it's private matter ...**

- Assignments Delay policy (실습과 동일)

	+1day	+2day	+3day	+4day	+5day
Max. Score	-20%	-40%	-60%	-80%	0

- eTL will be used for submissions.

Lab Environment

- **SSH Connect to:**
 - Sp?.snucse.org (sp01 ~ sp05)
 - Port: 22
- **We added individual accounts for students**
 - Announced in eTL
 - Username : stu?
 - Password : 학번 (-포함)

Connect to LAB Server (for Linux user)

- Linux/MacOS User

- type & execute command below:

```
# ssh username@domain
```

- (예제) 계정이 ta 인 경우,

```
# ssh ta@sp1.snucse.org
```

- ③ 계정 password 입력

```
osta@osta-VirtualBox:~$ ssh ta@sp1.snucse.org
The authenticity of host 'sp1.snucse.org (147.46.78.123)' can't be established.
ECDSA key fingerprint is [redacted]
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'sp1.snucse.org,147.46.78.123' (ECDSA)
ta@sp1.snucse.org's password: [redacted]
Welcome to Ubuntu 18.04.2 LTS (GNU/Linux 4.15.0-45-generic x86_64)

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

System information as of Mon Mar  4 14:16:56 KST 2019

System load:  0.0               Processes:    96
Usage of /:   40.5% of 9.78GB    Users logged in:  0
Memory usage: 5%               IP address for eth0: 147.46.78.123
Swap usage:  0%

 * Ubuntu's Kubernetes 1.14 distributions can bypass Docker and use containerd
   directly, see https://bit.ly/ubuntu-containerd or try it now with

   snap install microk8s --channel=1.14/beta --classic

 * Canonical Livepatch is available for installation.
   - Reduce system reboots and improve kernel security. Activate at:
     https://ubuntu.com/livepatch

1 package can be updated.
0 updates are security updates.

Last login: Thu Feb 28 19:20:12 2019 from 175.223.35.254
ta@sp1:~$
```

① host 입력

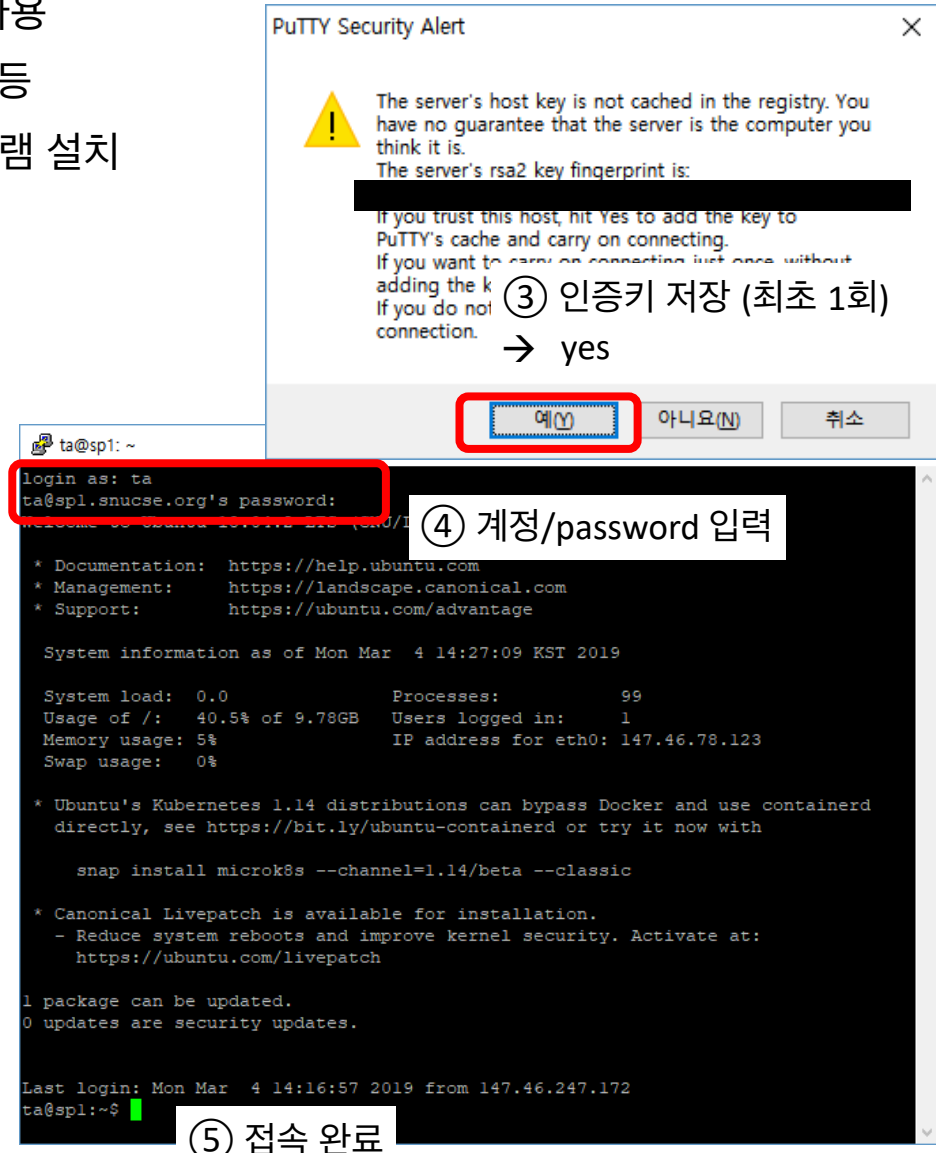
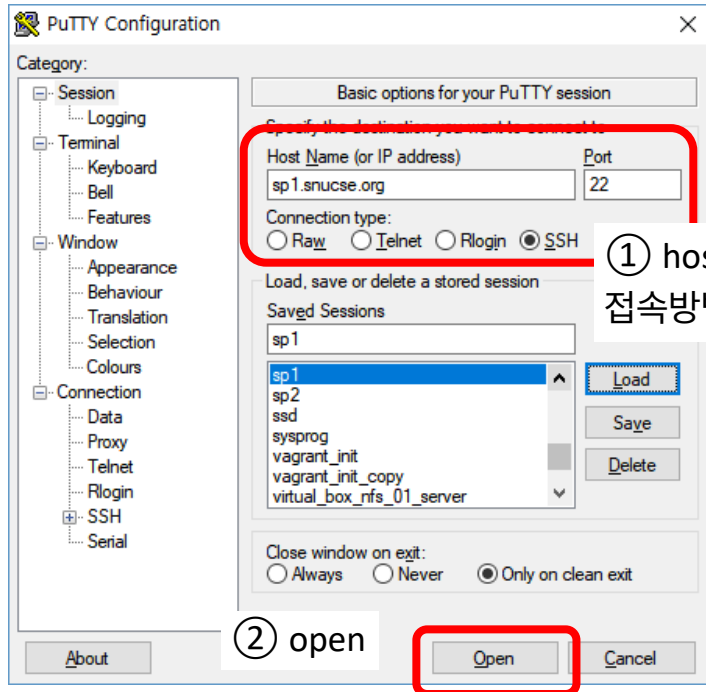
② 인증키 저장 (최초 1회)

→ yes

- ④ 접속 완료

Connect to LAB Server (for Windows user)

- Windows 사용자 → ssh 클라이언트 프로그램 사용
 - ssh 클라이언트: putty, xshell, secureCRT 등등
 - 구글/네이버 등에서 검색하여 원하는 프로그램 설치
- (예제) putty 를 사용하여 접속



Secure Copy (scp)

- Secure Copy : 서버 간 파일 전송
- Linux/MacOS 사용자
 - 터미널에서 다음과 같이 scp 명령어 입력

```
# scp sourceFileName username@host:/some/remote/directory
```
 - (예제) /home/sys/a.c 파일을 실습 머신 /home/sysprog/submit/lab0 디렉토리로 copy

```
# scp /home/sys/a.c ta@sp1.snucse.org:/home/sysprog/submit/lab0
```
- Windows 사용자
 - WinSCP 등 SCP 클라이언트 사용하여 전송
- SCP 명령어 참고 사이트
 - http://www.hypexr.org/linux_scp_help.php

Connect to server - Windows

- 서버 접속과 scp 과정만 다름

The screenshot shows a web browser window with two tabs: 'putty - Google Search' and 'Download PuTTY: latest release'. The address bar shows the URL 'chiark.greenend.org.uk/~sgtatham/putty/latest.html'. The page title is 'Download PuTTY: latest release (0.73)'. Below the title are links for 'Home', 'FAQ', 'Feedback', 'Licence', 'Updates', 'Mirrors', 'Keys', 'Links', and 'Team'. A download status line indicates 'Download: Stable · Snapshots · Docs · Changes · Wishlist'. The main text explains that the page contains download links for the latest released version of PuTTY (0.73, released on 2019-09-29) and provides a permanent link to the 0.73 release. It also mentions that release versions are reasonably likely to work well but may not be the most up-to-date code available, suggesting the development snapshots for problem diagnosis. The page is divided into two main sections: 'Package files' and 'Alternative binary files'. The 'Package files' section lists MSI installers for 32-bit and 64-bit versions, and a Unix source archive. The 'Alternative binary files' section explains that the installer packages provide versions of all utilities (except PuTTYtel), but standalone binaries can be downloaded one by one. It lists 'putty.exe' (the SSH and Telnet client itself) and 'pscp.exe' (an SCP client, i.e. command-line secure file copy) for both 32-bit and 64-bit versions. At the bottom of the browser window, a taskbar shows 'putty (1).exe' running.

Download PuTTY: latest release (0.73)

[Home](#) | [FAQ](#) | [Feedback](#) | [Licence](#) | [Updates](#) | [Mirrors](#) | [Keys](#) | [Links](#) | [Team](#)
Download: [Stable](#) · [Snapshots](#) | [Docs](#) | [Changes](#) | [Wishlist](#)

This page contains download links for the latest released version of PuTTY. Currently this is 0.73, released on 2019-09-29.

When new releases come out, this page will update to contain the latest, so this is a good page to bookmark or link to. Alternatively, here is a [permanent link to the 0.73 release](#).

Release versions of PuTTY are versions we think are reasonably likely to work well. However, they are often not the most up-to-date version of the code available. If you have a problem with this release, then it might be worth trying out the [development snapshots](#), to see if the problem has already been fixed in those versions.

Package files

You probably want one of these. They include versions of all the PuTTY utilities.
(Not sure whether you want the 32-bit or the 64-bit version? Read the [FAQ entry](#).)

MSI ("Windows Installer")

32-bit:	putty-0.73-installer.msi	(or by FTP)	(signature)
64-bit:	putty-64bit-0.73-installer.msi	(or by FTP)	(signature)

Unix source archive

.tar.gz:	putty-0.73.tar.gz	(or by FTP)	(signature)
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Alternative binary files

The installer packages above will provide versions of all of these (except PuTTYtel), but you can download standalone binaries one by one if you prefer.
(Not sure whether you want the 32-bit or the 64-bit version? Read the [FAQ entry](#).)

putty.exe (the SSH and Telnet client itself)

32-bit:	putty.exe	(or by FTP)	(signature)
64-bit:	putty.exe	(or by FTP)	(signature)

pscp.exe (an SCP client, i.e. command-line secure file copy)

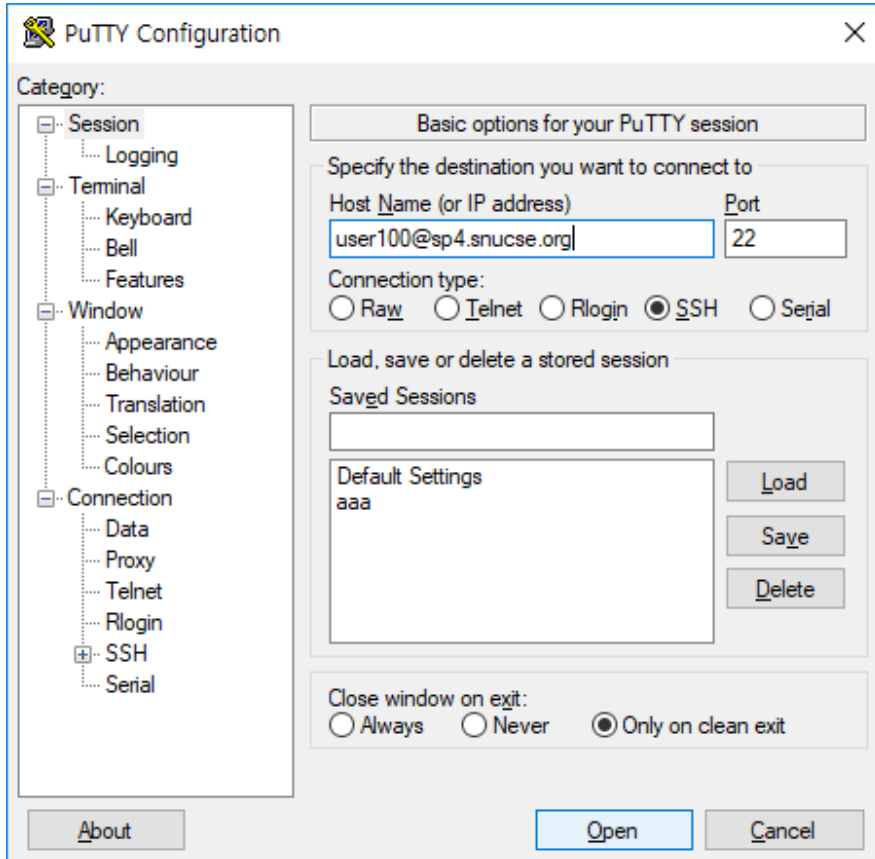
32-bit:	pscp.exe	(or by FTP)	(signature)
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<https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html>

Alternative binary file – putty.exe

Connect to server - Windows

- 서버 접속과 scp 과정만 다름

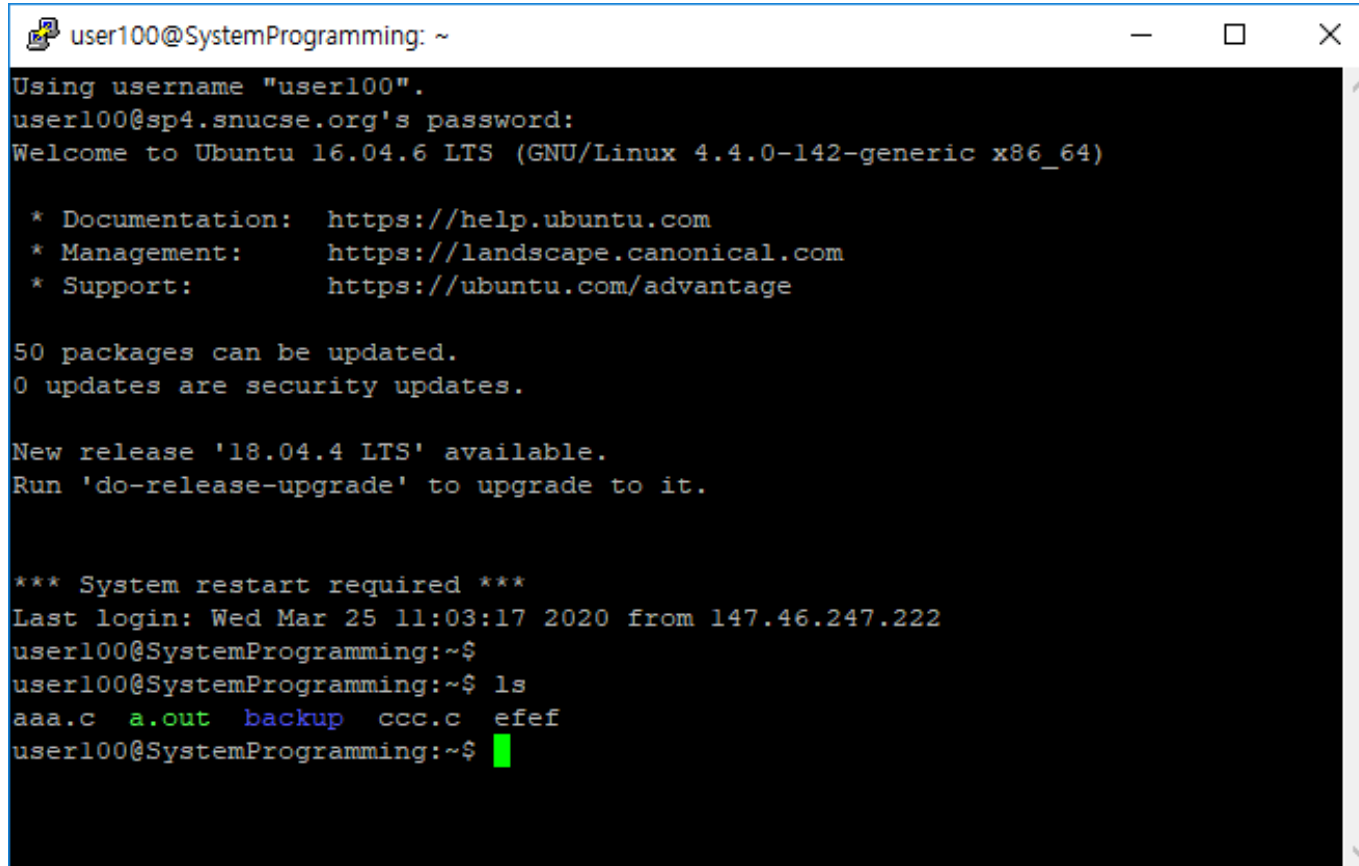


<https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html>

Alternative binary file – putty.exe

Connect to server - Windows

- 서버 접속과 scp 과정만 다름



The screenshot shows a terminal window titled 'user100@SystemProgramming: ~'. The terminal output is as follows:

```
Using username "user100".
user100@sp4.snucse.org's password:
Welcome to Ubuntu 16.04.6 LTS (GNU/Linux 4.4.0-142-generic x86_64)

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

50 packages can be updated.
0 updates are security updates.

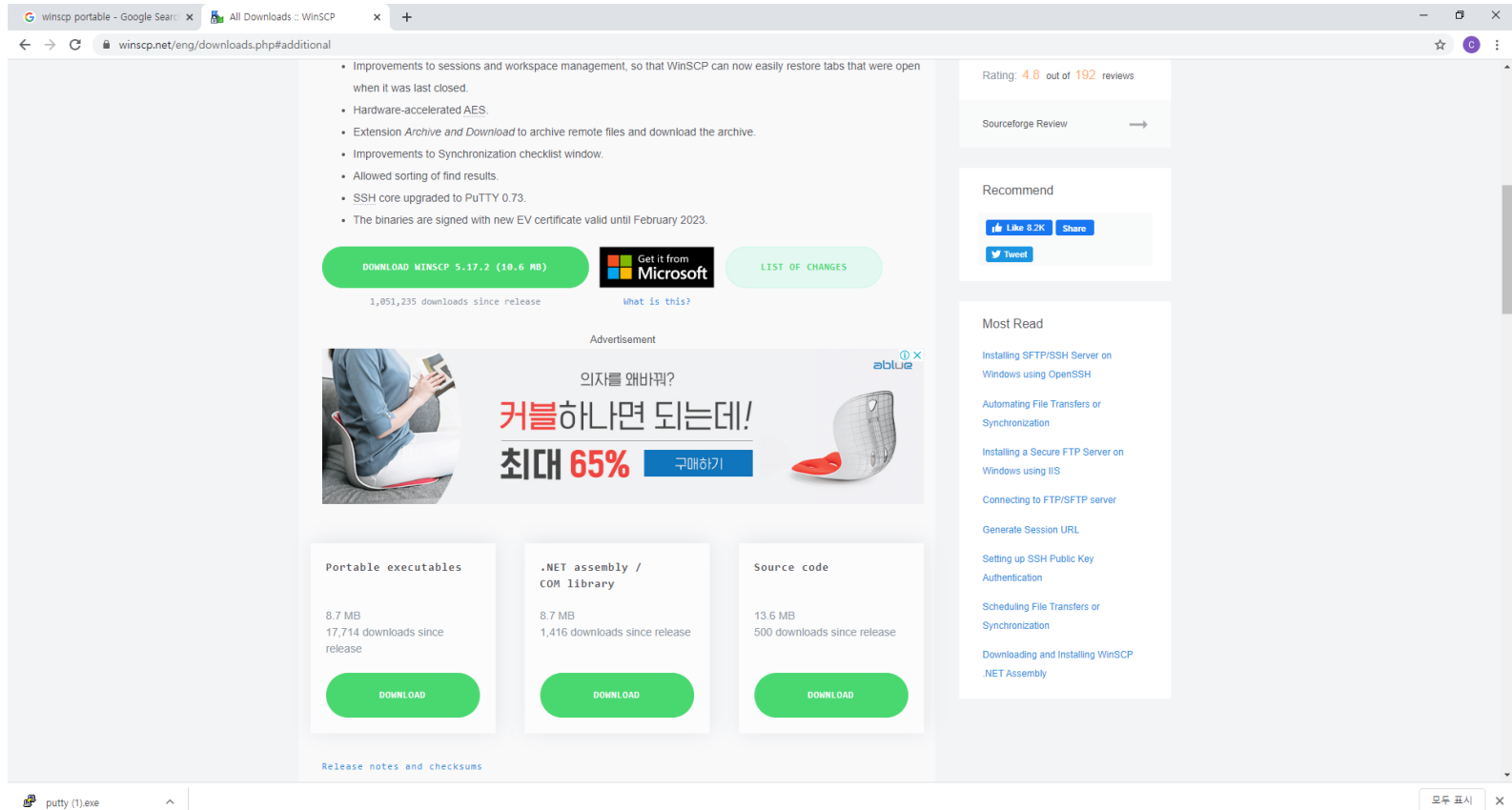
New release '18.04.4 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

*** System restart required ***
Last login: Wed Mar 25 11:03:17 2020 from 147.46.247.222
user100@SystemProgramming:~$
user100@SystemProgramming:~$ ls
aaa.c  a.out  backup  ccc.c  efef
user100@SystemProgramming:~$
```

<https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html>

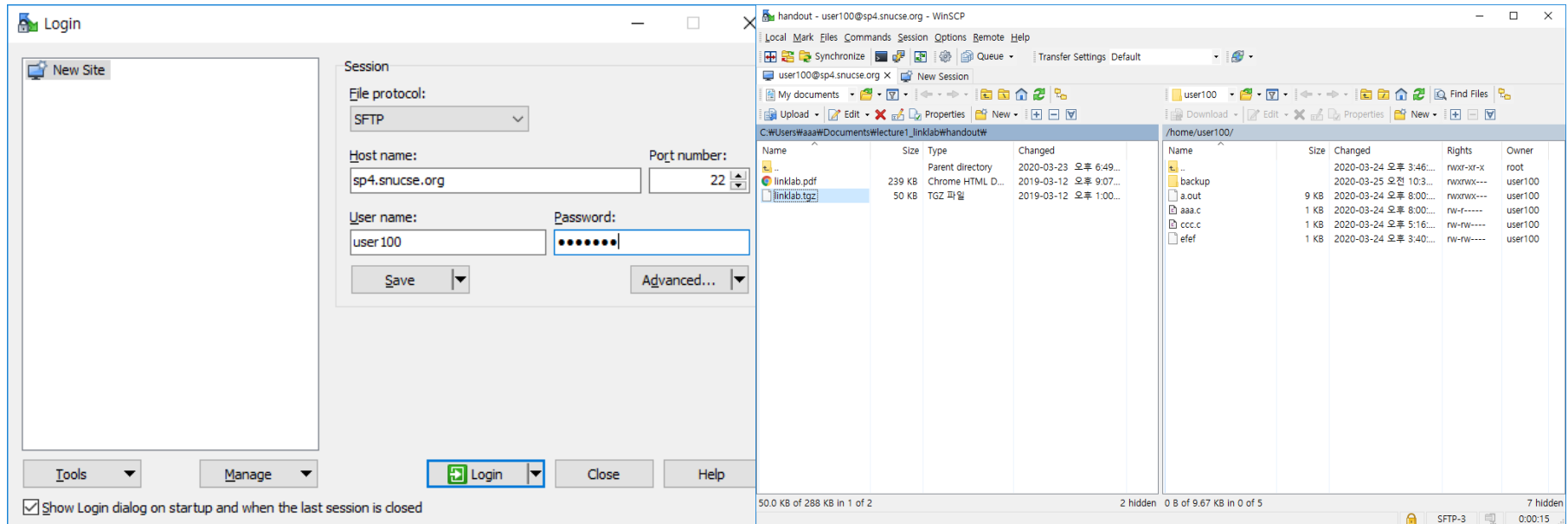
Alternative binary file – putty.exe

Windows – SCP



- <https://winscp.net/eng/downloads.php#additional>
- Portable executables – Decompression

Windows – scp



- Choose file protocol to SFTP
- Enter host name, user name, password.
- You can use other SFTP Clients. (FileZilla, etc)

Windows – scp

- 서버 접속과 scp 과정만 다름

<https://winscp.net/eng/downloads.php#additional>

Portable executables – Decompression

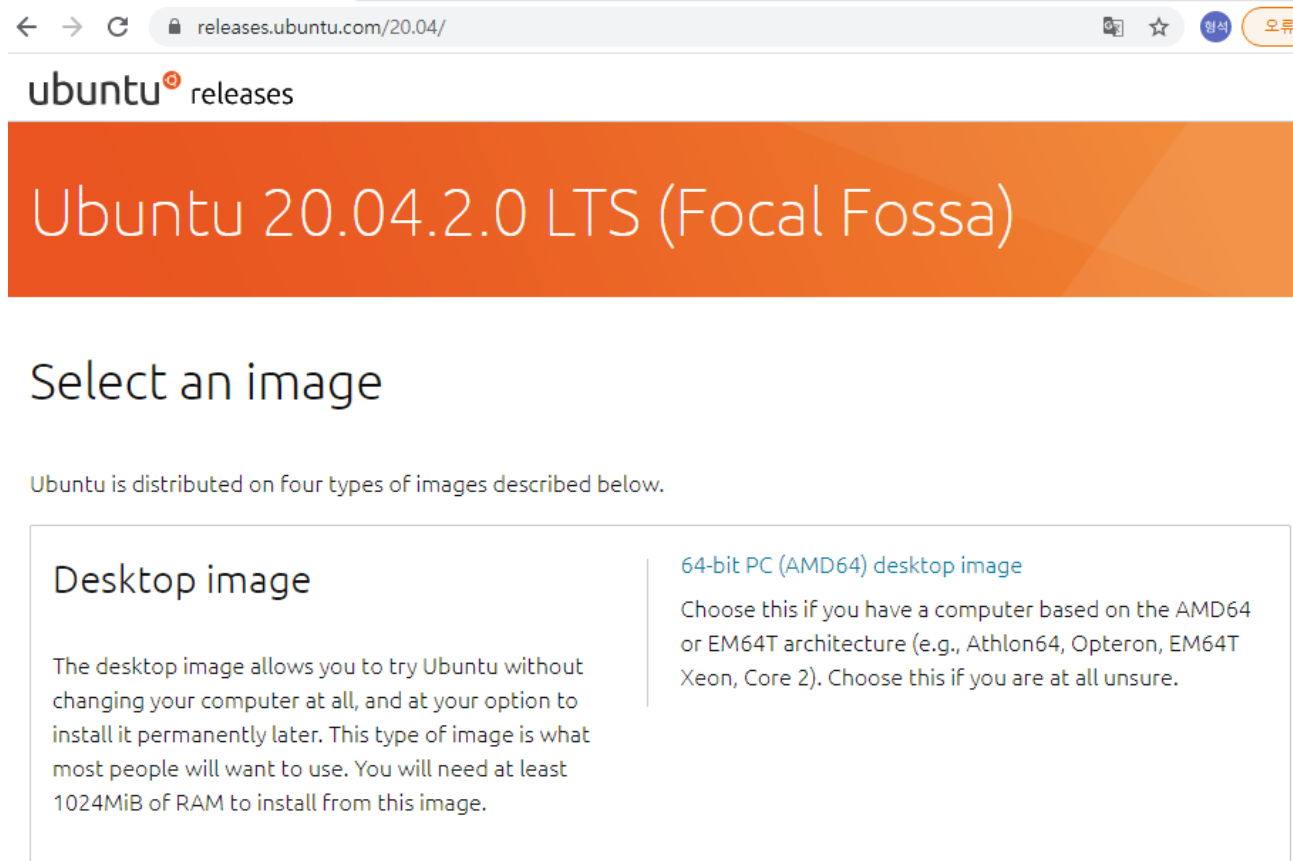
Let's try

- 1. 개인 컴퓨터에서 서버에 접속
 - # ssh [user?@sp?.snucse.org](#)
- 2. 자기 계정 password 변경 (필수)
 - # passwd
- 3. etl에서 개인 컴퓨터로 과제 파일(linklab.tgz) 다운받기
- 4. scp로 과제 파일을 서버로 옮기기
 - # scp linklab.tgz user?@sp?.snucse.org:/home/user?/
- 5. 서버에서 압축 풀기
 - # tar xvf linklab.tgz
- 6. 과제 수행

When you do your assignment...

- 1. 개인 컴퓨터에서 과제 진행 후 서버에서 테스트
 - 환경이 달라 문제 발생 가능
 - 채점은 실습 서버 환경에서 진행됨
 - 코딩은 각자 머신에서, 최종 테스트만 서버에서 진행
- 2. 실습 서버를 사용하지 않을 사람도 passwd 변경 필수

OS / Linux Kernel



- **Linux Kernel v5.15.65**
 - We don't accept questions regarding to other kernel version
 - Must use this kernel version

VirtualBox 6.1



- <https://www.virtualbox.org/wiki/Downloads>
- Choose & install appropriate package for your laptop.

VB Configuration

Oracle VM VirtualBox 관리자

파일(F) 머신(M) 도움말(H)

새로 만들기(N)... Ctrl+N
 추가(A)... Ctrl+A
 설정(S)... Ctrl+S
 복제(O)... Ctrl+O
 이동(M)...
 OCI로 내보내기(X)...
 삭제(R)...
 그룹(U)
 시작(T)
 일시 정지(P)
 재시동(R)
 닫기(C)
 도구
 저장된 상태 삭제(I)...
 로그 보기(L)... Ctrl+L
 새로 고침(F)
 탐색기에 표시(H)
 데스크톱에 바로 가기 만들기(E)
 정렬(S)
 검색(E) Ctrl+F

새로 만들기(N) 설정(S) 삭제 삭제 시작(T)

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

시스템
 기본 메모리: 4096 MB
 프로세서: 4
 부팅 순서: 플로피, 광 디스크, 하드 디스크
 가속: VT-X/AMD-V, 네스티드 페이징, KVM 반가상화


디스플레이
 비디오 메모리: 16 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: Ubuntu.vdi (일반, 40,00 GB)

오디오
 호스트 드라이버: Windows DirectSound
 컨트롤러: ICH AC97

네트워크

미리 보기



VB Configuration

가상 머신 만들기

이름 및 운영 체제

이름: Ubuntu

머신 폴더: C:\Users\Admin\VirtualBox VMs

종류(T): Linux

버전(V): Ubuntu (64-bit)

메모리 크기(M)

4 MB 8192 MB 4096 MB

하드 디스크

☐ 가상 하드 디스크를 추가하지 않음(D)

☒ 지금 새 가상 하드 디스크 만들기(C)

☐ 기존 가상 하드 디스크 파일 사용(U)

Ubuntu.vdi (일반, 40,00 GB)

가이드 모드(G) 만들기 취소



가상 하드 디스크 만들기

파일 위치(L)

C:\Users\Admin\VirtualBox VMs\UTest\UTest.vdi

파일 크기(S)

4,00 MB 2,00 TB 40,00 GB

하드 디스크 파일 종류(T)

☒ VDI(VirtualBox 디스크 이미지)

☐ VHD(가상 하드 디스크)

☐ VMDK(가상 머신 디스크)

☐ HDD(Parallels 하드 디스크)

☐ QCOW(QEMU Copy-On-Write)

☐ QED(QEMU 확장 디스크)

물리적 하드 드라이브에 저장

☒ 동적 할당(D)

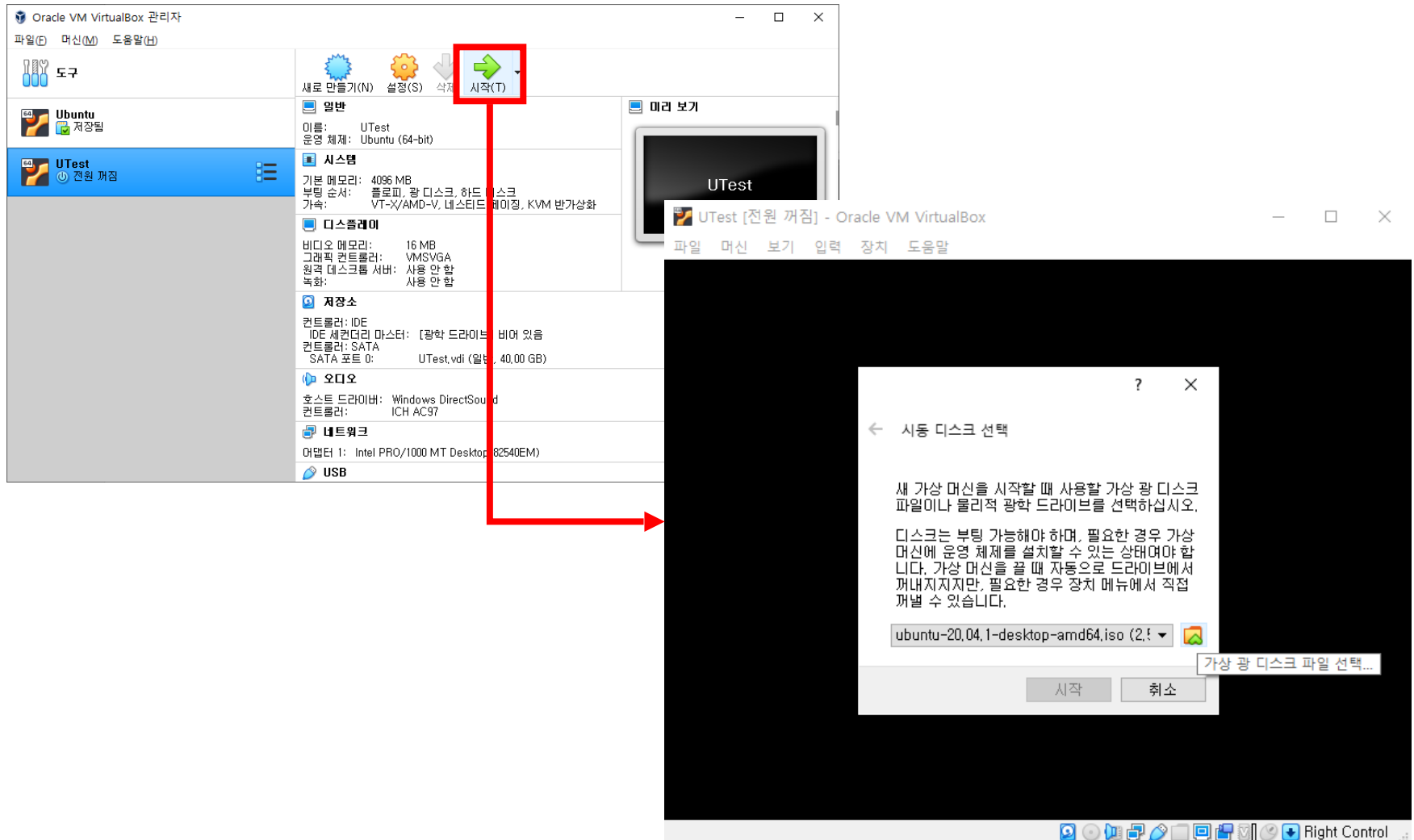
☐ 고정 크기(F)

☐ 2GB 단위로 분할하기(S)

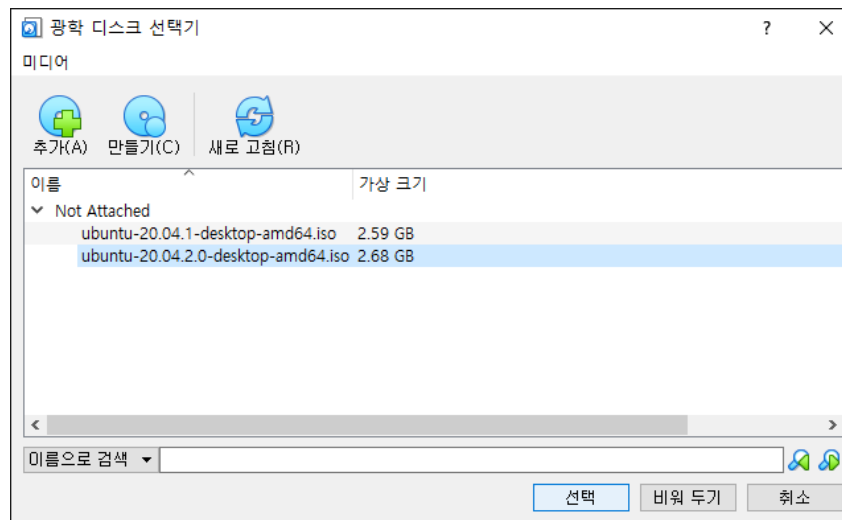
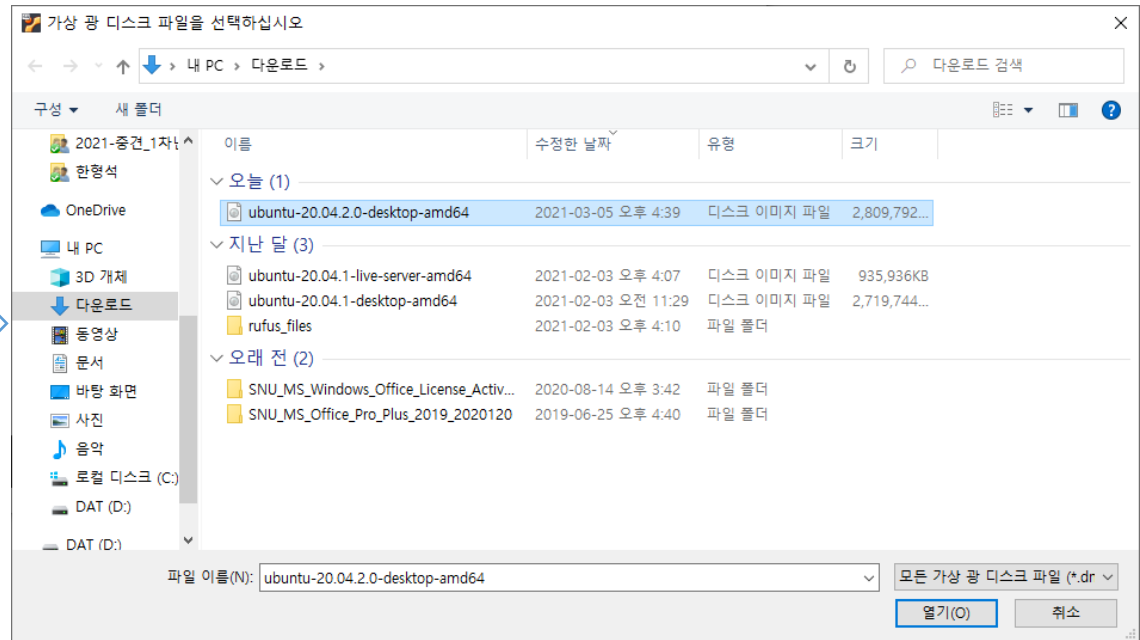
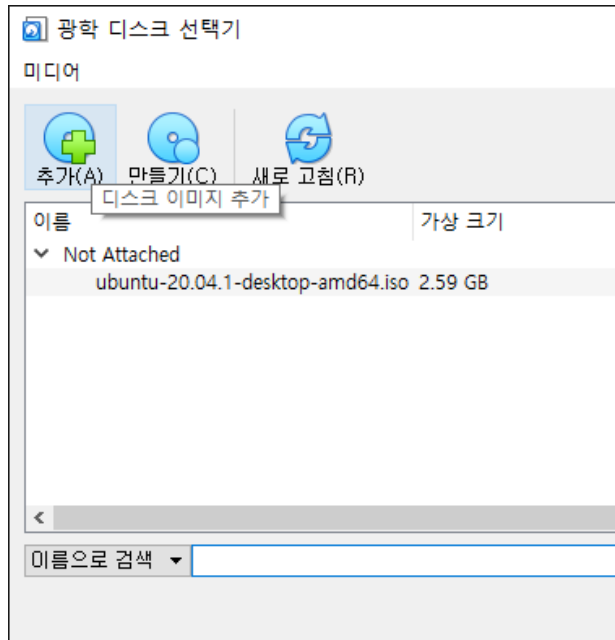
가이드 모드(G) 만들기 취소

- Modify memory & file size appropriately.
- (RECOMMENDED) Storage: 40-50 GB

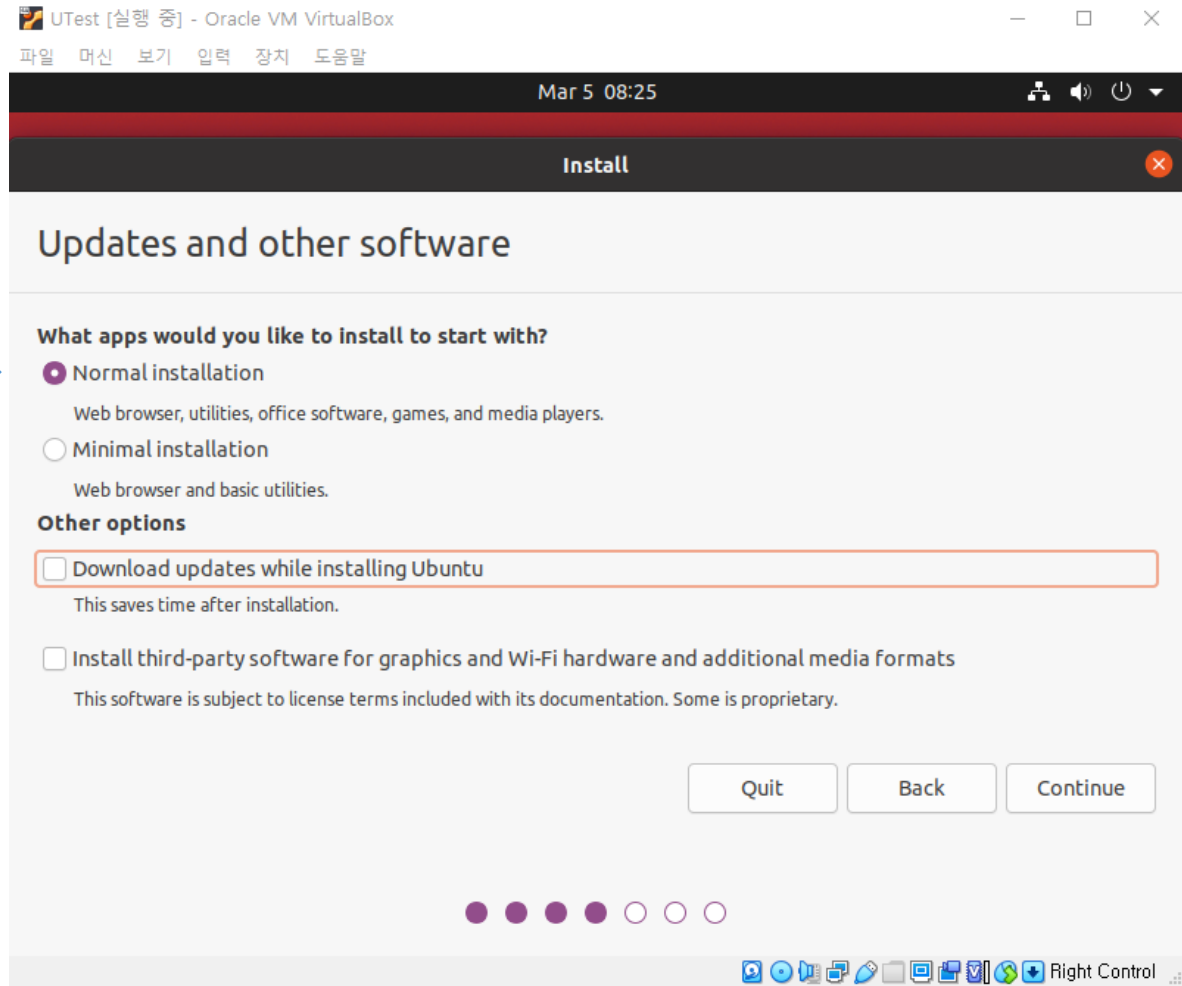
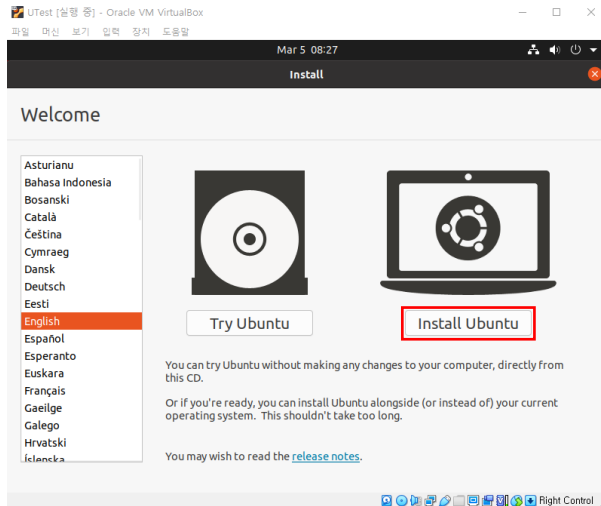
VB Configuration



VB Configuration



VB Configuration



Next class

- Assignment #1
- If you have any questions?
 - Questions on eTL Q&A board

대면 실습 일정

- 3/7 : ot
 - 3/14 : linker lab
 - 3/28 : shell lab
 - 4/18 : malloc lab
 - 5/2 : kernel lab
 - 5/23 : proxy lab
-
- 대면 실습일에는 과제에 대한 설명과 질의응답을 진행할 예정입니다
 - 해당 날짜 이외에는 실습 진행하지 않습니다. 질문은 etl로 받도록 하겠습니다
 - 출석체크는 하지 않습니다