

Linux Systems and Open Source Software

Course Overview

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Fall 2021



Introduction

- Instructor: Chia-Heng Tu (涂嘉恒)
  - chiaheng@mail.ncku.edu.tw
  - Office @ Room 65B03
  - Office hours: by appointment
  - Tel: 06-2757575 ext. 62527
- TA:
  - 王紹華、黃柏瑄、吳昱宗、鄭育丞
  - Office @ Room 65704
    (Advanced Systems Research Lab)
  - Tel: 06-2757575 ext. 62520 #2704
  - Email: asrlab@csie.ncku.edu.tw
    Email subject starts with ``**[Linux2021Fall]**''



Class Arrangement

- A 3-hour class is separated into three time slots:

Wednesday @R65203

1. 10:10 ~ 11:15 (Lectures)
2. 11:20 ~ 12:00 (Hands-on Labs)

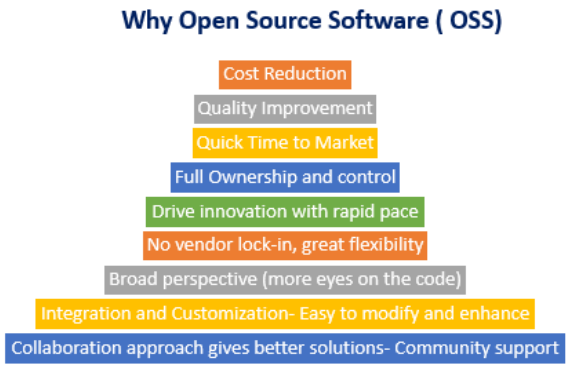
Friday @R65203 or R65704

3. 9:10 ~ 10:00 (Hands-on Labs and Office hours)



Open Source Software is Everywhere

- Open source software provides almost everything you may need
  - Operating systems
  - Browsers
  - Databases
  - Project management
  - Email client
  - …



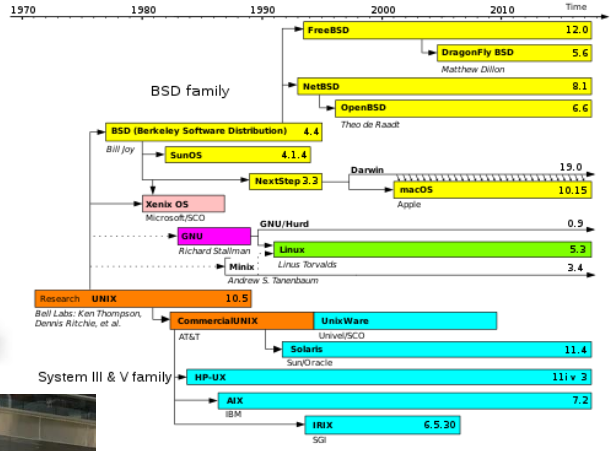
Courtesy of img source 1; src 2;



Linux-Based Systems Are Everywhere

- Linux is a family of open source Unix-like operating systems
- Linux is the core of various systems
  - Servers
  - 3C products
  - Appliances
  - Autonomous vehicles

Simplified history of Unix-like operating systems.



Courtesy of img source 1; src 2; src 3; src 4; src 5



This Course Will …

- Be suitable for students who have **little or zero experiences** in the open source development
- Be good for you to get familiar with open source **development tools and flows**
- Pave the road for your further studies related to **systems or other research fields**
- Provide you with many **hands-on experiences**



Requirements

- Pre-requisite:
  - Programming in C
  - Commitment to spending time for **hands-on works**

- Efforts:
  - Attend the classes
  - Do hands-on labs and mini projects
    - Hand in your codes and lab results almost every week
    - Hand in your codes and results of the mini projects on special topics

Timetable

This page will be updated separately
Keep an eye on the schedule at Moodle

1. 9/15 Course introduction
2. 9/22 Basics of hardware platform for Linux systems
3. 9/29 Version control system: Git
4. 10/6 Vim and its plug-in
5. 10/13 Bash and Shell Scripts
6. 10/20 Makefile and Maven
7. 10/27 Linux command-line tools

Basis of Linux tools

8. 11/3 Review and discussion (Discuss with TAs @R65704)
9. 11/10 Package management
10. 11/17 Process management
11. 11/24 Networking
12. 12/1 Basics of performance analysis
13. 12/8 Tools for performance analysis

Basis of Linux systems

14. 12/15 Inter-process communication
15. 12/22 Robotic Operating Systems (ROS)
16. 12/29 ROS-based autonomous driving systems
17. 1/5 Simulated autonomous driving systems

Advanced topics for Autonomous Driving

18. 1/12 Review and discussion (Discuss with Tas @R65704)

Grading…



- Weekly lab exercises: 75%
  - ◇ Weeks 2, 3, 4, 6, 7, 9, 10, 11, 12, 13, 15, 16
    - You should hand in codes/results by the end of each Friday class
- Mini projects: 25%
  - ◆ Weeks 5 (10%), 14 (10%)
  - 💎 Weeks 17 (5%)
    - You should hand in your codes/results at the specific dates The preliminary dates are shown in the following page
- No labs at
  - Weeks 1, 8, 18
- **Online submission of your codes to Moodle to get the above scores**

1.	9/15 Course introduction	1. N/A
2.	9/22 Basics of hardware platform for Linux systems	2. ◇
3.	9/29 Version control system: Git	3. ◇
4.	10/6 Vim and its plug-in	4. ◇
5.	10/13 Bash and Shell Scripts	5. ◆
6.	10/20 Makefile and Maven	6. ◇
7.	10/27 Linux command-line tools	7. ◇
8.	11/3 Review and discussion (Discuss with TAs @R65704)	8. N/A
9.	11/10 Package management	9. ◇
10.	11/17 Process management	10. ◇
11.	11/24 Networking	11. ◇
12.	12/1 Basics of performance analysis	12. ◇
13.	12/8 Tools for performance analysis	13. ◇
14.	12/15 Inter-process communication	14. ◆
15.	12/22 Robotic Operating Systems (ROS)	15. ◇
16.	12/29 ROS-based autonomous driving systems	16. ◇
17.	**1/5 Simulated autonomous driving systems**	17. 💎
18.	1/12 Review and discussion (Discuss with Tas @R65704)	18. N/A

The format of the demos is subject to change, depending on the status of COVID-19 pandemic

Timetable
(Each Color Has Different Meaning)

1. 9/15 Course introduction ← No labs
2. 9/22 Basics of hardware platform for Linux systems ← Hand-in lab results no less than each Friday class
3. 9/29 Version control system: Git
4. 10/6 Vim and its plug-in
5. 10/13 Bash and Shell Scripts ← A mini project; hand-in by 11/3
6. 10/20 Makefile and Maven
7. 10/27 Linux command-line tools
8. 11/3 Review and discussion (Discuss with TAs @R65704)
9. 11/10 Package management
10. 11/17 Process management
11. 11/24 Networking
12. 12/1 Basics of performance analysis
13. 12/8 Tools for performance analysis
14. 12/15 Inter-process communication ← A mini project; hand-in by 1/12
15. 12/22 Robotic Operating Systems (ROS)
16. 12/29 ROS-based autonomous driving systems
17. **1/5 Simulated autonomous driving systems** ← A mini project; hand-in by 1/12
18. 1/12 Review and discussion (Discuss with Tas @R65704)



In Each Class

- You will use your PC or the PC in the classroom
- You should download the VM image or use a USB stick to do the labs and projects
  - We have about 20 USB sticks for the students
  - You can use your own USB stick (~32GB)

- **You are expected to finish your labs on** Wed class
  - If you cannot make it, you can ask questions
  - **You should finish labs by no later than each** Friday class



Now, make your own decision

- Drop this class, if you expect to
  - listen to lectures and take exams
- Take this class, if you want to
  - learn something practical and get hands dirty



QUESTIONS?