Overview

- This Lecture
  - Introduction
  - Reference:
- Next Lecture
  - Network hardware and protocols
  - Reference:

CS engineering cliff

- CS students understand less and less computer systems and low level details
- Hands-on experience on computer systems (operating systems and computer networks) is valuable for understanding the details.

Network Management and Security

- Originated from system administration, especially for multi-user systems
- Computer networks and the Internet have broadened the area of system administration
- System/network administration as a profession
- Security of computer systems and networks is a serious concern now.

Objectives of the course

- Sound understanding of computer systems, networks, and their security issues with hands-on experience
- Understand and practise every aspect of system and network administration
- Focus on the technical aspect of system, network, and security management
- Use Linux plus Ethernet plus VM as a case study
- A place to test your knowledge of computer systems and networks in a practical way.

Resources

- The COSC301 website
- The textbook: the lab handbook plus the lecture notes
- Linux manual pages inside the Linux VM
- Related web sites
  - The Linux Document Project, **http://en.tldp.org**
    - HOWTO documents
- Maybe the above resources are obsolete, the last but most important resort is **Google search**!
  - Now chatgpt (they may be wrong; use with care and discernment)
- Most importantly, the teaching team!
  - Ruth Huang and me

Nature of the Course

- Nature of the course
  - No absolute truth.
  - Steadily changing area.
  - De-valued if no hands-on experience.
- How we'll teach it
  - Self-driven learning
    - Provide coaching rather than teaching
  - Lab intensive.
  - Lectures focus on understanding of theories.
    - Read the lecture notes before each lecture
  - Encourage learning from errors and questions.
  - Encourage team work and interest-driven adventure.

Course Details

- Assessment
  - Two assignments worth 10% and 25%
  - Four assessed advanced labs worth 15%.
  - 50% for final examination. Note you have to pass 40% of the final exam.
- Important points
  - Participate in lectures and labs.
  - This course is very hierarchical. If you miss labs or lectures you may not be able to follow the rest.
  - Good relationship is a must. This paper is a chance to practise team work in the course as administrators do.
  - Read the lab material before you go to a lab. It will save you a lot of time!

Notice

- Do The Prelab!
  - Use the lab time today
  - Get each lab manual at the course website. Note it will be updated from time to time given the current upgrade of lab computers and software.
- The labs are at Lab F & Lab E in Owheo Building
  - See me or Ruth for any lab related issues

System/network administrator

- Successful Administrators
  - No stereotypes. “White/black Cats Theory”
  - Normally if one can keep the users happy he/she is successful (which is very difficult).
  - Life-long learning skills. One’s proud knowledge and expertise today may be obsolete tomorrow (Be prepared to be jobless if you do not keep learning).
- Some myths for new SAs
  - There exists a right answer for every problem.
  - Things should always work in the way we expect.
  - Every problem should have a happy end.

System administrator (cont.)

- Challenges of SAs
  - Not just installing system/software, also about planning and designing an efficient community of computers.
  - Design a logical and efficient network.
  - Easy upgrade for a large number of computers.
  - Decide what and where services are installed.
  - Plan and implement security.
  - Provide a comfortable/convenient environment for users.
  - Develop ways of fixing problems and errors.
  - Efficient administrative skills, e.g. automating.
  - Keep track of new technology and software.

Practice of SAs

- Good practices
  - Look for answers in manuals, newsgroups, and archive of mailing lists. Usually "google" helps for most common problems.
  - Use controlled trial and error for diagnosis.
  - Listen to people who tell us there is a problem. It might be true.
  - Write down problems and solutions in a log book, and write down experiences (highly recommended).
  - Take responsibilities for our actions.
  - Remember to tidy things up regularly.
  - After learning something new, ask yourself *"How does this apply to my work?"*

Superuser

- Superuser (root user)
  - What is root user or superuser? A user that has privileges to access/modify all resources of a computer system.
  - Be aware of the double-edged sword
    - Convenient to do anything
    - Powerful enough to damage the system
- Login as superuser (root)
  - System admins should never login as root
    - Many commands can be executed by ordinary users
  - When you need root privilege
    - Use **sudo** or **sudo -s** or **su**

Issues in labs

- 99% are typos!
- Don’t check the errors or log files after configuration.
- Don’t follow lab instructions carefully.
- Don’t read lecture notes.
- Don’t participate.