

Computer Network Administration

2025 Spring

國立陽明交通大學資工系資訊中心
Information Technology Center, Department of Computer Science, NYCU

The Romance of a Network Administrator



Source: <https://twitter.com/realvictrid/status/1758795387052360054?s=46&t=e>

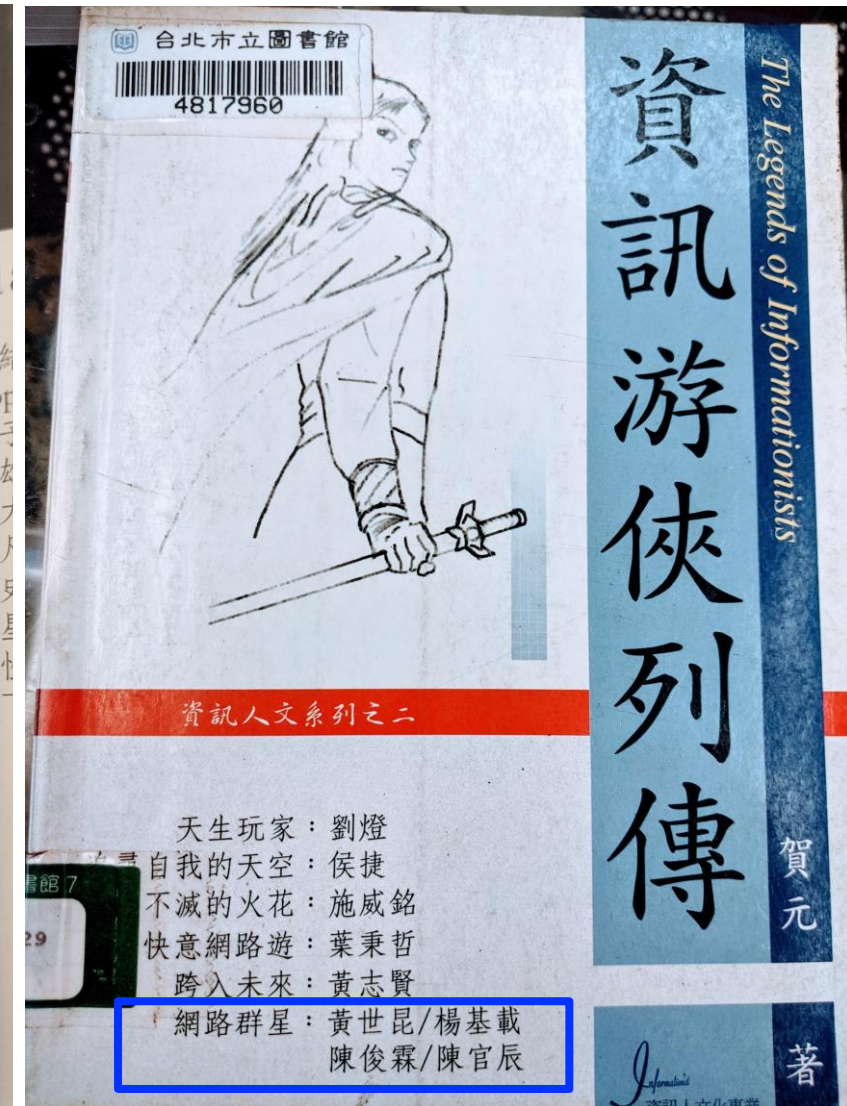
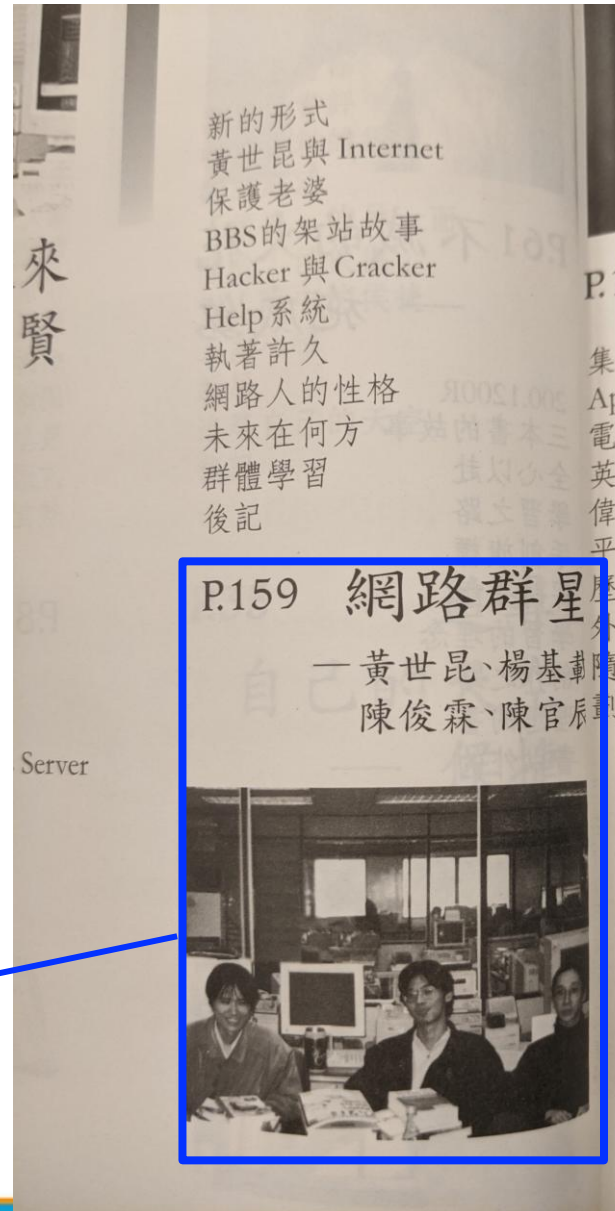
Why this course?

- NYCU CS has the only one “complete” departmental information technology center (called NYCU CSIT; a.k.a. computer center) in Taiwan.
- To cultivate professionals capable of operating CSIT, we offered two elective courses since 1996 (NCKU 2012-2022, NTU 2014-, NTHU 2019-) :
 - **Computer System Administration (Fall semester)** introduces basic **Unix** system administration skills, primarily in a **one-server scenario**.
 - **Computer Network Administration (Spring semester)** introduces advanced skills to operate the entire information technology center with **multiple servers and network equipment**.

NYCU CSIT - one of the main origins of Taiwan's Internet startups

- Wretch (無名小站)
- PIXNET (痞客邦)
- funP (雲沛創新集團)
- Appier (沛星互動科技)
- KKTix
- InfuseAI
- MeetAndy AI
- ...

Photo taken
at NYCU CSIT



NASA = SA + NA

NASA Course Website

Computer System and Network Administration, NYCU CSCC

HOME PAGE

▼ COURSES

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Graduate Courses

System Administration Practice (SAP, 2015~2017)

Network Administration Practice (NAP, 2015~2018)

Undergraduate Courses

Computer System Administration (SA, 1996~)

Computer Network Administration (NA, 2009~)

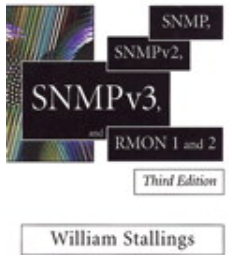
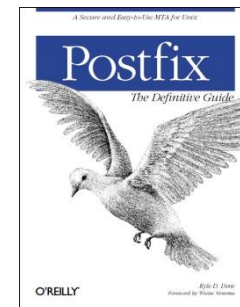
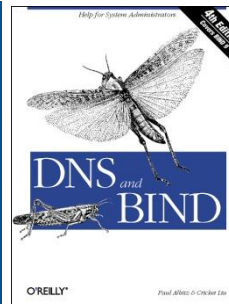
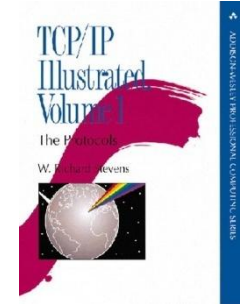
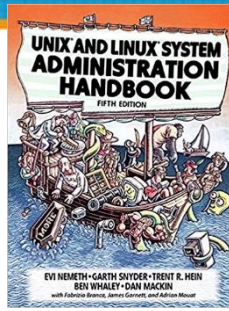
(Computer) Network Management (NM, 1997~2008)

Useful Articles

提問的智慧 (zh-tw)

How To Ask Questions The Smart Way (en)

NYCU CSCC (Computer Center, Department of Computer Science, National Yang Ming Chiao Tung University)



Three-year trial for graduates

NYCU CSIT is powered by Open Source

- Thanks to all the open-source contributors.
- This course is supported by MoE ITSA project.
- Let me know if you have open source contribution (bonus).



Syllabus

- Website:
 - <https://nasa.cs.nycu.edu.tw/na/2025/>
- Instructor:
 - Meng-Hsun Tsai (蔡孟勳)
tsaimh@cs.nycu.edu.tw
- Time:
 - Rabc (Thu. 18:30 ~ 21:20)
- Place:
 - EC115

Syllabus

- Discussion Forum

- <https://groups.google.com/g/nctunasa>
- We suggest you to join - TAs might give homework hints there
- Request join and tell us your student ID
- Ask **course-related/technical questions** there
- Everyone in the group can answer/vote
- **But DON'T post direct answer/configuration there!**
 - You will be banned

電子郵件傳送偏好設定： 有新訊息时通知我 (每天最多 1 封) ▾

當我針對某個主題留言時，自動為我訂閱該主題的電子郵件更新

這個群組的其他成員可查看你的電子郵件地址，甚至也可以查看你的 Google 個人資料。加入這個群組後，你就能存取群組的共用資源。[瞭解詳情](#)。

您可以在下面的文字方塊中填入說明，將詳細資訊傳送給管理員。

我是108下學期NA的修課生曾亮齊，學號0116057

申請加入這個群組 取消

Syllabus

- Lecture/Exam in Chinese
 - Not recommend for those who do not speak Chinese
- TAs:
 - We might have about 8 TAs.
 - Email to TAs: ta@nasa.cs.nycu.edu.tw
 - Also received by the lecturer
 - Office hour
 - Wed., 15:30 ~ 17:20, by appointment, @[CSIT](#)

Syllabus

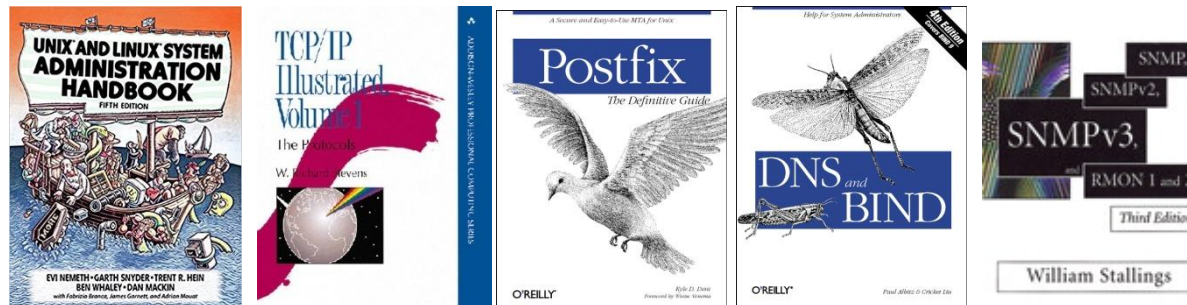
- Email Policy (**IMPORTANT**)
 - Don't send course-related/technical questions to TAs
 - TAs won't answer you
 - Please ask them on course forum instead
 - Only ask TAs for personal/non-technical questions
 - Grading
 - Office hour appointment
 - Demo appointment

Syllabus – Course Overview

- Main topics
 - Networking
 - TCP/IP Networking Environment
 - NAT, DHCP, VPN, Firewall, Load Balancer, ...
 - DNS – BIND (Berkeley Internet Name Domain)
 - Mail System - Postfix
 - SPF (Sender Policy Framework)
 - DKIM (Domain Keys Identified Mail)
 - DMARC (Domain-based Message Authentication, Reporting & Conformance)
 - Network Management/Authentication/Authorization
 - LDAP, SNMP
 - Configuration Management (Ansible, Puppet)

Syllabus – Course Textbook and Reference

- Textbook
 - Unix and Linux System Administration Handbook (5th Edition)
 - Course slides
- Reference book
 - TCP/IP Illustrated Volume 1
 - Postfix
 - DNS and BIND
 - SNMP, SNMPv2, SNMPv3 and RMON 1, 2



Syllabus – Text book outline

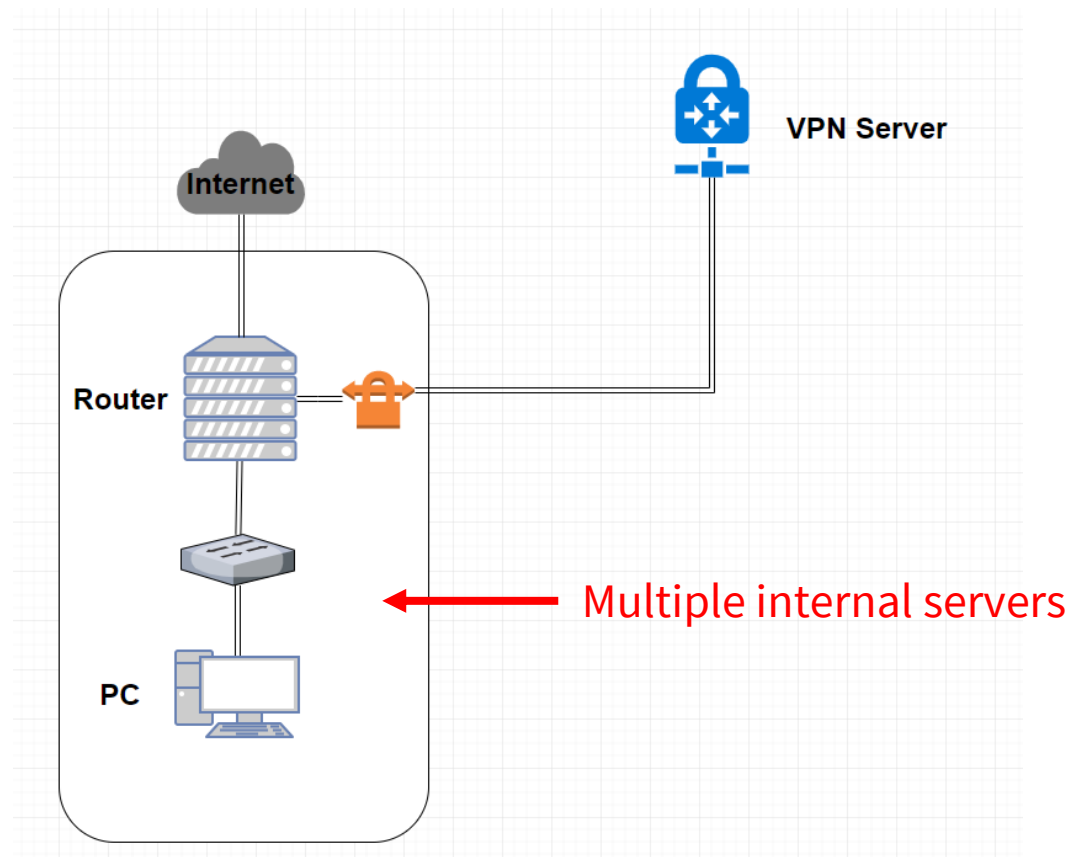
- Part II. Networking
 - Chap 16 – TCP/IP
 - Chap 17 – Routing
 - Chap 18 – DNS: Domain Name System
 - Chap 21 – SMTP: Simple Mail Transfer Protocol
 - Chap 22 – Directory Services
 - Chap 23 – Electronic Mail
 - Chap 25 – Network Management and Debugging
- Operations
 - Chap 30 – Monitoring

Syllabus – Grade Policy

- Homework (**No Delay Submission**)
 - » Homework 1: 10%
 - » Homework 2: 10%
 - » Homework 3: 20%
 - » Homework 4: 20%
- Exam
 - » Exam 1 (paper-based): 10%
 - » Exam 2 (paper-based): 10%
 - » Exam 3 (computer-based): 20%

Syllabus – Homework Outline

- Building an intranet with DHCP, NAT, VPN, DNS, LDAP, Mail, WWW... services
- Understanding and managing all these services



Syllabus – Homework Outline

- Every homework is based on previous one
- Homework 1
 - Setup Intranet
 - DHCP, NAT, VPN
- Homework 2
 - + DNS Service
- Homework 3
 - + Mail Service
- Homework 4
 - Authorization, Authentication, Monitoring, Management
 - + LDAP, SNMP

Syllabus – Computer-based Exam

- Time: 6/8 (Sun.) 13:00 ~ 18:00 (5hr)
- Hands-on exam
- Open Internet
- Fix the broken services in the provided environment

Syllabus – Computer-based Exam

- OS: GNU/Linux Debian 12
- Software list
 - DNS: bind
 - Mail: Postfix, Dovecot
 - LDAP: OpenLDAP
 - Other software / services, you might have to read the manual during the exam
- You can use the above software in homework if you want to get familiar with them

Syllabus – Computer-based Exam

- There will be multiple checkpoints
- Scoring will be based-on the time that you finish the checkpoints
- You will have to make your configuration persistent
 - The config should be valid after reboot
- The detailed scoring formula will be announced before exam

Syllabus – Prerequisite

- Background Knowledge
 - We recommend that you should take these first
 - "Computer System Administration" (計算機系統管理)
 - "Introduction to Networking" (計算機網路概論)
- About OS
 - You can use any POSIX-compliant Unix-like OS for homework
 - FreeBSD is used for lecturing
- Environment
 - A dedicated (powerful?) PC that can run **multiple** VMs
 - VirtualBox, VMware
 - 2~3 Unix-like system running at the same time

Attitude

- Attend every class
- Do every exercise
 - As early as possible
 - **On your own**
- Collect information on the Internet
 - The newer, the better.
- **Not recommended for those who have more than 3 major courses in this semester**
 - Sometimes you may spend the whole weekend to just figure out what to do in the homework
 - Loading of this course **roughly equals to 2~3 major courses**
- **You will learn a lot if you study hard!**

Some comments on the Internet

- [交大修課心得 - 網路管理實務\(計算機網路管理\) NAP2018](#)

修這門課時，我是第一次接觸網路、伺服器架設... 等等，平常上完課根本一知半解，於是就花了很多時間在網路上查資料，然後和同學討論；作業更是如此，因為我們都是用 Ubuntu 在做作業，所以還要查各種資料把 FreeBSD 的指令搬到 Linux 上。

這門課應該是這學期花最多時間的一門課了，但同時也是收穫最多的一門課，感覺碰到很多以前完全不會嘗試去碰的知識，是真的學到滿多東西的。

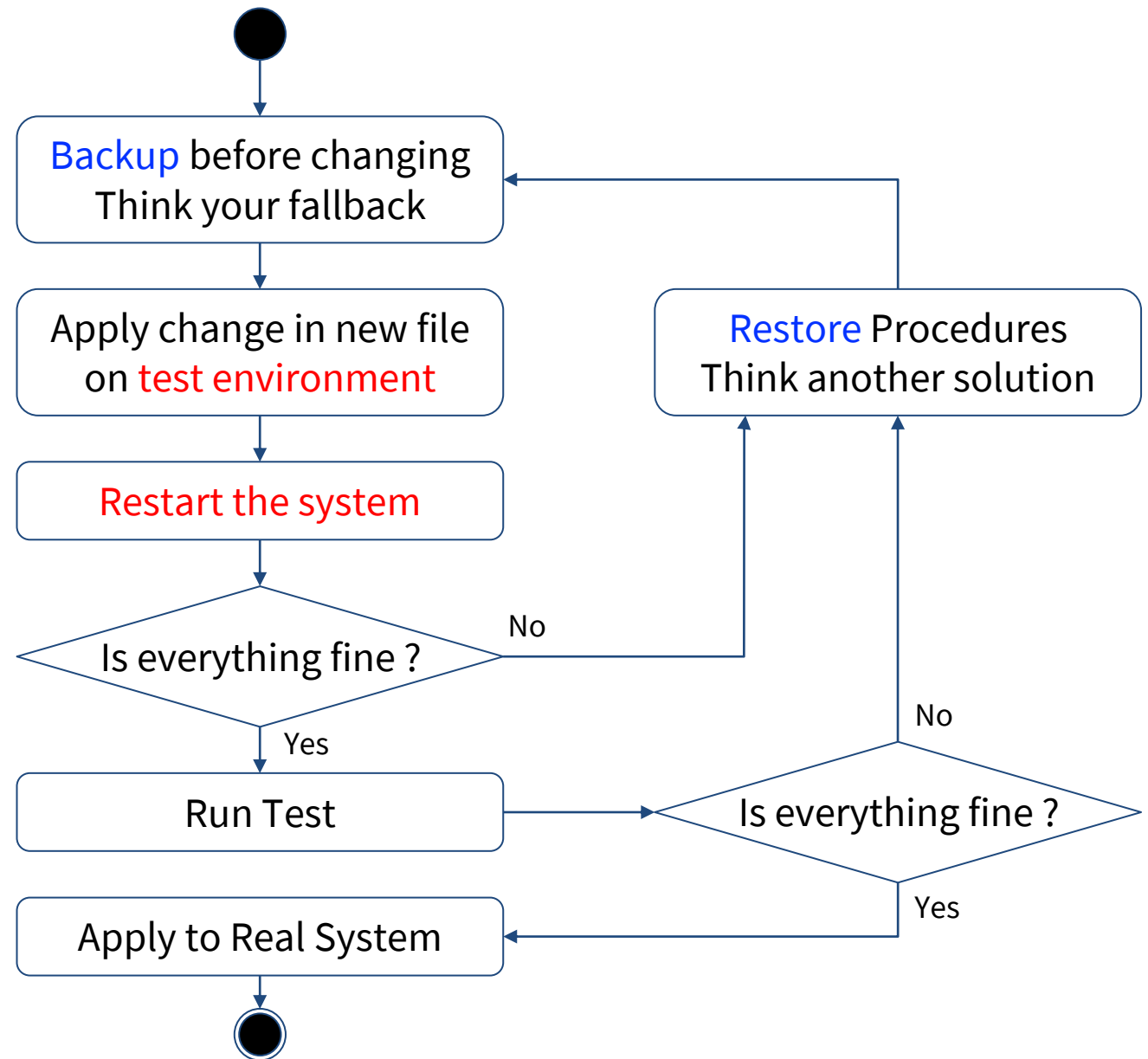
總之，這門課如果是沒有基礎的人，修得時候可能會有點辛苦，但修過了就會覺得成就感滿滿吧！（至少我是滿喜歡這門課的XD）

- [\[心得\] 曾亮齊 計算機網路管理\(NA\) NA2020](#)

教授剛開學的時候有放話說這門課的loading相當於9學分的必修課
個人覺得這種說法有點誇張了
應該差不多是15甚至18學分
每一份作業都要花費至少30-40小時來完成
不過學到的東西真的很多
就算你是個網路白癡
修完這門課你就甚麼都懂了
大概是這樣
真的很硬，不過收穫也很多

When You Perform Any Changes...

- Flow of Change



Q & A

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