

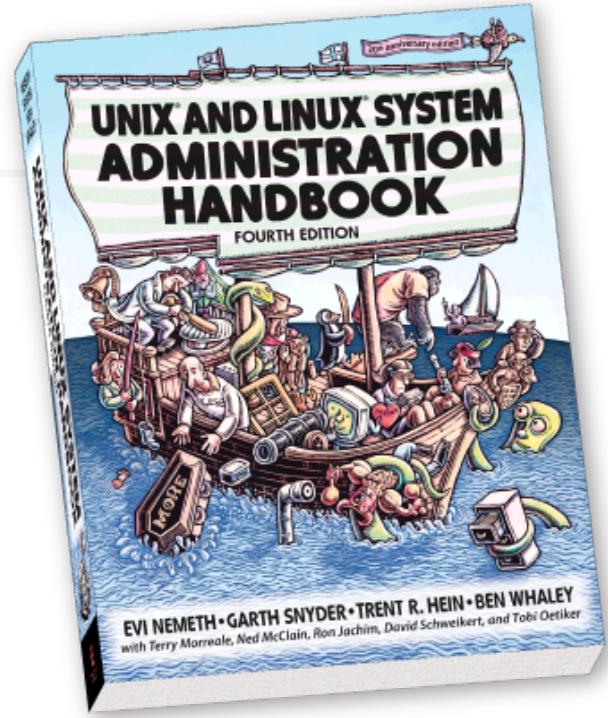
# Network Administration Practice

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pschiu

# Syllabus

- Website:
  - [e3.nctu.edu.tw](http://e3.nctu.edu.tw)
- Instructor:
  - 吳育松
  - 易志偉
- Time:
  - Thu. IJK (PM 6:30 ~ 9:20)
- Place:
  - EC115
- English Slides and Exams, Chinese Lecture (TAs can support)
- TAs:
  - Email
    - [ta@nasa.cs.nctu.edu.tw](mailto:ta@nasa.cs.nctu.edu.tw)
  - IRC channel
    - #nctuNASA on freenode
  - Facebook
    - <https://www.facebook.com/groups/NCTUCSNASA/>



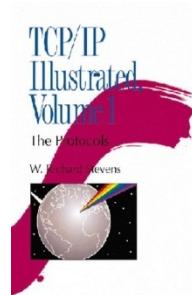
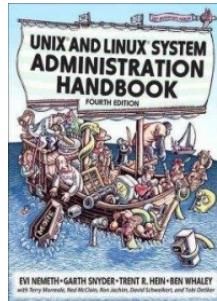
# Syllabus – Course Textbook and Reference

## □ Textbook

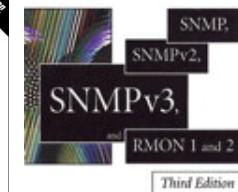
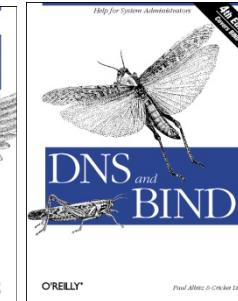
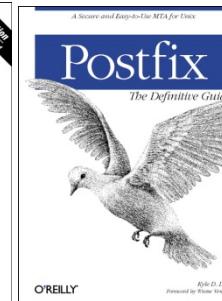
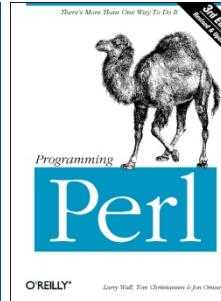
- UNIX and Linux System Administration Handbook, 4th ed.
- Slides

## □ Reference book

- FreeBSD handbook
- TCP/IP Illustrated Volume 1
- Postfix
- DNS and BIND
- SNMP, SNMPv2, SNMPv3 and RMON 1, 2



AUTOMATION, PROFESSIONAL COMMUNITY, MARS



Thin Edition

# Syllabus – Course Overview

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## □ Main topics

- DNS -- BIND (Berkeley Internet Name Domain)
  - DNSSEC
- Web
  - Apache
  - Nginx
  - PHP

# Syllabus – Course Overview

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## □ Main topics

- Mail System -- Postfix
  - SPF (Sender Policy Framework)
  - DKIM (DomainKeys Identified Mail)
  - DMARC (Domain Message Authentication Reporting & Conformance)
- Network Management
  - SNMP (Simple Network Management Protocol)
- Networking
  - Routing (Global Internet Routes & DDoS mitigation)
  - Network Environment
  - NAT, DHCP, Firewall, ...

# Syllabus – Adjunct Lecturer Overview

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- Nagios
- Ansible
- Containe
- Quagga (Quagga Routing Suite)
- Service Infrastructure
  
- Lecturer
  - Edge Core - Phil Huang
  - NCHC - Chunhung Huang

# Syllabus – Prerequisite

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## □ Background Knowledges

- It is better to have taken
  - “System Administration Practice” (計算機系統管理實務)
  - “Introduction to Networking” (計算機網路概論)
- At least
  - Experience of using Unix-like environment

# Syllabus – Prerequisite

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## □ Environment

- Server
  - One **dedicated** PC
  - Virtual Machine
    - CSCC
  - VPS
    - Linode (recommended)
    - DigitalOcean (second choice)
- Operation System
  - With **Unix-like OS** installed (e.g. FreeBSD, Linux, Sun OS, ...etc.)
  - FreeBSD is recommended for the reason: TA supports.
- Network
  - Public IP (No NCTU Dormitory IP for Some Reasons)
- Domain Name

# Attitude

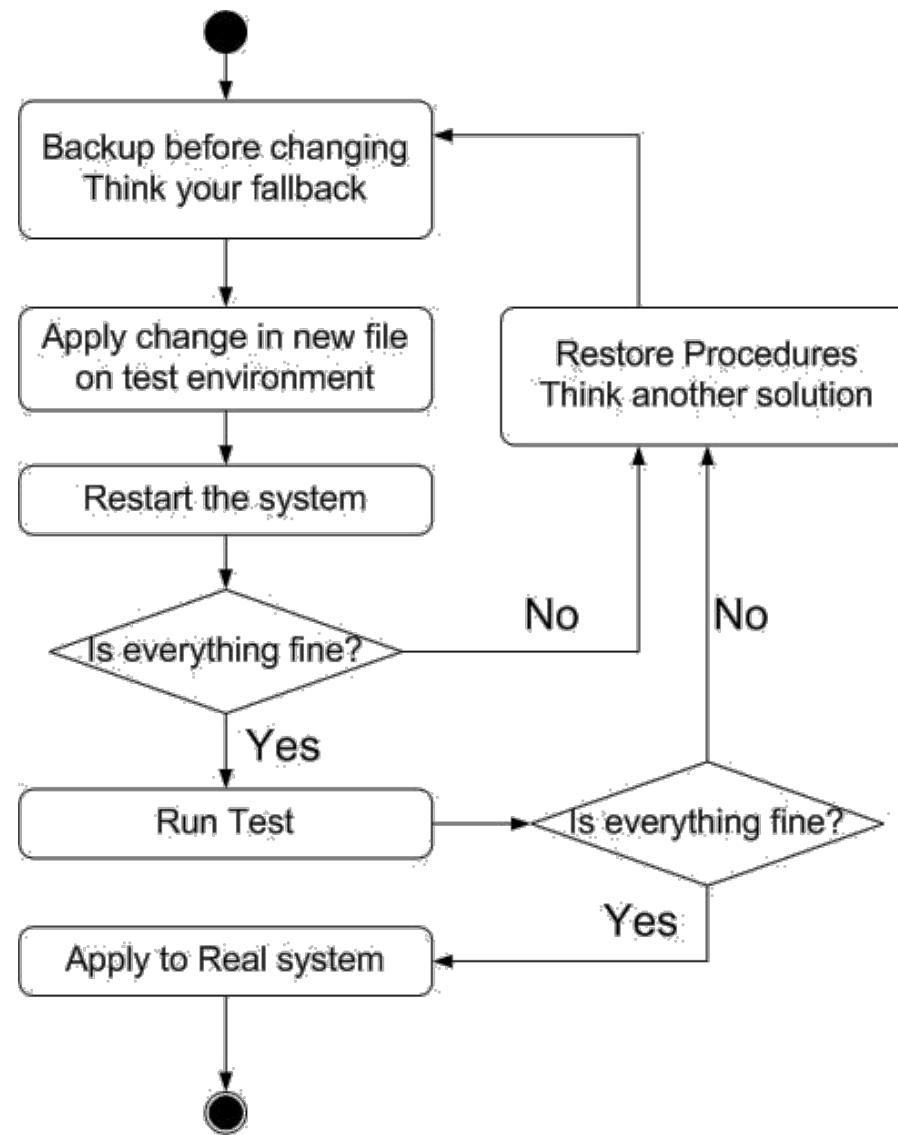
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- Attend every class
- Do every exercise
  - As **early** as possible
  - **On your own**
- Read book and practice at least 6 hours every week
  - Use unix-like environment
  - Recommend: more than 1.5 hours/day averagely.
- Collect information on the internet
  - The newer, the better.



# When You Perform Any Changes...

## □ Flow of Change



# Mission Goal

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## □ Web Server Check

- ssllabs.com - A+

## □ DNS Server

- <http://dnsviz.net> – all dnssec chain

## □ Email Server

- <https://mxtoolbox.com/SuperTool.aspx>

## Web Server Goal

- ❑ No more unnecessary information leak
- ❑ SSL Certificate

### Summary

Grade Today      Future Grade

A+      C

Our gradings will change in a month. [MORE »](#)

Certificate      Protocol Support      Key Exchange      Cipher Strength

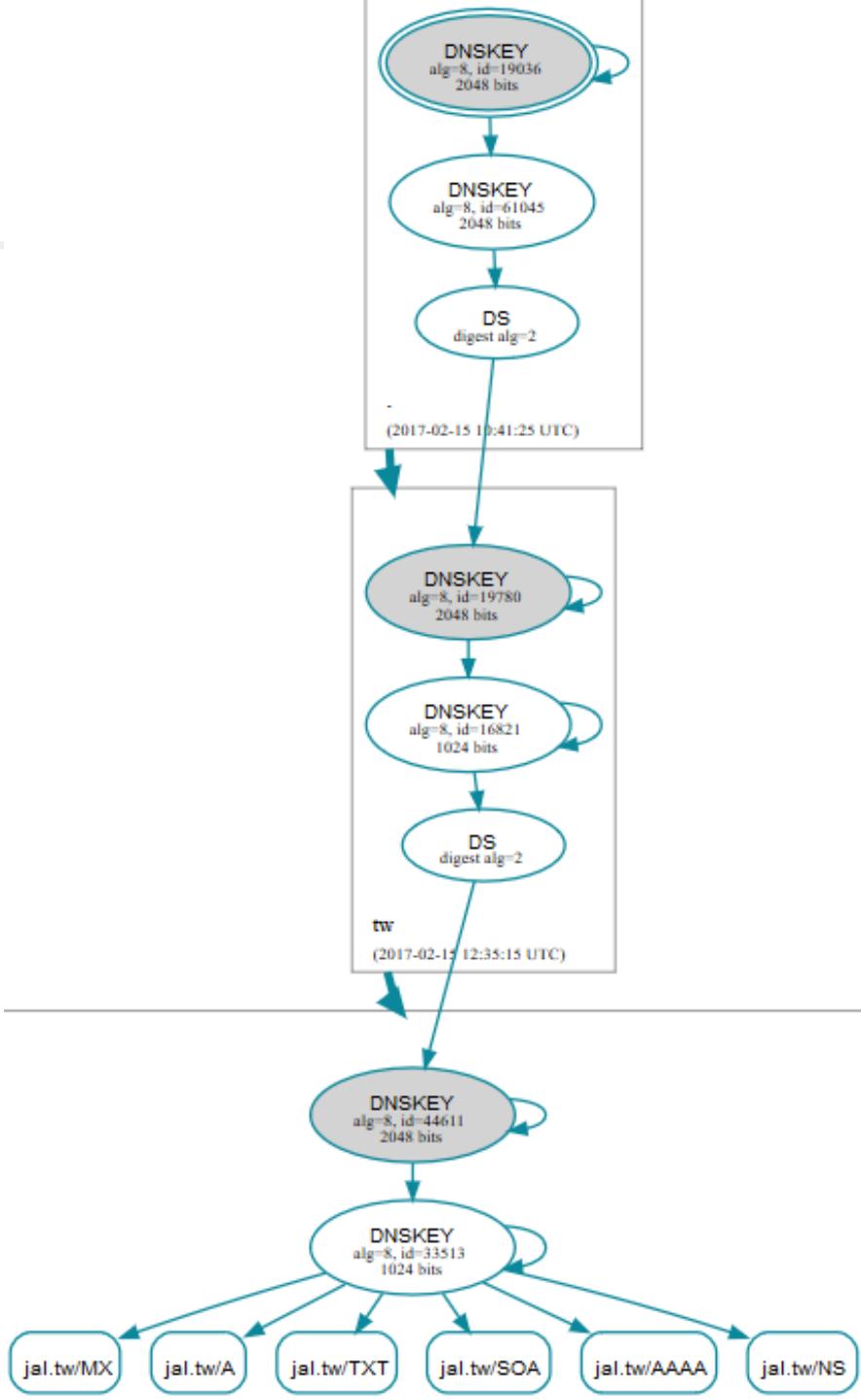
Metric	Score
Certificate	100
Protocol Support	~95
Key Exchange	~90
Cipher Strength	~90

Visit our [documentation page](#) for more information, configuration guides, and books. Known issues are documented [here](#).

HTTP Strict Transport Security (HSTS) with long duration deployed on this server. [MORE INFO »](#)

# DNS Server Goal

## □ DNSSEC Chain



# Email Server Goal - SPF

```
v=spf1 a mx include:_spf.google.com ~all
```

Prefix	Type	Value	PrefixDesc	Description
v	version	spf1		The SPF record version
+	a		Pass	Match if IP has a DNS 'A' record in given domain
+	mx		Pass	Match if IP is one of the MX hosts for given domain name
+	include	<a href="#">_spf.google.com</a>	Pass	The specified domain is searched for an 'allow'.
~	all		SoftFail	Always matches. It goes at the end of your record.

	Test	Result
✓	SPF Record Published	Record found
✓	SPF Syntax Check	The record is valid
✓	SPF Multiple Records	Less than two records found
✓	SPF Record Deprecated	No deprecated records found
✓	SPF Included Lookups	Number of included lookups is OK

# Email Server Goal - DMARC

```
v=DMARC1; p=reject; sp=none; adkim=s; aspf=s; rua=mailto:aggreg@jal.tw!25m; ruf=mailto:forrep@jal.tw; rf=afrf; pct=100; ri=86400
```

	Test	Result
✓	DMARC Record	Record Found
✓	DMARC Syntax Check	The Record is Valid

# This Semester

## □ Availability !

- Keep Server Always Up.
  - We Will Monitor Your Service

# □ Based Security !

**StatusCake** 6

**UPGRADE NOW AND SAVE 15%**

Tests    [New Test](#)    [Bulk Update](#)    [Page Speed](#)    [SSL](#)    [Domain Monitoring](#)    [Server Monitoring](#)

Filters & Search    Table View    1 Month    Enable Autorefresh

**Down Tests**

Status	Code	Type	Test Name	Uptime	Loadtime	Actions
	0	HTTP	sslvpn.tu5.me	94.13%	7.46s	EDIT  CLONE  DETAILS

**Up Tests**

Status	Code	Type	Test Name	Uptime	Loadtime	Actions
	200	HTTP	mrtg.edu.tw-HTTPS	93.67%	3.05s	EDIT  CLONE  DETAILS
	200	HTTP	shen.com.tw-HTTP	100%	1.73s	EDIT  CLONE  DETAILS
	200	HTTP	jursts.tw-HTTP	100%	2.28s	EDIT  CLONE  DETAILS
	200	HTTP	louis-tu5.me-HTTP	100%	2.71s	EDIT  CLONE  DETAILS

# Syllabus – Grade Policy

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## □ Mid

- 10 ~ 15 %

## □ Final

- 10 ~ 15 %

## □ Exercise

- 60 ~ 70 %

➤ No Delay Work

➤ 10 Exercises

## □ Your Server Availability

- 10 ~ 15 %

# SA-NA Junction

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## □ FreeBSD

- 10.3-RELEASE
  - <http://ftp.freebsd.org/pub/FreeBSD/releases/ISO-IMAGES/10.3/>

## We Want You!

