



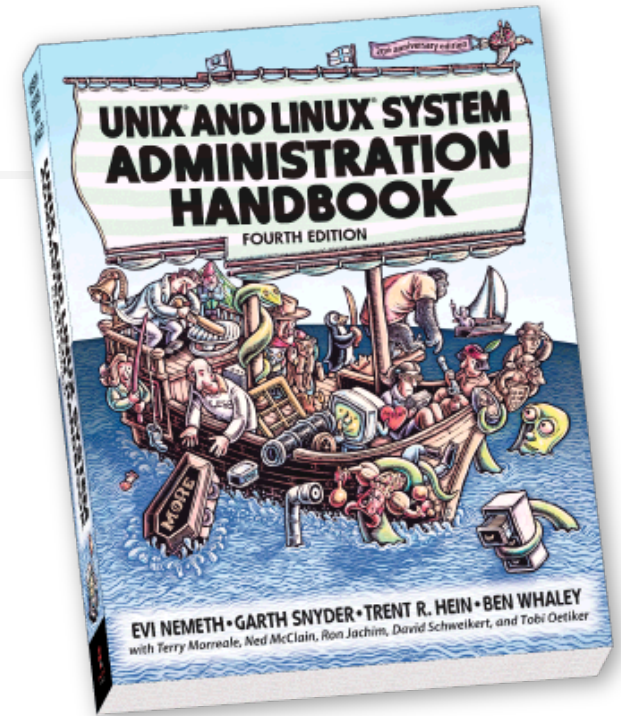
# Network Administration Practice

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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/>



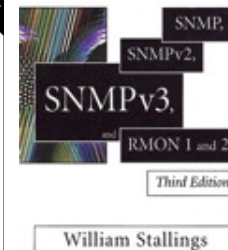
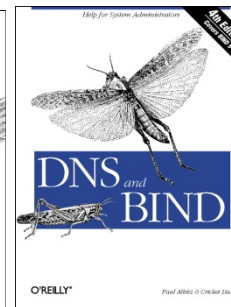
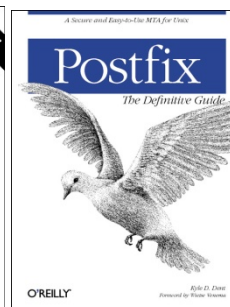
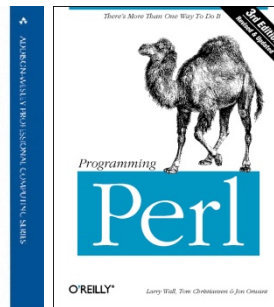
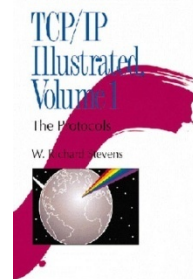
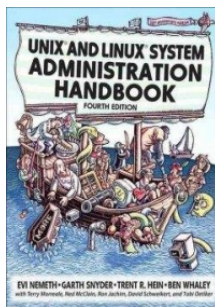
# Syllabus – Course Textbook and Reference

## ❑ 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



# 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

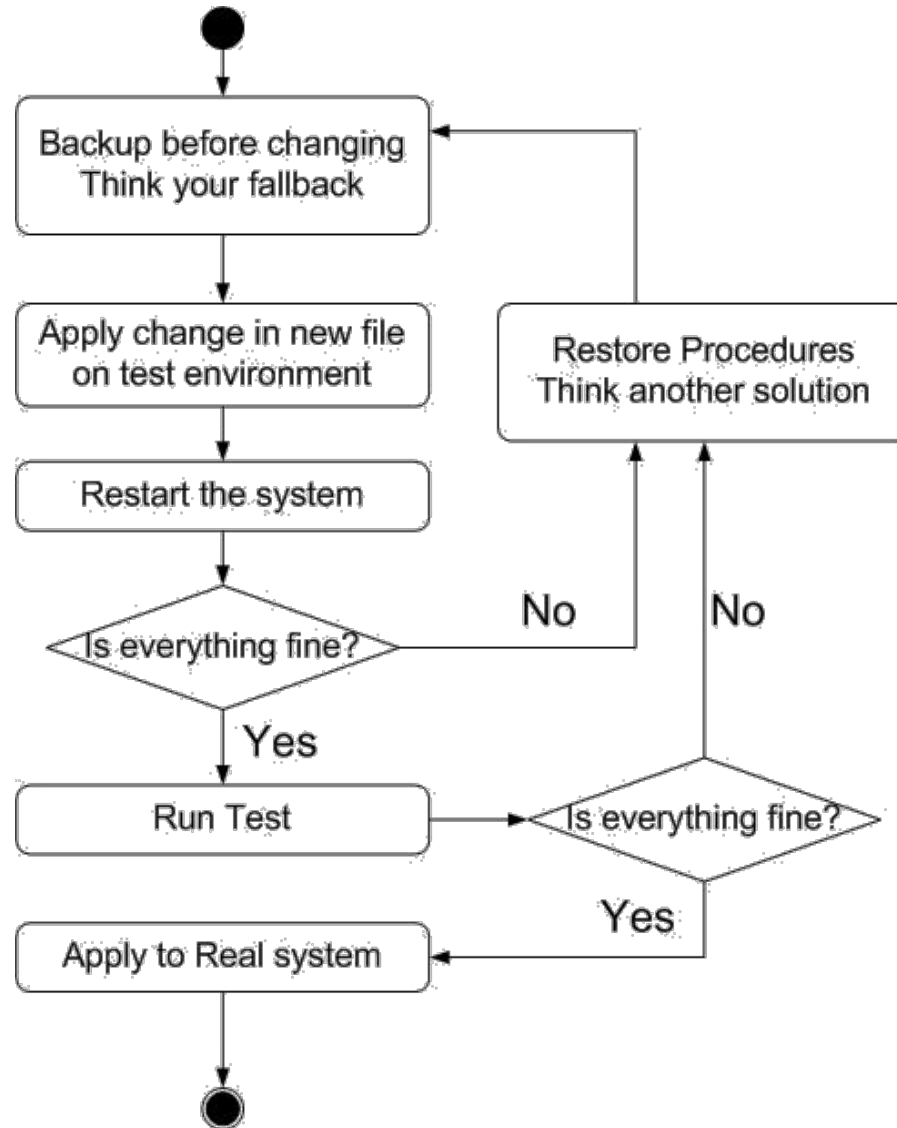
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- Attend every class
- Do every exercise
  - As **early** as possible
  - **On your own**
- Read book and practice at least 6 hours every week
  - Use unix-like environment
  - Recommend: more than 1.5 hours/day averagely.
- Collect information on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



# When You Perform Any Changes...

## □ Flow of Change



# Mission Goal

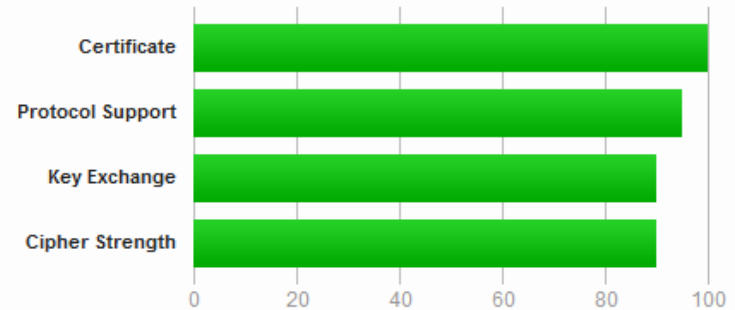
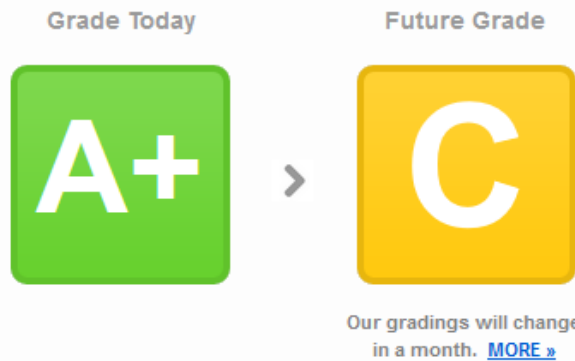
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- Web Server Check
  - [ssllabs.com](https://ssllabs.com) - A+
- DNS Server
  - <http://dnsviz.net> – all dnssec chain
- Email Server
  - <https://mxtoolbox.com/SuperTool.aspx>

# Web Server Goal

- No more unnecessary information leak
- SSL Certificate

## Summary

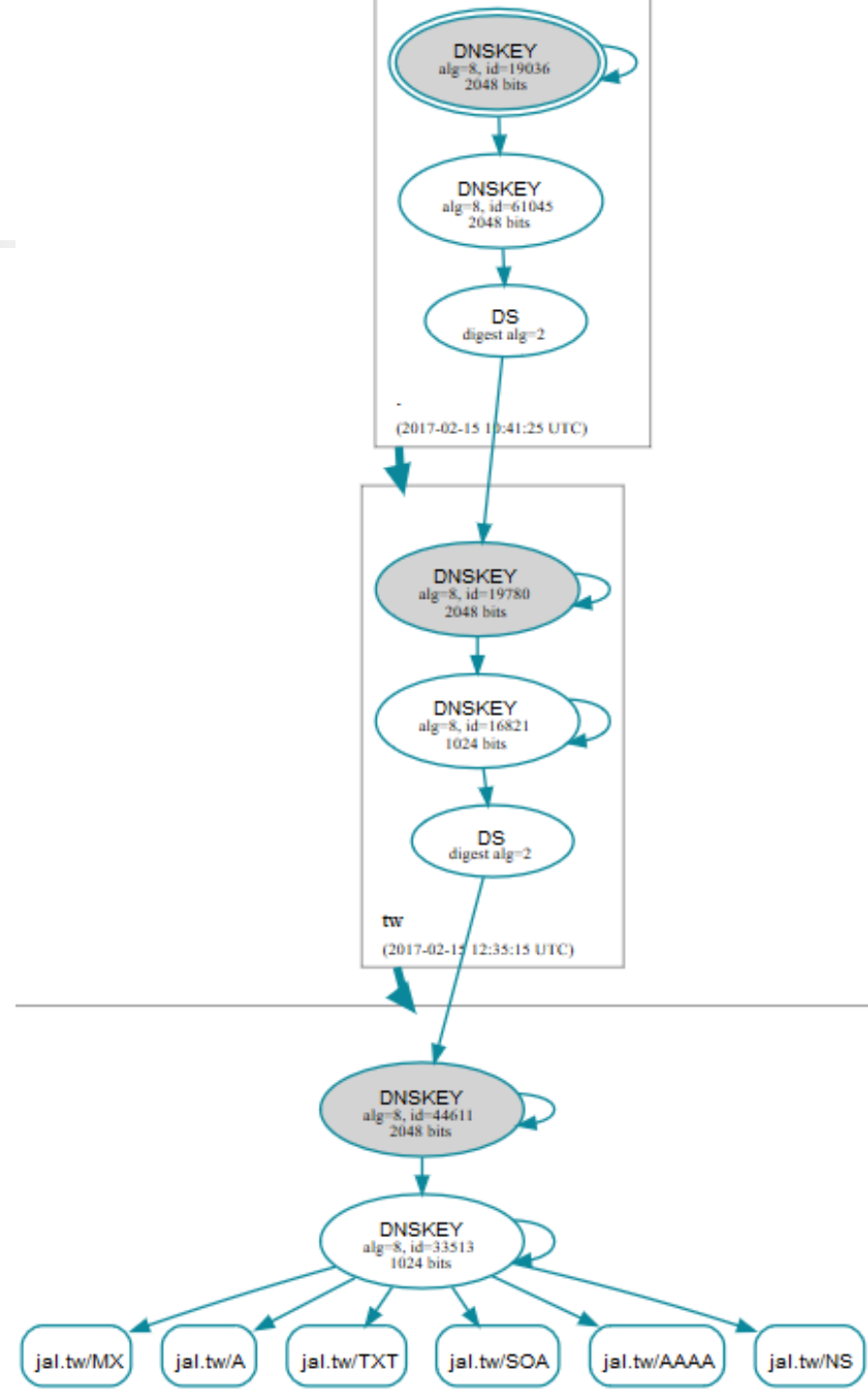


Visit our [documentation page](#) for more information, configuration guides, and books. Known issues are documented [here](#).

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

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

The screenshot shows the StatusCake monitoring dashboard. On the left is a dark sidebar with navigation options: Tests (checked), New Test, Bulk Update, Page Speed, SSL, Domain Monitoring, and Server Monitoring. A banner at the top of the sidebar says 'UPGRADE NOW AND SAVE 15%'. The main content area has a top navigation bar with 'Filters & Search', 'Table View', '1 Month', and 'Enable Autorefresh'. On the right, there are three status indicators: 1 Down (red), 20 Up (green), and 3 Paused (grey). Below this are two tables: 'Down Tests' and 'Up Tests'.

Status	Code	Type	Test Name	Uptime	Loadtime	Actions
Down	0	HTTP	sslvpn.tn .me	94.13%	7.46s	EDIT CLONE DETAILS
Up Tests						
Status	Code	Type	Test Name	Uptime	Loadtime	Actions
Up	200	HTTP	mrtg. edu.tw-HTTPS	93.67%	3.05s	EDIT CLONE DETAILS
Up	200	HTTP	sh. en.com.tw-HTTP	100%	1.73s	EDIT CLONE DETAILS
Up	200	HTTP	jur. ds.tw-HTTP	100%	2.28s	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!

