

HOMEWORK 3

Mail Server

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Objectives

- Setup a mail service
- Understand the protocols used in Email
- Secure your mail service

Mail Service

- IP: `192.168.${ID}.25/24`
- Hostname: `mail.${ID}.nasa`
- Mail domain: (10%)
 - `.${ID}.nasa.`
 - `mail.${ID}.nasa.`
- Support STARTTLS and TLS for IMAP/SMTP (5%)
 - Use certificates retrieved from Debug Tools on NASA Online Judge
- Enforce user authentication on IMAP/SMTP (10%)
 - Only allow sending mails with authenticated username
 - Prevent users from spoofing others
- Disallow null sender, i.e. sender address being `<>` on envelope (5%)
- No open relay (5%)

DNS Records (5%)

- Point `mail.${ID}.nasa` to your mail server
- Set MX records properly
- Reference

Name	Type	Content
<code>mail.\${ID}.nasa</code>	MX	Your mail server domain
<code>mail.\${ID}.nasa</code>	A	Your mail server IP
<code>\${ID}.nasa</code>	MX	
<code>\${ID}.nasa</code>	TXT	SPF rules
...	TXT	DKIM rules
...	TXT	DKIM rules
...	TXT	DMARC rules

Securing Mail Service

Email dates back to early days of Internet, use following methods to enhance security:

- SPF ([Sender Policy Framework](#)) (5%)
 - Allow only authorized IP to send mails with your domain
 - Reject mails from unauthorized server
- DKIM ([DomainKeys Identified Mail](#)) (10%)
 - Publish public key on a special DNS TXT record
 - Sign outgoing mail with your private key
 - Be sure to check incoming mails as well
- DMARC ([Domain-based Message Authentication Reporting and Conformance](#)) (5%)
 - A DNS TXT record that defines policy upon failure of SPF and DMARC check
 - Reject mails that don't comply with the policy
 - Set `adkim` and `aspf` to strict
 - Set RUA report address to `dmARC-report-rua@${ID}.nasa`

Greylisting

- Greylisting (5%)
 - Apply to incoming mails from unseen mail server or account
 - Except `ta@ta.nasa`
 - Greylist for 15 seconds

Email Accounts

- Prepare two users: `TA` and `cool-TA` (5%)
 - Set passwords retrieved from Online Judge
 - Online Judge will login to your mail server with these accounts
 - Keep all mails that `TA` and `cool-TA` received on your server
- Virtual aliases (10%)
 - Alias `NASATA@` to `TA@`
 - Alias `<user>+<word>@` to `<user>@`
 - e.g. `TA@` can receive mails sent to `TA+nycu@`
- Sender rewrite (5%)
 - Rewrite `@mail.${ID}.nasa` to `@{ID}.nasa`
 - Rewrite `cool-TA@` to `supercoool-TA@`

Spam Filters

- Incoming mail filter (5%)
 - Prepend ****SPAM**** to the subject of mail if it contains viruses or spam message
 - You can use amavisd / SpamAssassin / rspamd or shell scripts
 - Test case
 - <https://github.com/apache/spamassassin/blob/trunk/sample-spam.txt>
- Outgoing mail filter (10%)
 - Reject mails whose subject contains keyword:
 - Graduate School
 - 博士班

Test Your Email Service

- IMAP (143) testing
 - <https://wiki.dovecot.org/TestInstallation>

```
$ openssl s_client -connect mail.${ID}.nasa:143 -starttls imap
```

- SMTP (25) testing
 - <https://www.postfix.org/INSTALL.html>

```
$ openssl s_client -connect mail.${ID}.nasa:25 -starttls smtp
```

- Use GUI/TUI mail client
 - [Mozilla Thunderbird](#)
 - [mutt](#)

Attention

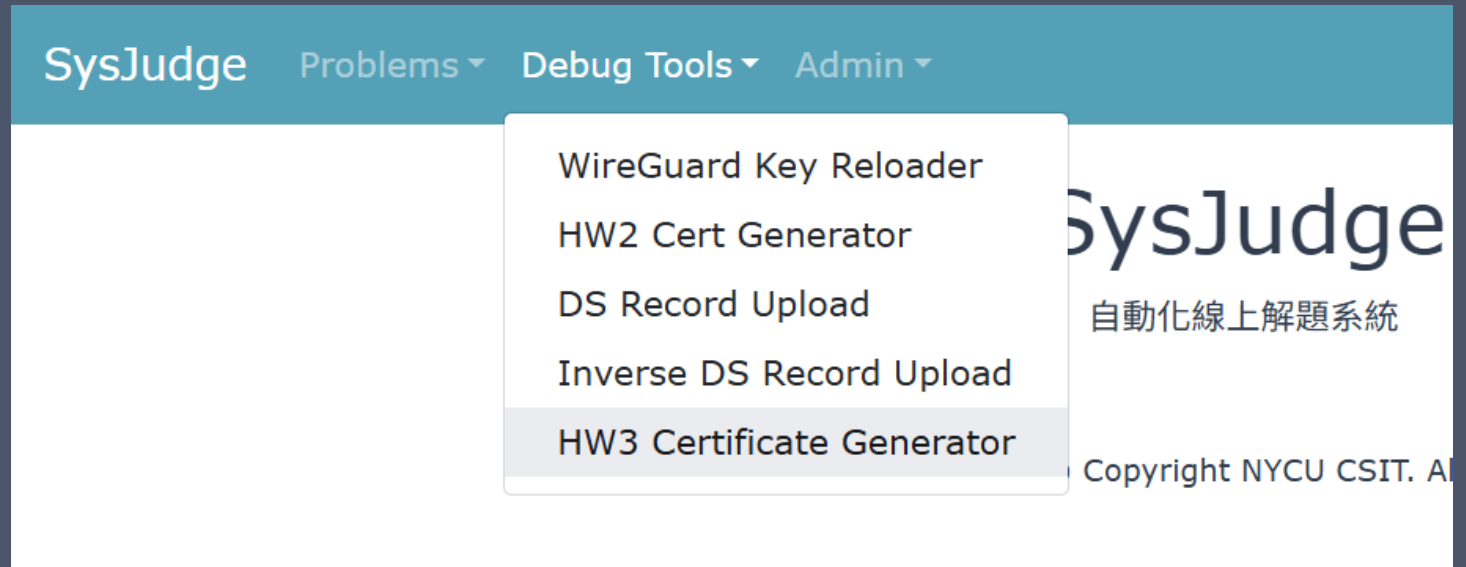
- Your work will be scored by Online Judge system
 - Online Judge cools down for **several minutes** after judge
 - Only the **LAST** submission will be scored
 - Late submission will **NOT** be accepted
- **ALWAYS BACKUP** your system before submission, as we may do malicious actions
- Make sure everything works after reboot
- **Deadline: 4/27 (Sun) 23:59**

Appendix: Get Certificate and Password

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HW3 Debug Tool

- Use HW3 debug tool to retrieve TLS certificate and password
- DO NOT use HW2 certificate
- Same Certificate Authority



Help

- Join NCTUNASA google group
 - If you have any question, you can post your problem in this group, TAs and Students will help you.
 - <https://groups.google.com/g/nctunasa>
- UNIX 常見指令教學
 - <https://it.cs.nycu.edu.tw/unix-basic-commands>
- How To Ask Questions The Smart Way
 - <https://github.com/ryanhanwu/How-To-Ask-Questions-The-Smart-Way>