

Homework 2

Domain Name System

tsclu

國立陽明交通大學資工系資訊中心

Requirement

In this homework, you are requested to build a series of DNS servers.

Which includes:

- An authoritative DNS Server
- A resolver

Authoritative DNS Server (45%)

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Computer Center of Department of Computer Science, NYCU

Requirement (1/2)

- IP: 192.168.\$ID.53
- FQDN: ns1.\$ID.nasa

- Should handle the zone \$ID.nasa
- Reverse Zone should be handled too
- Root server at 192.168.254.3

Since it is an authoritative DNS server, it should not resolve any other records outside of your designated zone.

Requirement (2/2)

- ZONE \$ID.nasa
 - whoami A 10.113.\$ID.1
 - dns A 192.168.\$ID.153
 - ns1 A 192.168.\$ID.53

Resolver (55%)

Requirement (1/2)

- Resolves nasa. from root server recursively
- Resolves others from Cloudflare DNS Server (1.1.1.1)
- Provide DoH, DoT functionality
 - DoT endpoint: `tls://dns.$ID.nasa`
 - DoH endpoint: `https://dns.$ID.nasa/dns-query`
 - Get certificate from debug tool
- DNSSEC is required
 - Use debug tool to submit your DS records
 - Collect your DS record values and join them, to submit
 - Algo. 13 (ECDSAP256SHA256) is **required**.

Requirement (2/2)

- IP: 192.168.\$ID.153
- FQDN: dns.\$ID.nasa

Note: Judge uses your resolver as its DNS while judging!

Grading

Automated grading (Online Judge), 100 pts.

- Authoritative DNS
 - Forward (20%)
 - Reverse (15%)
 - Public Check (10%)
- Resolver
 - Resolver (20%)
 - Resolver DNSSEC (15%)
 - Resolver DoH (10%)
 - Resolver DoT (10%)

Attention

- Your work will be tested by Online Judge system.
 - You can submit multiple judge requests. However, OJ will **cool down for 10 minutes** after each judge.
 - **We will take the last submitted score** instead of the highest score.
 - Late submissions will not be accepted.
- Make sure everything is fine after reboot.
- **Backup your VM before judge every time.**
 - We may do something bad when judging.
- Due date: **2023/04/25 Thur. 23:59:59**

Help Me!

- Questions about this homework.
 1. Make sure you have studied through lecture slides and the HW spec.
 2. Clarify your problems and google it to find out solutions.
 3. Ask them on <https://groups.google.com/g/nctunasa> .
 - Be sure to include all information you think others would need.
- We MIGHT give out hints on google group.
 - **Be sure to join the group!**
- Do not mail us unless it's personal or you're making an appointment.

Good Luck!