Homework 4
LDAP

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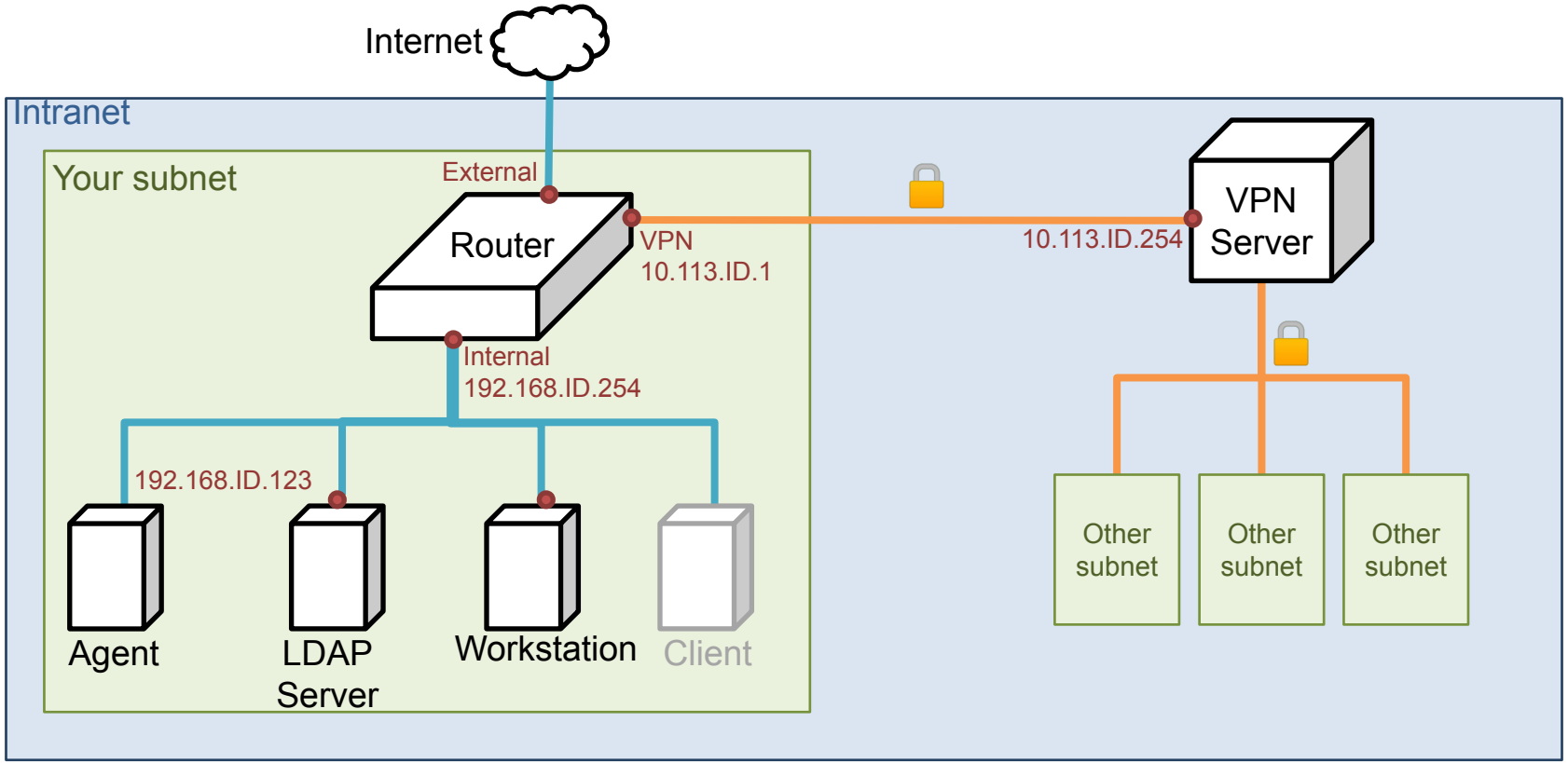
Purposes

- Build a basic LDAP service
- Understand how to…
  - configure LDAP server
  - manage LDAP data using LDIF
  - auth and permission control on Unix client with LDAP server

Overview - Architecture



Overview (cont.)

- A simple LDAP server
  - LDAP client
- One or more Workstations
  - LDAP client

Requirements

- LDAP Server
  - IP: 192.168.ID.y/24 with static DHCP, where y is arbitary.
  - Hostname: ldap.{ID}.nasa. (5%)
  - Base DN: dc=<ID>, dc=nasa
  - LDAPS and force TLS search (8%)
    - Not LDAP over TLS (StartTLS) (2%)
    - Use certificate generator to get your key and certificate

Requirements

- Organizational Unit Naming
  - People
  - Group (posixGroup)
  - MemberGroup
  - Ppolicy
  - SUDOers

Requirements

- Workstation
  - IP: 192.168.ID.y/24 with static DHCP, where y is arbitary
  - Hostname: workstation.{ID}.nasa. (5%)

Requirements

We need two posix group in LDAP:

- ta group (GID=10000)
  - can login (ssh) into LDAP server and any workstations (6%)
  - can use sudo for any command (7%)
    - ex. `sudo adduser`
- stu group (GID=20000)
  - can login (ssh) into workstations, cannot login into LDAP server (6%)
  - only allow sudo for `ls` command (7%)
- You need use “LDAP” to implement above requirements
  - Including sudo rules and ssh key!
- TA will add any named user using generalta into these group (10%)

Requirements

Add an user with DN “uid=generalta,ou=People,<Base DN>”

- This user under ta group, use ta group permission
- Allow this user to connect via SSH with both ssh public key and password
  - uid: generalta
  - uid number: 10000
  - public key: <ta’s public key> # See p.12
  - user password: <your TA_PASSWORD> # Same as HW3
    - user password need hash

Requirements

Add an user with DN “uid=securityta,ou=People,<Base DN>”

- This user under ta group, use ta group permission
- Add TOTP password to this user (10%)
  - uid: securityta
  - uid number: 10001
  - user password: `{NA2023}`

Requirements

- The TOTP should configure with the following parameters
  - Algorithm: SHA256
  - Time step: 30 seconds
  - Length: 6 digits
  - Secret: <unhexlified TA_PASSWORD>
- The final login password would be: `{NA2023}` + <TOTP code>
- Hint: slapo-otp (openldap 2.5+)

Requirements

TA's public key: https://nasa.cs.nctu.edu.tw/na/2023/slides/hw4.pub

- Public key:

```
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIPedeG/ZoQUNLqbMn+1b303DjJWLtuXXb8chEv6KBTGm 2023-na-hw4
```

- User can set their authorized keys with the `sshPublicKey` attribute

Requirements

Add another user with DN “uid=stu<ID>,ou=People,<Base DN>”

- This user under stu group, use stu group permission
- Allow this user to connect via SSH with both ssh key and password
  - uid: stu<ID>
    - e.g. stu1, stu55
  - uid number: 20000 + <ID>
    - e.g. 20001, 20055
  - user password: <your TA_PASSWORD>

Requirements

- Configure LDAP Client on every machine
  - Configure LDAP for login (ssh) authentication
    - can use password or public key to login
  - When you add a user into LDAP, this user can login on any workstation or LDAP Server
    - Login permissions at Page 7

Requirements

- Set proper LDAP access control
  - Allow generalta to manage users and groups
  - Allow every users to modify their own userPassword, loginShell and sshPublicKey (8%)
    - Set other attributes as read-only (8%)
  - Allow users to search all user data but other users' password (8%)
    - i.e., users can only read their own password
    - generalta can write to it but not read!
  - No one can read oathSecret!

Requirements

- Set password policy for each user (10%)
  - userPassword can't same as previous when change password
    - But can set password as previous two time used
    - You need implement this by LDAP way
  - password requires at least 8 characters long
  - password must contains at least 3 different classes of characters:
    - Upper-case characters
    - Lower-case characters
    - Digits
    - Special characters
  - Hint: ppolicy overlay & pwdCheckModule

Attention

- Your work will be tested by our online judge system
  - Submit a judge request when you are ready.
  - You can submit request multiple times. However, the score of the latest submission instead of the submission with the highest score, will be taken.
  - Late submissions are not accepted.
  - Please check your score at OJ after judge completed.
- Scoring starts at : 2022/5/11 (Thur.) 21:00
  - The cool-down time is 15 minutes
- Deadline: 2022/5/31 (Wed.) 23:59

Help

- Questions about this homework.
  - Make sure you have studied through lecture slides and the HW spec.
  - Clarify your problems and search it to find out solutions first.
  - Ask them on https://groups.google.com/g/nctunasa .
    - Be sure to include all the information you think others would need
- Do not mail us unless it’s personal or you’re making an appointment.

Good Luck!