



3. Setting up Active Directory in Windows Server

PHỤC VỤ MỤC ĐÍCH GIÁO DỤC
FOR EDUCATIONAL PURPOSE ONLY

NETWORKS AND SYSTEMS ADMINISTRATION LABS

(V09.2022)

A. OVERVIEW

1. Learning objective

The learning objective in this task is learning about the fundamentals of Active Directory Domain Services (AD DS) in Windows Server, including forests, domains, sites, domain controllers, organization units (OUs), users, and groups.

After completing this lab, you will be able to:

- Understand the difference between Workgroup and Domain.
- Design and set up a Domain model with Active Directory.
- Understand how the Additional Domain Controller (ADC) and Read Only Domain Controller (RODC) work.

2. Practice Environment

Students need to prepare at least the following:

- **Two VMs** that installed Windows Server 2019 works as Domain Controllers.
- **A VM** that installed Windows Server 2019 works as Domain Controller.
- **A VM** that installed Windows OS (Windows 7, 8, 10, or Server) works as a Client.

It will help if you use VMWare or VirtualBox to have the necessary VMs listed above. We recommend choosing the newest stable version of the OS to reach more recent functions and features.

	IP Address	DNS	Operating System
Domain Controller 1 (DC1)	192.168.1.5 / 24	192.168.1.5	Windows Server 2019
Domain Controller 2 (DC2)	192.168.1.6/24	192.168.1.5	Windows Server 2019
File Server	192.168.1.10 / 24	192.168.1.5	Windows Server 2019
Client	192.168.1.20 / 24	192.168.1.5	Windows 7,8,10, or newer

Table 1: The information of VMs

For all VMs required to install the Windows Server version, you should choose the *DataCenter Evaluation (Desktop Experience)* option to have a full Windows graphical environment.

B. LAB TASKS

Please note that you should complete all tasks of this lab sequentially!

1. Workgroup

In this task, we need to use two VMs (a File Server and a Client), as shown in Figure 1. We will install the Windows Server 2019 (or newer) on the File Server and Windows OS (7,8,10, or more recent) on the Client. You need to refer IP addresses for these VMs in Table 1.



Figure 1: The Workgroup topology

File Server VM:

1. Create a new account (username: **user1**, password: **123**). Let's configure that only users with **Administrator** privilege can change this account's password.
2. Create a new folder (**Data**). You need to configure the "File sharing over a network" feature for this folder so that other PC can access this folder through networking.
3. Grant the read and write privileges on the folder "**Data**" to the user "**user1**".

Client VM:

4. From the Client, access the Shared Folder on File Server and try creating new files and folders. You may be required to log in as **user1**.

Note:

- The password complexity policy is enabled by default on Windows Server. That's why you can't set the password '123' to a user. You can disable this policy to get easier practice. To do that, go to the Local Security Policy, browse to **Security Setting** → **Account Policies** → **Password Policy**, find the

"Password must meet complexity requirements" item on the right panel, and change its value to Disable.

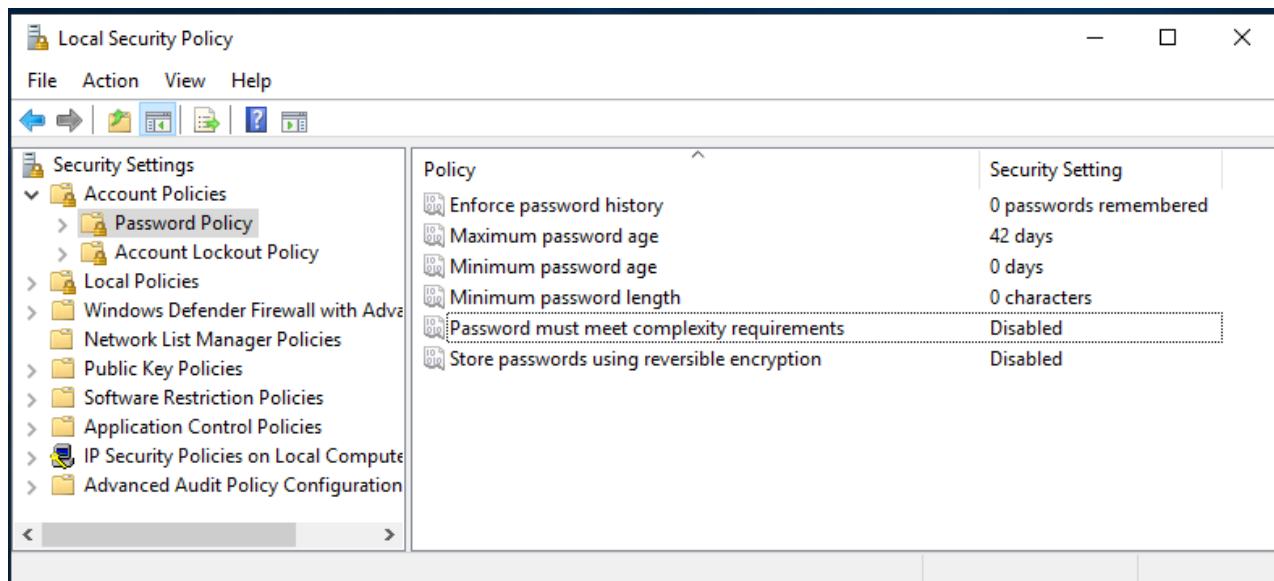


Figure 2: Disable the Password Complexity Policy

2. Setting up the Active Directory and building the domain model

In this task, we need to use three VMs (a VM for the Domain Controller - DC1, a VM for the File Server, and a VM for the Client), as shown in Figure 3. We will install Windows Server 2019 (or newer) on the DC1. The File Server and Client can reuse from task 1 or newly set up; that is up to you. You need to refer IP addresses for these VMs in Table 1. The DNS on these VMs will point to DC1.



Figure 3: The Domain topology

First, we need to deploy a domain, a domain controller.

DC1 VM:

1. Set the Primary DNS Suffix to **groupX.local** (X refer to your group's ID).

2. Install the Active Directory Domain Service (AD DS).
3. Promote this server to a domain controller. You need to add a new forest that its "root domain name" is **groupX.local** and set the "BIOS domain name" to **UIT** during the promotion.
4. Log in to Domain Controller with **UIT\Administrator** account.
5. Create a new account **u1/123** on Active Directory. You may create and manage users through the "*Active Directory User and Computer*" tool.

File Server VM:

6. Join this server to **groupX.local** domain.
7. Create a folder (**Data**) if it does not exist, then grant the read and write privileges on this folder to user **u1/123** (this account on Active Directory).

Client VM:

8. Join this host to **groupX.local** domain.
9. Log in to Windows with account **UIT\u1** (this account is managed on Active Directory). Then access the folder **Data** on File Server, and test read/write capability.

Summarization:

10. Find out the purpose and the difference between Workgroup and Domain.

3. Additional Domain Controller

In this task, we need to use three VMs (a VM for the Primary Domain Controller - DC1, a VM for the Additional Domain Controller - DC2, and a VM for the Client), as shown in Figure 4. We will install Windows Server 2019 (or newer) on the DC1 and DC2. The Client can reuse from the previous task or newly setup; that is up to you. You need to refer IP addresses for these VMs in Table 1. The DNS on DC VMs will point to the DC1 and DC2, the others VMs will point to the DC1.

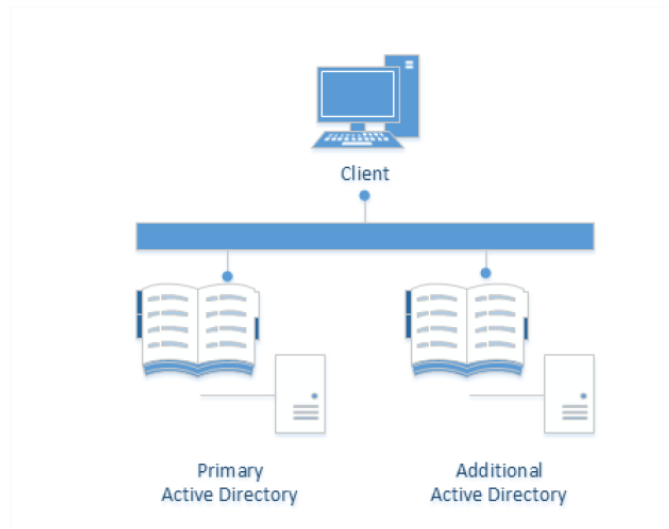


Figure 4: High Availability Domain Controller

DC1 VM – Primary Domain Controller:

1. Deploy and promote this server to Primary Domain Controller (or reuse the DC1 from the previous task)

DC2 VM – Additional Domain Controller:

2. Join this server to **groupX.local** domain.
3. Deploy and promote this server to an additional domain controller.

Testing:

4. On Primary Domain Controller, create new accounts u2/123, u3/123, and u4/123. Then observing on the Additional Domain Controller and verify whether these users are synchronized automatically or not.
5. On Additional Domain Controller, create a new account u10/123. Then observing on the Primary Domain Controller and verify whether the u10 is synchronized automatically or not.
6. Can we log in with the account UIT\u2 on Client?
7. Turn off the Primary Domain Controller, then log in with account UIT\u3 on Client. What's happened?
8. Turn off the Additional Domain Controller, then log in with account UIT\u4 on Client. What's happened?
9. Turn on the Primary Domain Controller, then log in with account UIT\u5 on Client. What's happened?
10. Turn on the Additional Domain Controller, then log in with account UIT\u5 on Client. What's happened?

11. From what you observe, let's briefly summarize the ADC model. Can the controller's workload be shared with all controllers on the domain (typically called load balancing) to avoid overloading?

4. The Active Directory Policies

Before doing this task, make sure that you already complete the “Additional Domain Controller” task. You will continue working on environment from this task to conquer requirements below.

Let's research the Active Directory Group Policy and apply the following policies:

1. Automatically applies the picture specified by the domain's administrator as the wallpaper when the user logs in to any computer.
2. Prevent clients from using external storage devices (such as USB, CD, DVD,...).
3. Prevent users on the domain using Task Manager or CMD.
4. Automatically distribute a program to client computers or users.

5. Read Only Domain Controller (Advanced task - optional)

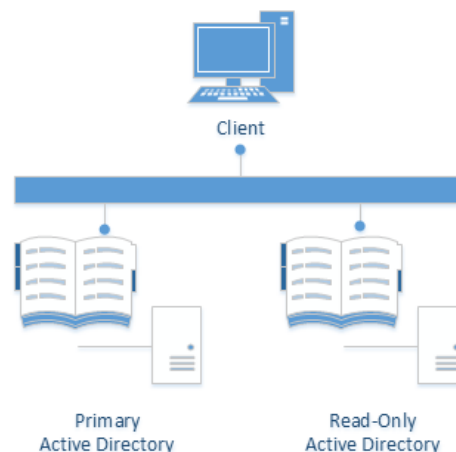


Figure 5: The RODC model

In this task, we need to use three VMs (a VM for the Primary Domain Controller - DC1, a VM for the Read Only Domain Controller - DC2, and a VM for the Client), as shown in Figure 4. We will install Windows Server 2019 (or newer) on the DC1 and DC2. The Client can reuse from the previous task or newly set up; that is up to you. You need to refer IP addresses for these VMs in Table 1. The DNS on DC VMs will point to DC1 and DC2, and the other VMs will point to DC1.

Let's deploy the RODC model and clear all tasks described as the ADC task.

C. REQUIREMENTS

You are expected to complete all tasks in section B (Lab tasks). Advanced tasks are optional, and you could get bonus points for completing those tasks. We prefer you work in a team of four to get the highest efficiency.

Your submission must meet the following requirements:

- You need to submit a **detailed lab report in .docx** (*Word Document*) format, **using the report template** provided on the UIT Courses website.
- Either Vietnamese or English report is accepted, that's up to you. The report written in the mixing of multiple languages is not allowed (except for the untranslatable keywords).
- When it comes to **programming tasks** (*require you to write an application or script*), please attach all source-code and executable files (if any) in your submission. Please also list the important code snippets followed by explanations and screenshots when running your application in your report. Simply attaching code without any explanation will not receive points.
- Submit work you are proud of – don't be sloppy and lazy!

Your submissions must be your own. You are free to discuss with other classmates to find the solution. However, copying reports is prohibited, even if only a part of your report. Both reports of the owner and the copier will be rejected. Please remember to cite any source of the material (website, book,...) that influences your solution.

Notice: Combine your lab report and all related files into a single **ZIP file (.zip)**, name it as follow:

StudentID1_StudentID2_ReportLabX.zip