**PROJECT INTRODUCTION**

You will need to create 2 new virtual machines for this assignment. You will provide screen captures (with labels) as evidence that you have completed each task, but you must not use more screen captures than necessary or you will lose marks. For example, you do not need 100 screen shots showing completion of a task when only a few screen captures are needed. All work must be submitted using a professional looking report.

**Scenario:** You are the assistant to the Network Administrator of a busy product services company called DigiTech. You are required to build a fully operational Server that will be running as a Domain Controller for the Network. You will be required to use the Domain Controller to set up Organizational Units which will contain user accounts for two different departments within the company and these accounts must be placed into groups. You will create network resources (a shared folder) for each of the two departments and you will assign access to these resources based on group membership. You will also set up two security policies for the entire Domain (password policy and account lockout policy). You will also set up a policy to install software on one of the Organizational Units in your domain. Be sure to keep track of any problems and their solutions to problems encountered while you work your way through the project.

**SPECIFIC REQUIREMENTS FOR THIS VIRTUALIZED NETWORK:**

**Part 1: Installing the network and setting up the network infrastructure.**

Using virtualization software, install 2 virtual machines. Use Windows Server 2022 ISO (Desktop - GUI). One VM will act as the Domain Controller Server and the other VM will act as a Web server.

1a. Rename the server using the name DC followed by your student number as the server name. For example, if my student number is 2025123, I would name my server DC-2025123 Rename this computer Windows System Properties.

1a. Rename the second server using the name Web followed by your student number as the server’s name. For example, if my student number is 2025123, I would name my server Web2025123. Use Windows PowerShell to rename this computer. 1b. Assign the server static IP addressing using the following configuration. Server address: 172.16.0.100/16 The /16 indicates the subnet mask. Use 172.16.0.1 as the default gateway, for the preferred DNS Server address use 172.16.0.100 and for or the alternate DNS Server use 8.8.8.8 Web address: 172.16.0.200/16 The /16 indicates the subnet mask. Use 172.16.0.1 as the default gateway, for the preferred DNS Server address use 172.16.0.100 and for or the alternate DNS Server use 8.8.8.8

1b. Test and demonstrate connectivity between the two devices by using the PING command.

1c. Convert the first server (DC) into a Domain Controller. Notice that the DNS service is installed during the DC installation procedure (in other words your server will act as its own DNS server and the DNS service will get installed while Active Directory is installed). You will create an Active Directory domain following these specifications: Use the name Domain-123.abc where xyz are the last 3 numbers of your student number (If your student number is 2025-123 you will use the name Domain-123.abc).

1d. After the Domain Controller has been installed, join the Web computer to the Domain.

1e. DigiTech has two departments. Using Active Directory Users and Computers (ADUC), create 2 departments (Organizational Units) called Accounting-Dublin and Sales-Dublin.

**Part 2: Setting up the resources and network users.**

Inside the Accounting-Dublin OU and in the Sales-Dublin OU create user accounts, and network groups as specified below:

2a. Inside the Accounting-Dublin OU create a Global Security group called Accounting.

2a. Inside the Sales-Dublin OU create a Global Security group called Sales.

2b. Create the 5 Accounting users accounts shown below, using the names supplied.

2b. Create the 5 Sales users accounts shown below, using the names supplied. For the password: Use pass1234! Set up the accounts so that the users must change the password at next logon

|  |  |
| --- | --- |
| Patrick J Jones (Accounting)  Username: pjjones | Claire Morris (Sales)  Username: cmorris |
| Patrick L Jones (Accounting)  pljones | Claire Galway (Sales)  cgalway |
| Patrick Richardson (Accounting)  prichardson | Debra J Doran (Sales)  djdoran |
| Barb Dwyer (Accounting)  Bdwyer | David R Doran (Sales)  drdoran |
| Cherry Pies (Accounting)  cpies | Justin Case (Sales)  jcase |

2c. Inside each departmental OU (Accounting-Dublin and Sales-Dublin), create and share two folders (one for each department) and apply permissions as specified here:

2d. Create one folder for each department (Sales-Documents for the sales department and Accounting-Documents for the accounting department). Share each of the folders applying permissions as follows: You will apply both Share permissions and NTFS permissions. The Sales group should have Full Control permissions for the Sales-Documents folder. Give the Accounting group Full Control permissions for the Accounting-Documents folder. You should remove the Everyone group when applying the share permissions. Note: you will need to set the permissions on both the Share and Security tabs.

2e. Test the permissions for both the Sales-Documents folder and the AccountingDocuments folder by logging onto the Web computer by using a user account from DublinSales or a user account from Dublin-Accounting [for example, the Sales-Dublin user should be able to access Sale-Documents but not Accounting-Documents]. If asked to change the password during the first log-in, use pass1234$ for the password as we have been using. Use UNC format to check the permissions for both resources: \\Server-name\Share-name If the permissions do not work, go back to the Domain Controller, and troubleshoot! Testing the resources permissions: You should be able to demonstrate that the permissions are working for both the Sales and the Account folders. For example, if you log onto the Web server as a member of the Sales group, you should be able to access the Sales\_Documents folder but have Access Denied on the Accounting folder.

2f. Apply a password policy and an account lockout policy for the entire domain as follows: The password should have 9 characters, the account history should be 12 months, the maximum password age should be 30 days and the minimum should be 29 days. The user should be locked out for 1 hour after 4 bad log-in attempts.

**Part 3: Setting up and testing a simple web site.**

3a. Install the Web server services (IIS) using PowerShell. Create a simple one-page Website for a company called DigiTech.abc (you do not need a fancy web page but include at least one picture and your name).

3b. Using Internet Information Server (IIS), use the web page you created to set up a Web site on the Web computer (not the Domain Controller).

3c. Use the DNS console to set up a DNS entry for the DigiTech web site. From the Domain Controller you should use the Edge browser that is built into the Server to demonstrate that the Web site is working by using

**Part 4: Setting Up a DHCP Server for the Domain**

4a. Add the DHCP server role to the Domain Controller server computer using the Add Roles and Features in the Server Manager console [for this project, you do not need to add support for WINS or IPv6]. Configure DHCP using the DHCP console in Administrative Tools. Use to following range of IP addresses for the IP Address Scope: The DHCP Scope Name should be the name of your Domain (such as Domain-2025123). Starting IP address is 172.16.0.1 / Ending IP address is 172.16.0.254 The subnet mask should be /16 and the default gateway should be 172.16.0.1 The DNS server address should be 172.16.0.100. The lease duration should be for 24 hours

4a. Create four DHCP address exclusions. In the Address Pool create the following four exclusion ranges: From 172.16.0.1 to 172.16.0.1 From 172.16.0.50 to 172.16.0.50 From 172.16.0.100 to 172.16.0.100 From 172.16.0.200 to 172.16.0.200

4b. Create an address reservation for the Web computer… from Administrative Tools access the DHCP console. In the Web computer find the MAC address of the Network Card (IPCONFIG/ ALL) and then go to the DHCP console and make a reservation called Web 2025xyz where xyz are last digits of your student number and assign the IP address of 172.16.0.50 (description optional)

4c. Configure the Web computer to dynamically receive the IP address from the reservation instead of using the static IP address (there is information that you will need to obtain from the Web computer). Demonstrate that both computers can still ping each other.

**Part 5: Explain about Patch Management and Update Servers for the Domain Patch management**:

All computers should have regular updates and ‘patches’. However, while client computers should be configured to get automatic updates from the manufacturer such as Microsoft for Windows and updates from Apple for Mac computers. But servers should not get automatic updates and instead should use a system of patch management.

5a. Explain the importance of patch management for network servers. Along with your explanation, provide one case-study that shows what could happen if proper patch management procedures are not followed.

5b. Also, explain how Windows Software Update Server (WSUS) is used in Windows networks to provide updates to servers in the network. This is a research assignment.

**Part 6a: These are challenge tasks.**

Attempt these only if you have completed all of the tasks shown above and you are willing to put in some extra effort and do your own work (do not seek assistance from other students). These tasks require some research. You must show your source of information for each challenge task in order to obtain credit.

6. Automated Software installation. Your IT manager needs you to install software in both the Sales and Accounting departments and she needs you to do this thorough Active Directory. She needs to have Notepad++ available for the Sales department users. Download the software packages needed for the Notepad++ software. Be sure to download the MSI versions of this software installation programs. She needs to have a PDF reader such as Adobe Reader available for the Accounting department users. Note that you do not have to specifically use the Adobe Reader software but whatever software you use must have an MSI installer package. Download the software packages needed for the PDF reader software. Be sure to download the MSI versions of this software installation programs. Perform research that will show you how to use Active Directory Group Policy to install (assign) a software package (Notepad++.msi) and .msi) from a shared network location. Both Notepad++.msi and the Adobe Reader Enterprise msi files can be downloaded from the Internet.

6a. Create a Group Policy attached to the Sales department Organizational Unit. The policy should Assign the Notepad++ software to anyone from the Sales department who logs into the domain. Demonstrate that you have this working by logging into the Web Server as a member of the Sales group and provide screen captures showing that Notepad++ works for a Sales user.

6b. Create a Group Policy attached to the Accounting department Organizational Unit. The policy should Assign the Adobe software to anyone from the Accounting department who logs in. [You will be able to download the adobe reader msi file from the Internet but you may have to search around a little bit but this should help you - How to Silently Install Adobe Acrobat Reader DC: <https://www.youtube.com/watch?v=TVAADl2J65Y>].

6c. The IT manager would like each department to have their own custom wallpaper for the user desktop. Use the Sale-Department and Accounting-Department JPEG images that are posted on Moodle to set the wallpaper for each department. If a user logs on as a member of the SalesDepartment, they should see the wallpaper for that department and if they log in as a member of the Accounting-Department they should see the wallpaper for that department as the background on their PC desktop (copies of this wallpaper are available on Moodle).

6d. The users in both the Sales department and the accounting department have been making unauthorized changes to their systems using the Control Panel. The Chief information Officer (CIO) has requested that regular users do not have access to the Windows Control Panel. Use Group policy to remove their access to this software by removing the Control Panel icon from their desktop.

6e. The IT manager needs you to set up an FTP server in the accounting department where you installed Adobe Reader. You will need to demonstrate that the FTP server is able to distribute the PDF version the DigiTech-Acceptable-Use-Policy document (a copy of this is available on Moodle).

6f. Research question: Find out how much it costs to buy one licenced copy of Windows Server 2022 and explain if you think that paying this money is a good value for the money or not a good value for the money spent. Continue and explain what you are getting for this money spent. Your explanation should include a discussion the benefits of Microsoft Active Directory and explore ways that AD can help a network administrator streamline their workflows to save time and effort in everyday network administration tasks and reduce the time they need to spend on IT tasks.

6g. Windows Software Update Server (WSUS) – In task 4d you explored the importance of patch management. Windows has a software service called Windows Software Update Server (WSUS). The IT department has requested that you set up the WSUS service on the Web Server to provide updates for the servers in the network. On the Web Server (Server 2) , set up a WSUS server to obtain it’s updates from Microsoft and configure it if Automatically Download and Notify to Install every Friday at 3:00 pm. There are other settings that need to be configured and I will give you the freedom to choose whichever settings you feel are best, but you do need to explain which settings you configured and why you made those decisions.. Use examples and explain some of the configuration settings that are available on the WSUS server. You should be able to demonstrate that the Domain Controller (Server 1) can obtain updates from the Web Server (Server 1) once the updates have been scheduled for release. Ideally you would have the WSUS services set up through Active Directory. Of course you must provide all of the sources of references that you used for this and all other challenge tasks.

**Additional Notes:**

1. Please ensure your documentation is free from spelling and grammatical errors.

Weighting Marking Scheme Summary Marks

0 to 10 Marks Part 1 Installing the network Infrastructure 10

0 to 15 Marks Part 2 Setting up Resources and Network Users 15

0 to 10 Marks Part 3 Set up and test a Simple Website on a Web server 10

0 to 10 Marks Part 4 Set up DHCP service for the network 10

0 to 10 Marks Part 5 Patch Management 10

0 to 45 Marks Parts 1, 2, 3 4 and 5 are required tasks.

Part 6 has challenge tasks that can earn additional marks 45

Student ID is 2023331