Lab 2: Windows Administration

CNIT 24200-LabSection006

Group 22

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EXECUTIVE SUMMARY

The goal of this project was to further configure the Active Directory Domain that had already been put in place to support users, groups, and organizational units, as well as enabling group policy and configuring network file sharing for all users across the network. Active Directory is a directory service that is used in Microsoft to link Windows domain networks efficiently. Along with this, VMware workstation and a Windows 10 virtual machine were to be configured on each domain controller. A domain controller is a server computer that responds to security authentication requests sent by non-domain controllers within the domain. The project consisted of several major phases- configure directory services containing network users and groups, implement network file sharing, implement seamless profile and document access across domain clients, implement user disk quotas for redirected home directories and desktops, implement network printing on each domain controller, set up group policy on each domain and at the forest level, install the latest version of VM workstation on all machines, and install Windows 10 virtual machine in VMware Workstation on each domain controller. Directory services includes all the services that is customizable by the administrator throughout the network or domain and group policy is also one of the services which regulates rules for different hierarchies of users. The appendix of this report refers to several problems faced during the configuration of this network, such as difficulty implementing roaming profiles and folder redirection, issues logging created non-administrator users, and folder permissions.

BUSINESS SCENARIO

ServerTech is a medium sized business that was looking to expand services, streamline file sharing, and security between the Technology and Finance departments and clients and to increase organization of users by creating groups and organizational units for employees and clients. One of the core businesses in ServerTech is to maintain servers and to store offline and cloud information for users. Expensive servers, switches, and routers are needed to be paid for by the financial department when the technology department requests equipment with a valid reason. Because of the amount of interaction between the two departments and the amount of paperwork that is distributed between them, the online transmission of files between technology and financial departments is critical to the business. The overall network structure of this lab was one forest domain and two other child domain controllers in the same domain, sharing the same cit.lcl network which is the CIT network located via the switch. The two other child domain uses the forest domain's IP address as their DNS address and shares directory services within the domain. ServerTech was looking to further configure these domains by creating organizational units (OUs), groups, and users in the active directory, while also implementing network sharing between the three domains. ServerTech has created two OUs (Financial Department and Technology Department), two groups (Finance Group and Technology Group), and two users (Finance Users and Technology Users) in total. Roaming profiles are implemented to increase the number of users in each department and users to conveniently access and exit the server and folder redirection is applied in order to increase the security of the resources because it eliminates data left on clients or employees. ServerTech was also looking to set up Group Policy on each domain at the forest level. Lastly, ServerTech wanted VMware Workstation to be installed in order to set up virtual machines on each domain. The programs used include Windows 10 Enterprise x64, Windows Server 2016, VMware Workstation Pro, Microsoft Active Directory, and Group Policy. Information for IPv4 configuration is recorded in the diagrams (Figure 1, 2).

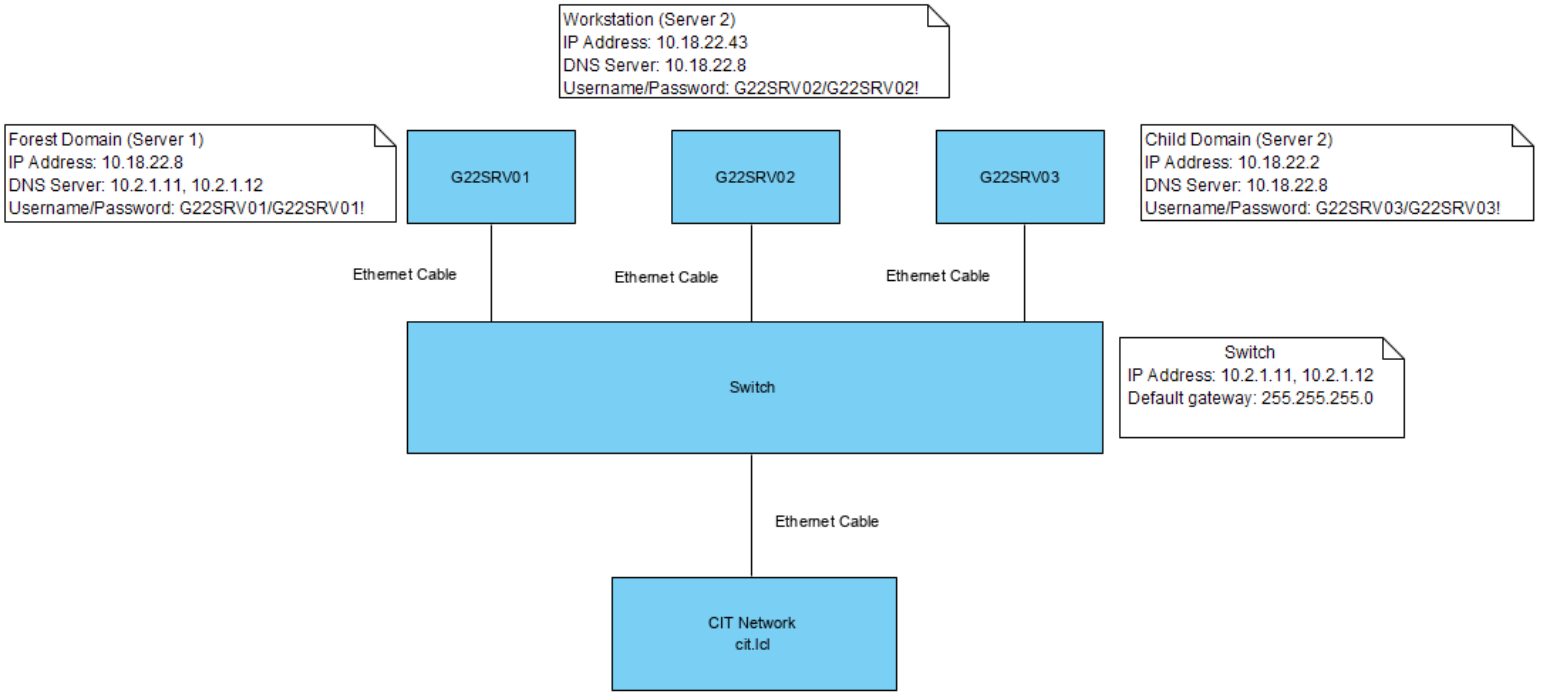

Figure 1: Pre-Lab Physical Network Diagram

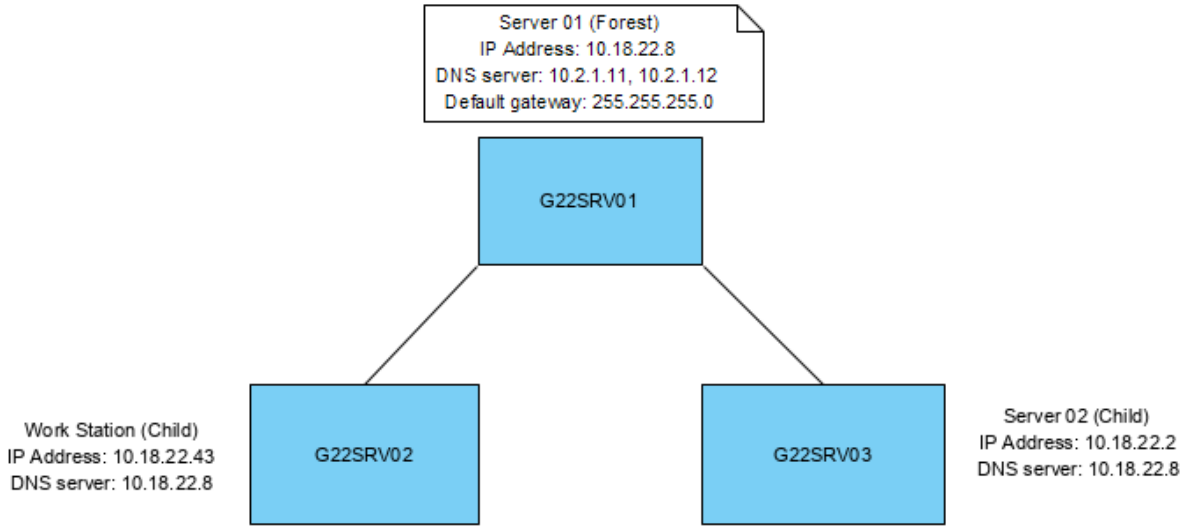

Figure 2: Pre-Lab Logical Network Diagram

PROCEDURE

This procedure phase is separated by the list of tasks shown chronologically in the check off sheet for server one. Most procedure tasks are followed on every machine. The text entered are italicized, buttons are underlined, texts displayed inside quotation marks, location of the object creations are in between parenthesis beside task names, and menu tree navigation are formatted | in between menus.

Machine updates

1. Went to Start | Settings | Update & Security | Windows Update
2. Clicked on Install now
3. Restarted machines

VMware Workstation installed

1. Went to File explorer
2. Searched: *rtfm.cit.lcl* on the menu tree bar
3. Typed in Purdue career account with “CIT\” in front of the username
4. Selected ISO | VMware | VMware Workstation | Workstation 15
5. Copied the license key provided in the text document
6. Ran VMware Workstation 15 installer
7. Selected Next | Agree to License Agreement | Next | Next | Next | Next | Install | Finish
8. Opened installed VMware and pasted license code “HH6AH-LZ38L-580DD-0T186-0EV30”

Windows 10 Client installed on VMware

1. Went to the \\rtfm.cit.lcl folder | ISO | Windows | Client | Windows 10 Old

2. Selected EN_WINDOWS_10_ENTERPRISE_X64_DVD_6851151 and the text document file under it and moved it to desktop
3. Selected Create a New Virtual Machine | Typical | Installer disc image file (iso) | Browse
4. Selected the EN_WINDOWS_10_ENTERPRISE_X64_DVD_6851151 file that was moved to desktop
5. Microsoft Windows 10 x64 | Next
6. Entered the license key provided in the text document in desktop
7. Typed 30 GB for Maximum disk size
8. Selected Split virtual disk into multiple files | Finish
9. Started Windows 10 x64 machine by clicking on Power on this virtual machine

Windows 10 VM connected to network and domain

1. Went to Start | Control Panel | System and Security | System
2. Clicked on Change settings under "Computer name, domain, and workgroup settings
3. Clicked on Change… under "Computer Name" tab
4. Typed under "Computer name" and "Domain" for each machine:
    a. Server 01: Computer name: *C242-22-VM01*

       Domain: *group22.c24200.cit.lcl*

    b. Server 02: Computer name: *C242-22-VM02*

       Domain: c242-22-b.*group22.c24200.cit.lcl*

    c. Workstation: Computer name: *C242-22-VM03*

       Domain: c242-22-c.*group22.c24200.cit.lcl*
5. For Authentication pop-up, typed *Administrator* for "Username" and Administrator's password for "Password"
6. Went to Start | Control Panel | Network & Sharing Center
7. Clicked on Ethernet | Properties | Internet Protocol Version 4 (TCP/IPv4)

8. Changed the IP address to static:
    a. Server 01 IP address: 10.18.22.47
    b. Server 02 IP address: 10.18.22.27
    c. Workstation IP address: 10.18.22.13
9. Typed *255.255.255.0* for "Subnet mask", *10.18.22.1* for "Default gateway" and *10.18.22.8* for "Preferred DNS Server" for all Windows 10 Client virtual machines

VMware updated

4. Went to Start | Settings | Update & Security | Windows Update
5. Clicked on Install now
6. Restarted machines

Users and computers configured

1. Went to Server Manager | Tools | Active Directory Users and Computers
2. Right clicked on domain "group22.c242.00.cit.lcl"
    a. Went to New | Organizational Unit
        i. Under "Name" entered *ServerTech* and clicked on Ok
3. Right clicked on "ServerTech"
    a. Went to New | Organizational Unit
        i. Under "Name" entered *Finance Department* and clicked on Ok
        ii. Repeated step a and under "Name" entered *Technology Department* and clicked on Ok
    b. Went to New | Group
        i. Under "Group name" entered *ALL*
        ii. Toggled "Group scope" to Global and "Group type" to Security and clicked on Ok

4. Right clicked on “Finance Department”
    a. Went to New | Group
        i. Under “Group name” entered *Finance Department*
        ii. Toggled “Group scope” to Global and “Group type” to Security and clicked on Ok
    b. Went to New | User
        i. Under “First name” entered *Finance User*
        ii. Under “User logon name” entered *Finance User*
        iii. Typed password for User and toggled “User must change password at next logon” and “User cannot change password”
5. Right clicked on “Technology Department”
    a. Went to New | Group
        i. Under “Group name” entered *Technology Department*
        ii. Toggled “Group scope” to Global and “Group type” to Security and clicked on Ok
    b. Went to New | User
        i. Under “First name” entered *Technology User*
        ii. Under “User logon name” entered *TechnologyUser*
        iii. Typed password for User and toggled “User must change password at next logon” and “User cannot change password”
6. Right clicked security group ALL and selected Properties
    a. Selected Members tab and selected Add…
    b. Typed *Finance Department*, clicked Check Names, and Ok
    c. Typed Technology Department, clicked Check Names, and Ok
    d. Clicked Apply and Ok
7. Right clicked security group Finance Department and selected Properties

   a. Selected Members tab and selected Add…
   b. Typed in *Finance User* and clicked Check Names and Ok after users were underlined
   c. Clicked Apply and Ok
8. Right clicked security group Technology Department and selected Properties
   a. Selected Members tab and selected Add…
   b. Typed in *Technology User* and clicked Check Names and Ok after users were underlined
   c. Clicked Apply and Ok

Set password policy (Server 01)

1. Went to Server Manager | Tools | Group Policy Management | Action
2. Right clicked on the company OU "ServerTech" and selected "Create a GPO in this domain, and Link it here"
3. Typed *Password Policy* under Name and set "Source Starter GPO" as "(none)"
4. Right clicked the created GPO under "ServerTech" and selected "Edit"
5. Expanded Computer Configuration | Policies | Windows Settings | Security Settings | Account Policies | Password Policy
6. Right clicked on "Password must meet complexity requirements" and selected "Properties"
7. Under Security Policy Setting, toggled "Define this policy settings" and toggled "Enabled"
8. Right clicked on the "Password Policy" GPO and toggled "Enforced"
9. Clicked on the "Password Policy" GPO and clicked on Add under "Security Filtering" under the "Scope" tab
   a. Typed *ALL*, clicked Check Names, and Ok
   b. Typed *Finance Department*, clicked Check Names, and Ok
   c. Typed Technology Department, clicked Check Names, and Ok

Printing

1. Went to Control Panel | Hardware | Devices and Printers | Add a printer
2. Selected The printer that I want isn't listed
3. Selected Add a printer using a TCP/IP address or hostname
4. Typed in: *10.3.1.238* for the Hostname or IP address
5. Agreed on printer name

File sharing

1. Went to Server Manager | File and Storage Services | Shares | Tasks | New Share
2. Selected SMB Share Quick (SMB)
3. Toggled "Type a custom path" and typed *C:\Shares*
4. Under "Share name" typed *Files*
5. Toggled "Enable access-based enumeration" and "Allow caching of share"
6. Clicked on Customize permissions
    a. Selected Add and Select a principal
        i. Entered *G22SRV02* and clicked on Check Names and Ok
        ii. Toggled "Modify" under "Basic permissions" and clicked on Ok
    b. Selected Add and Select a principal
        i. Entered *G22SRV03* and clicked on Check Names and Ok
        ii. Toggled "Modify" under "Basic permissions" and clicked on Ok
    c. Selected Add and Select a principal
        i. Entered *ALL* and clicked on Check Names and Ok
        ii. Clicked on Show advanced permissions under "Basic permissions" and toggled "Create folders / append data" and clicked on Ok
    d. Clicked on Apply and Ok

7. Clicked on Create and Close
8. Went to File Explorer | This PC
9. Right clicked on empty space
10. Selected Add a network location | Next | Choose a custom network location | Next
11. Typed *\\G22SRV01.group 22,c24200,cit.lcl\Files*
12. Clicked on Finish

Regedit Group Policy (Server 01)

1. Went to Server Manager | Tools | Group Policy Management
2. Right clicked on the company OU "ServerTech" and selected "Create a GPO in this domain, and Link it here"
3. Typed *Regedit Policy* under Name and set "Source Starter GPO" as "(none)"
4. Right clicked the created GPO under "ServerTech" and selected "Edit"
5. Went to User Configuration | Policies | Administrative Templates | Control Panel | Personalization
    a. Right clicked on "Prevent changing theme" and selected Edit
    b. Toggled "Enabled" and clicked Apply and Ok
6. Went to User Configuration | Policies | Administrative Templates | System
    a. Right clicked on "Prevent access to registry editing tools" and selected Edit
    b. Toggled "Enabled" and clicked Apply and Ok
7. Right clicked on the "Regedit Policy" GPO and toggled "Enforced"
8. Clicked on the "Regedit Policy" GPO and clicked on Add under "Security Filtering" under the "Scope" tab
    a. Typed *ALL*, clicked Check Names, and Ok
    b. Typed *Finance Department*, clicked Check Names, and Ok
    c. Typed Technology Department, clicked Check Names, and Ok

Set roaming profiles

1. Went to Server Manager | Tools| Active Directory Users and Computers on each machine
2. Right clicked “ServerTech” | “Finance Department”
3. Left clicked Finance User and selected Properties | Profile
    a. Typed *\\G22SRV01.group22.c24200.cit.lcl\Files\FinanceUser* in the User profile box for the Profile path
    b. Right clicked Apply
    c. Right clicked Ok
4. Right clicked “Technology Department”
5. Left clicked Technology User and selected Properties | Profile
    a. Typed *\\G22SRV01.group22.c24200.cit.lcl\Files\TechnologyUser* in the User profile box for the Profile path
    b. Right clicked Apply
    c. Right clicked Ok
6. Went to VMware Workstation | Windows 10 x64| Start | System and selected System info
7. Right clicked Advanced system settings and selected Settings… in the User Profiles box
8. Right clicked User Accounts | Manage User Accounts | Add… | Browse…
    a. Server 01: Used Administrator’s network credentials of this domain for permissions
        i. Typed *Finance User*, clicked Check Names, selected User from Server 01’s domain and Ok
            1. Selected Standard user and selected Ok
        ii. Right clicked Add… | Browse… , Typed *Technology User*, clicked Check Names, selected User from Server 01’s domain and Ok
            1. Selected Standard user and selected Ok
    b. Server 02: Used Administrator’s network credentials of this domain for permissions

i. Typed *Finance User*, clicked Check Names, selected User from Server 02's domain and Ok

1. Selected Standard user and selected Ok

ii. Right clicked Add… | Browse… , Typed *Technology User*, clicked Check Names, selected User from Server 02's domain and Ok

1. Selected Standard user and selected Ok

c. Workstation: Used Administrator's network credentials of this domain for permissions

i. Typed *Finance User*, clicked Check Names, selected User from the Workstation's domain and Ok

1. Selected Standard user and selected Ok

ii. Right clicked Add… | Browse… , Typed *Technology User*, clicked Check Names, selected User from Workstation's domain and Ok

1. Selected Standard user and selected Ok

Set folder redirection (Server 01)

9. Went to Server Manager | Tools | Group Policy Management
10. Right clicked on the company OU "ServerTech" and selected "Create a GPO in this domain, and Link it here"
11. Typed *Folder Redirection* under Name and set "Source Starter GPO" as "(none)"
12. Right clicked the created GPO under "ServerTech" and selected "Edit"
13. Went to User Configuration | Policies | Windows Settings | Folder Redirection | Desktop
    a. Right clicked on Desktop and selected Properties went under the "Target" tab
    b. Selected "Basic - Redirect everyone's folder to the same location" in the drop-down menu
    c. Selected "Create a folder for each user under the root path" in the drop-down menu
    d. Typed in *\\G22SRV01.group22.c24200.cit.lcl\Files* under "Root Path"

e. Clicked on Apply and Ok

14. Went to User Configuration | Policies | Windows Settings | Folder Redirection | Documents
    a. Right clicked on Documents and selected Properties went under the "Target" tab
    b. Selected "Basic - Redirect everyone's folder to the same location" in the drop-down menu
    c. Selected "Create a folder for each user under the root path" in the drop-down menu
    d. Typed in *\\G22SRV01.group22.c24200.cit.lcl\Files* under "Root Path"
    e. Clicked on Apply and Ok
15. Right clicked on the "Folder Redirection" GPO and toggled "Enforced"
16. Clicked on the "Folder Redirection" GPO and clicked on Add under "Security Filtering" under the "Scope" tab
    a. Typed *ALL*, clicked Check Names, and Ok
    b. Typed *Finance Department*, clicked Check Names, and Ok
    c. Typed Technology Department, clicked Check Names, and Ok

Group policy linking (Server 02 and Workstation)

1. Went to Server Manager | Tools | Group Policy Management
2. Right clicked on the domain name:
    a. Domain: c242-22-a.group22.c24200.cit.lcl
    b. Domain: c242-22-b.group22.c24200.cit.lcl
3. Selected Link an Existing GPO
4. Selected the drop-down menu and clicked on the forest domain: group22.c24200.cit.lcl
5. Highlighted the GPO names:
    a. Folder Redirection
    b. Password Policy
    c. Regedit Policy

6. Clicked on Ok

Set disk quotas

1. Went to Server Manager | File and Storage Services | Shares
2. Clicked on Create new disk quota
3. Toggled “Role-based or feature-based installation” and “Select a server from the server pool”
4. Ensured that “File and Storage Services”, “File and iSCSI Services”, “File Server Resource Manager”, and “Storage Services” are toggled
    a. Clicked on Add Features
5. Did not configure the next page
6. Clicked on Install
7. Toggled “Automatically create and apply quotas for all users” and selected 10 GB Limit under “Select a quota template”
8. Clicked on Ok

Results

The results of these procedures ultimately are that many of the objectives were accomplished. VMware Workstations was installed on each machine with the most recent version of Windows Enterprise 10 x64 as an available operating system within the virtual machines. Each of the virtual machine's Windows 10 were connected to their respective domains and network and were updated to the most current release of VMware Workstation. Organizational units were also created using a functional design to represent the structure of clients that ServerTech is in business with. Various group policy objects were created to define rules for the organizational units, groups and users. The application of roaming profiles which stored the user's profile on a network share virtually was a great way to allow the clients of ServerTech to have a consistent environment without any issues. The group policy objects created were the regedit, password, and folder redirection policies. These were applied at the organizational unit level, domain level and forest level. The regedit policy created prevented a non-administrative user from accessing registry tools. The password policy defined required parameters for user passwords. The folder redirection policy was meant to redirect the technology user and financial user's desktops and documents to a shared folder on the network, but this goal was not successfully met. The final success was that disk quotas were set for every share folder created which limited the amount of data that each file share was allowed to allocate for its files. There were three physical machines used in this lab (Figure 3), sever 01 named as G22SRV01, server02 as G22SRV02, and a workstation computer as G22SRV03. The login names for the virtual machines (Figure 4) that was created on each machine was G22VM01, G22VM02, and G22VM03 respectively.

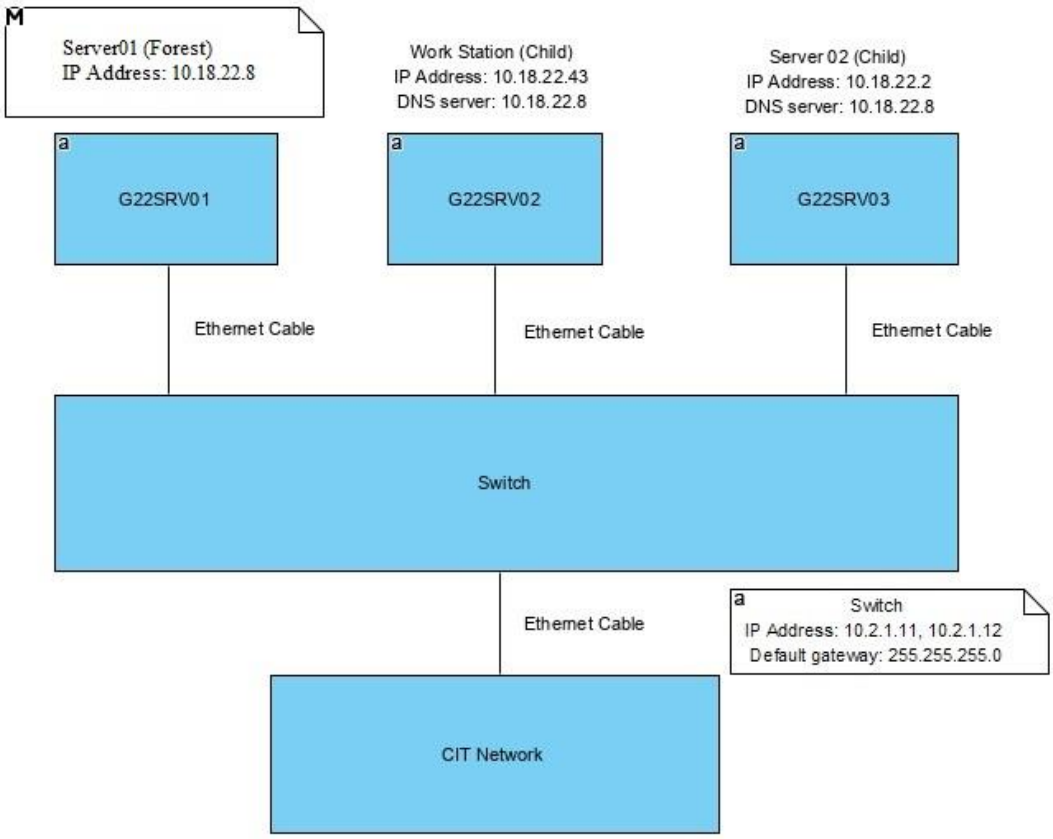

Figure 3: Physical Network Diagram

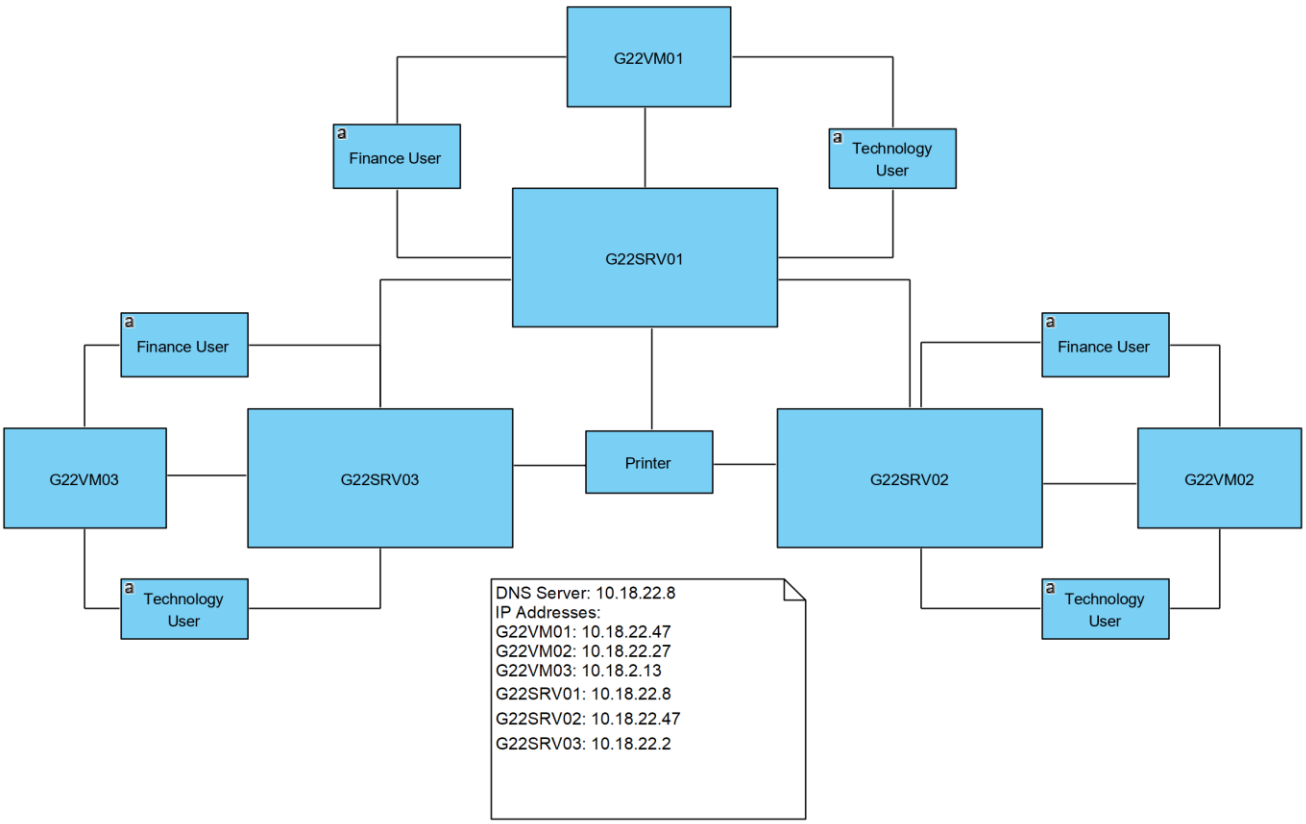

Figure 4: Logical Network Diagram

Conclusions and Recommendations

Conclusion

Overall, most of the requirements for the project was met but not all was successfully accomplished during the given time. In the business case, we had to configure folder redirection in order to increase the security for the employees and clients of ServerTech, but it was not achievable during this lab due to the lack of time. The attempt of trying to set folder redirection of the machines is shown in the procedure but the result was a failure to share portions of the profile to a network share. Other than the folder redirection, this current project met the rest of the requirements that was stated on the check-off list. All of the departments and users that were suitable and needed for the company, group policies such as regedit and password, and roaming profiles were created for the convenience and the security of ServerTech in order to expand services, streamline file sharing, and security for employees and clients of ServerTech.

Recommendations

Recommendation 1: Before moving forward with configuring the VMware virtual machine, make sure the correct version of Windows. The version to install is Windows Enterprise 10 x64, if the wrong version is installed it will result in various objectives of the lab failing. Incoming students should pay attention to the number at the end of the IOS disc image because the number behind the Windows Enterprise 10 x64 has to be different.

Recommendation 2: Ensure the proper configuration of folder redirection and roaming profiles is implemented so that further configuration of the system will not contain potential flaws that would cause the system to fail. One of the most important steps are when editing the group policies, accurate settings has to be enabled or disabled or it will cause issues in the future. Another major step is to add the security

groups that to the group policies because if not done the folder redirection and roaming profiles will not be applied to the unspecified user.

Recommendation 3: During the creation of passwords in VMs, Windows client, and Windows Server, the passwords should be uniform due to the overcoming complication of passwords when logging in at other times. Remembering one universal password for such a lab that has numerous authentications in the process can be very beneficial in the speed of the lab. Creating one password and recording that down on a note is the best method to efficiently go down the process without having complex issues due to incorrect passwords.

Recommendation 4: While configuring the IP addresses of the VMs or any OS on physical computers, it is more convenient to remember and record down the IP address in order if only the last 8 bits is altered to provide a unique IP address to each different machine. This method will not make administrators confused about which machine is using which IP or which IP is already being used or not because it is written in chronological order which makes it easier to memorize.

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APPENDIX A: Problem Solving

Problem 1: Roaming profiles

Problem Description: Made incorrect configurations for roaming profiles on machines.

Problem Solution: The possible solutions are to ask the lab instructor, google alternate solutions and ways to configure roaming profiles on the VM (user profiles), or to ask students from the same lab session for help.

Solution Attempted: After consulting several different guides online and attempting to follow them, roaming profiles were still not configured properly and would not work as intended. It failed due to lack of similarity of environment between the lab and online resources.

Final Solution: After researching and asking people for help, the goal of roaming profiles on machines was not successfully finished in time for lab check off. But after the check off and searching online for more information, roaming profiles was configured accurately to other directory controllers.

Problem 2: Folder redirection

Problem Description: Unable to successfully set folder redirection on machines.

Problem Solution: The possible solutions are to ask the lab instructor, google solutions and ways to redirect folders on the VM (user profiles) and the domain controller, or to ask students from the same lab session for help.

Solution Attempted: The solutions attempted was to google solutions for folder redirection and to ask students who were done with the folder redirection section for help. It failed due to lack of commonality of network environment between the lab and online resources.

Final Solution: After researching and asking people for help, the goal of folder redirection on machines was not successfully finished in time for check off. The steps in procedure did not lead to a successful solution.

Problem 3: Folder permissions

Problem Description: During the trials of attempting to accomplish the folder redirection, the permission to access the shared folder was blocked for an unknown reason.

Problem Solution: The solutions that were available was to go back and check the given permission for folders to users and computers, and to ask the TA about the issue.

Solution Attempted: The solution attempted was to re-check the given permission to user groups and computers and to ask the TA about the problem. Double checking the permissions did not have any errors, so the only solution was to ask the TA. When double checking the permission for the shared folder, there was not a way to solve the issue at the time since the forest domain was denied access to the created shared folder.

Final Solution: The final solution was to ask the TA about the problem but even the TA could not solve the problem. The procedure written down for folder redirection in this lab report was not accurately listed.