Lab 4: Enterprise Windows Server Administration – Part I

CNIT 24200-006

Group 22

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Executive Summary

The main goal of the project was to expand the previous server environment into a larger Windows based enterprise model. The first few steps to complete the lab objectives were to install the Workstation host from Windows Server 2016 to Windows 10 Client and to install a new Windows Server 2016 on vCenter. To create another network location within the enterprise, a new VM port group was created. Several new machines were added to the second network location in the form of VMs by cloning the Windows Server 2016, including a new domain controller in the forest and the IIS web server. The implementation of Microsoft Backup were scheduled to create a backup target on Windows 10 client and to conserve disk space by backing up one week's worth of data. Printing was also managed separately into two different queues, one for prioritized users and the other for regular users. Lastly, the IIS web server was cloned from the Windows Server 2016 to make accessing permissions for regular users (public), domain members (private), and server hosts (site-specific). Major problems in the process of the lab were that the Window OS was unable to boot up, an unstable network connection for the Windows Server VM, the cloning process in the second domain controller, and the screen resolution in the VM had issues. In the major phases in the lab, one objective that was not completed was the implementation of the Microsoft Backup which carried a large portion in the lab. A few recommendations for this lab is to create a uniformed password for the entire lab machines throughout the lab and to utilize snapshots when having unexpected systematic errors. The sections in this lab are separated into parts. The first part, the business scenario applies this lab architecture to a real life organization that utilizes this lab effectively to obtain its purpose. Next, the procedure walks the audience through this lab with specific information to lead the readers into completing the lab. The results lists the successfully accomplished objectives and overall logical and physical network diagrams in this lab. The conclusion and recommendations reflect upon the business scenario on how much of the goals in this lab were completed successfully and the recommendation section gives suggestions to future lab students on completing the lab.

Business Scenario

ServerTech has expanded significantly over the past few months and IT has decided to expand the server environment to a larger enterprise model. This expansion includes the creation of another port group joining the domain which would allow them to serve more users by offering another IP range that is different than the first port group. To allow for the creation of another site a second domain controller was created on this port group. Implementing another domain controller into the network enables fault tolerance and keep services available if one controller malfunctions. This requires setting the FSMO roles for the forest, which assigns what functions each domain controller is responsible for. ServerTech implemented Internet Information Services (IIS) which created various websites for the company. These sites range from anyone being able to access them, only available to members of the domain having access or only machines that belong to a specific port group within the domain having access. Restricting the access of who or what is allowed to see a specific site is done within the private site's configuration.

ServerTech is also starting to take advantage of the use of templates to save time when creating and configuring virtual machines to fit varying purposes as well as snapshots of existing virtual machines. With the creation of a Windows Server 2016 template, they are now able to quickly create another server if one of the existing servers were to fail, also now having the capability to revert a failed machine to a previous functioning state from taking snapshots.

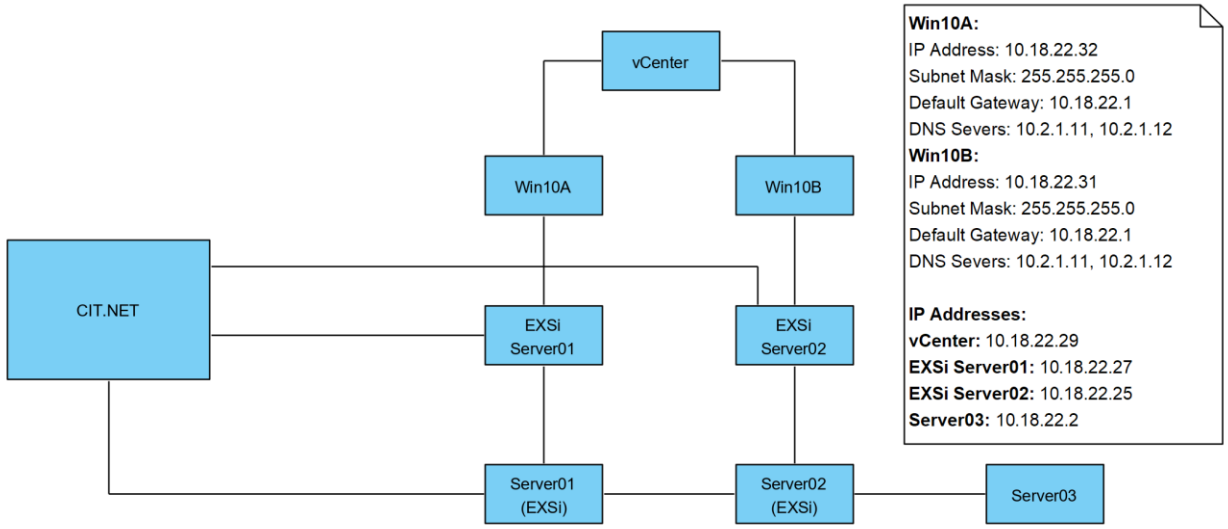

Figure 1: Pre-lab Logical Network Diagram

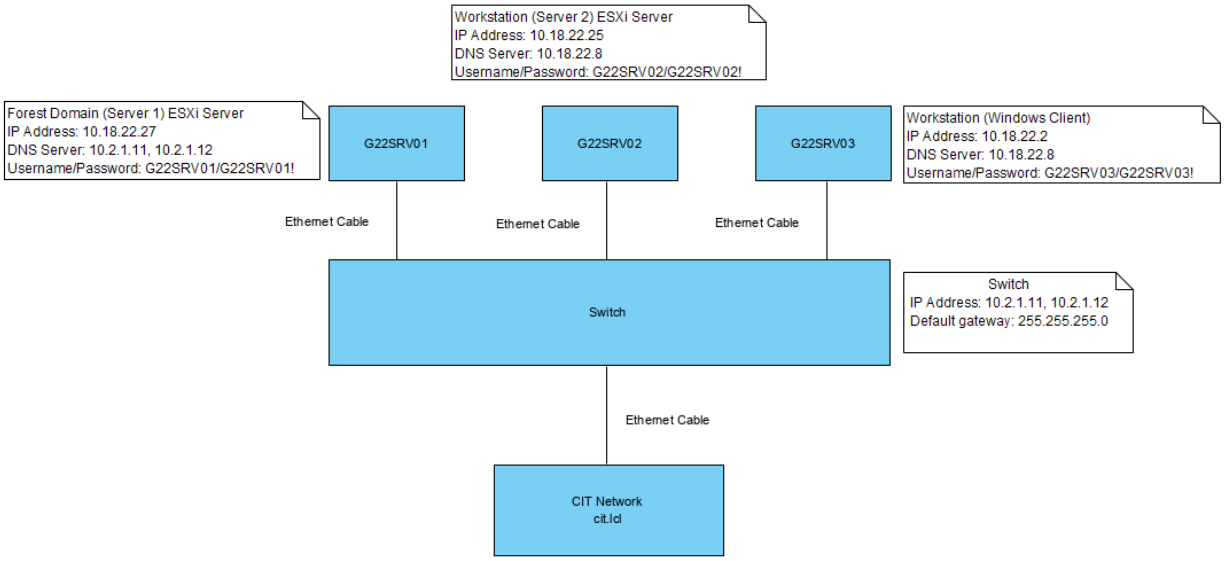

Figure 2: Pre-lab Physical Network Diagram

Procedure

This procedure phase is separated by the list of tasks shown chronologically in the check off sheet. The format for the procedure is according to: **buttons** are bold, *options* are italicized, text entered into the computer is in Courier New, menu navigation is by the pipe symbol and italic words: *Start* | *Programs* | *MS Office* | *Word*.

Installed Windows 10 on Workstation

1. Inserted Windows USB retrieved from TA drive into Optiplex 990
2. Turned on machine and used **F12** to go into boot up menu
3. Selected *USB Drive*
4. Selected *English* for language and clicked **Next**
5. Selected *English (US)* for keyboard layout and clicked **Next**
6. Clicked **Install Now**
7. Selected *Windows 10 Pro* and clicked **Next**
8. Accepted the license terms and clicked **Next**
9. Selected *Custom Install* and clicked **Next**
10. Deleted all partitions and then clicked **Next**
11. Clicked **Next** and **Next**
12. Typed in `Administrator` for the PC name
13. Clicked **Next** and **Next**
14. Clicked **Accept**
15. Waited for install to be completed
16. Clicked on Internet icon in taskbar

17. Opened Network and sharing center
18. Clicked connect to the internet then clicked ethernet
19. Clicked properties and then clicked Internet Protocol Version 4 and then clicked properties again
    a. IP address: `10.18.22.08`
    b. Subnet mask: `255.255.255.0`
    c. Default gateway: `10.18.22.1`
    d. Preferred DNS server: `10.2.1.11`
    e. Alternate DNS server: `10.2.1.12`
20. Closed all windows
21. Opened Control Panel
22. Navigated to system and security and then clicked **System**
23. Clicked **Change settings** for Name, Domain, and Workgroup
    a. Changed domain to `group22.c24200.cit.lcl`
24. Clicked **Restart now**

Installed and Updated Fresh Windows Server 2016

1. Logged into ESXi Server 02 on `10.18.22.25` and chose create new VM
    a. Username: root
    b. Password: g22srv2!
2. Clicked **Create/Register VM** then **Next**
3. Typed name: `Windows Server 2016`
4. Selected in Guest OS family: *Windows*
5. Selected in Guest OS version: *Microsoft Windows Server 2016(64-bit) then Next*
6. Selected *Group22SRVDS02-1* for storage then **Next**

7. In customize settings inputted information as follows:

CPU	*2*
Memory	*4*
Hard Disk 1	*60GB*
Network	*Lan 2*
CD/DVD Drive 1	*Datastore ISO file*
CD/DVD Media	*[RTFM] Windows/Server/en_windows_server_2016_updated_feb_2018_x64_dvd_11636692.iso*

8. **Next** then **Finish**
9. Specified Disk selection to *Windows | Server |* W*indows 2016*
10. Booted up VM by opening a browser
11. Selected **Next** then chose **Start Installation**
12. Selected **I don't have product key**
13. Selected option *Windows Server 2016 Standard (Desktop Experience)* and clicked **Next**
14. Accepted the license terms and clicked **Next**
15. Selected *Custom: Install windows on (advanced)*
16. Chose *Drive 0 Unallocated Space* then **Next**
17. Created password and verified it by entering it again.
    a. Username: `Administrator`

   b. Password: `g22srv2!`

18. Logged into the machine using the password created in the previous step.
19. Opened **Network and sharing center** and selected **Ethernet 0**
20. Clicked **IPv4** and clicked **Properties**
21. Selected **Use the following IP address** and entered:

IP address	`10.18.72.2`
Subnet Mask	`255.255.255.0`
Default Gateway	`10.18.72.1`
Preferred DNS Server	`10.2.1.11`
Alternate DNS Server	`10.2.1.12`

22. Selected **Ok** then **Close** then **Close** again
23. Navigated to *Start* | *Settings*
24. Clicked **Search for Updates**
25. Clicked on **Install** when update downloads were downloaded completely

Saved VM as a Template and Took Snapshots

1. Navigated to vCenter on `10.18.22.29`
   a. Username: `administrator@vsphere.local`
   b. Password: `G22srv1!`
2. On the sidebar, selected *Hosts and Clusters* | *10.18.22.29* | *Group22* | *Group22cluster* | *Windows Server 2016*

   a. Selected **Actions** beside VM name: Windows Server 2016
   b. *Selected Template* | *Convert to Template*
3. On the side bar, right clicked on **Windows Server 2016**
   a. Clicked on *Snapshots* | *Take Snapshot*

Controlled Virtual Machine Access

1. Went to vCenter on `10.18.22.29` with provided credentials
2. Clicked on **vSphere Client**
   a. Selected *Administration* | *Configuration* | *Identity Source* | *Add Identity Source*
   b. Selected *group22.c24200.cit.lcl* (Forest Domain) for Domain Name
   c. Clicked **OK**
3. Clicked on **Menu** dropdown
   a. Selected *Hosts and Clusters* | *Group22cluster*
   b. Clicked on **Permissions**
   c. Clicked on the **+** symbol to add permissions
      i. User: *group22.c24000.cit.lcl , TechnologyUser*
      ii. Role: *Administrator*
      iii. Clicked on **OK**

Added new VM port group to ESXi Server

1. Logged into ESXi Server 01 on `10.18.22.27` with credentials:
   a. Username: `root`
   b. Password: `g22srv1!`
2. On the side bar, selected *Networking* | *Add port group*
   a. Changed the name of the port group to: `LAN2`

   b. Changed the VLAN ID to: `1872`
   c. Left other settings to default
   d. Selected **Add**

3. Repeated steps 1 - 2 on Server 02 with credentials:
   a. Username: `root`
   b. Password: `g22srv2!`

Cloned Windows Server VM Template

1. Went to vCenter on `10.18.22.29` with provided credentials
2. Clicked on *vSphere Client*
3. Went to *Networking* | *LAN2* | *VM Templates in Folders*
4. Right Clicked "Windows Server 2016" and selected *New VM from This Template*
5. Typed next to Virtual machine name: `DC 2 Windows Server 2016`
6. Selected location for virtual machine *10.18.22.29* | *Group22* | *Discovered virtual machine*
7. Clicked **Next**
8. Selected the compute resource to be 10.18.22.25 and clicked **Next**
9. Selected the virtual disk format to be *Thin Provisioned*
10. Selected the datastore to be *Group22SRVDS02-1*
11. Then clicked **Next** | **Next** | **Finish**

Implemented Cloned Windows Server as a Second Domain Controller

1. From vCenter at 10.18.22.29 launched a Web Console of the virtual machine DC 2 Windows Server 2016
2. Logged into the VM with the Template's credentials
3. Went to *Network and sharing center* | *Ethernet 0* | *IPv4* | *Properties*

4. Changed the IP address to `10.18.72.11`
5. Went to *Start* | *Server Manager*
6. Selected *Manage* | *Add Roles and Features*
7. Clicked **Next**
8. Then Selected *Role-based or feature-based installation*, clicked **Next**
9. Selected the server *G22DC2* then clicked **Next**
10. Selected the options: *Active Directory Domain Services* and *File and storage services*
11. Clicked **Next** | **Next** | **Install**
12. After the installation finished, selected *Notifications*
13. Clicked *Promote this server to a Domain Controller*
14. Selected *Add a domain controller to an existing domain*
15. In the domain textbox typed `group22.c24200.cit.lcl` and provided the credentials of the forest domain controller (Group2201\Administrator)
16. Typed a new password for the new domain controller. (Password to 2nd DC: G22srv02!)
17. Clicked *Next* for each page until the Prerequisites Check page then clicked **Install**

Defining the New Subnet/Site

1. In the Web Console for the second domain controller, navigated to *Server Manager* | ***Tools*** | *Active Directory Sites and Services*
2. Right-clicked **Sites** and selected **New Site**
3. Typed in the Name box `Site2`
4. Selected *DEFAULTIPSITELINK* and clicked **OK**
5. Navigated to Default-First-Site-Name | Servers
6. Right-clicked G22DC2 and selected *Move…*
7. Selected *Site2* and clicked **OK**

8. Right-clicked on *Subnet* and selected *New Subnet…*
9. Typed in the Prefix text box `10.18.72.0/24`
10. Selected the Site object to be *Site2* and clicked **OK**

Changing FSMO roles of the Domain

1. Opened a Web Console on the original forest domain controller (G22SRV01.group22.c24200.cit.lcl) from vCenter
2. Navigated to *Server Manager* | *Tools*| *Active Directory Users and Computers*
3. Right-clicked on the domain *group22.c24200.cit.lcl* and selected *Operations Master…*
4. Ensured that the RID, PID and Infrastructure master is assigned to this domain controller
5. Navigated to the *Domain Controllers* file and right-clicked *G22DC2* then selected *Properties*..
6. Clicked *NTDS Settings* and clicked the *Global Catalog* check box
7. Clicked **OK**
8. Right-clicked *G22SRV01* and selected *Properties*... then clicked *NTDS Settings*
9. Unchecked the *Global Catalog* check box and clicked **OK** | **OK**

Installed Windows 10 VM at new port group

1. From vCenter navigated to *Hosts and Clusters* | *10.18.22.29* | *Group22* | *Group22cluster*
2. Right-clicked *10.18.22.27* and selected *New Virtual Machine…*
3. Selected *Create a new virtual machine*, then clicked **Next**
4. Named the new virtual machine: `Windows 10 VM`
5. Selected *Discovered virtual machine* to be the location for the virtual machine then clicked **Next**
6. Selected *10.18.22.27* to be the compute resource, then clicked **Next**
7. Selected the storage to be *Group22SRVDS01-1*, then clicked **Next**| **Next**

8. Ensured that the Guest OS Family is set to *Windows*, and the Guest OS Version is *Microsoft Windows Server 2016 (64-bit)*, then clicked **Next**
9. Under the "CPU" section selected **1**
10. Under "New Network" section selected **LAN2**
11. In the "New CD/DVD Drive" section selected **Datastore ISO File**
12. Navigated to *Group22SRVDS01-1* | *en_windows_server_2016_updated_feb_2018_x64_dvd_11636692.iso*
13. Clicked **Next** | **Finish**

Configuring the Windows 10 VM

1. Launched a Web Console from vCenter for the newly installed Windows 10 VM
2. Prompted to press any key to boot from the Windows 10 ISO
3. Selected **Install Now**
4. Selected *Windows 10 Enterprise* then clicked **Next**
5. Agreed to the End User License Agreement by clicking the checkbox then clicking **Next**
6. Selected *Custom: Install Windows Only* then clicked **Next**
7. Selected *Drive 0 Unallocated Space* as the place to install Windows then clicked **Install**
8. After the VM rebooted, ensured that the region was *United States* then clicked **Yes**
9. Ensured the keyboard layout was *US* then clicked **Yes**
10. Created user "Administrator" and made password for the user
11. Selected different random security questions and used the same answer for all of them.
12. Logged into the user on the VM.
13. Navigated to *Network and sharing center* | *Ethernet 0* | *IPv4* | *Properties*
14. Selected *Use the following IP address* and entered:
    a. IP address: `10.18.72.3`

   b. Subnet mask: `255.255.255.0`
   c. Default Gateway: `10.18.72.1`
   d. Preferred DNS server: `10.2.1.11`
   e. Alternate DNS server: `10.2.1.12`

15. Selected **OK** | **Close** | **Close**
16. Went to *Settings* | *System* | *About*
17. Clicked **Join a domain**
18. Entered `group22.c24200.cit.lcl`
19. Entered credentials of Windows Server 01 administrator (Group2201\Administrator)
20. Created user account called administrator, clicked **Next** | **Restart Now**

Configured Printer

1. Navigated to vCenter `10.18.22.29` and logged in with provided credentials
2. In the left navigation sidebar, clicked VMs and Templates | Group22cluster | G22SRV01.group22.c24200.cit.lcl
3. Opened the forest VM
   a. Typed `Server Manager` in the Windows Search bar and pressed **Enter**
   b. Clicked on **Tools** at the top right hand corner of Server Manager
   c. Clicked on **Active Directory Users and Computers**
      i. On the sidebar, clicked on **Users** and added New user by clicking an icon of a person on the toolbar
      ii. Entered `Print Operators` for the name
      iii. Entered `PrintOperators` for the login name and clicked **Next**
      iv. Entered `Group22!` for password and clicked **Next** and **Finish**
4. In the Windows search bar, typed `Devices and Printers` and pressed **Enter**

a. Clicked **Add Printer** on toolbar and clicked on **The printer that I want isn't listed**

b. Selected radio button beside *Add a printer using a TCP/IP address or hostname*

c. Typed in the following: and clicked **Next**

Device Type	Autodetect
Hostname or IP address	10.3.1.238
Portname	10.3.1.238

d. Selected *HP* for Manufacturer Name

e. Selected *HP LaserJet P205X series PCL6 Class Driver* for Printer Name and clicked **Next**

f. Selected the radio button next to *Use the driver that is currently installed (recommended)* and clicked **Next**

g. Typed `HP LaserJet P205X series PCL6 Class Driver 1` for Printer name and clicked **Next**

h. Selected the radio button beside Do not share this printer and clicked **Next**

i. Selected **Print Test Page** and clicked **Finish**

5. Repeated step 4 but changing the name of the printer to `HP LaserJet P205X series PCL6 Class Driver 2`

6. Right clicked **HP LaserJet P205X series PCL6 Class Driver** and clicked on Printer Properties and **HP LaserJet P205X series PCL6 Class Driver 1**

a. Went to Advanced tab and set Priority to `1`

b. Went to the Security tab and under Group or user names, removed Everyone and clicked on **Add…**

c. Typed `Print Operators` and clicked **OK**

7. Right clicked **HP LaserJet P205X series PCL6 Class Driver** and clicked on Printer Properties and **HP LaserJet P205X series PCL6 Class Driver 2**
    a. Went to Advanced tab and set Priority to `50`
    b. Went to the Security tab and under Group or user names clicked on **Add…**
    c. Typed `Print Operators` and clicked **OK**

Implemented Cloned Windows Server VM to IIS Server

1. Navigated to `10.18.22.29` with provided credentials
2. Opened Server Manager by typing Server Manager to the Windows search box
    a. Clicked Manage | Add roles and features
    b. Clicked **Next** three times then selected *Web Server IIS*
    c. Under **features** check the "Security" tab
    d. Clicked **Next** and then **Install**
    e. Created PublicSite folder in the C: Drive
    f. Created blank text file saved as `index.html`
3. Clicked Tools | IIS Manager
    a. Right clicked **Sites** on the left side
    b. Selected **Add new sites**
    c. Site name: `PublicSite`
    d. Set the IP Address to `10.18.72.11` and set the Port to `80`
    e. Set the designated folder to `C:/PublicSite`
    f. Clicked **Public Sites** and clicked **Authentication Roles**
    g. Selected anonymous authentication and clicked **Edit**
    h. Selected application pool identity clicked **Enable** then **Save**
    i. Created PrivateSite folder within the websites folder in the C:Drive

j. Created blank text file saved as `index.html`

4. Clicked tools | IIS Manager
    a. Right clicked sites on the left side
    b. Selected **Add New Sites** named `PrivateSite`
    c. Set the IP Address to `10.18.72.11` and set the Port to `81`
    d. Set the designated folder to C:/PrivateSite
    e. Clicked **Public Sites** and clicked **Authentication Roles**
    f. Selected *Windows Authentication* and clicked **Enabled** followed by **Save**
    g. Created Site2 folder within the websites folder in the C:Drive
    h. Created blank text file saved as `index.html`
5. Clicked Tools | IIS Manager
    a. Right clicked sites on the left side
    b. Selected add new site named Site2
    c. Set the IP Address to `10.18.72.11` and set the Port to `82`
    d. Set the designated folder to C:/Site2
    e. Clicked **Public Sites** and clicked **Authentication Roles**
    f. Selected *Anonymous Authentication* and selected *Application Pool Identity*
    g. Clicked **Enabled** followed by **Save**
    h. Clicked on **Site2**
    i. Selected **IP & Domain roles and selected limit** to IP Range
    j. Entered `10.18.72.0-10.18.72.255` and clicked **Save**

Results

In the lab that was recently completed, a network architecture that an enterprise often applies were successfully created. First, the installation of Windows 10 on the Workstation PC to configure clients to access shared resources from the forest domain. Then, Windows Server 2016 was created on the previously created vCenter to save it as a template to be used in future usages. Snapshots were taken in the process to protect major configurations from sudden changes and permissions were set for active directory users and groups to the VM from the vCenter. A new VM port group were added to the ESXi servers which created a second location of the new domain controller. Implementing the new VM port group into the newly created VM, the Windows Server 2016 template was cloned and implemented as a second domain controller in the forest domain, group22.c24200.cit.lcl. After cloning, a new subnet that used another address range was configured and the FSMO roles were moved. The implementation of Microsoft Backup was not successful in this lab due time constraints. Printing was configured on the forest domain host by creating two different printer settings, one for administrators and another one for regular users. The clone of Windows Server VM template was created again and was implemented a three kinds of web page of IIS web server which were public, private and site-specific web pages that were made for multiple applications in an enterprise.

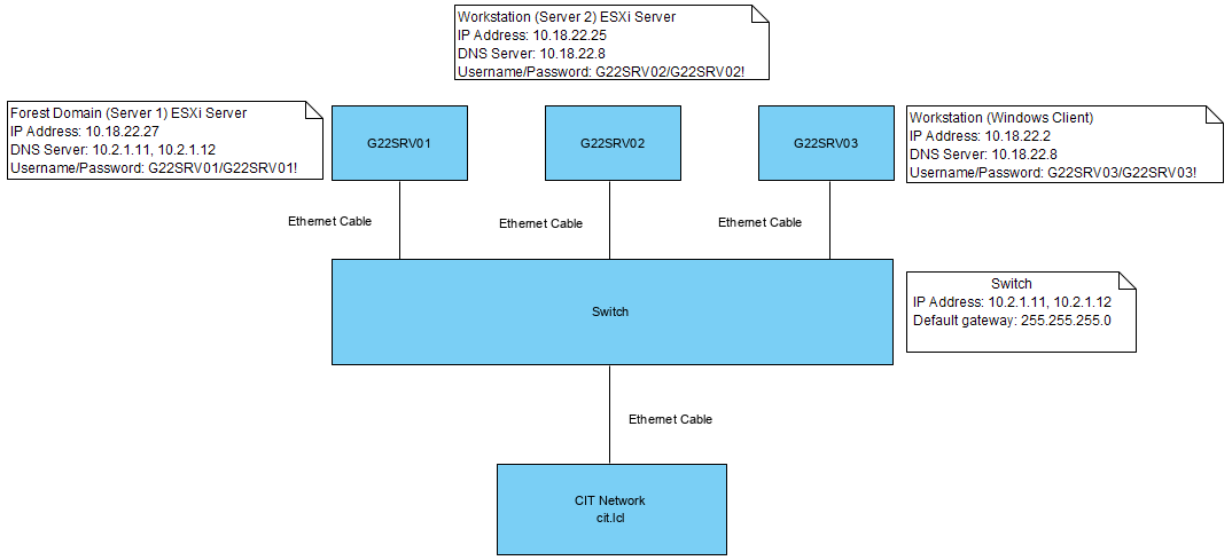

Figure 3: Physical Network Diagram

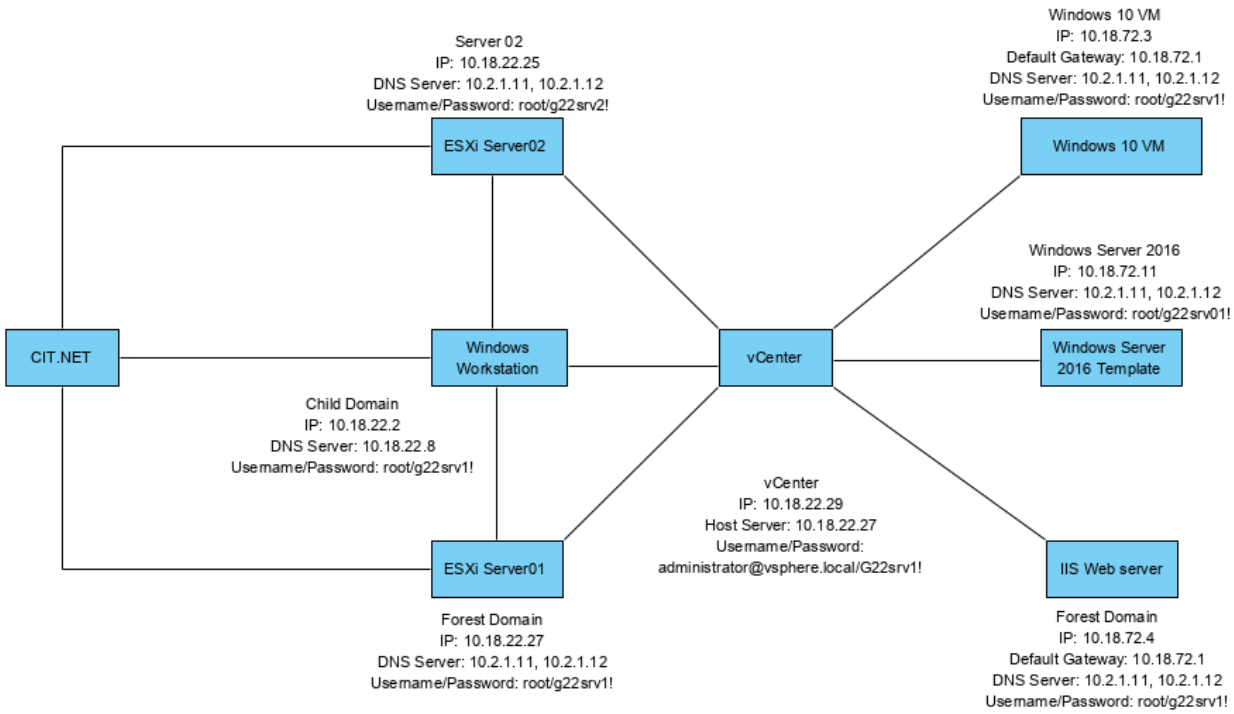

Figure 4: Logical Network Diagram

Conclusions and Recommendations

Conclusions

Although every required criteria for this project was not able to be completed and fully detailed in this report, the overall project was successful. Following the procedures outlined earlier in this report results in successfully accomplishing each goal of the procedures section. The creation of new virtual machines from using the cloning process and implementing them into a newly created network location worked seamlessly. The introduction of another domain controller, a new subnet/site, and an IIS server were able to be easily incorporated into the network and required little troubleshooting.

Recommendations

Recommendation 1: Make sure to utilize virtual machine snapshots. Snapshots essentially create a restore point for a virtual machine. Take a snapshot of a VM before installing something new on the virtual machine, implementing a new configuration of settings or even installing an update. It is important to consistently take snapshots for documentation, as well as having the capability to restore the VM if a configuration or an update causes the machine to fail.

Recommendation 2: When changing configurations on a VM, be extremely careful if changing or creating passwords, and it is common for the VM to take one key input as two, resulting in difficulty signing in user accounts with a password. Before making any configurations final, check that the password that was input is the intended password. If this were to happen before backups were implemented or on a VM with no snapshots, large amounts of work could be lost due to a simple error.

Recommendation 3: Create a method that results in the creation of unique yet similar passwords required for the multiple virtual machines, ESXi Servers, vCenter and users being created. This helps with remembering the numerous passwords created for servers or users by being able to

reference the implemented method to figure out the username and password of the credentials needed for authentication, rather than writing or typing usernames and passwords in a document which is not a safe practice.

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APPENDIX A: Problem Solving

Problem 1: Windows Unable to Boot

Problem Description: When installing Windows 10 onto the workstation, the OS failed to boot

Potential Solutions: An issue with the boot sequence must have been causing the issue.

Solutions Attempted: Boot settings were changed from UEFI Boot to Legacy Boot.

Final Solution: The above solution was able to resolve the issue.

Problem 2: Network Connection for Windows Server VM

Problem Description: Couldn't establish a connection from the new Windows server 2016 virtual machine to the LAN2 network in order to grant the virtual machine internet access.

Potential Solutions: Potential solutions to this problem were to turn the virtual machine off and on, turn the ESXi server off and on, changing the DNS or IPv4 configurations in the network settings, as well as changing the VLAN ID of the LAN2 network.

Solutions Attempted: All of the potential solutions were attempted. Restarting the virtual machine and the ESXi server did not result in fixing the problem. Changing the DNS and/or the static IPv4 configurations was not the solution to the problem. The fix of this problem was to change the newly created port group's (LAN2) VLAN ID to the one given in the updated lab report.

Final Solution: The final solution was implemented by first logging into the ESXi server that the virtual machine was created on then navigating to *Networking* | *LAN2* | *Edit settings*. Then change the VLAN ID from 2 to 1872 and click *Save*. This fixed the problem because the original VLAN ID (2) was not set to support the IP Address range (10.18.72.0/24) being used for the virtual machine's IPv4 configuration, while the new VLAN ID (1872) allowed the port group (LAN2) to broadcast over it and support the IP Address range used. This problem was probably caused by the VLAN ID of 2 not supporting or allowing the port group created to broadcast over it.

Problem 3: Mouse in Domain Controller 2 Clone

Problem Description: When opening a browser console for the virtual machine that was created by cloning the Windows server 2016 template, the mouse would not appear and was not functional within the console. The keyboard was functional though.

Potential Solutions: Potential solutions to this problem were to restart the virtual machine, restart the ESXi server, or check if "Pointing device" appears in the Input Devices section within Hardware Configuration.

Solutions Attempted: The solution of restarting just the virtual machine was unsuccessful in fixing the problem. The next solution was to ensure that "Pointing device" was in the Input Devices section within the Hardware Configuration of the virtual machine, which it was. The last solution attempted was to restart/reboot the ESXi server which ultimately fixed this problem.

Final Solution: The final solution that fixed this problem was to reboot the ESXi server that hosted the virtual machine. This was done by first logging into the server online (10.18.22.25),

then powering off each VM that the server hosts by navigating to *Virtual Machines* and right clicking on each VM and selecting the *Power off* option. Next right click *Host*, located in the upper left corner, and select *Enter maintenance mode*.After the Host is in maintenance mode, right click the *Host* and select *Reboot*. After the server reboots, log in again and power on all of the VMs by right clicking each VM and selecting the *Power on* option. The problem probably arose from some file for the VM getting corrupted or improperly loaded by the Host. This solution worked because rebooting the ESXi server required the host to reload the problematic VM and it's configuration files.

Problem 4: Virtual Machine Screen Resolution

Problem Description: When opening a browser console from the ESXi server or from vSphere for the G22SRV01.group22c24200.cit.lcl virtual machine, the screen resolution would consistently default to a resolution (EX: 640 x 480) that made navigating the machine extremely difficult.

Potential Solutions: Potential solutions included restarting the virtual machine, manually trying to zoom in/out by using a pinching like method, adjusting the size of the web console client and changing the settings within the virtual machine.

Solutions Attempted: All solutions that we thought of were attempted. The restart of the virtual machine did not fix the problem. Trying to zoom in or out by using a pinching like method resulted in the resolution to the VMware Host to be zoomed in or out. Adjusting the size of the browsing console itself only allowed for it to increase in size, but not fix the proportion problem. Adjusting the screen resolution in windows settings was the fix to this problem.

Final Solution: This fix was done by navigating to *Start* | *Settings* | *System* | *Display* | *Advanced display settings* then selecting the 800 x 600 option underneath the Resolution section and

clicking *Apply* then *Keep changes* after. This problem probably stemmed from the virtual machine trying to adjust the resolution to fit to the size of the browser console opened. This solution worked because it is manually the screen resolution for the display of the virtual machine to the option selected (800 x 600).