Microsoft Server Pilot project assignment – Graded C

In this scenario, I am to create the computer server infrastructure from scratch based on a Microsoft Active Directory structure for two merging companies, Travelling Nerds and Nerdy People. Travelling Nerds based in Kongsvinger and Nerdy People based in Bodø have their own already existing departments and employees in their region. I will take their departments and employees in account when creating the Microsoft based network structure and apply the proper permissions and appropriate environment for each department. I have been given a list of requirements for this structure and will document the setup and of the necessary environment according the requirements.

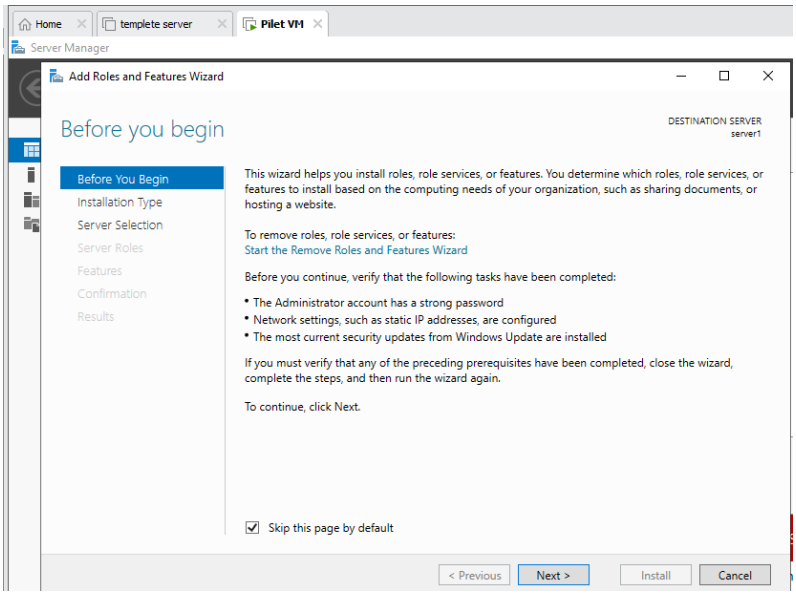
Table of ip addresses for simple reference navigation

Server1	192.168.154.152 and 127.0.0.1
Server2	192.168.154.147
Server3	192.168.154.167 and later changed to 192.168.154.128
Client	192.168.154.200 (DHCP)

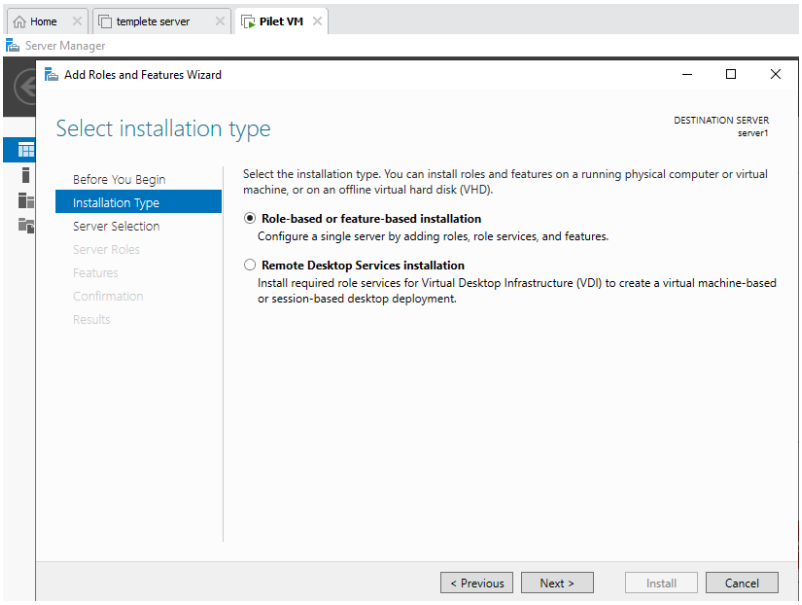
(If you are wondering why my ip addresses are not sequential, it is because I simply use the ip addresses I have been automatically given. I had to delete and reinstall some vms in the process, that might affect future addresses)

For starting this scenario, I start up my first server and changed the server computer name to Server1.

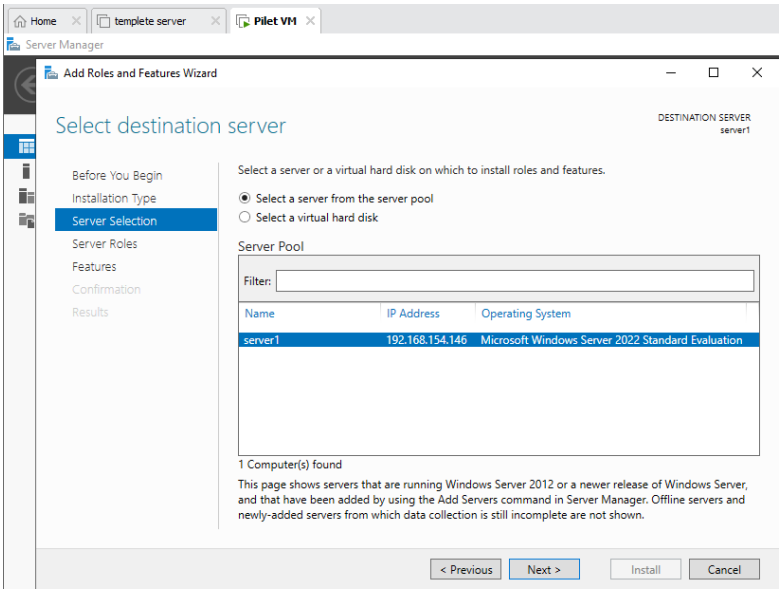
For server1, I start by installing AD DS which will provide me with many useful features. I click on “Add roles and features”



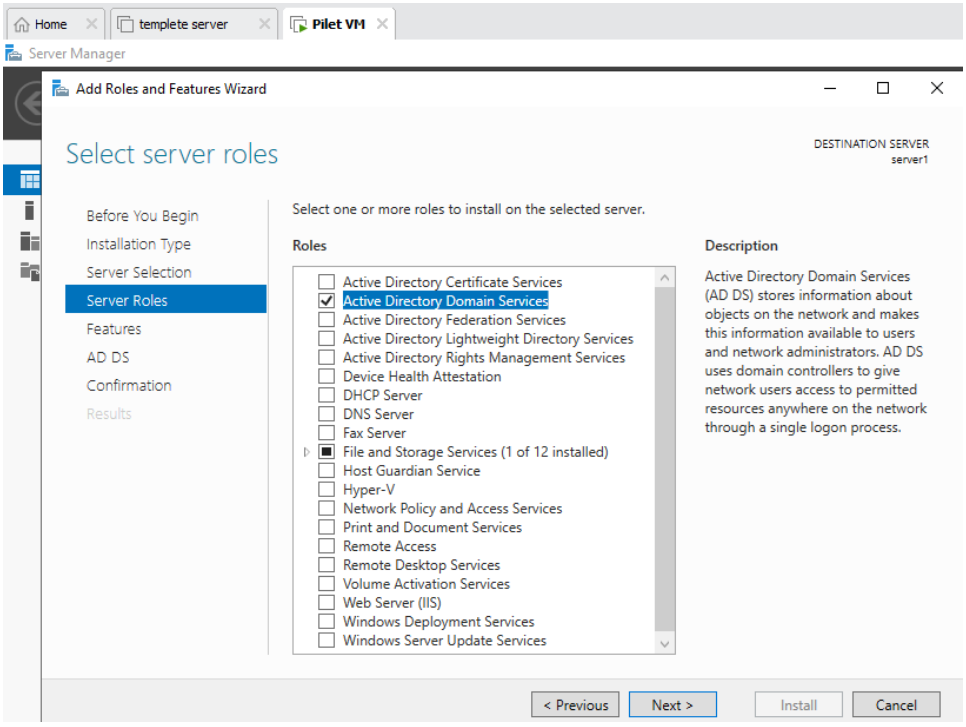
Next I check off “Role Based or Feature based installation”



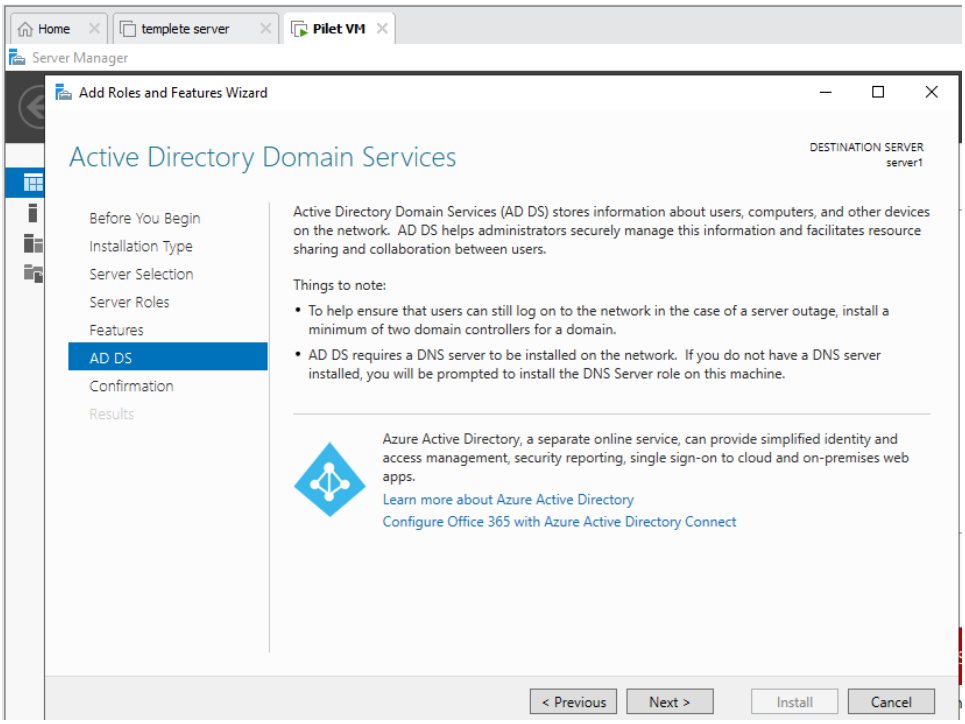
I select the server available, which is my renamed server “server1”.



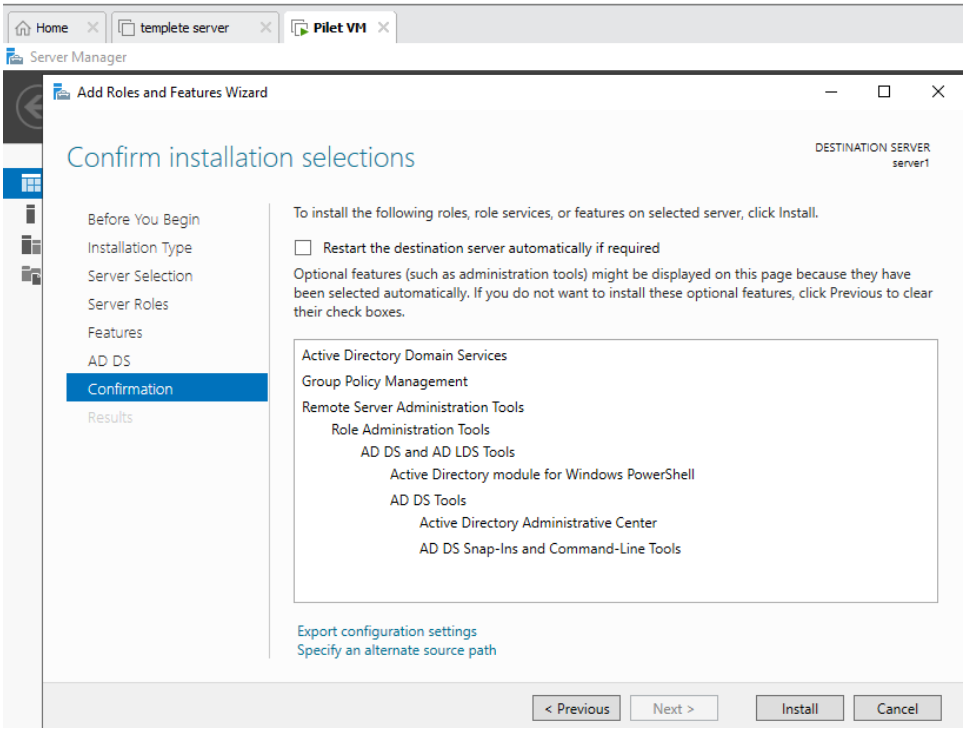
I now select only the “Active Directory Domain Services” and click next. It will inform me of the features I will install and I acceppt, click next.



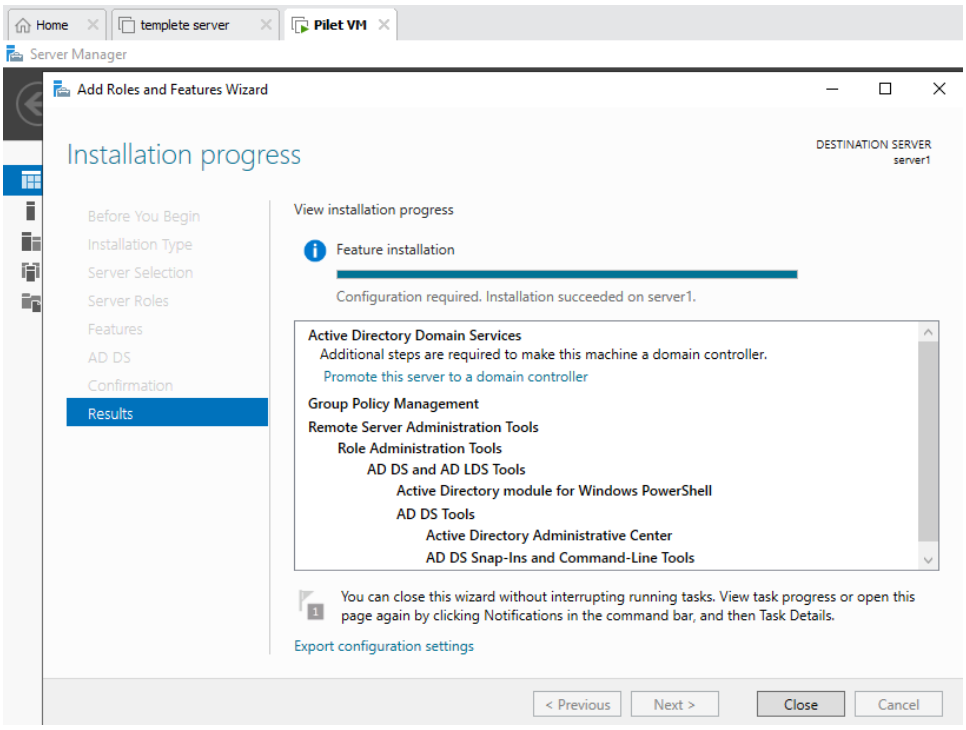
I again accept the features I am installing and click next.



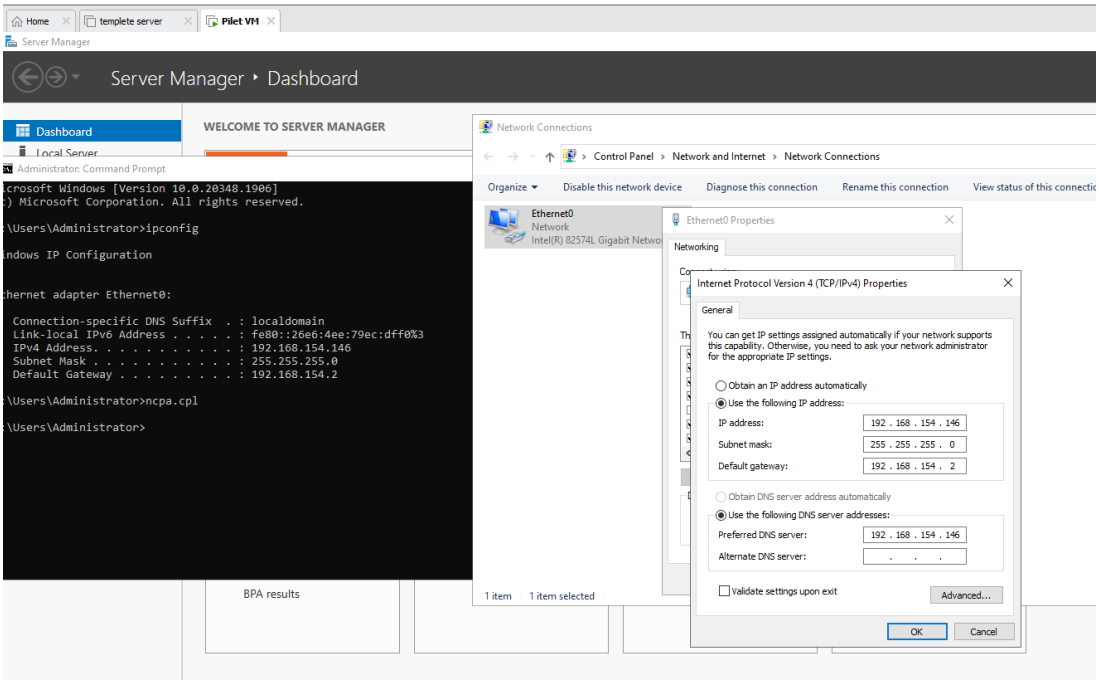
I confirm the installing seclections and click install.



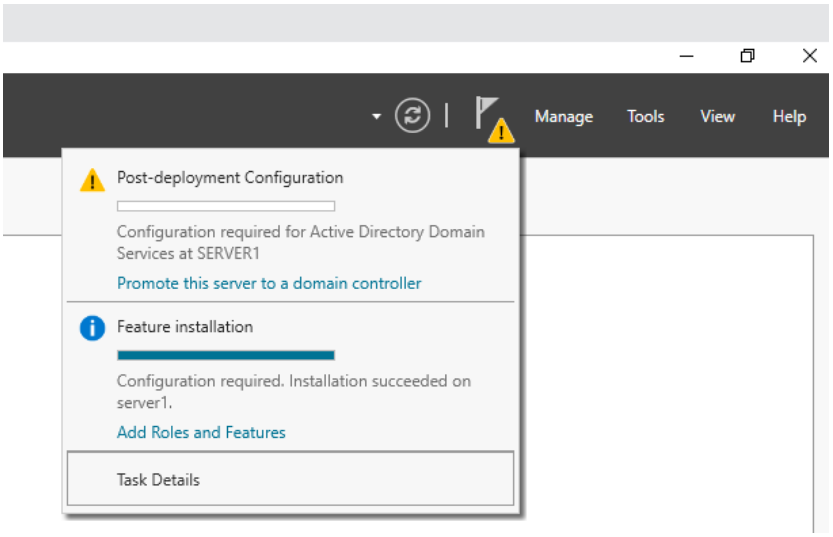
Installastion finished, I close it tab.

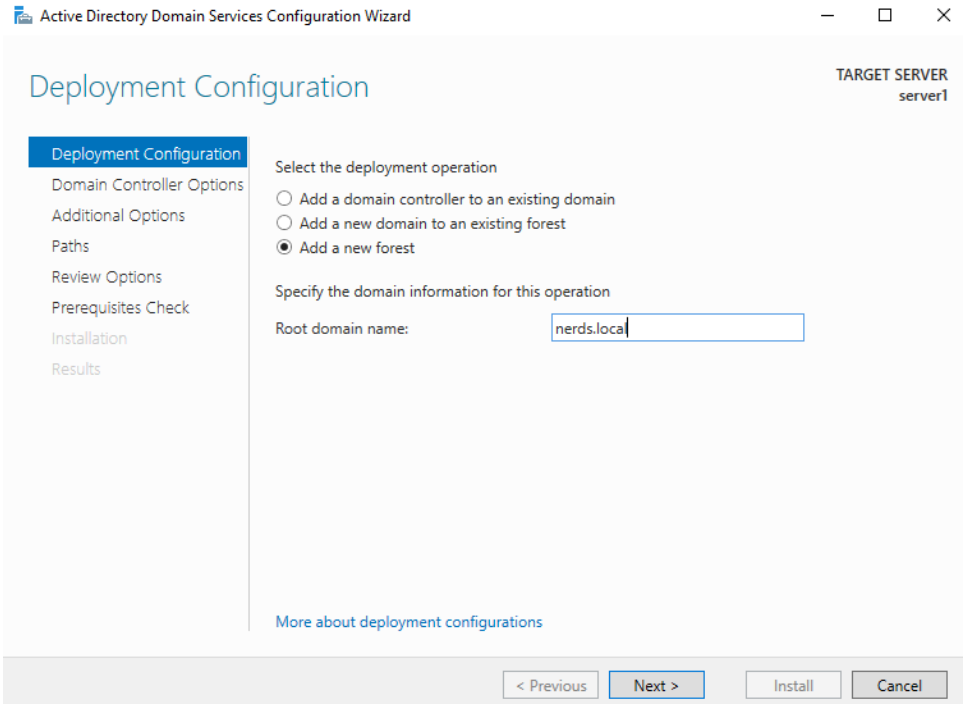


Next step is to set the static ip address settings to our server. I do that by typing “ipconfig” in command prompt, it will display information on my ip. I then type “ncpa.cpl” to open network settings. I open properties on “Internet protocol version 4” to set my static addresses. I fill in the information by copying what my settings says in command prompt. That includes IPv4 address, subnet mask, default gateway, and lastly I set preferred DNS server as my own IP address.

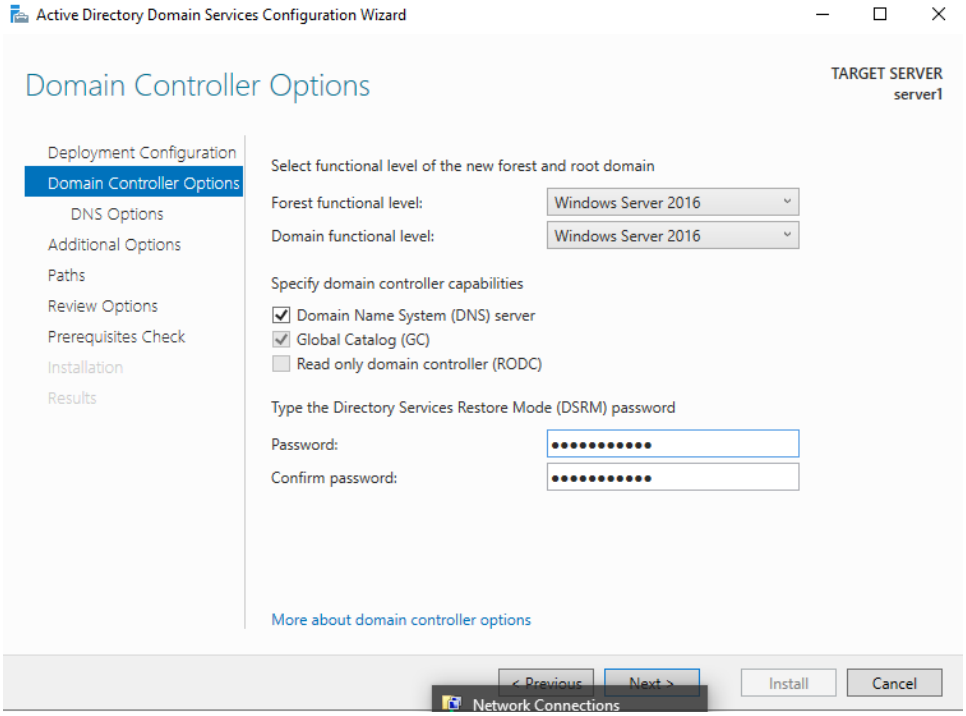


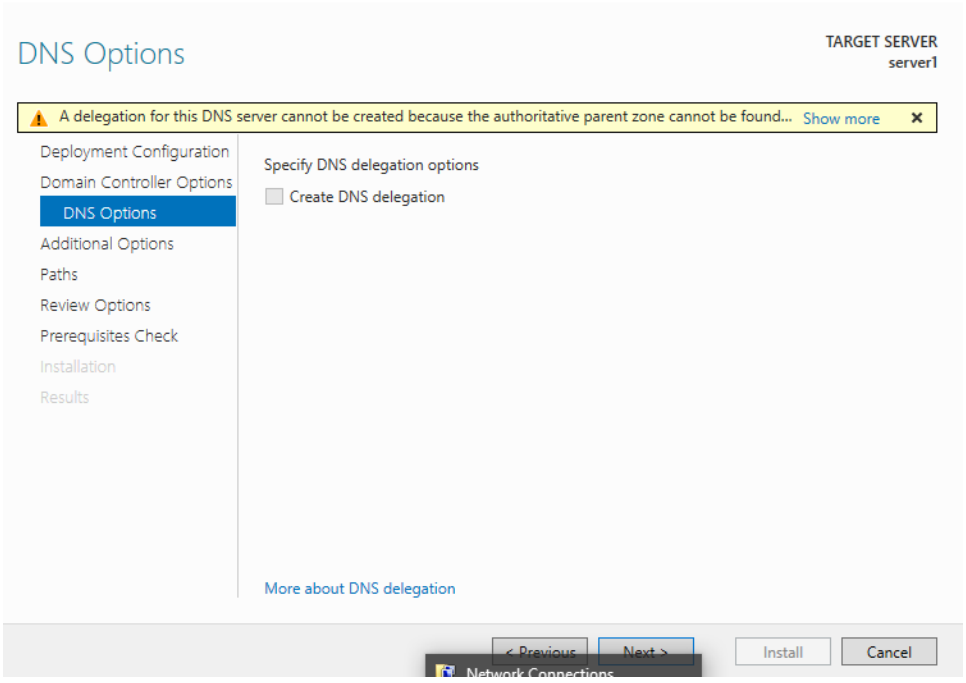
Now that IPs are set, last step is to promote server to domain controller, where I add a new forest. I will choose my root domain name to be “nerds.local”. In reference to our two companies, Travelling Nerds and Nerdy People.



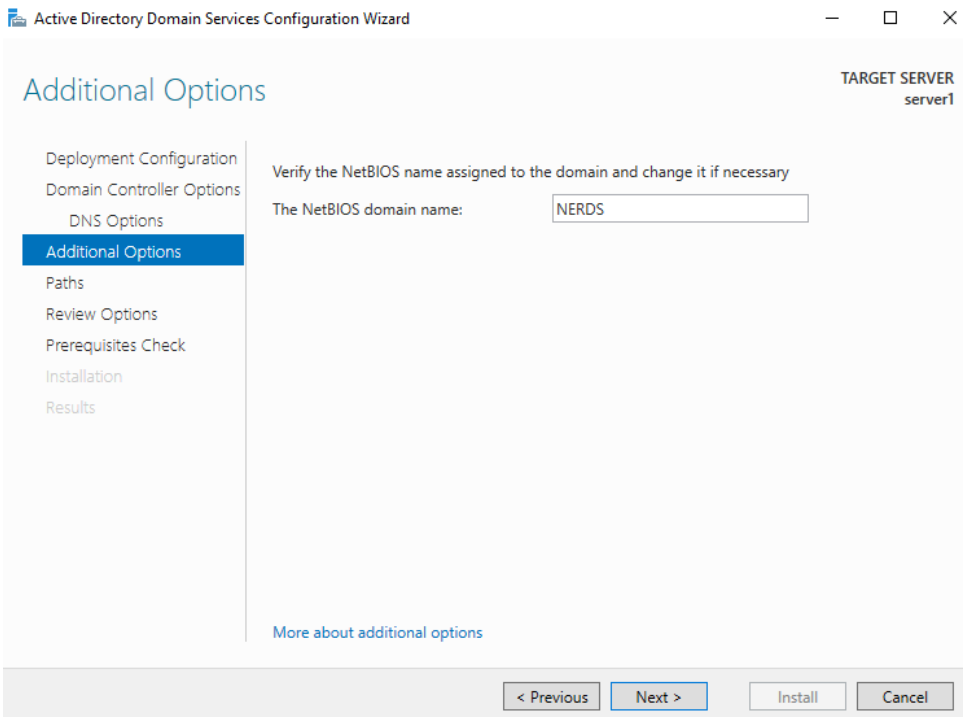


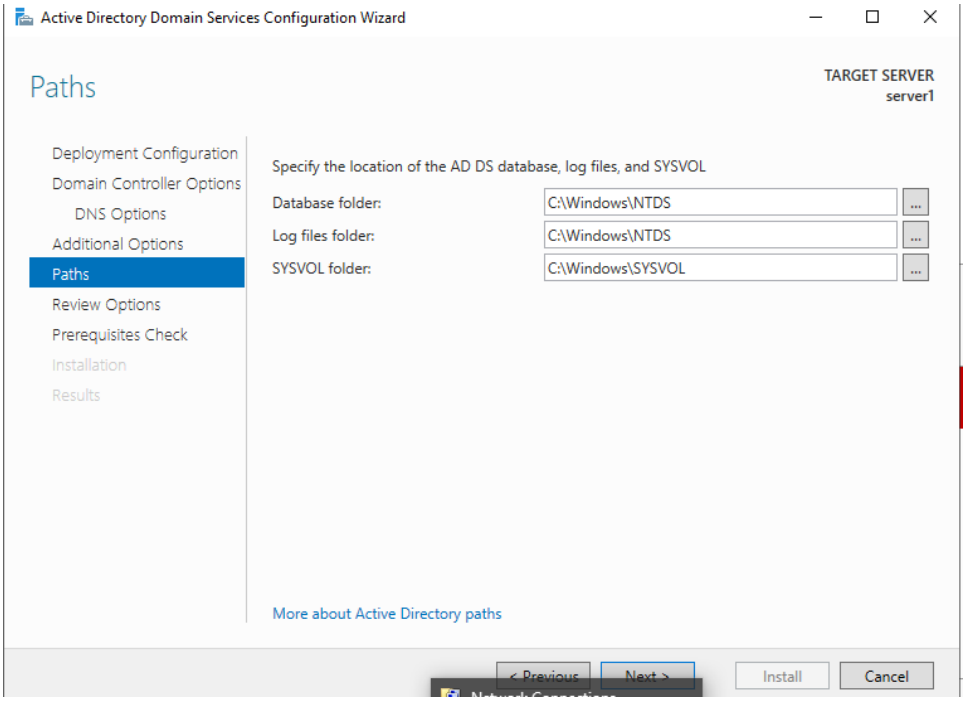
Next we select the default “Windows Server 2016” as forest and domain functional level, along with a private password.

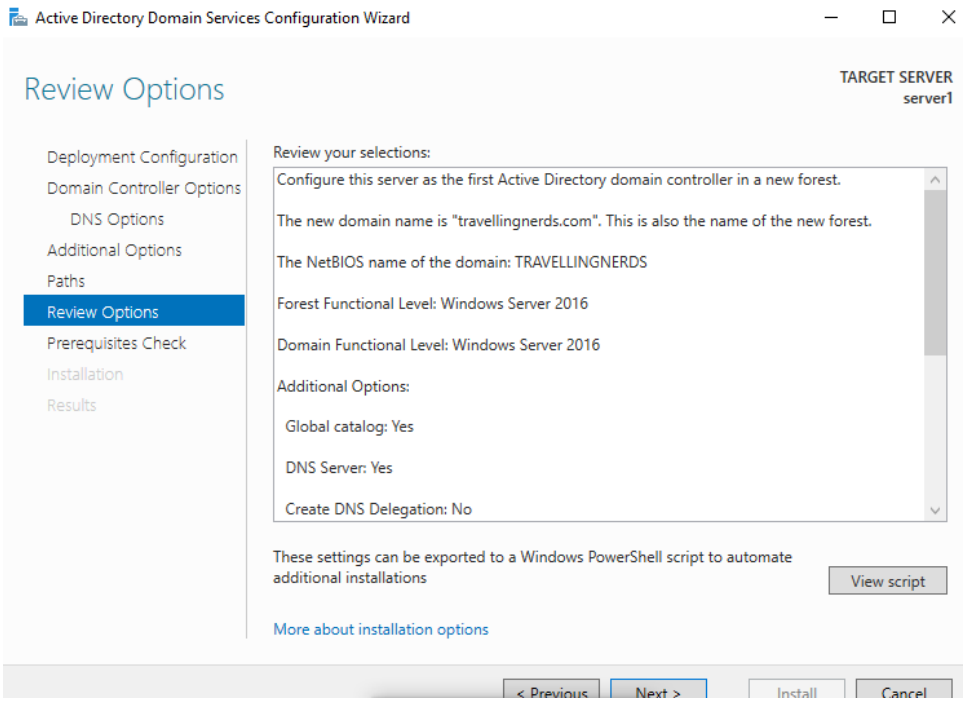




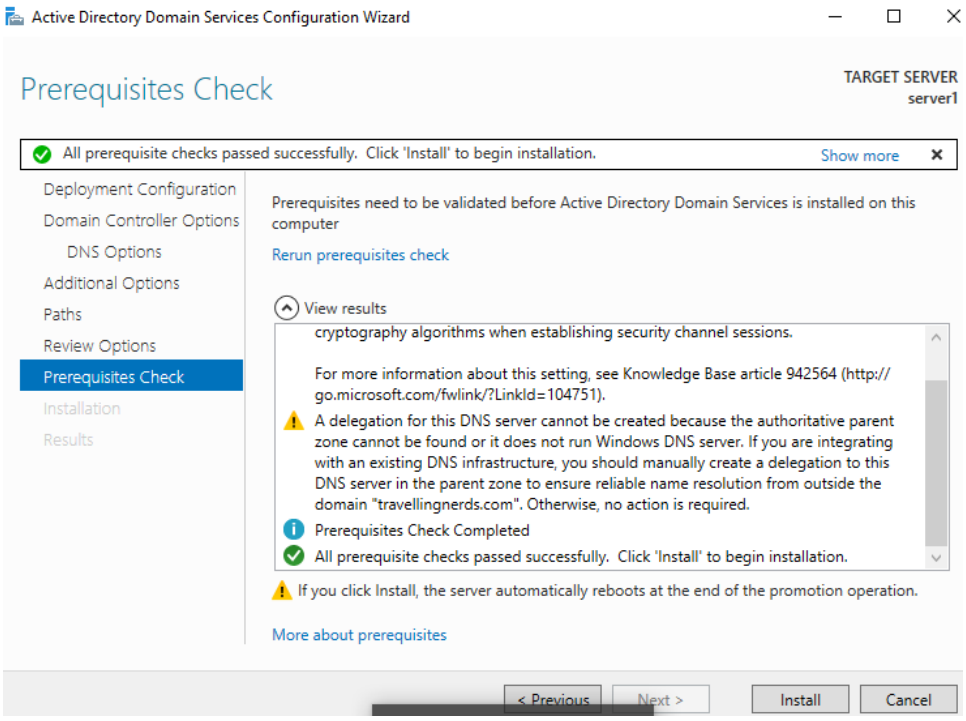
We have been given “nerds” as netbios domain as I approve.

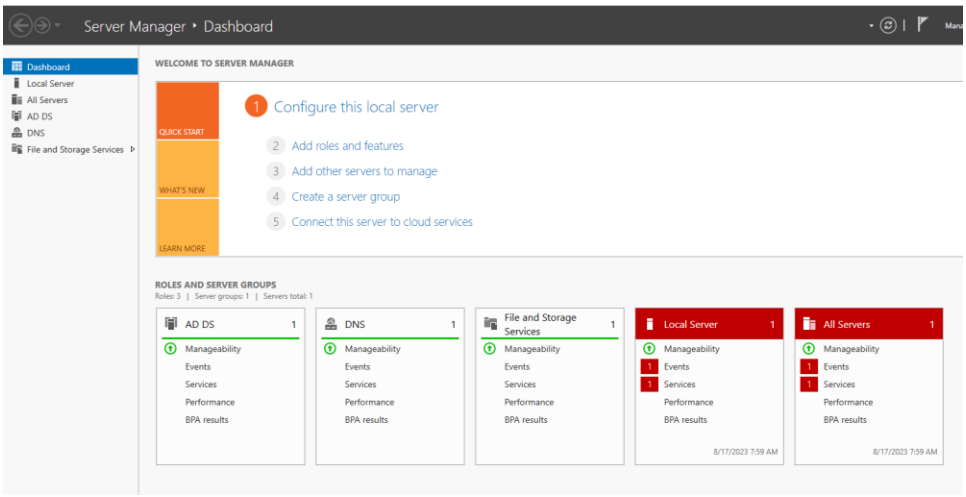


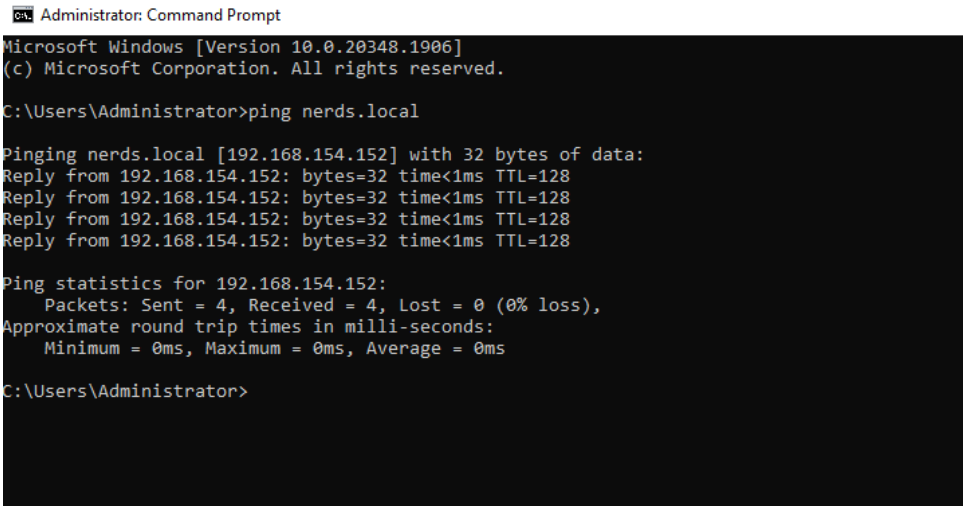




We have now reviewed our install and approve it. We finish the installation of AD DS by clicking install. Then wait.

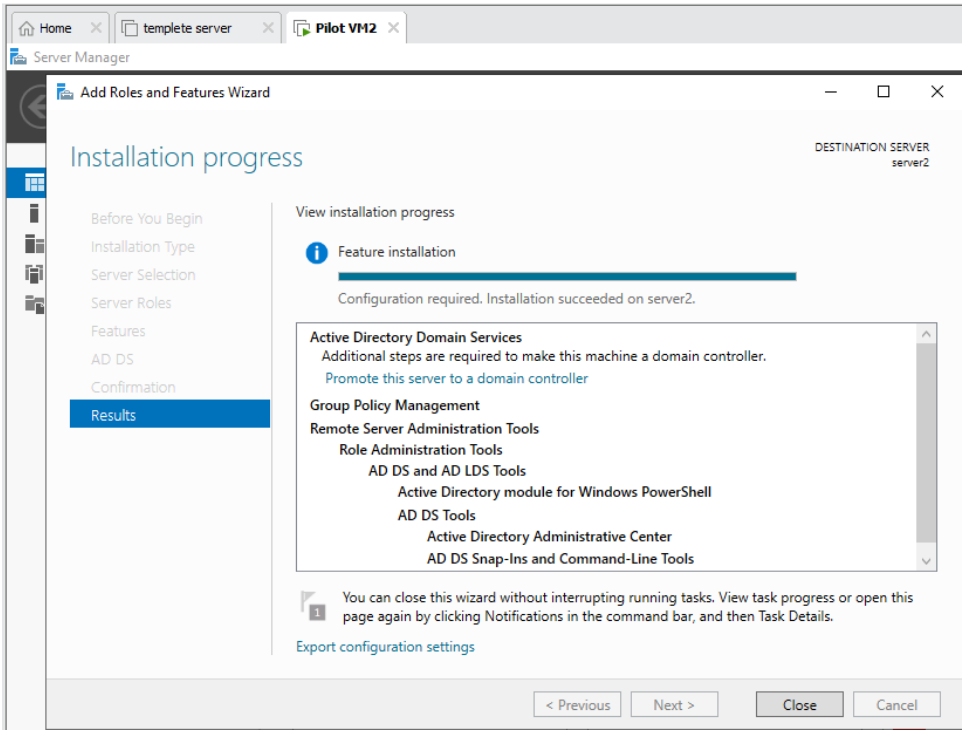




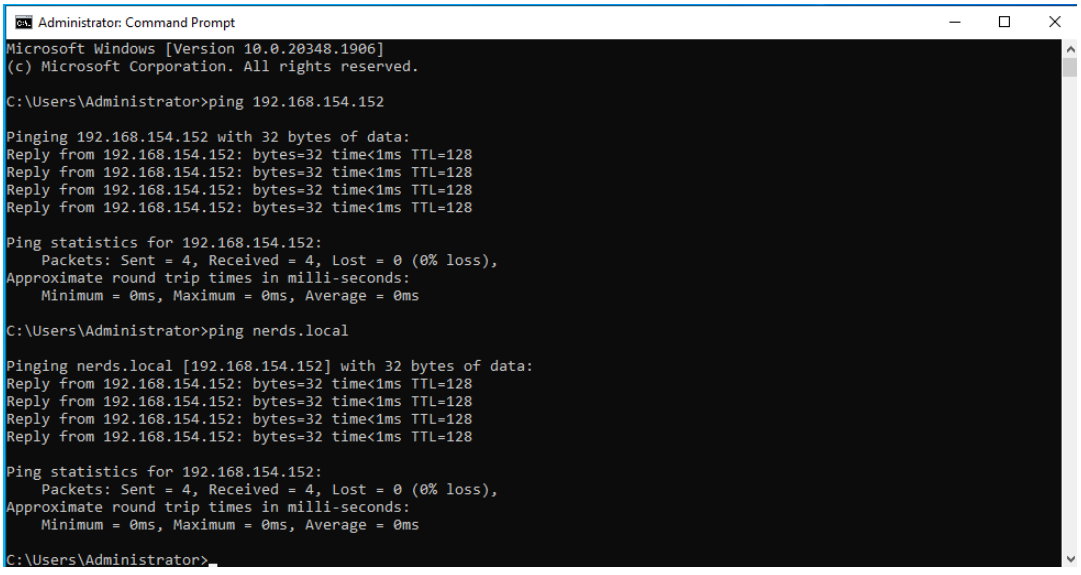


Done, I have installed and proved connectivity by pinging nerds.local on server1. I will now install a second domain controller in an existting domain for **redundancy and fault tolerance purposes**. This is for in case of a potential shutdown of server1. Server2 will be there to pick up for server1. *(Allen, 2023)*

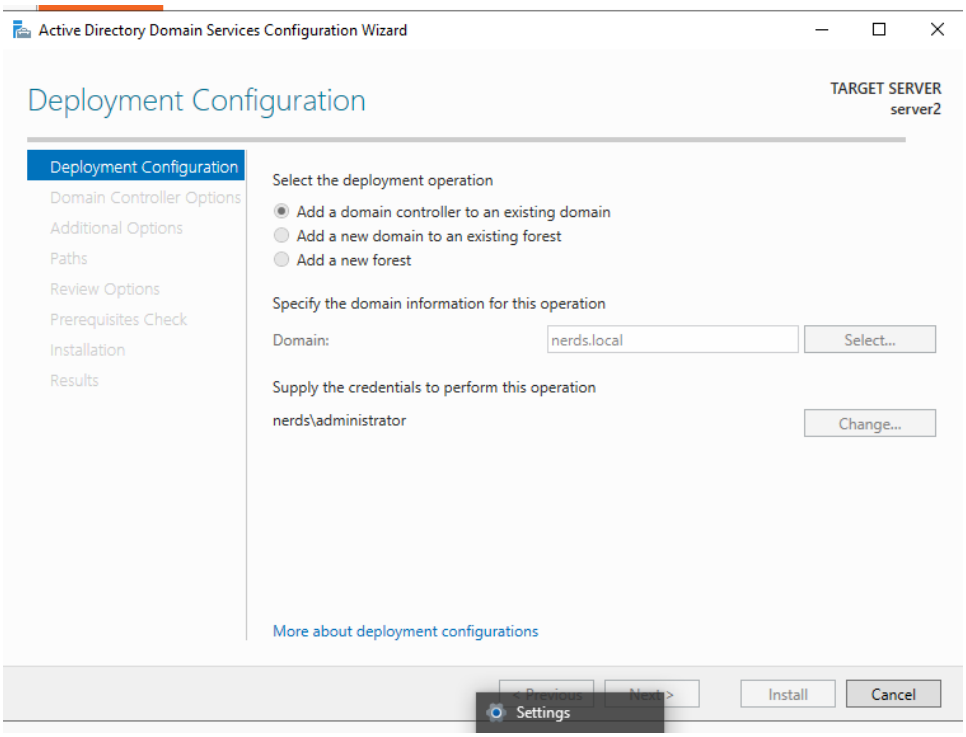
Installing AD DS on server 2 – follow the same steps for installation as server1. But this time, after installing the AD DS roles, we will set the static ip preferred DNS server ip to the ip of the server1.



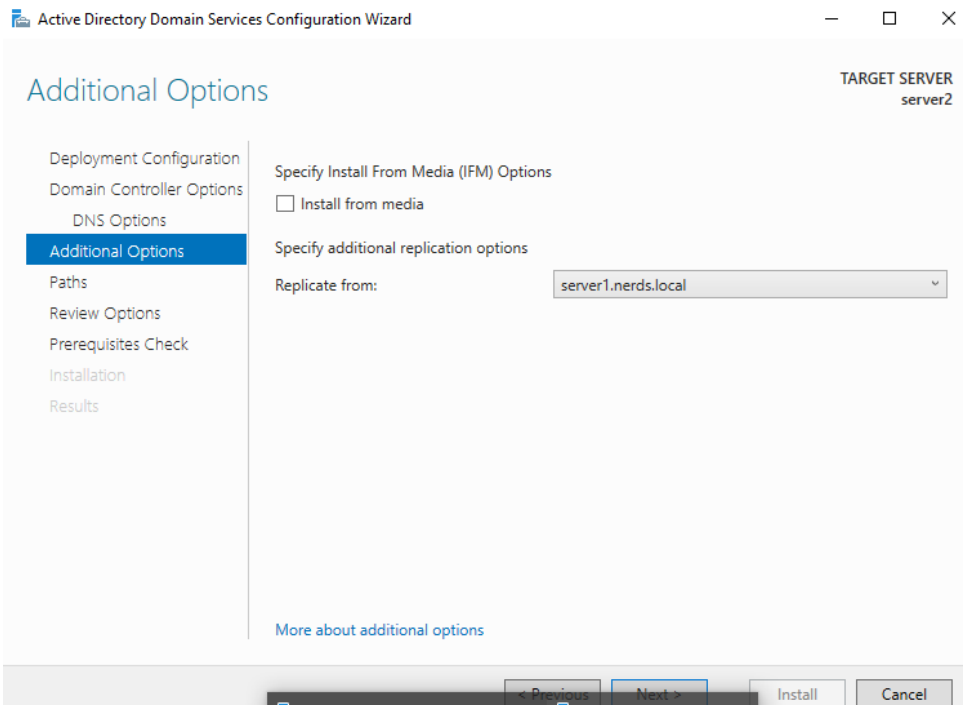
We test the connectivity from server2 to the ip of server1. Then we test the connectivity of nerds.local. They both were a success.



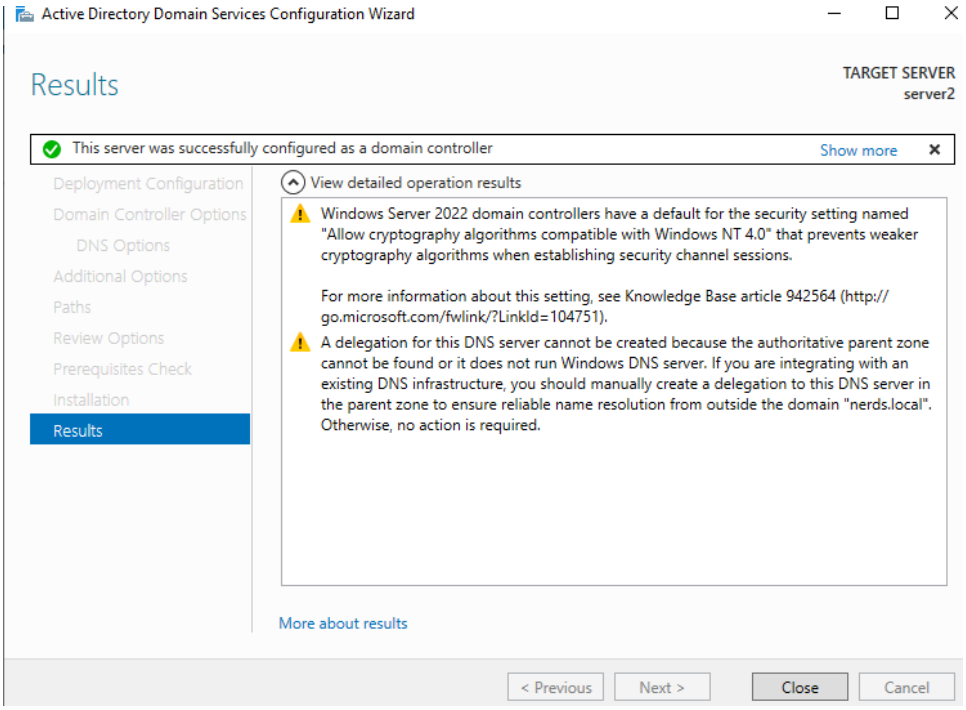
Now we add the domain controller of server 2 to an exiisting domain and choose “nerds.local” as the exisitng domain. We also supply credentials of a adminstrator account that has permission to install domain controllers. In this case I choose the account nerd/administrator.



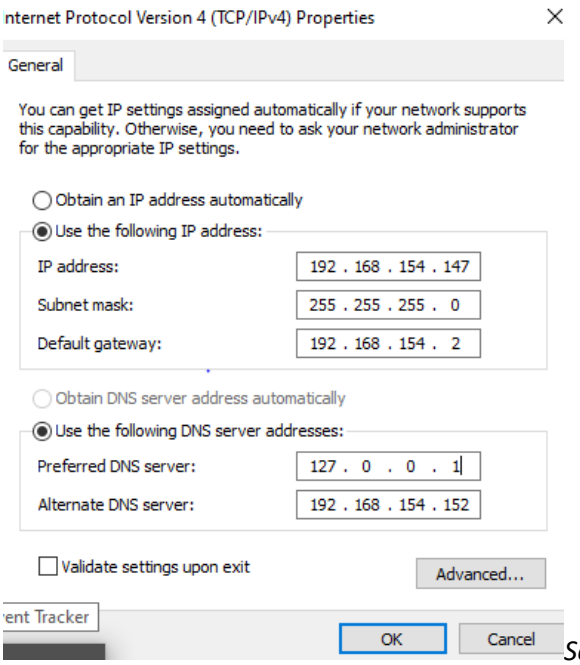
We select our existing server “server1.nerds.local”



The install was a success, we close it down and restart the systems.

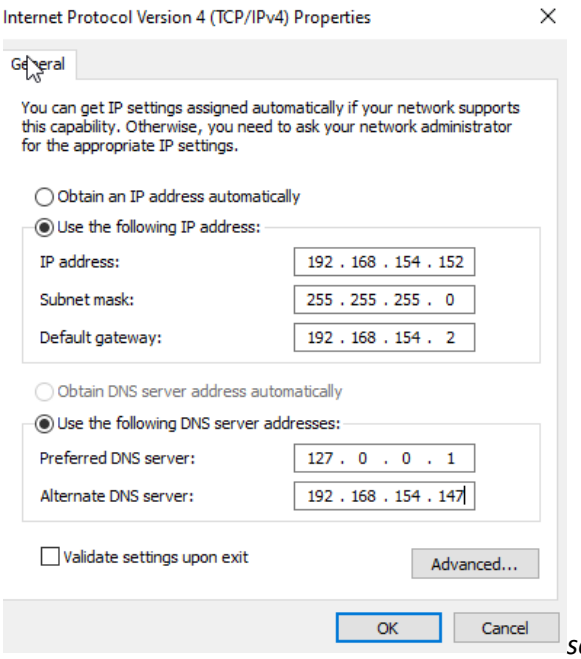


If we now take a look as the IP properties of server1 and 2, We have been given “127.0.0.1” which is an IP for localhost. This is recommend so we are using it. Using server 2, We are now setting the preferred dns server to “127.0.0.1” and set the alternative DNS server to the ip of server1. *(bauldung, 2023)*



Server2

We do the same from server1. Setting the preferred dns server to “127.0.0.1” and set the alternative DNS server to the ip of server2. The DNS server alternatives are now pointing to each other.



server1

We test the connectivity on both servers and it were a success for both.

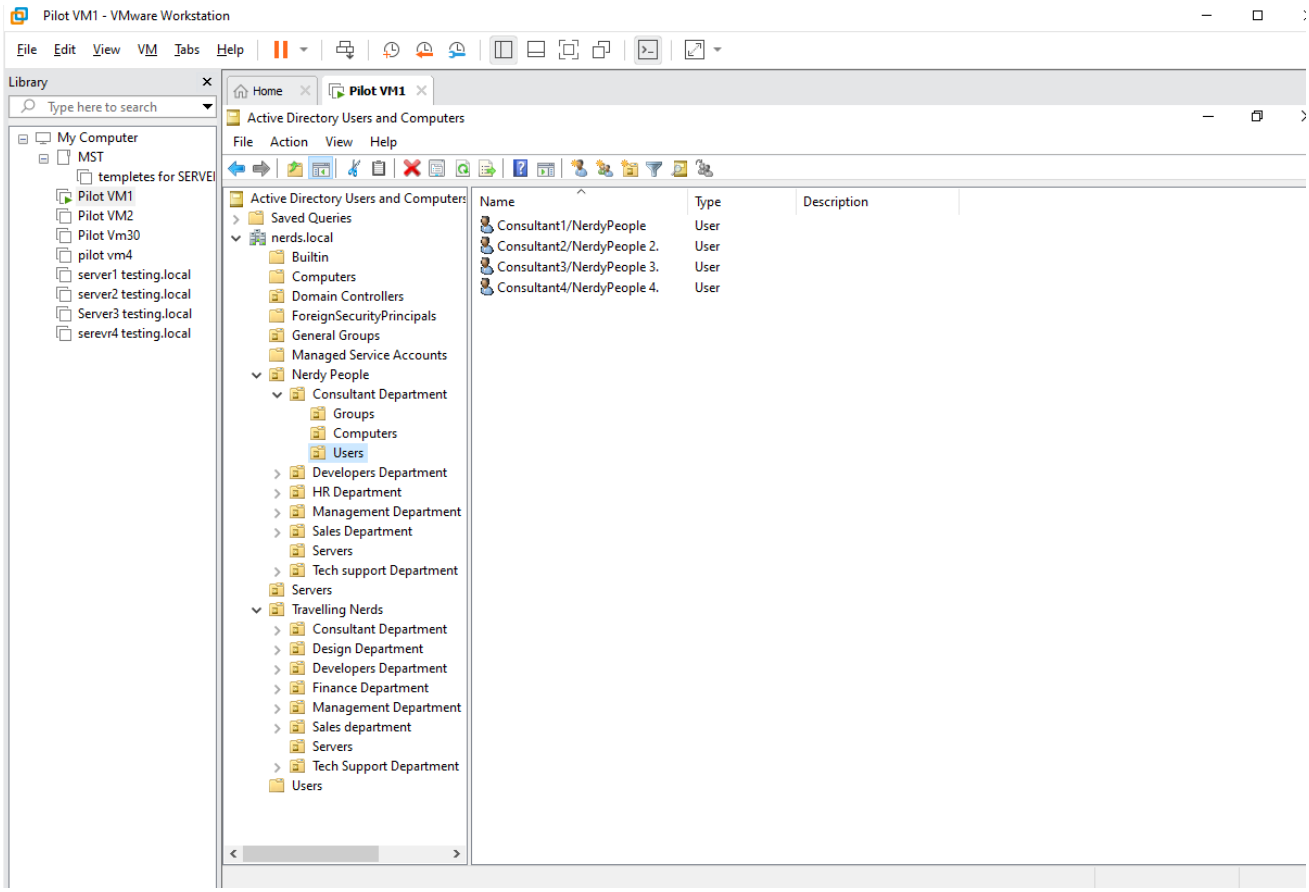
```
C:\Users\Administrator.NERDS>ping 192.168.154.152

Pinging 192.168.154.152 with 32 bytes of data:
Reply from 192.168.154.152: bytes=32 time<1ms TTL=128
Reply from 192.168.154.152: bytes=32 time<1ms TTL=128
Reply from 192.168.154.152: bytes=32 time<1ms TTL=128
Reply from 192.168.154.152: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.154.152:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\Administrator.NERDS>ping nerds.local

Pinging nerds.local [192.168.154.147] with 32 bytes of data:
Reply from 192.168.154.147: bytes=32 time<1ms TTL=128
Reply from 192.168.154.147: bytes=32 time<1ms TTL=128
Reply from 192.168.154.147: bytes=32 time<1ms TTL=128
Reply from 192.168.154.147: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.154.147:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\Administrator.NERDS>
```

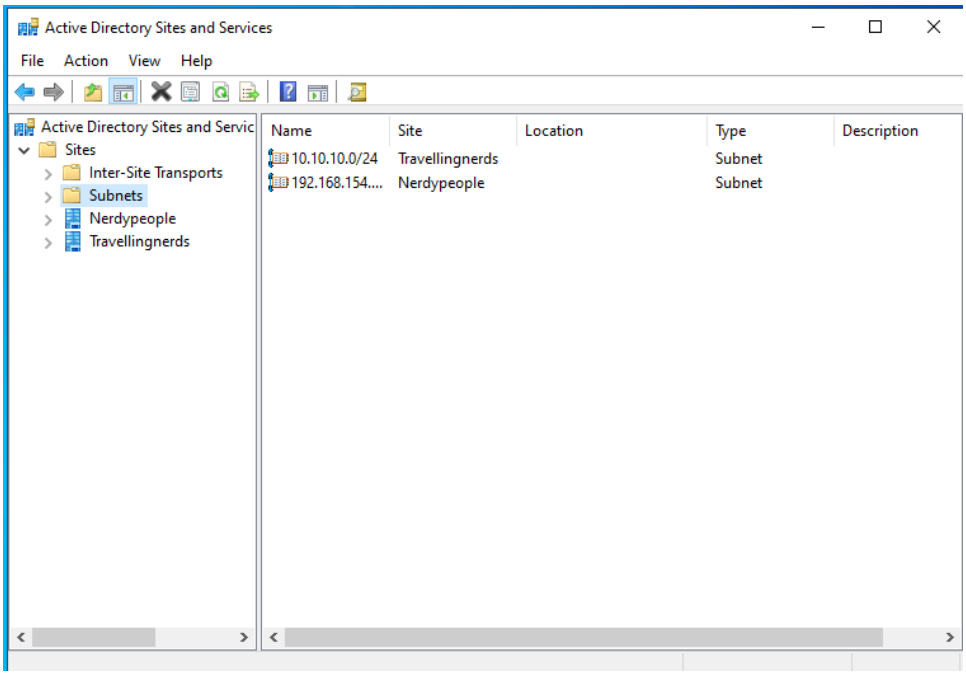
Server2

```
C:\Users\Administrator>ping 192.168.154.147

Pinging 192.168.154.147 with 32 bytes of data:
Reply from 192.168.154.147: bytes=32 time<1ms TTL=128
Reply from 192.168.154.147: bytes=32 time<1ms TTL=128
Reply from 192.168.154.147: bytes=32 time<1ms TTL=128
Reply from 192.168.154.147: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.154.147:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\Administrator>ping nerds.local

Pinging nerds.local [192.168.154.147] with 32 bytes of data:
Reply from 192.168.154.147: bytes=32 time<1ms TTL=128
Reply from 192.168.154.147: bytes=32 time<1ms TTL=128
Reply from 192.168.154.147: bytes=32 time<1ms TTL=128
Reply from 192.168.154.147: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.154.147:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\Users\Administrator>
```

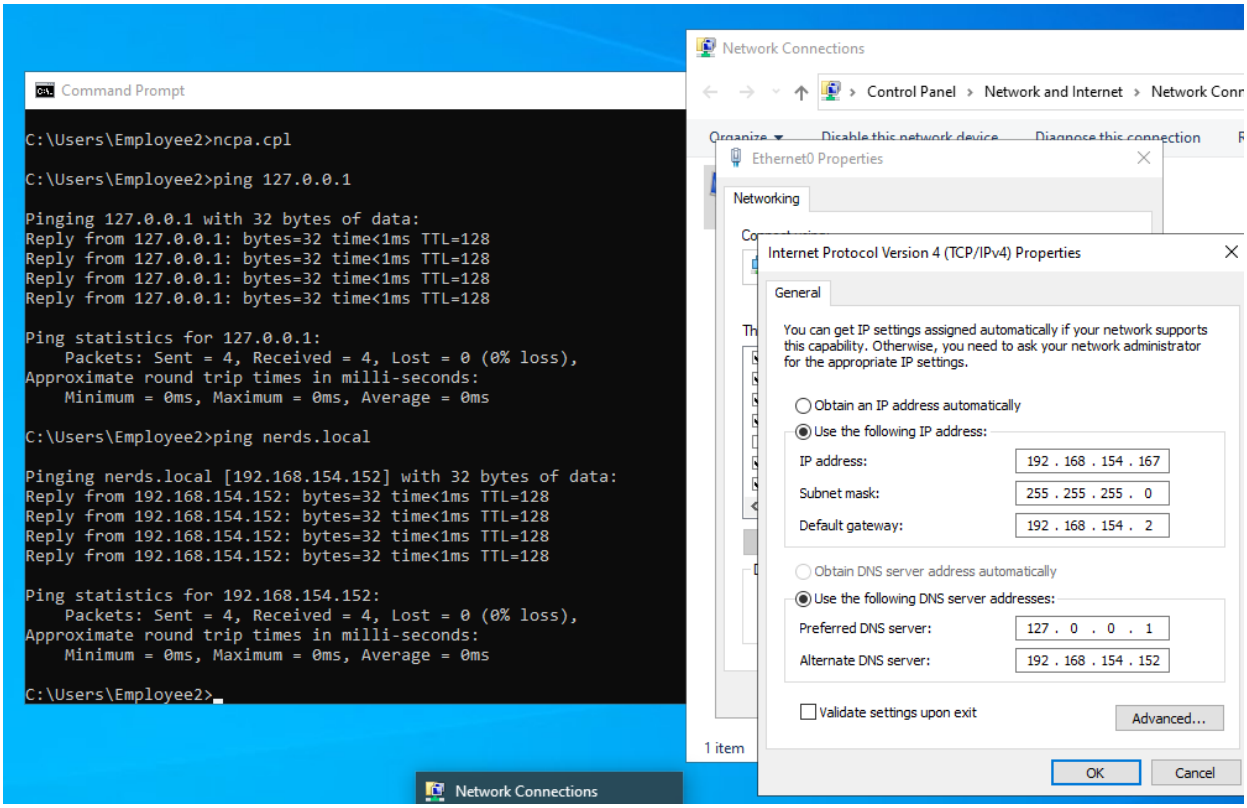
Server1

We are now organizing the different departments and their locations of Travelling nerds and Nerdy people using Organizational units. The stucture looks like this



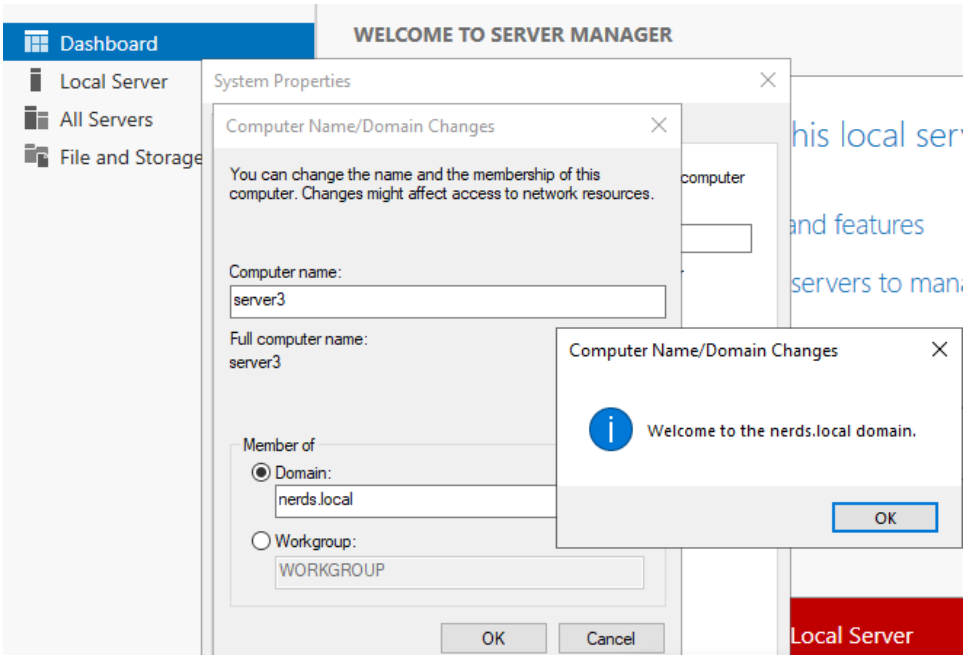


Now I am adding a Server3 to the domain as a member only server. I do that by configuring the DNS ips to the domain where server is hosted(server1). I have also set the alternative dns to the second domain controller(server2). I ping both server1 and domain nerds.local and they were successful.

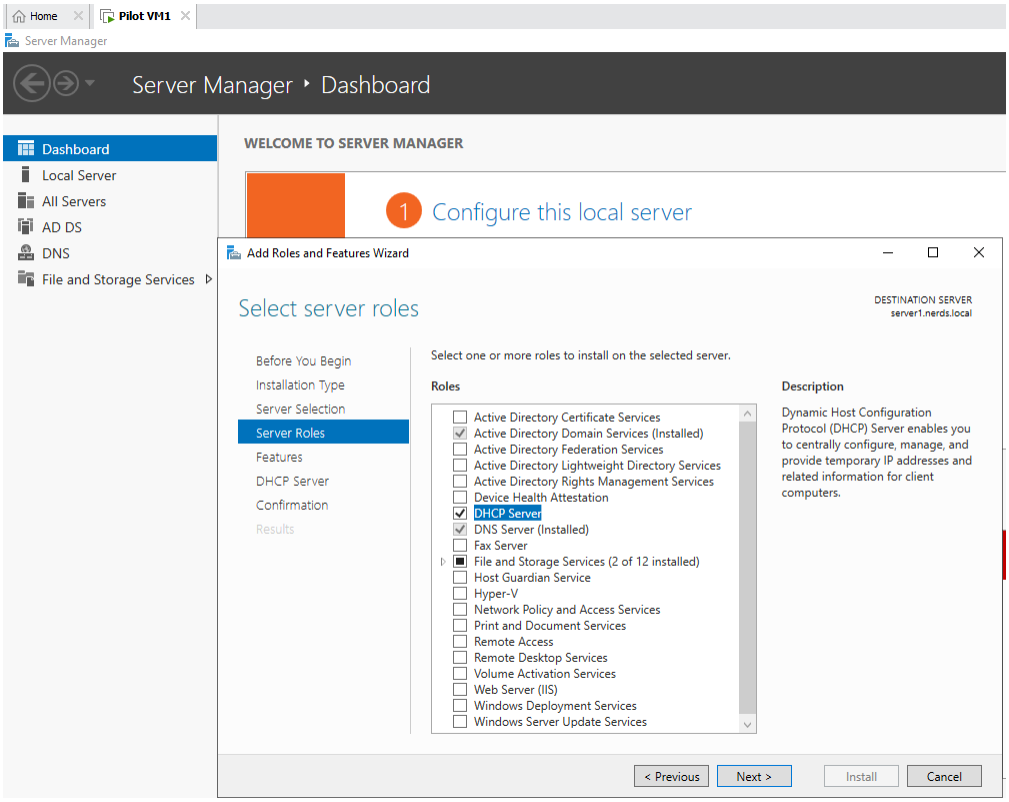


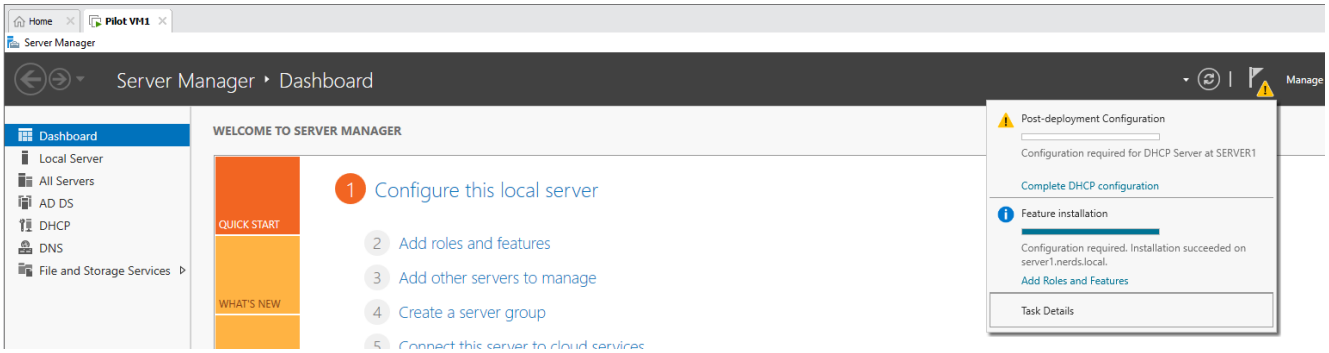
Server3

On server3, I enter setting – system – about – Rename this pc Advanced – click on “change” and set this pc as a member of domain ‘”nerds.local”. Enter adminastrator login and click enter. It was a success and I was greeted into the nerds.local domain.

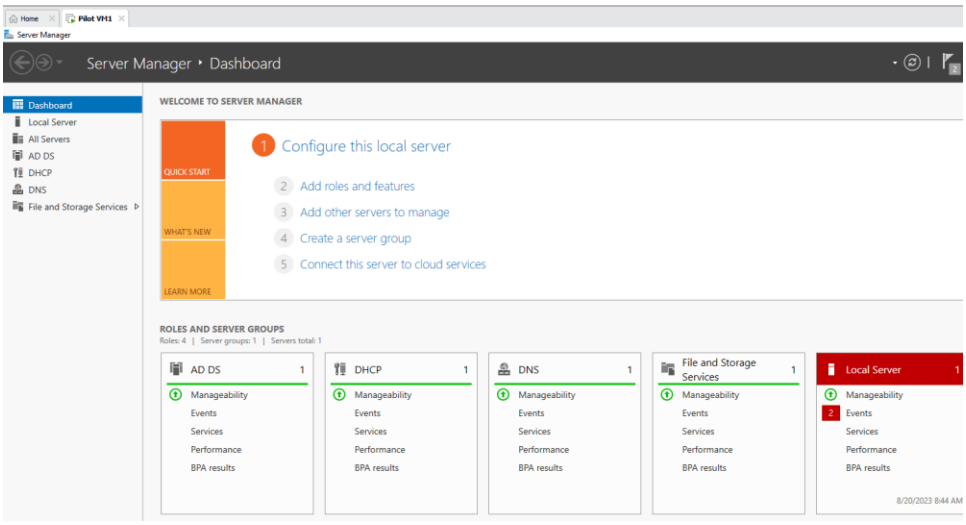


I am now installing the DHCP Server role in server1 to the domain. I add roles and features and install

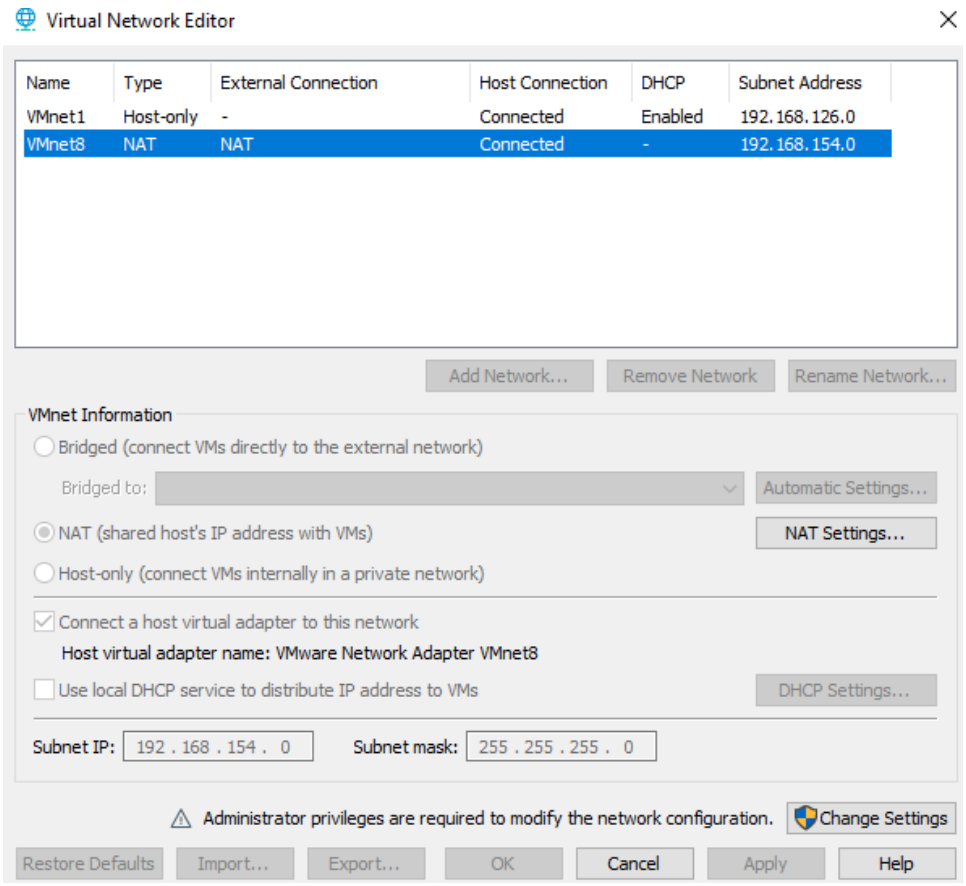




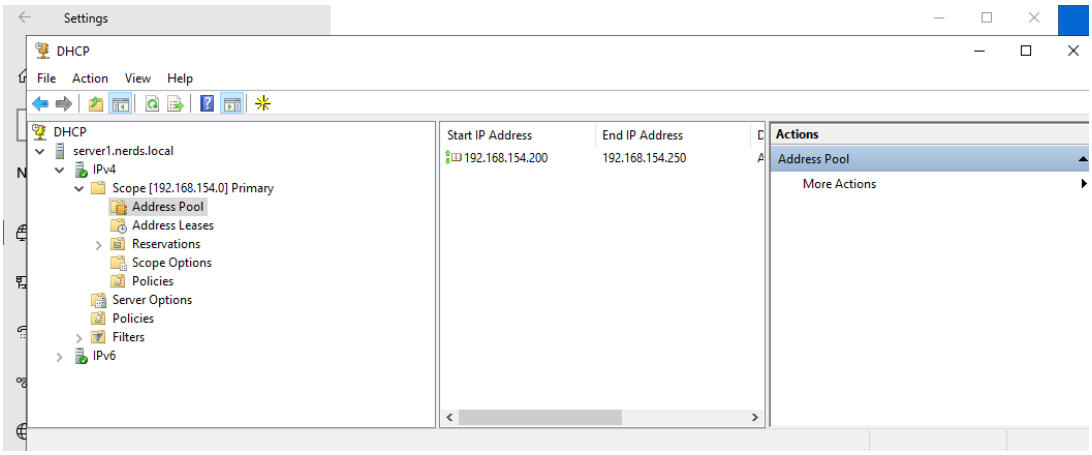
I have now installed DHCP



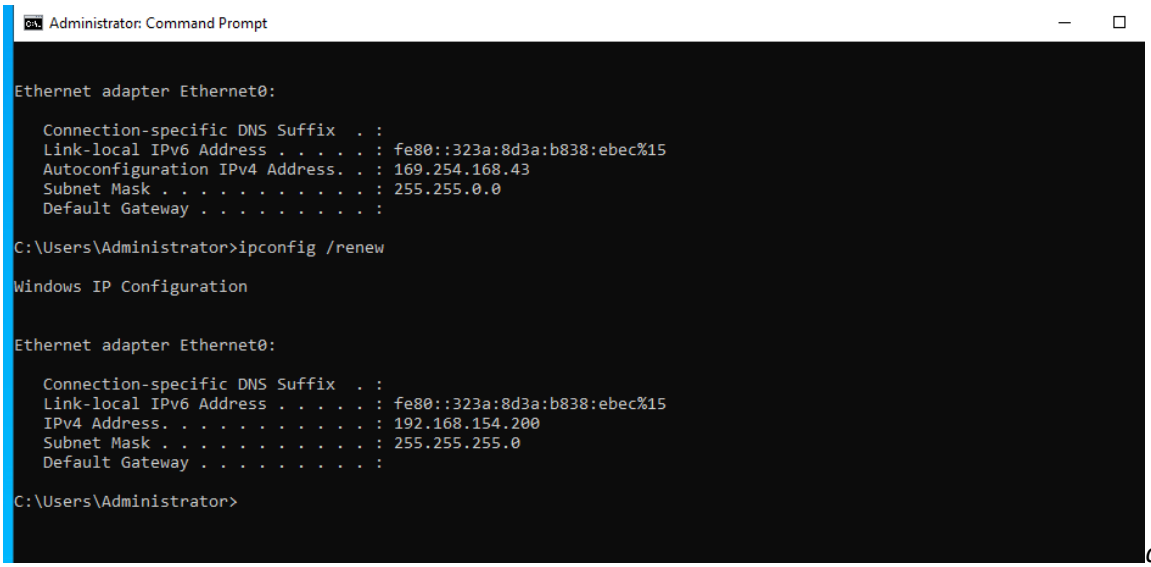
I click on edit inside VMware and open Virtual Network editor – change settings – Deselect “Use of local DHCP service”. Then click Apply.



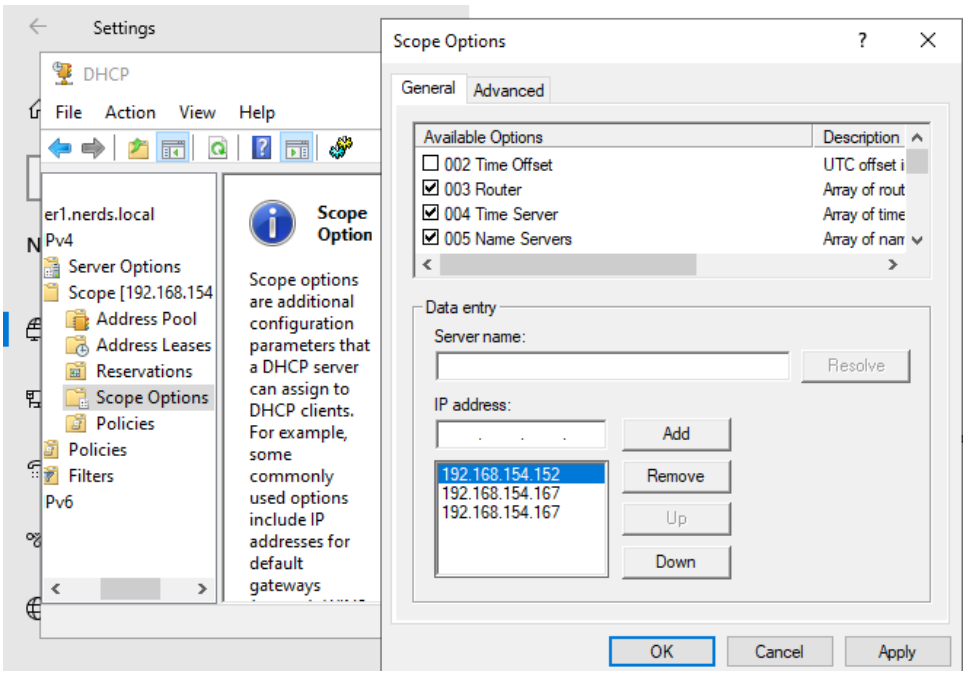
I create a new Scope from “DHCP” with the ip address from “192.168.154.200” to “192.168.154.250”. Lets see if it works from a client server perspective (client)



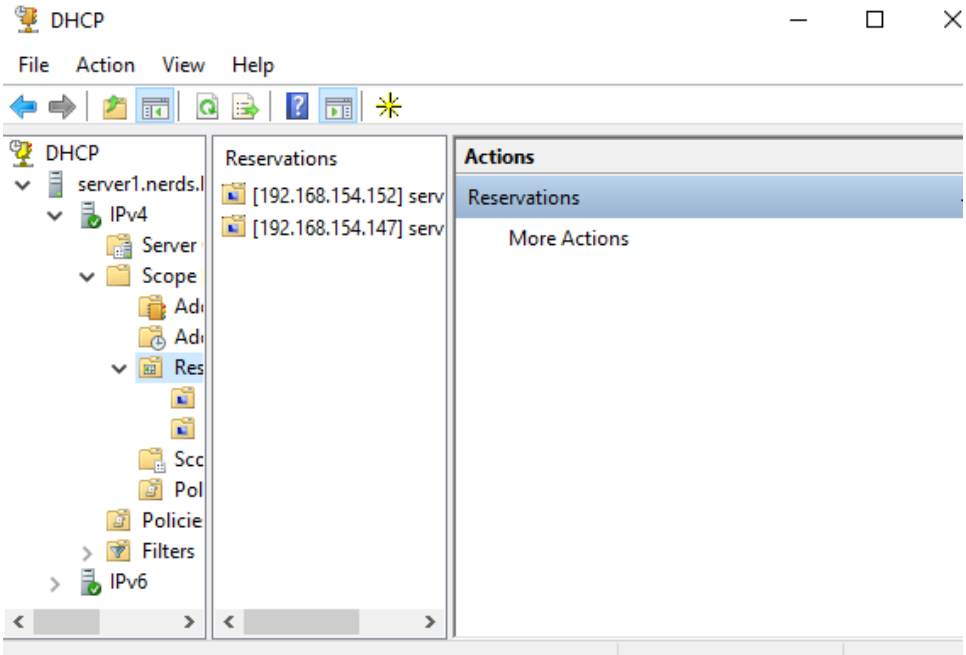
It worked! I typed ”ipconfig /flushdns“, then ”ipconfig /renew”. I was given the ip ”192.108.154.200” from the DCHP server. (client)


client

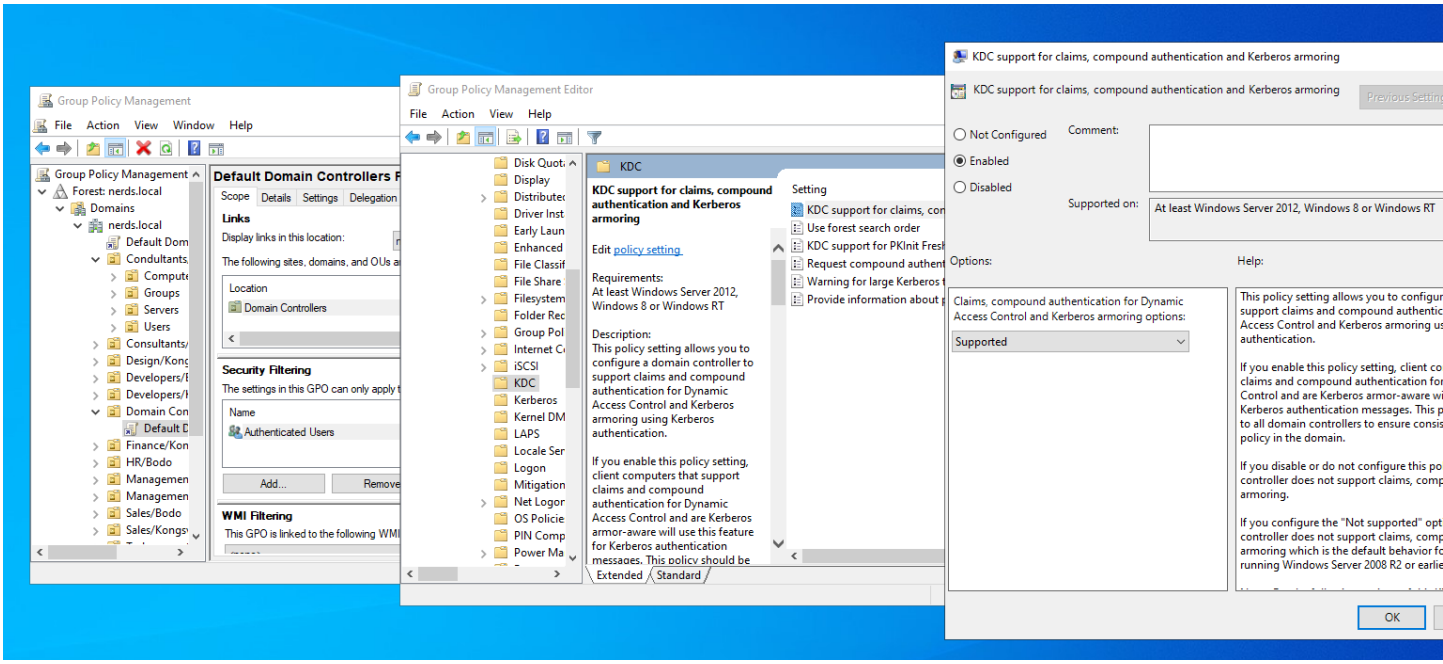
I did some further settings, I selected some options and added the IPs of server 1 and 2.



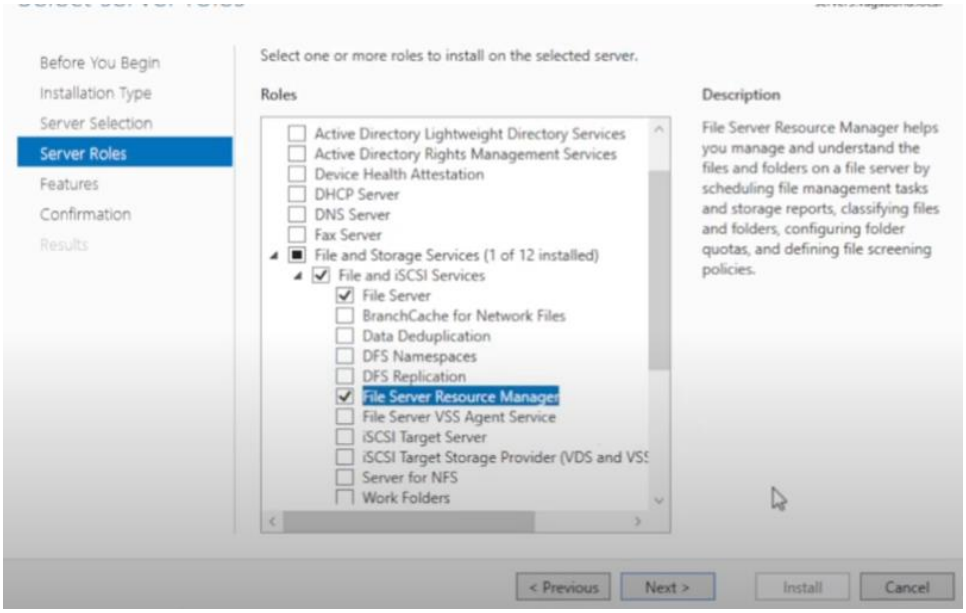
I did also reserve the IP addresses of server 1 and 2 as I do not want their ips mixed up in DHCP to cause potential errors.



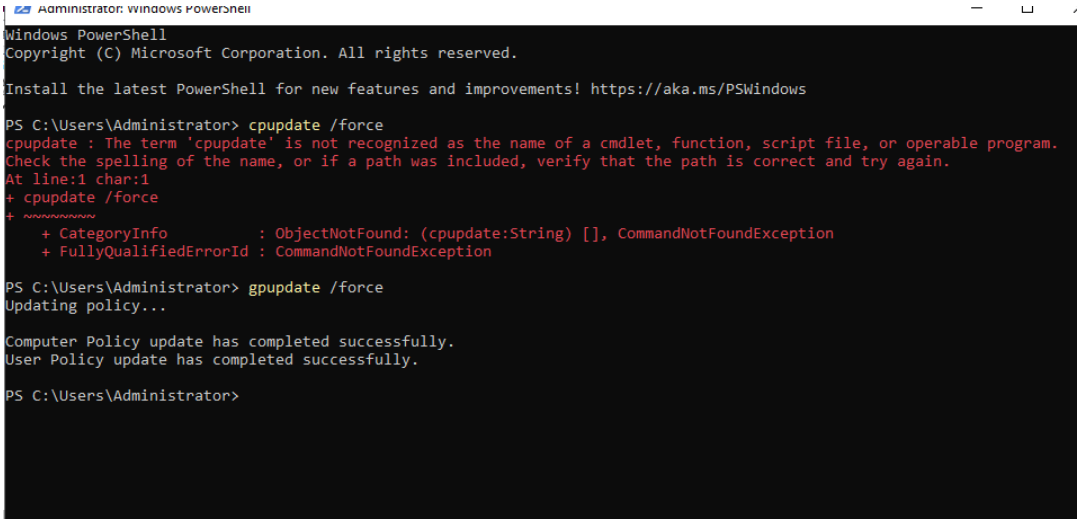
Now to install dynamic access controll, before that we must enable “KDC Support” found in group policy editor shown below.



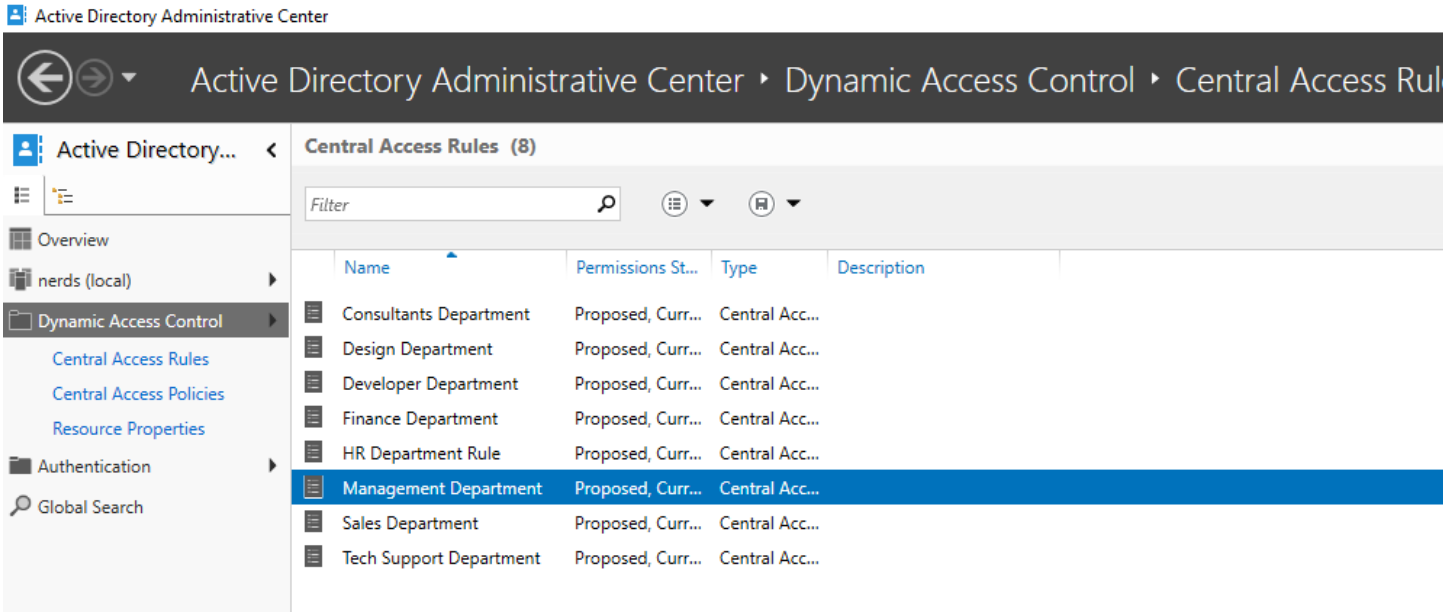
Install “File Server Resource Manager”



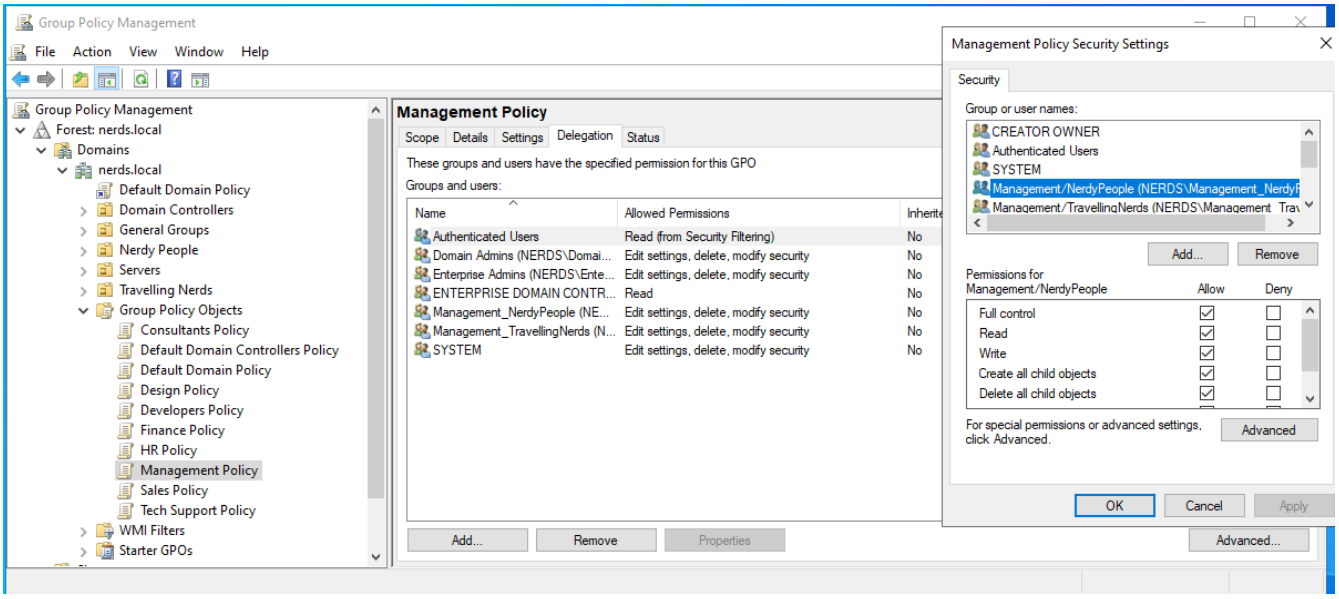
Force update using “gpupdate /force”



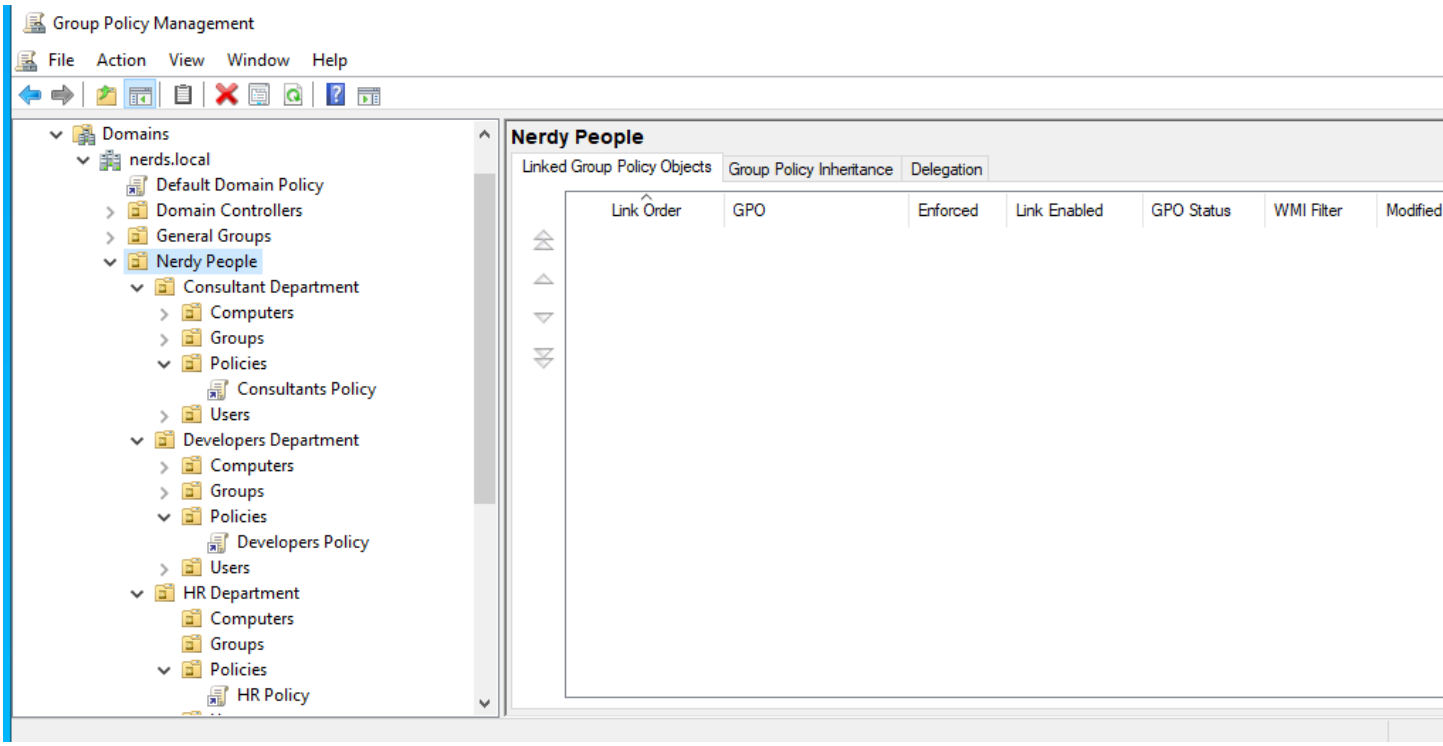
I now enter DAC and create departments for both Travelling Nerds and Nerdy people within Central access rules and policies. From DAC I have grouped the departments from both companies in their own shared departments. I configured appropriate permissions for the following departments within the companies.



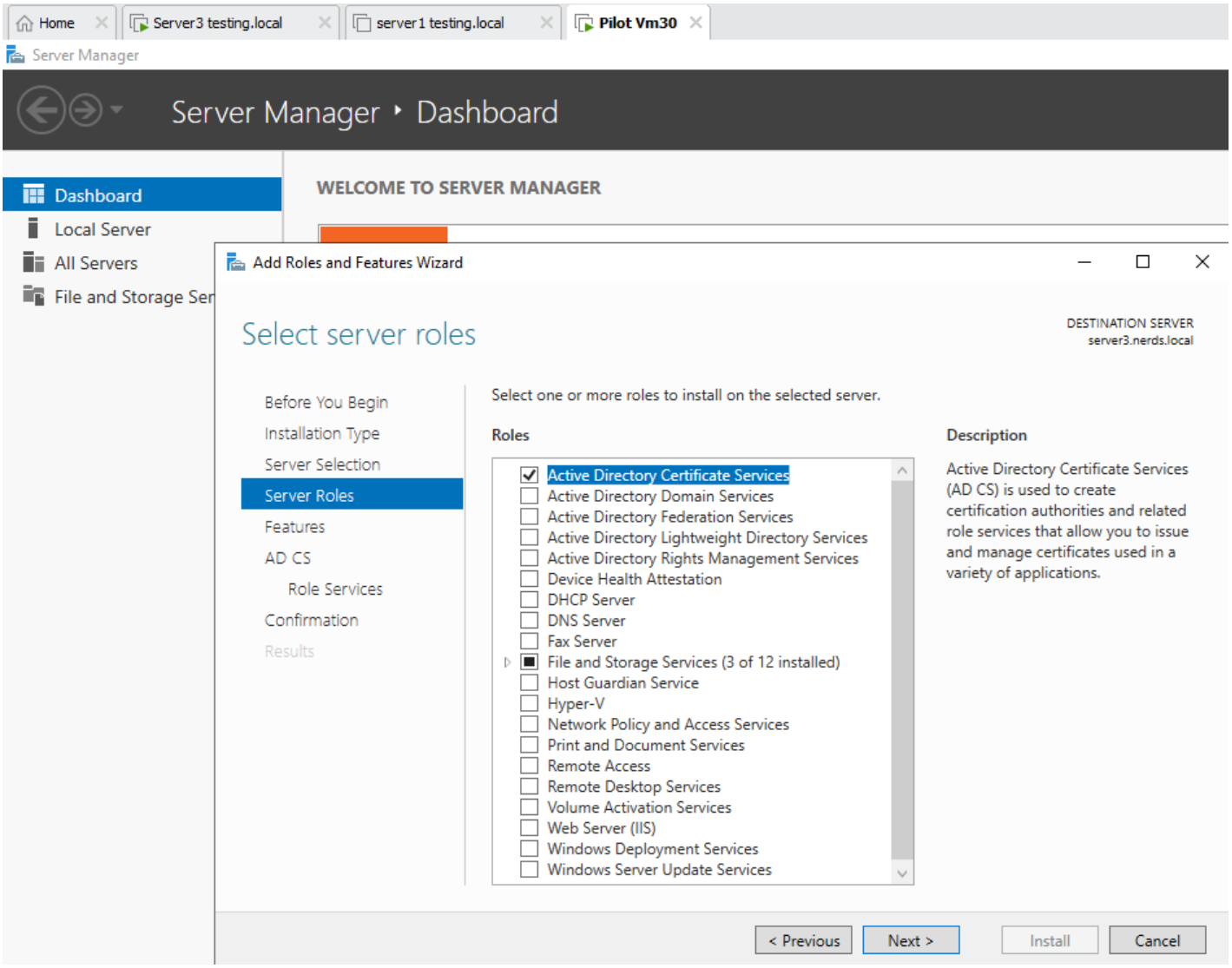
To create Group policies, I right click “Group policy Objects”, register names for all departments and add the users and groups to the policies where they belong like the one listed below. I also set the proper permissions for the departments through Delegation. For example, departments like “Management” should have more powerful permissions than those in “Sales” department.



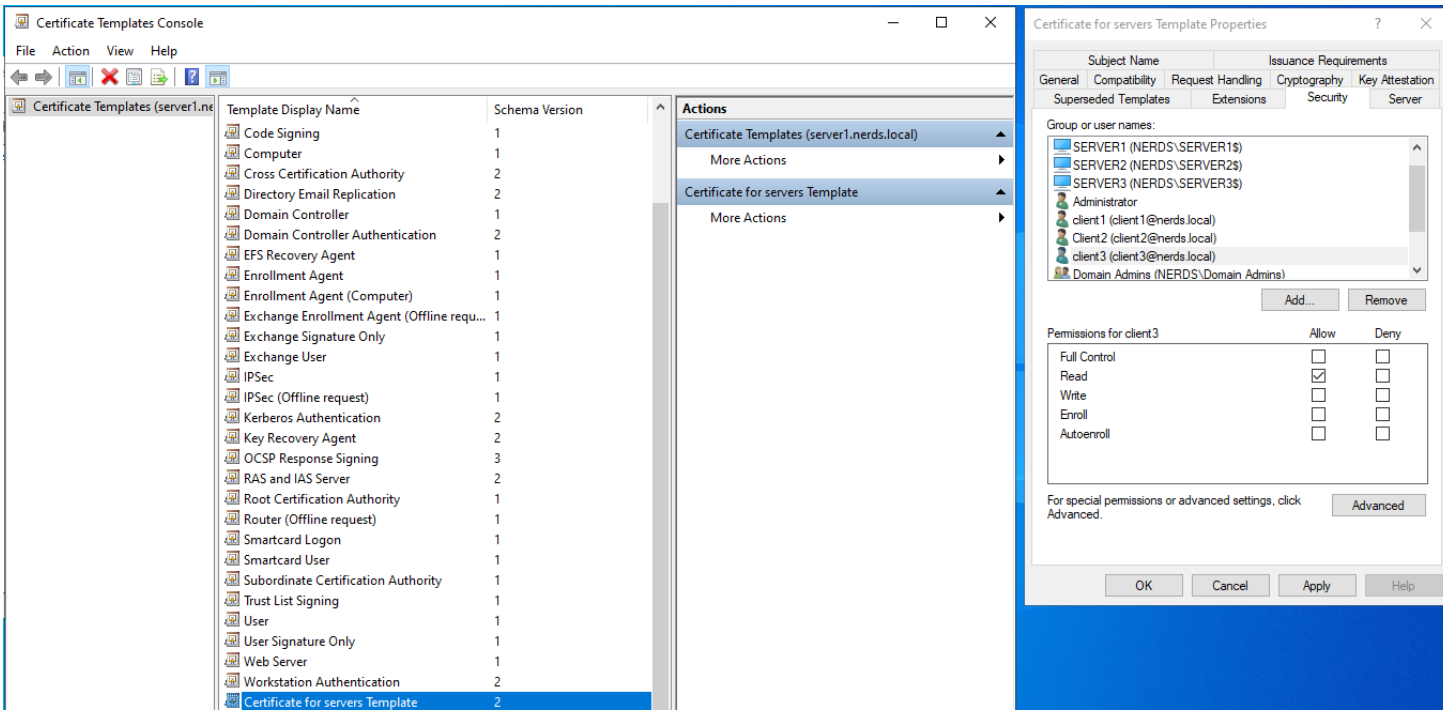
I now link the group policies to its proper location. Each department policy to its matching department organizational unit.



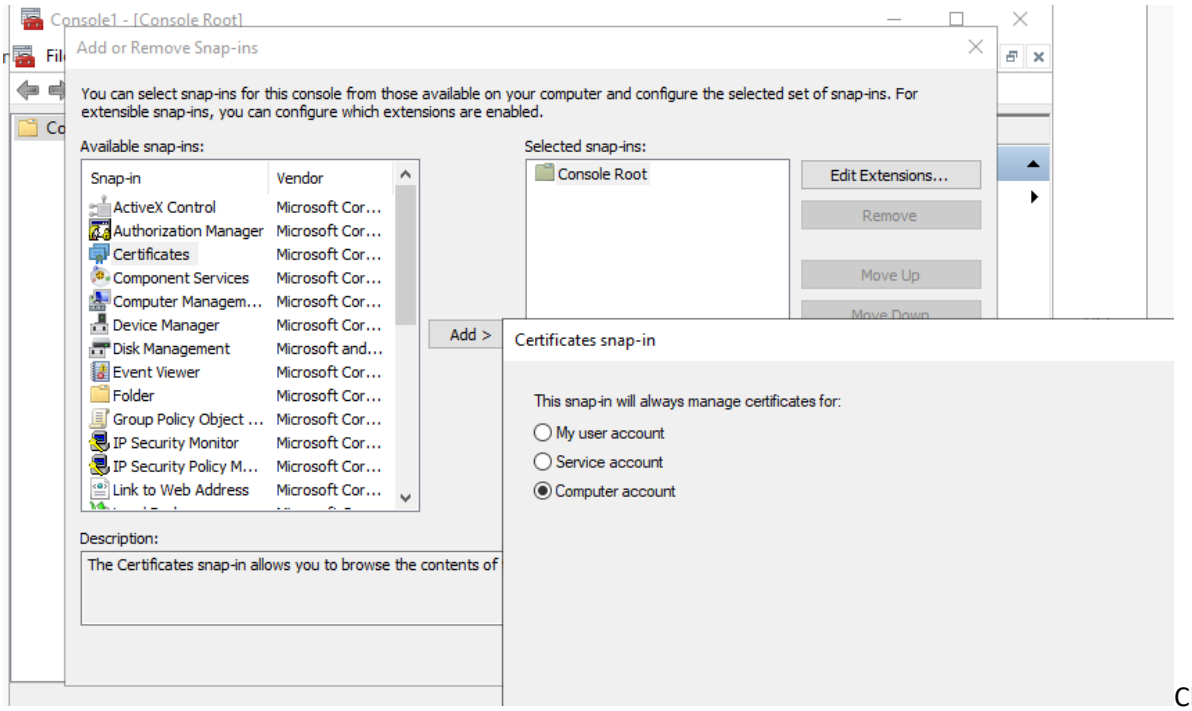
Now I go on to install “Active Directory Certificate Services” by adding a role on server3



Once the Certificate is installed and avaliable, we open it up and create a certificate template, and add the 3 servers and the clients.

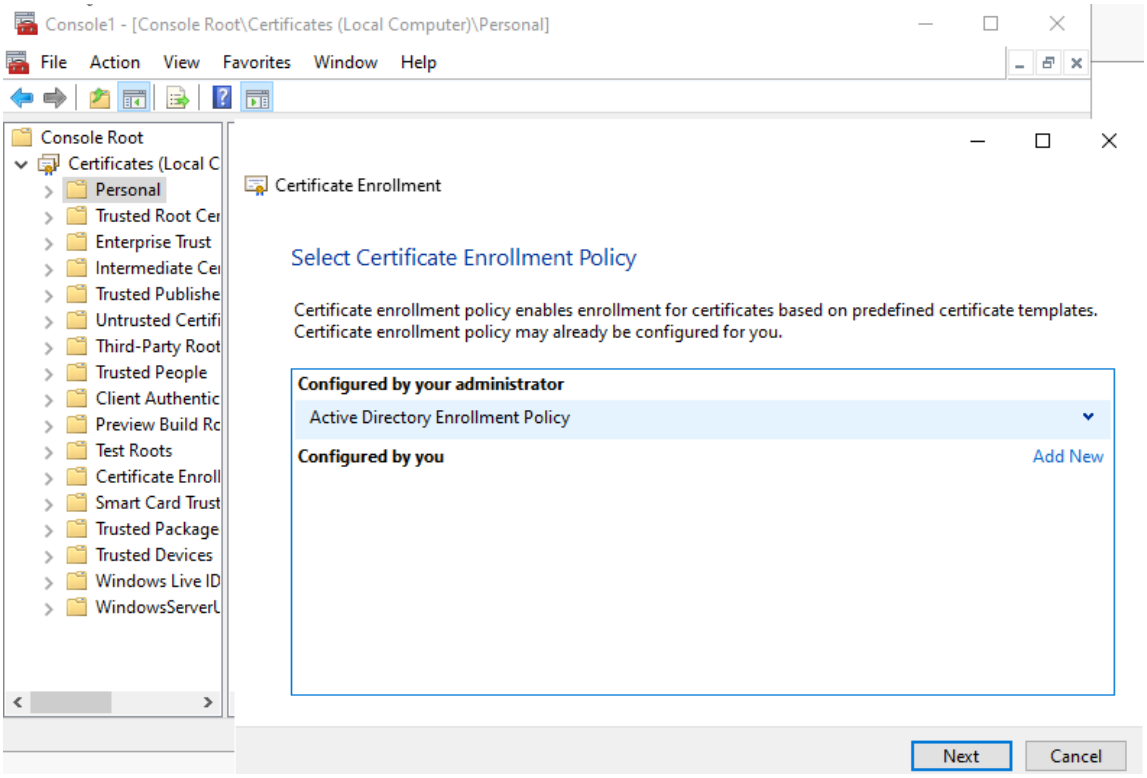


I continue to add “Console Root” snap in for “Computer account” certificate

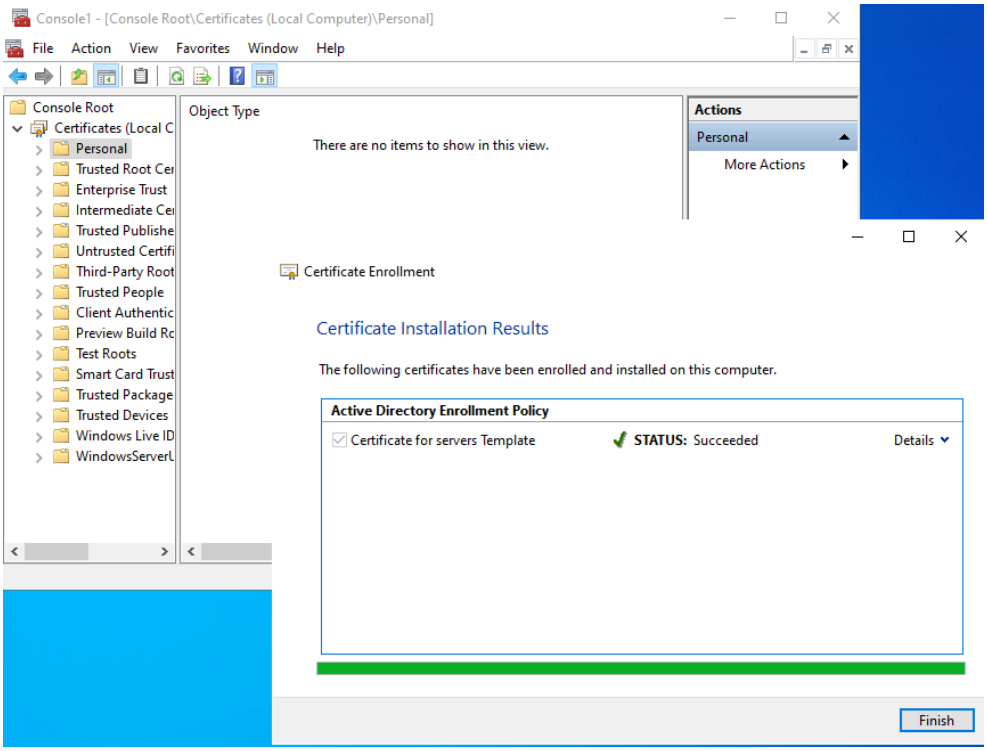


Client

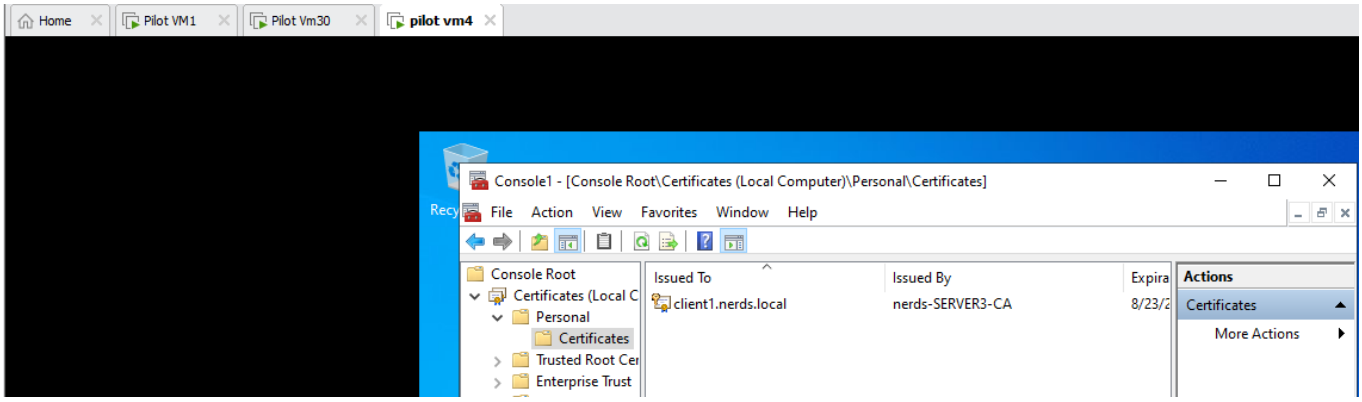
I now go inside the “Personal” folder and select certificate under “Active Directory Enrollment Policy”



I finish the installation successfully.



I now have my new certificate ready inside my “Personal” folder

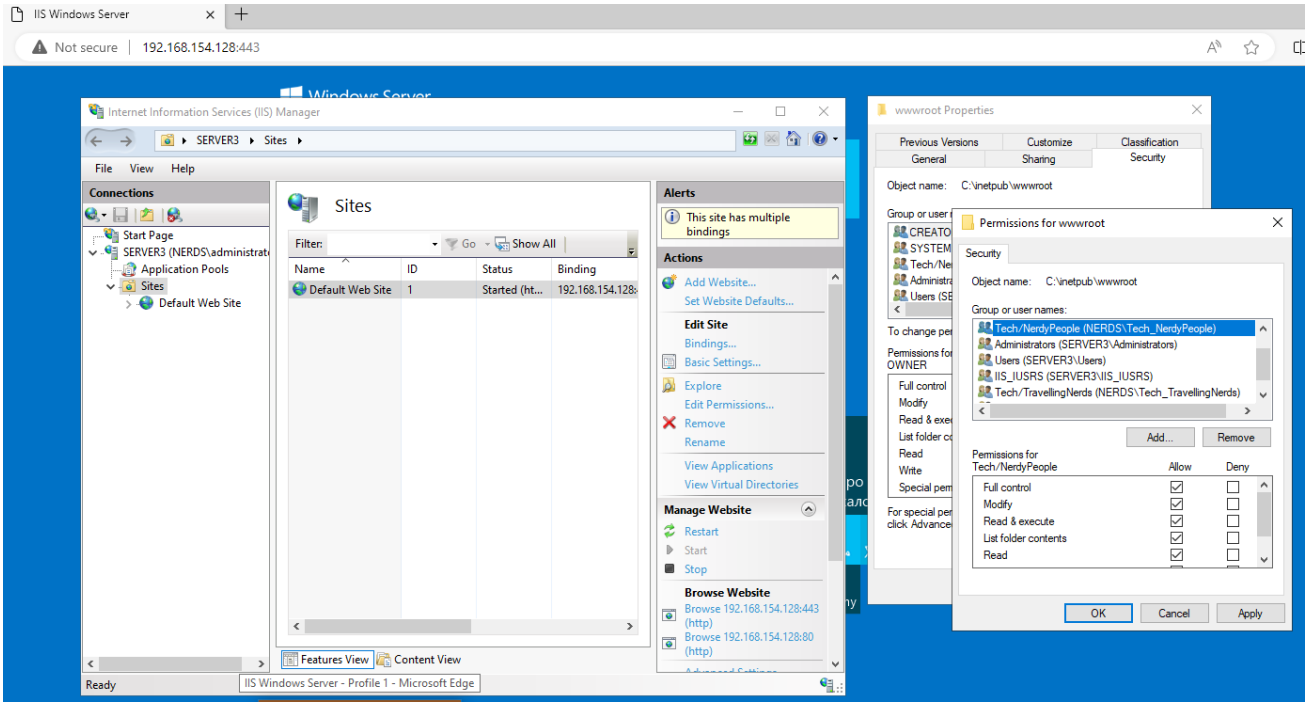


At this point I must inform the teachers that I accidently deleted server3, and had to reinstall the whole server along with all its roles and connect it to the domain. Server 1 and 2 did not take damage from this, I simply connected the new server3 to the domain with the other servers. In the process, server 3 was given a NEW ip address which is “192.168.154.128”. Just needed to clear this up incase of future confusion.

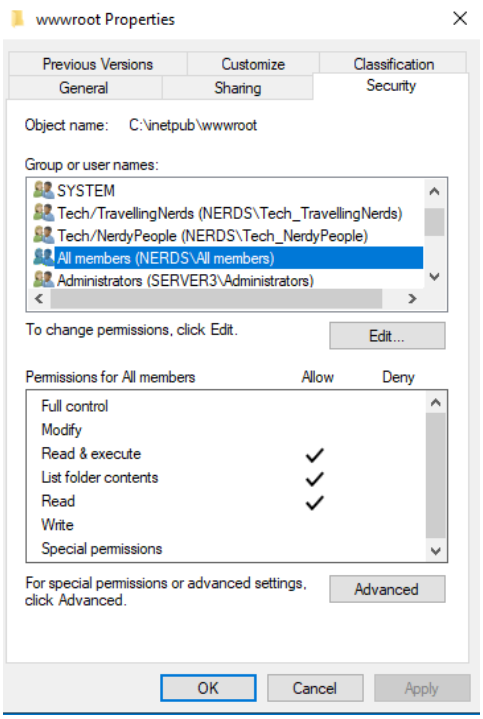
NEW IP from here

Server3	192.168.154.128

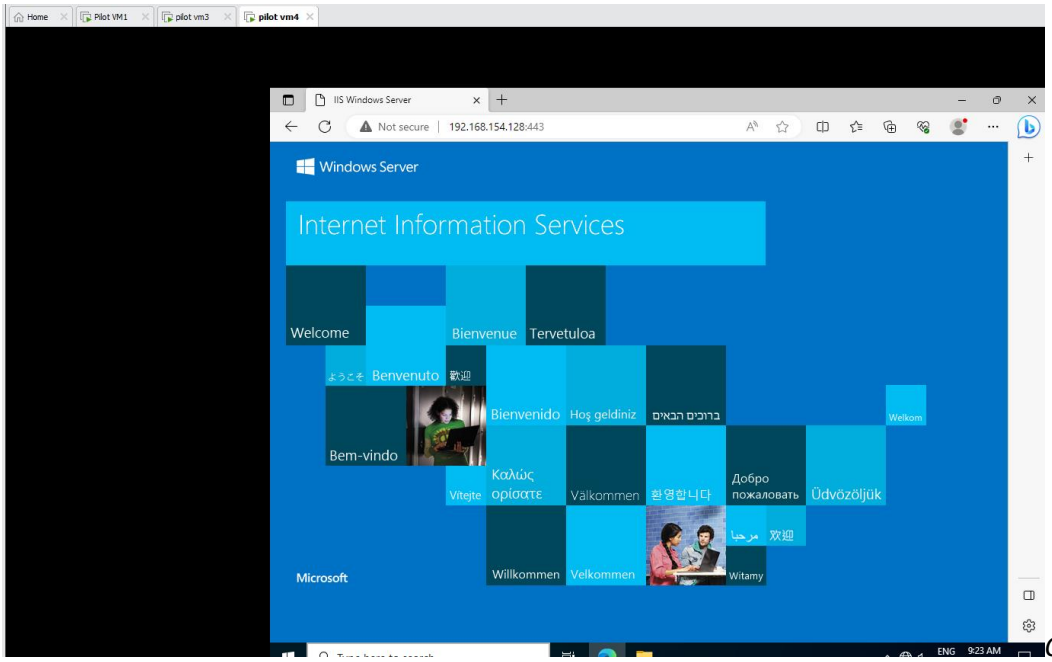
According to the requirements, I have added the “Techical Support” departments from both Kongsvinger and Bodø and given them the proper permissions as they will be the ones managing the site.



I then give the rest of the users only the permission to read the site, let's see if a regular user can read the site from a client perspective

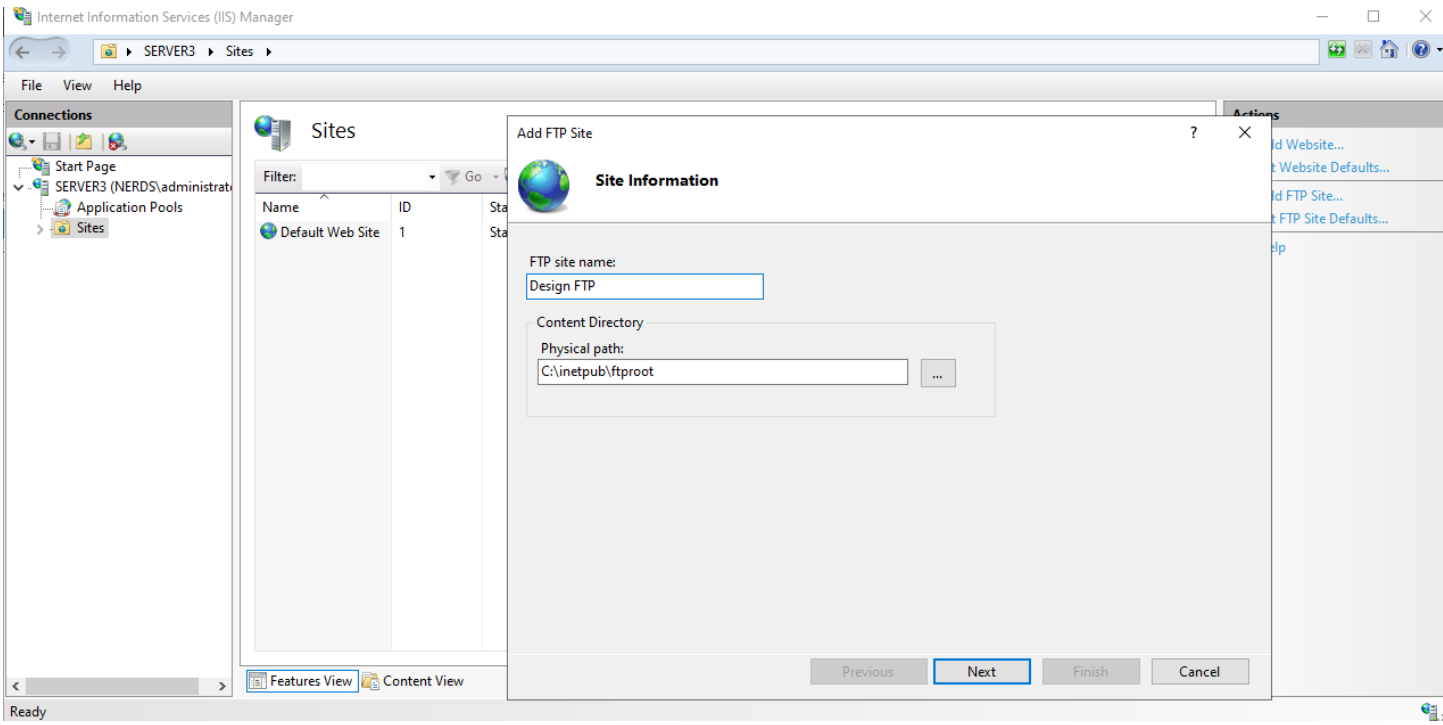


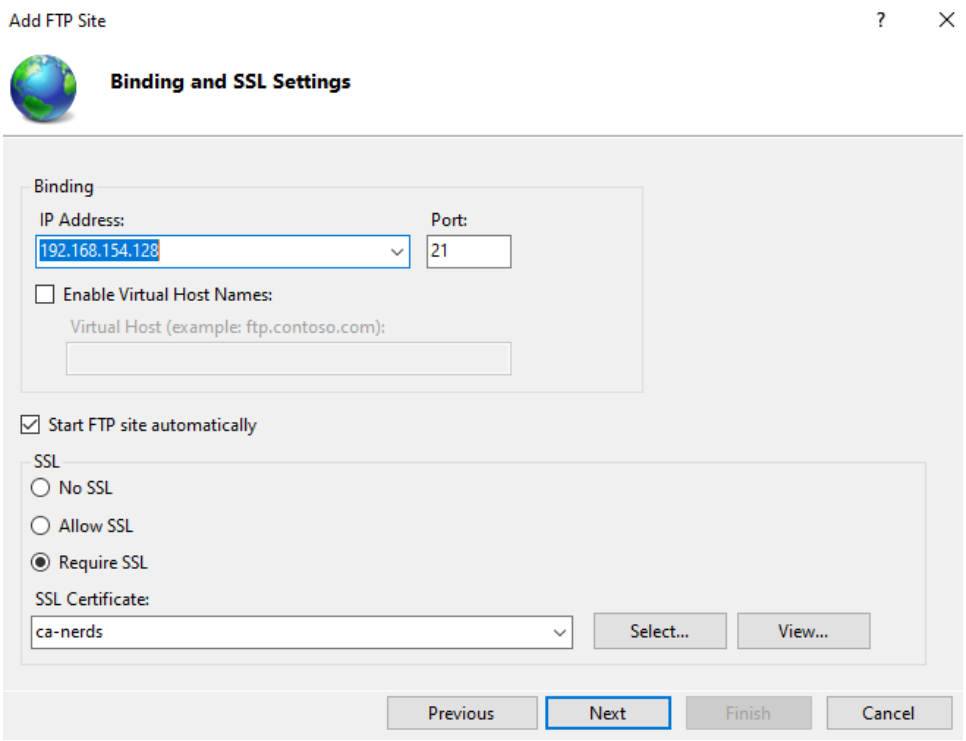
From the perspective of any user on the domain, I log in from developer1 from Nerdy People in the client server and access the IIS website and I was granted read access to the site.



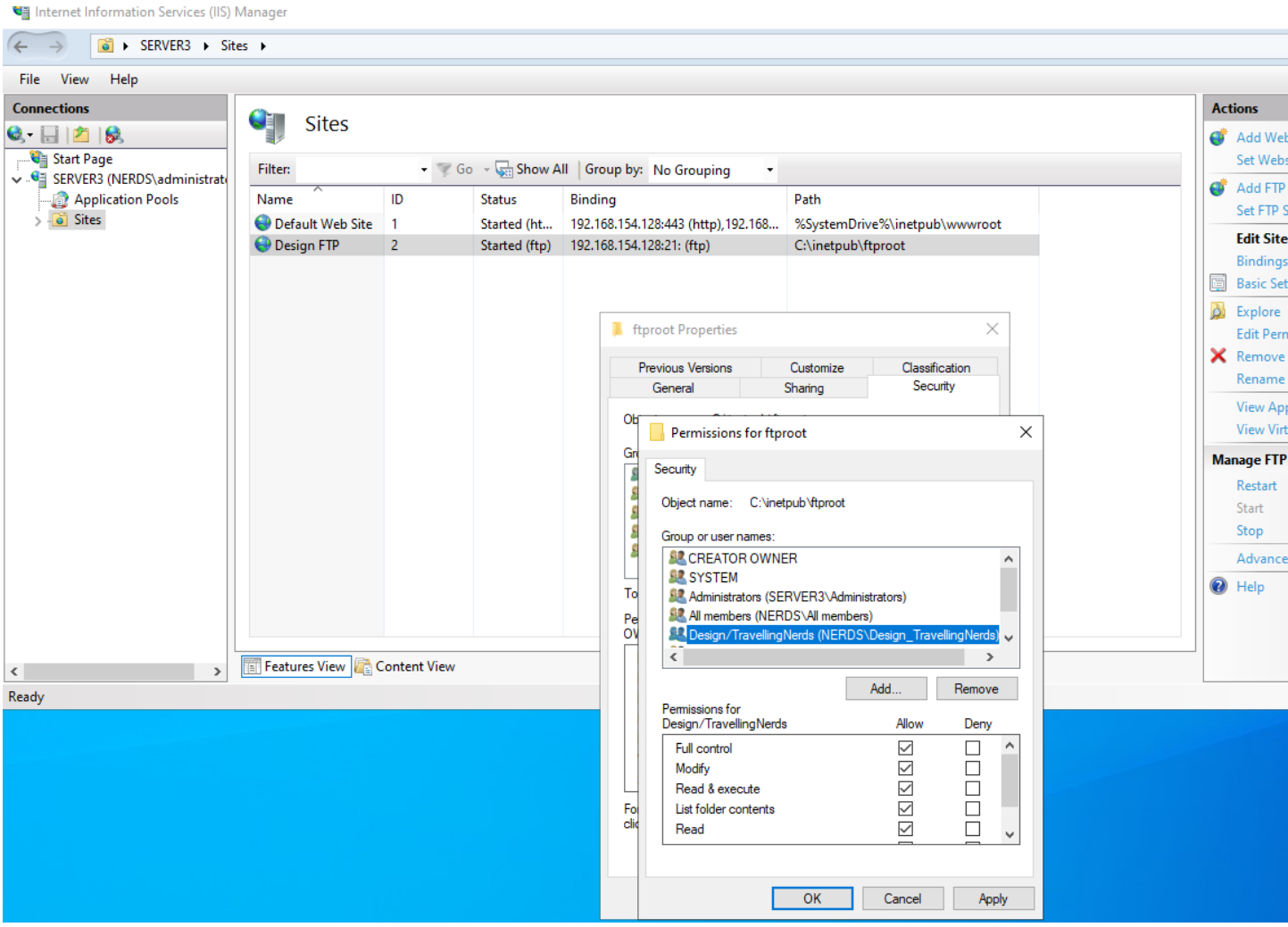
Client

I go on to add a FTP server for the Design Department to manage. I installed the FTP role and added a FTP site

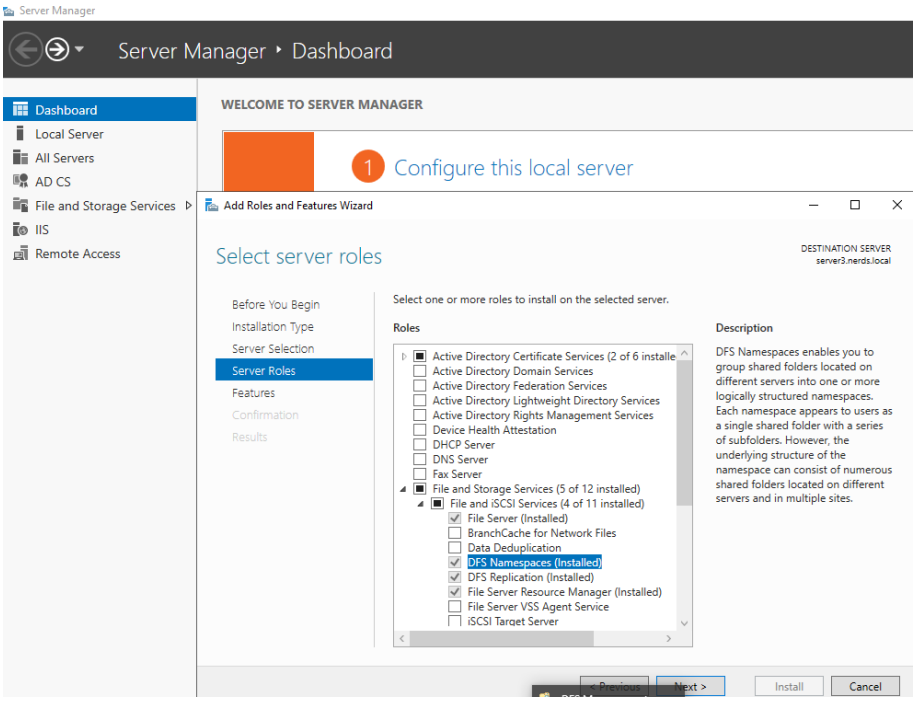




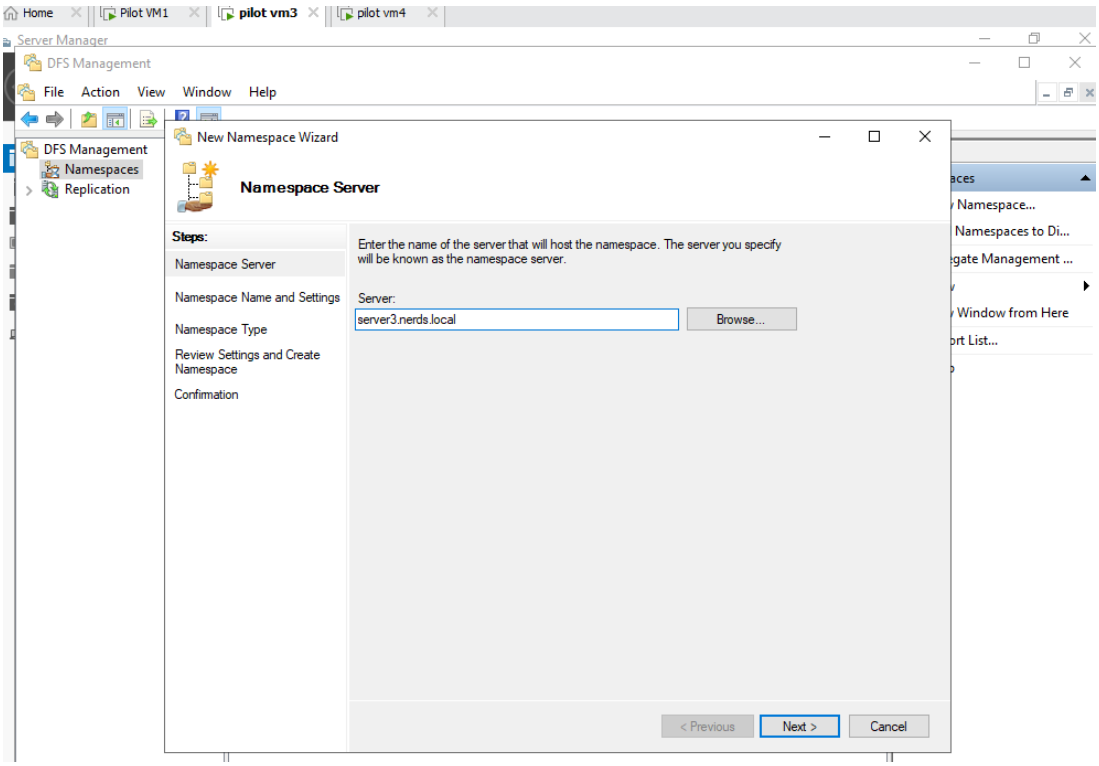
I set the proper permissions for Design Department members, and let the rest only have the basic read permissions.



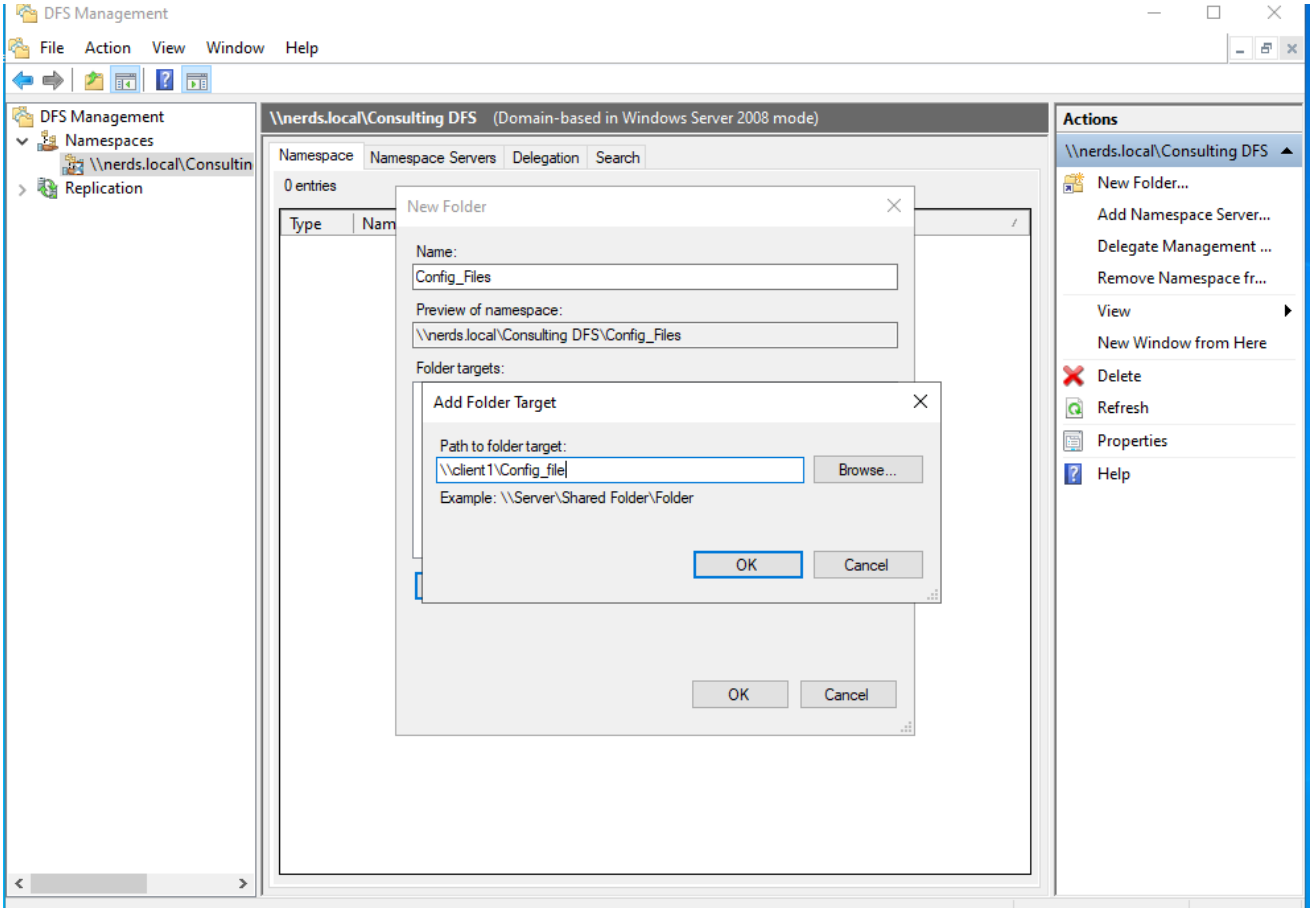
I now go on to add DFS Management through adding roles in Server Manager



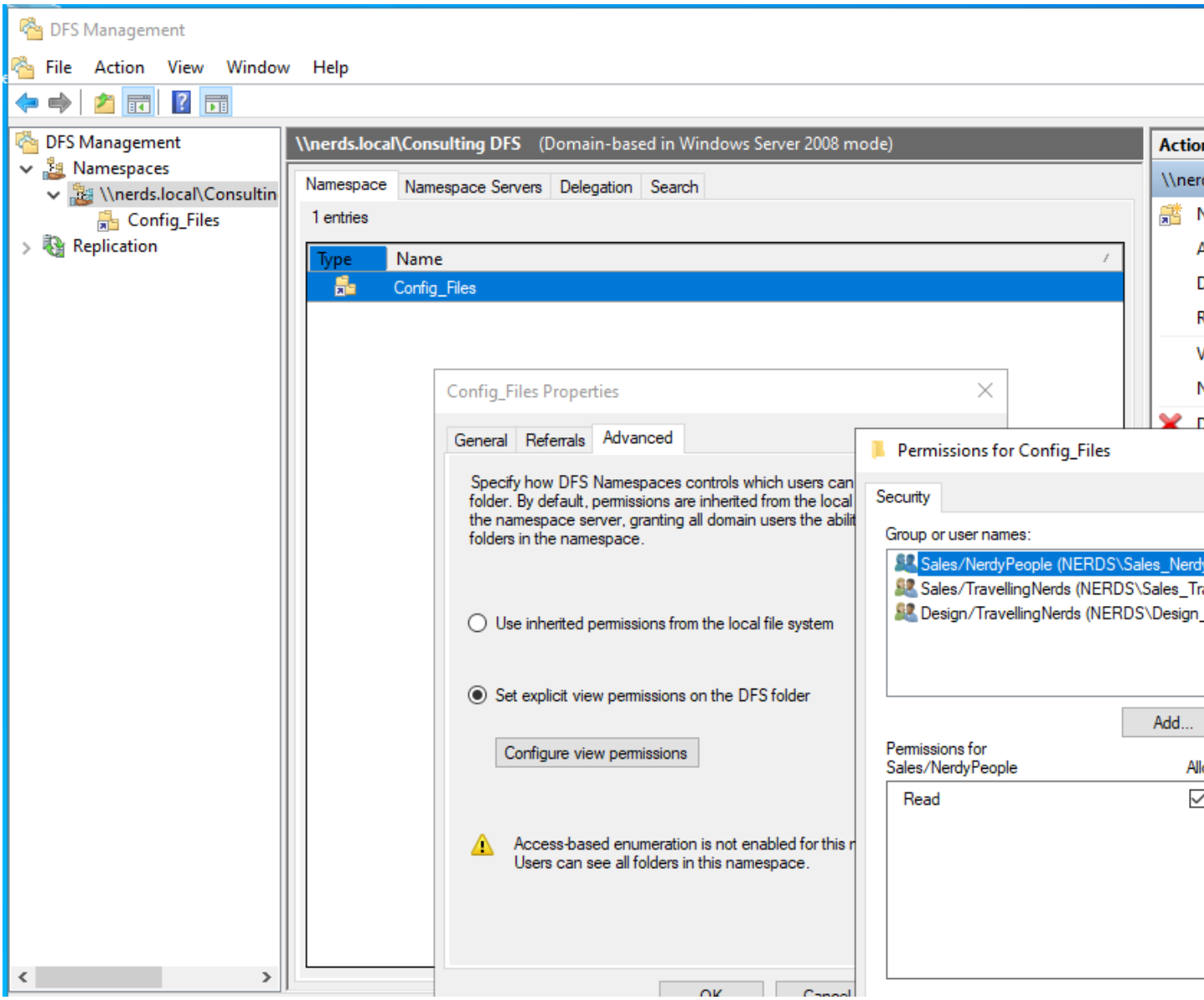
I created a Namespace server called “Consulting DFS” under server3



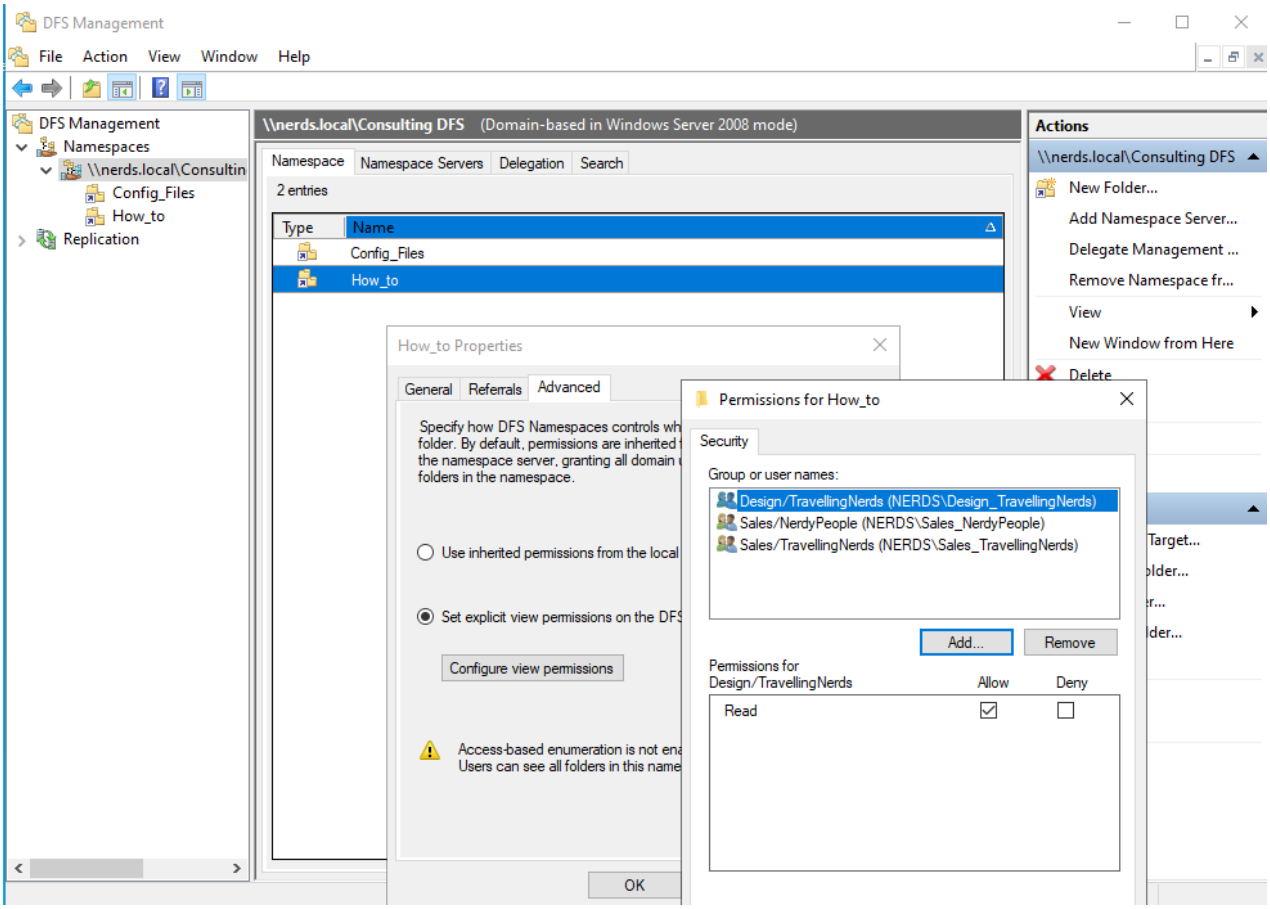
I created a new file for configuration files and called it “Config_files”.

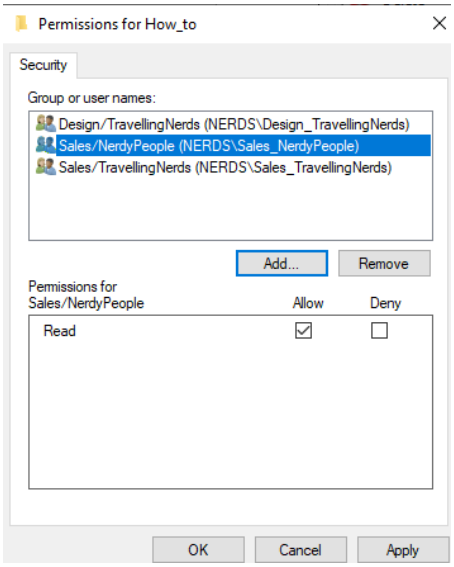


I set the permissions for Sales departments groups to read the file and for the Design departmant group to read and write.

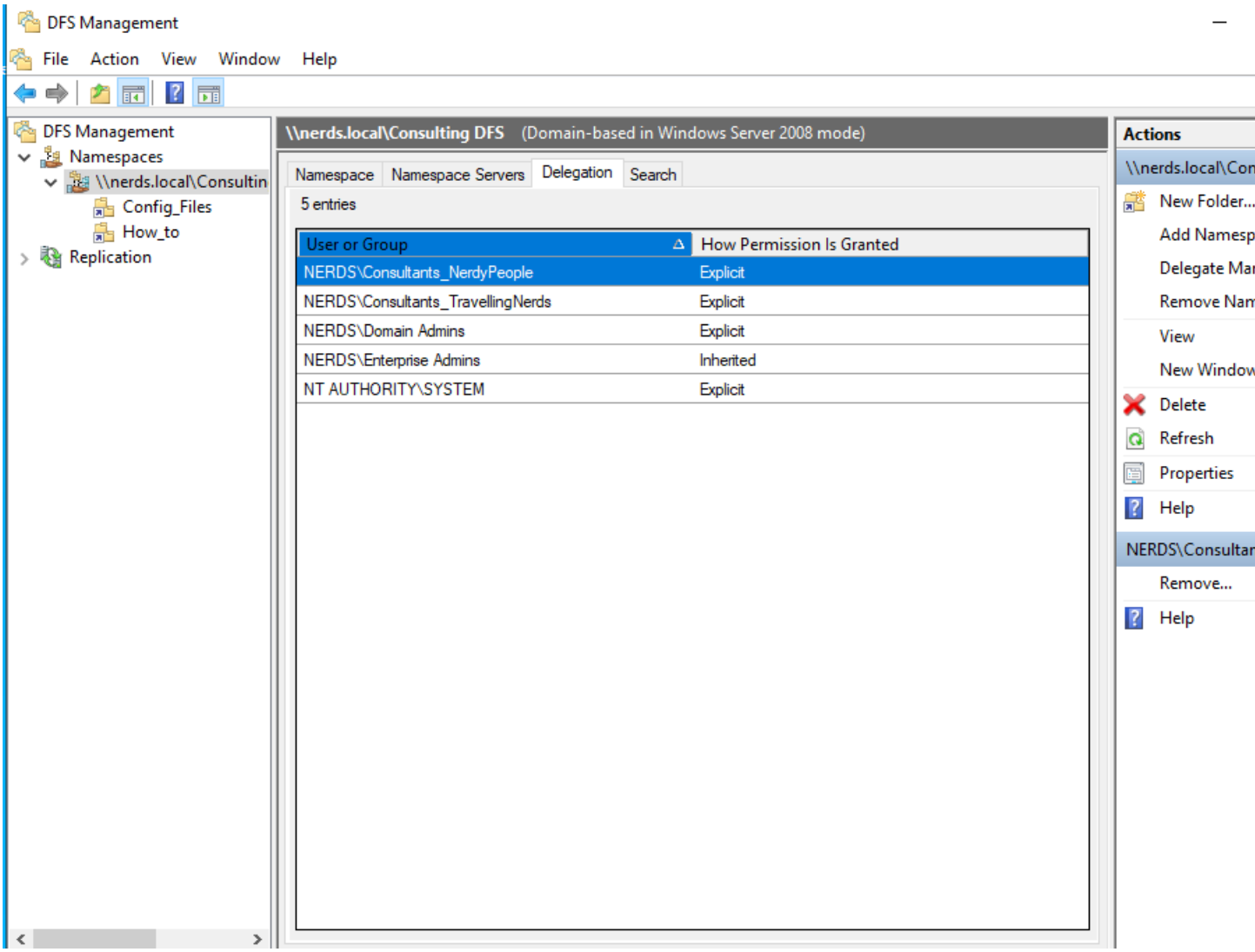


I created another file to contain How to instructions to be available for both Design department groups and Sales department groups. I set the permissions for both groups to allow “Read” function.

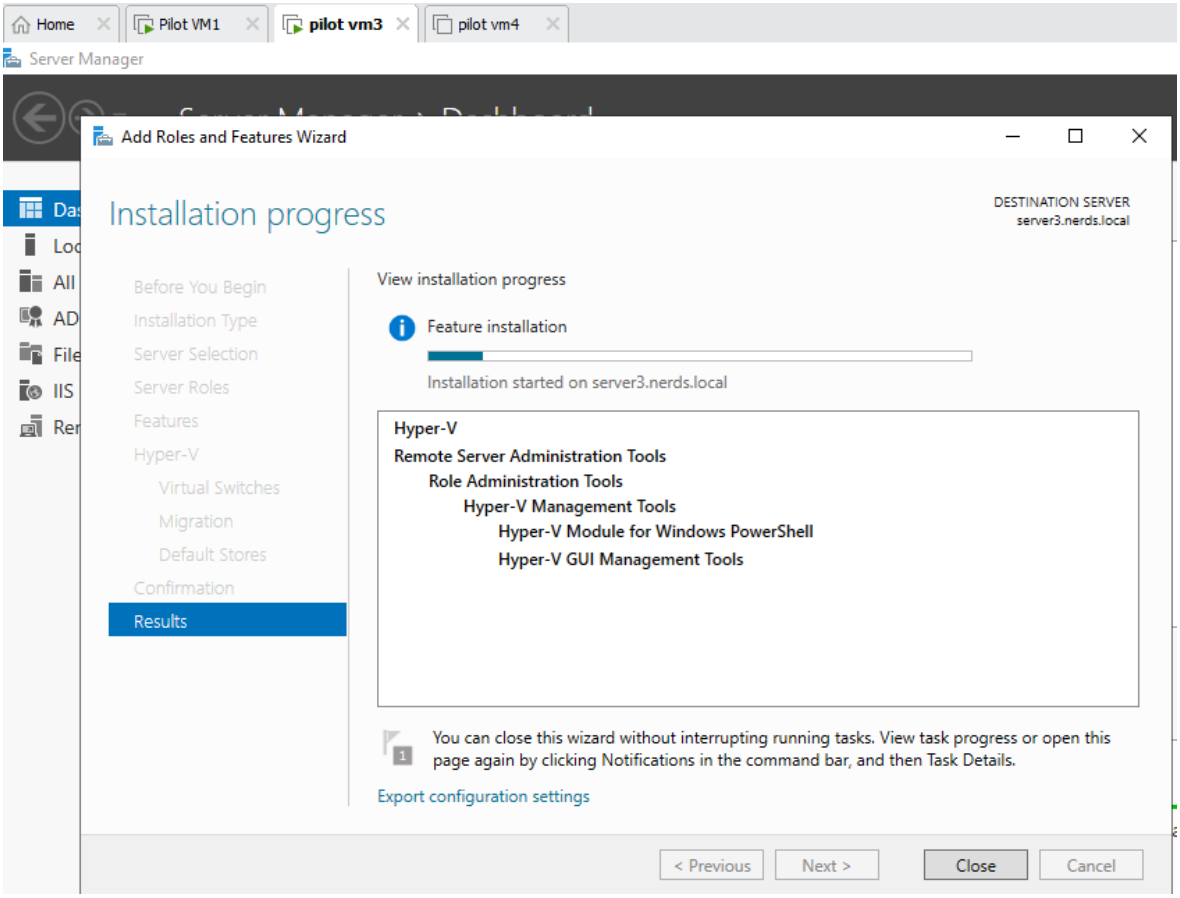




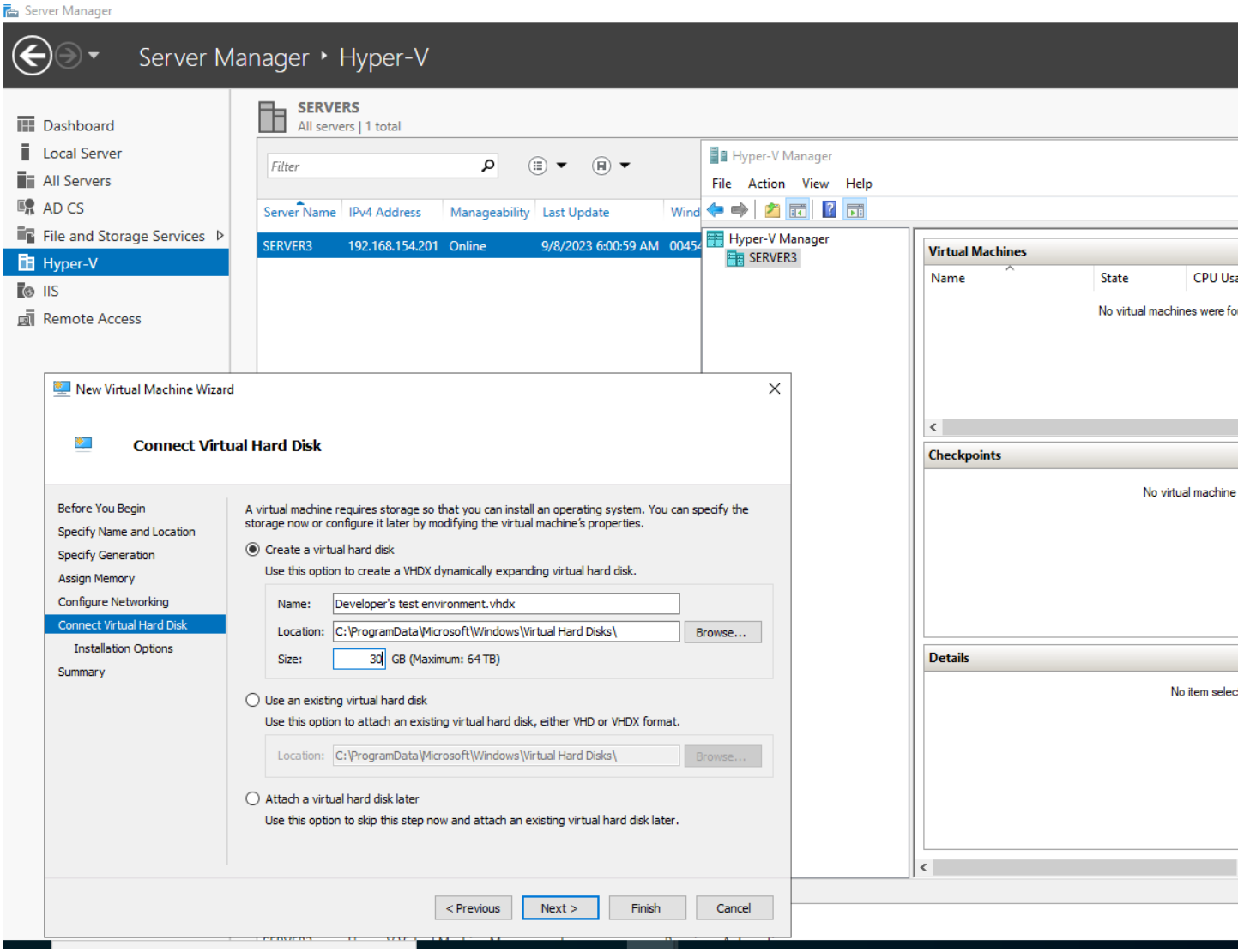
Through Delegation I set both consulting departments groups to have full control of all contents within the DFS systems.


DFS Management
File Action View Window Help
DFS Management
Namespaces
\\nerds.local\Consultin
Config_Files
How_to
Replication
\\nerds.local\Consulting DFS (Domain-based in Windows Server 2008 mode)
Namespace Namespace Servers Delegation Search
5 entries
User or Group
How Permission Is Granted
NERDS\Consultants_NerdyPeople Explicit
NERDS\Consultants_TravellingNerds Explicit
NERDS\Domain Admins Explicit
NERDS\Enterprise Admins Inherited
NT AUTHORITY\SYSTEM Explicit
Actions
\\nerds.local\Con
New Folder...
Add Namesp
Delegate Mar
Remove Nam
View
New Window
Delete
Refresh
Properties
Help
NERDS\Consultar
Remove...
Help

I am now about to create a test environment for Devolopers to test their applications before distrubution. I plan to do this through Hyper-V nested virtualization in an already exisiting vm. I first activate the ablity to virtualize hyper v within VMware for server3. I then install the “Hyper-V” role in server3. *(Bose, 2021)*

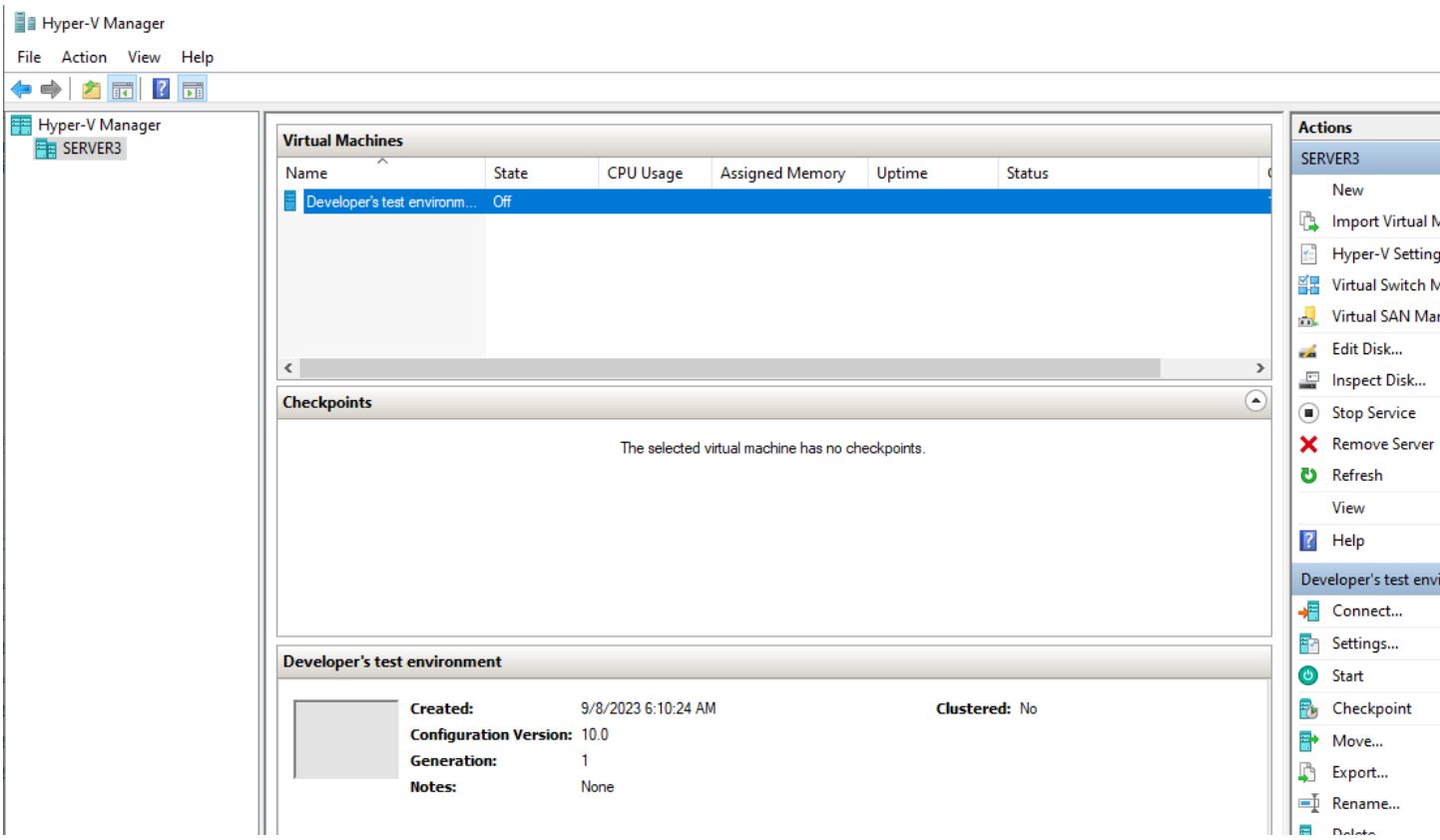


After a restart of the server, I open Hyper V role within server manager, open “Hyper-V Manager” and create a new Virtual Machine called “Developer’s test environment”.

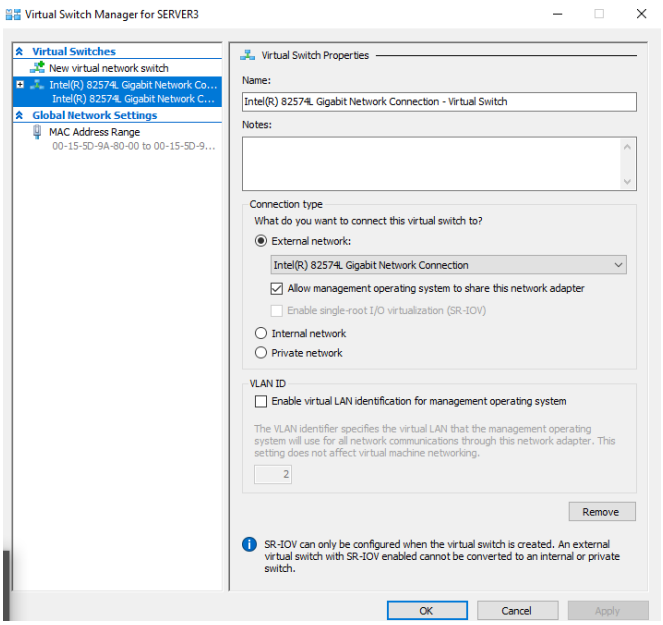


(***I want to note that for some reason I was automatically given a DHCP ip address on server3 after downloading hyper v as can be seen in screenshot above. I changed this back to the static ip address I had already configured at 192.168.154.128)***

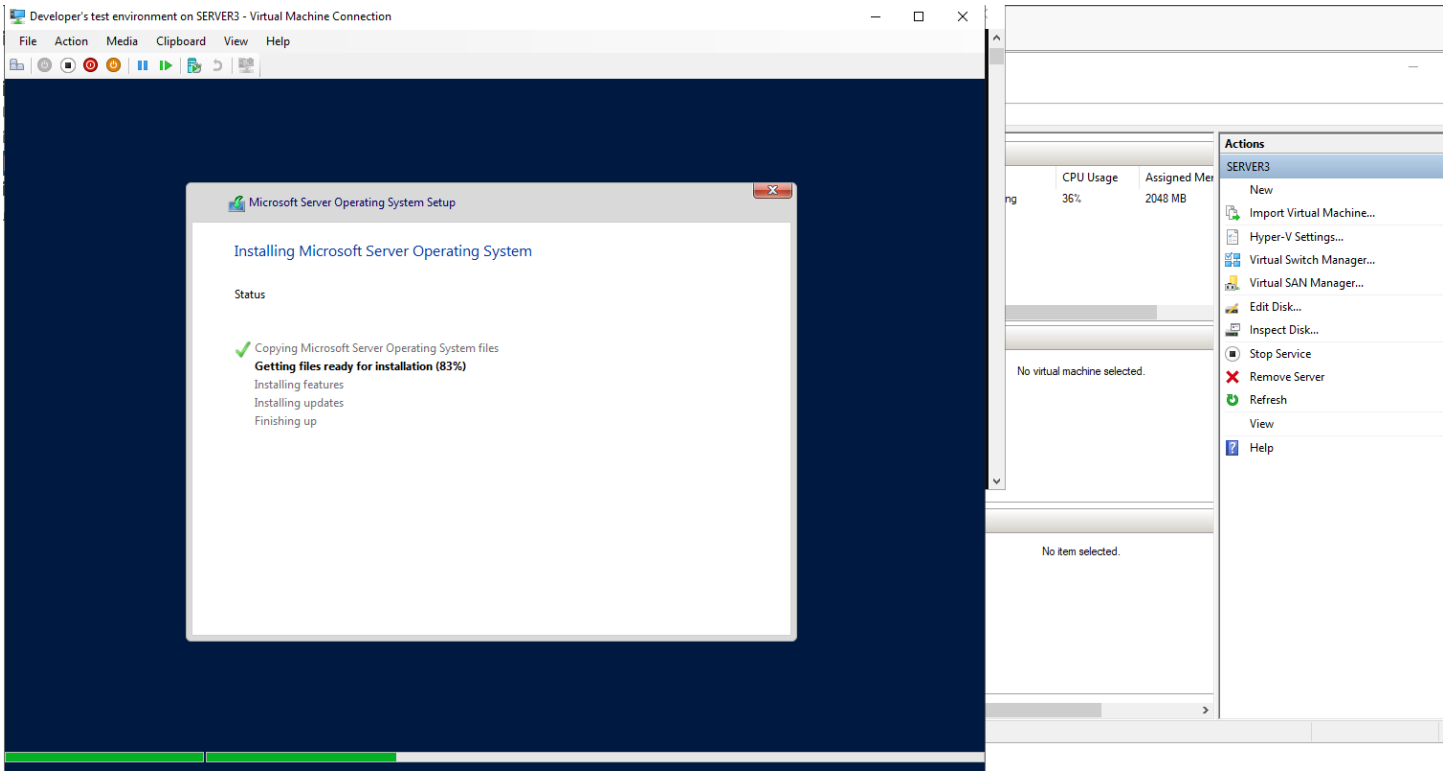
I have created the VM and I give it and ISO through setting which is the “Microsoft Server Desktop Experience” ISO.



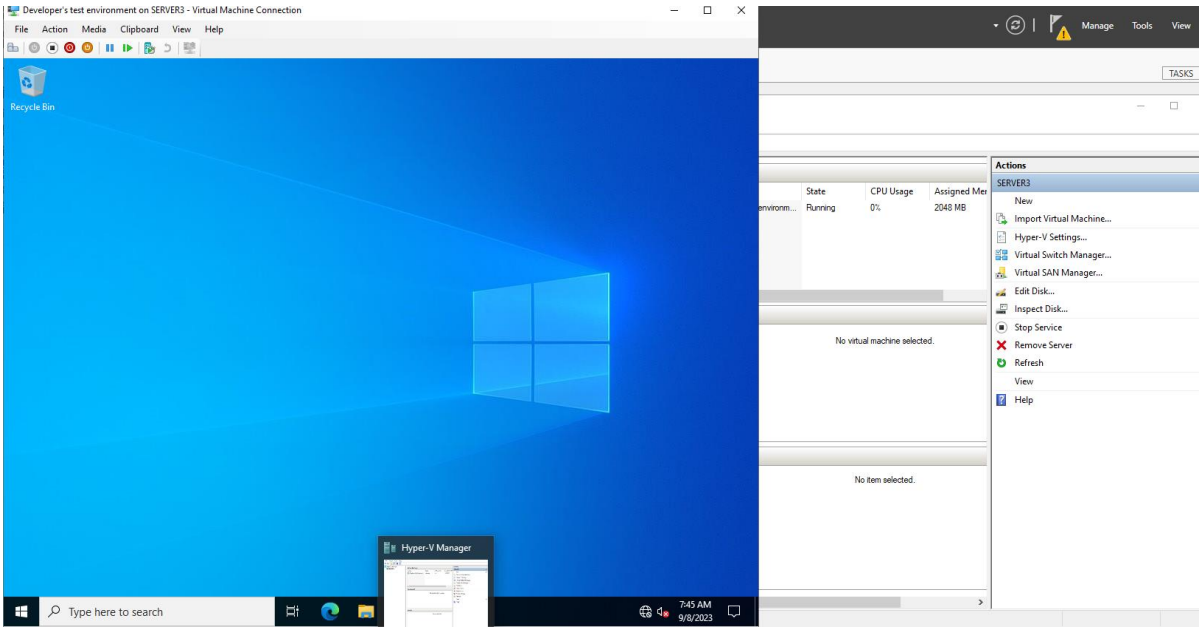
I add an External virtual network switch to the VM



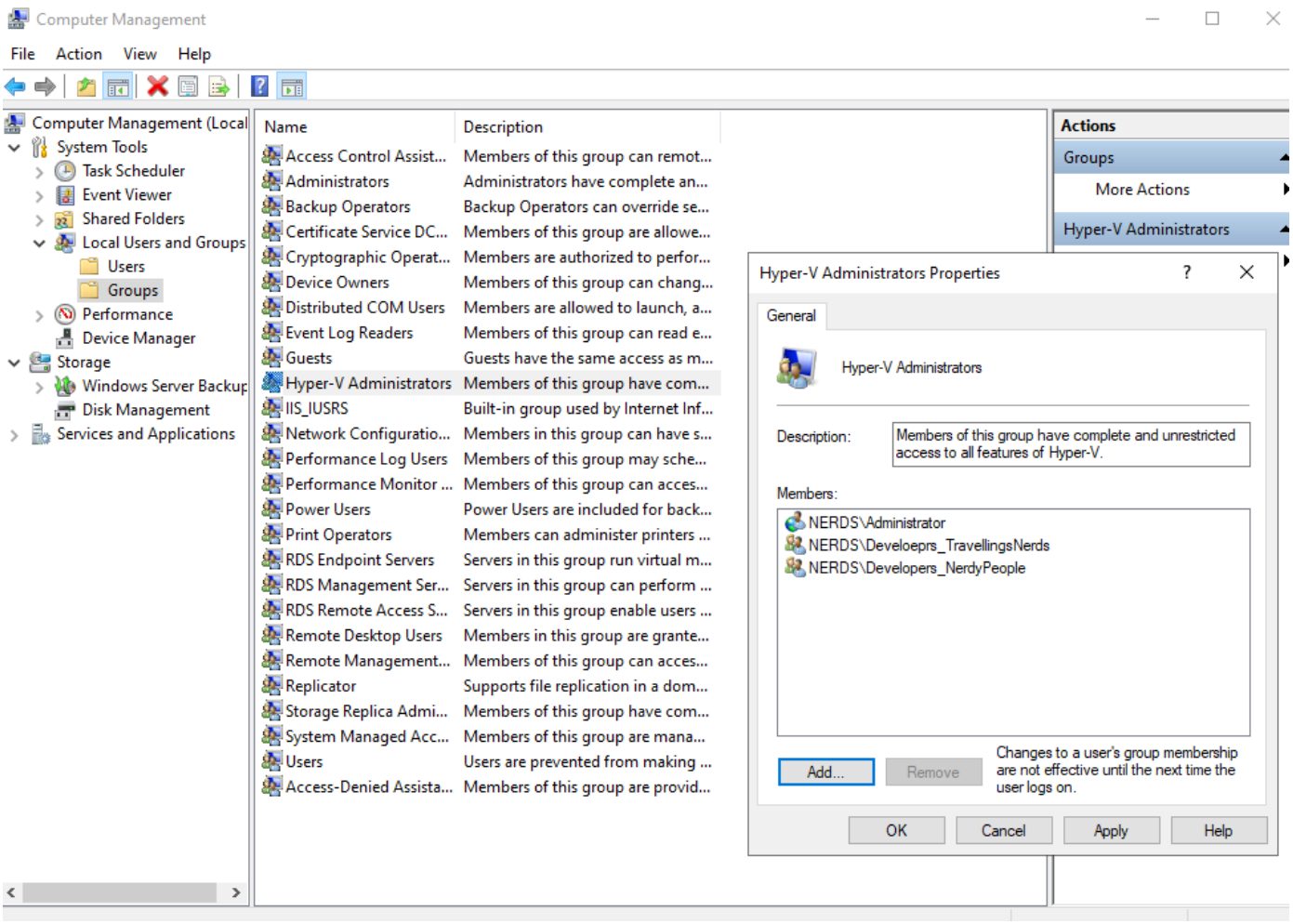
Installation started



Installation was a success, I have now created a test environment.

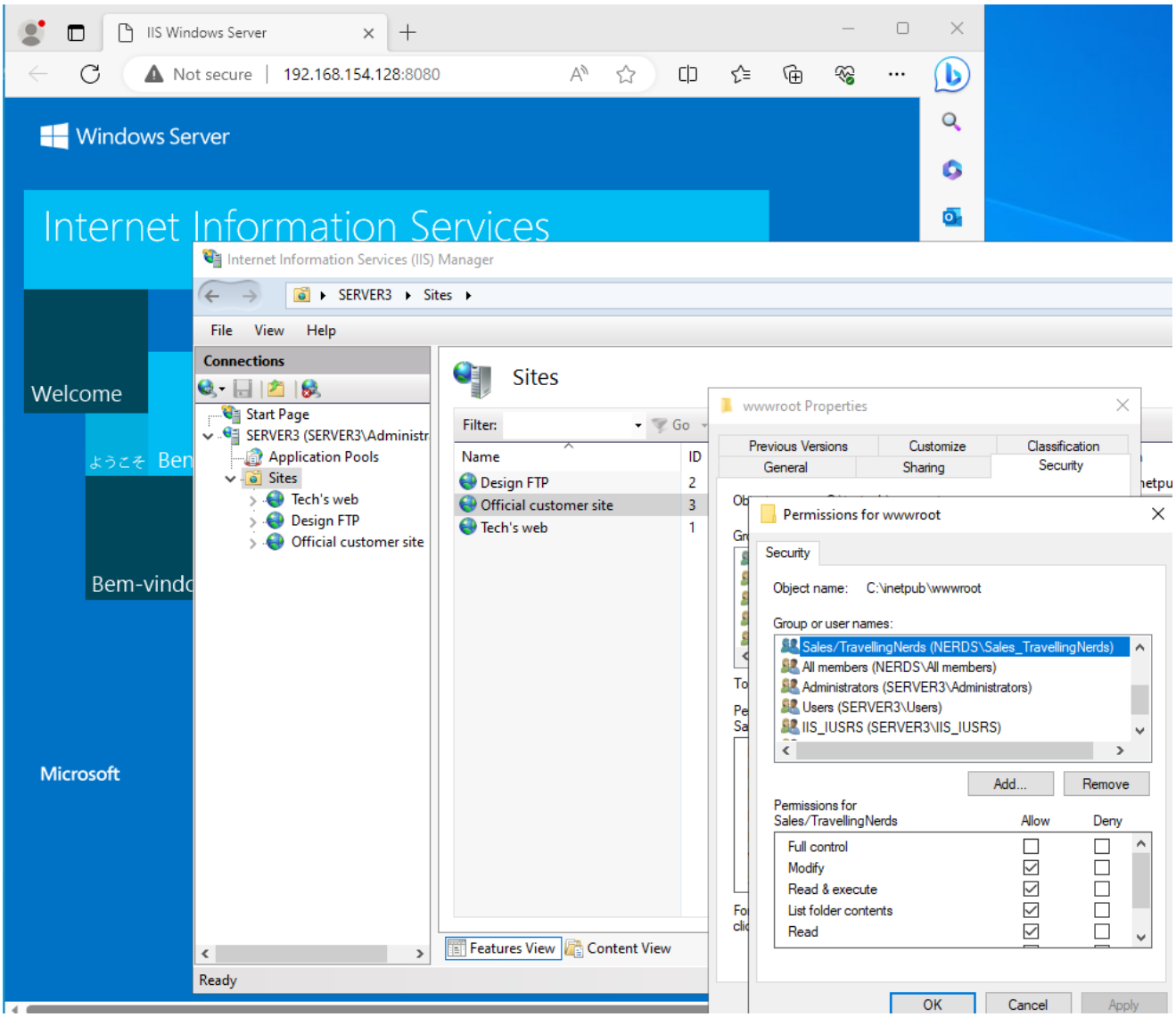


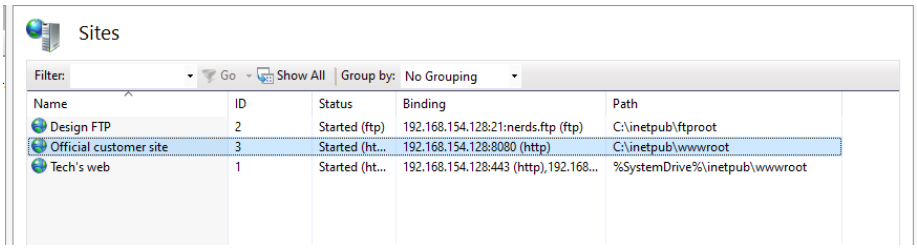
Now I give Hyper V administrator access the developer departments from both “Travelling Nerds” and “Nerdy People” as they are the ones using the test environment. An administrator will always be given access to any role or feature due to maintenace and support purposes.



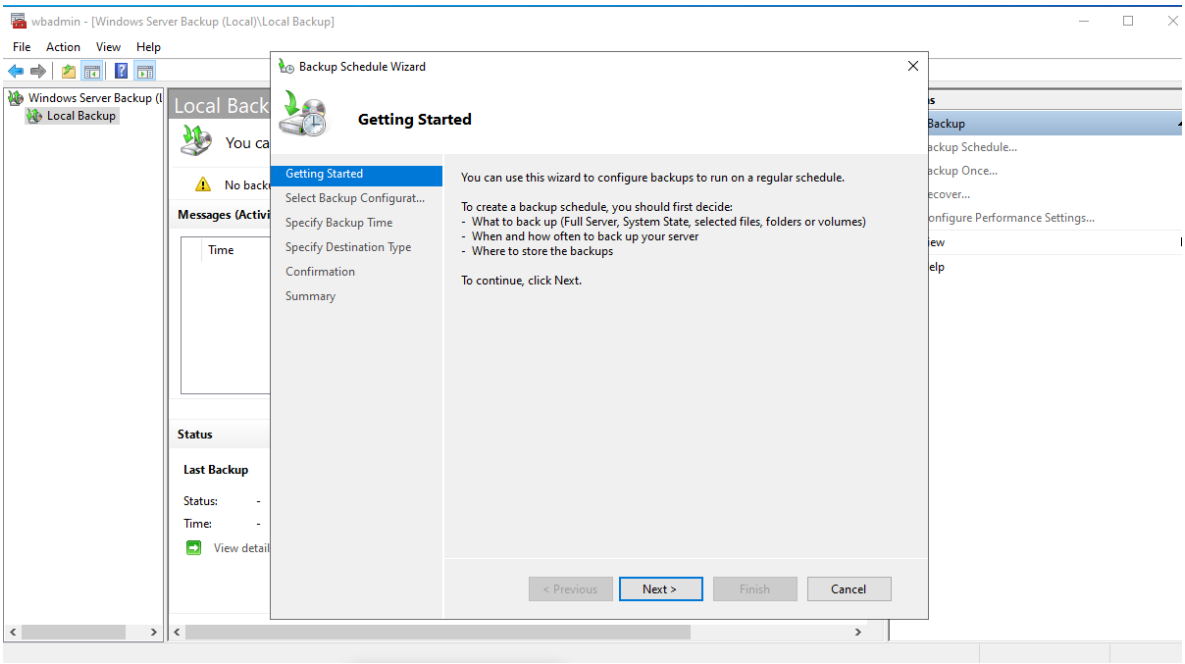
According to the requirements, I add a new site to be managed by the sales departments from both Travelling Nerds and Nerdy People. I create the new site under port “8080” under Ip “192.168.154.128”. The site is accessible from a browser. I edited the permissions to give access to “Sales” departments

from both companies to grant most permissions to Sales departments except absolute full control as that is preserved for administrators. “All members” of the domain have read access, but not much else.

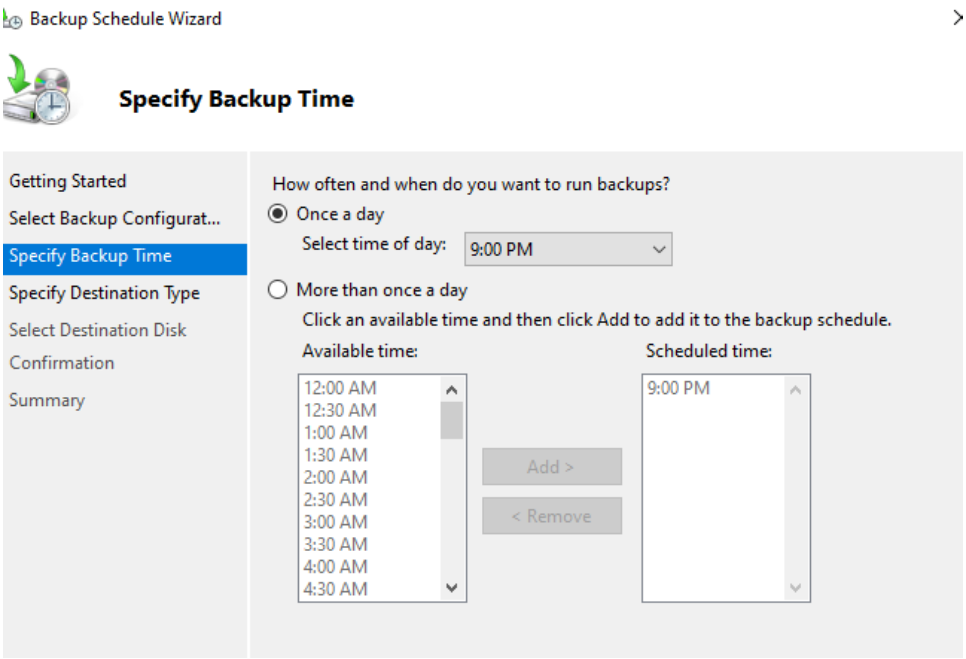




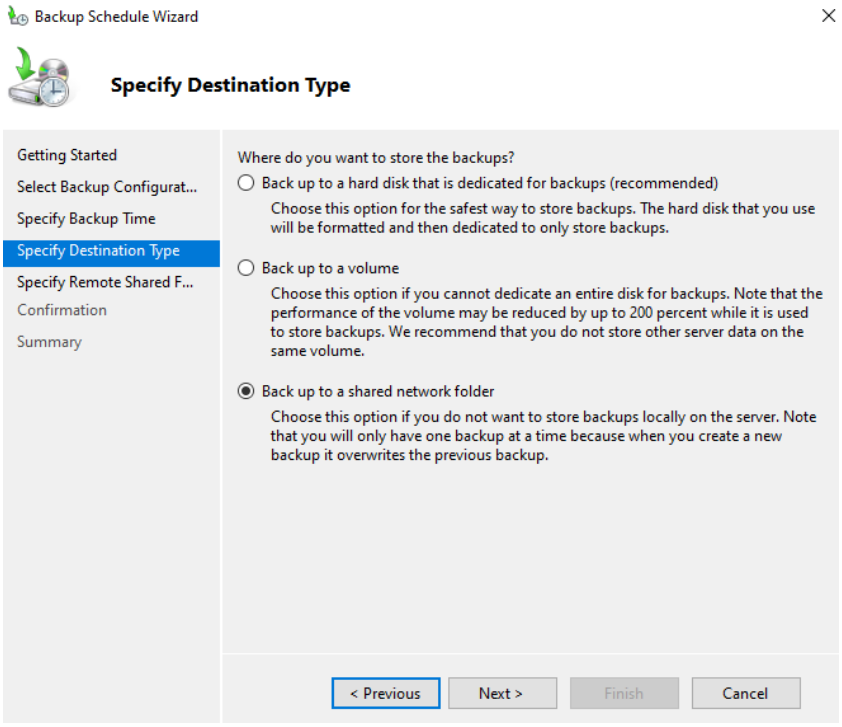
In terms of security the first and probably most important aspect is the creation of backup files. I install the role “Windows Server Backup” and run it once installed. I open the application “Windows Server Backup” and create a new “Backup Schedule”.



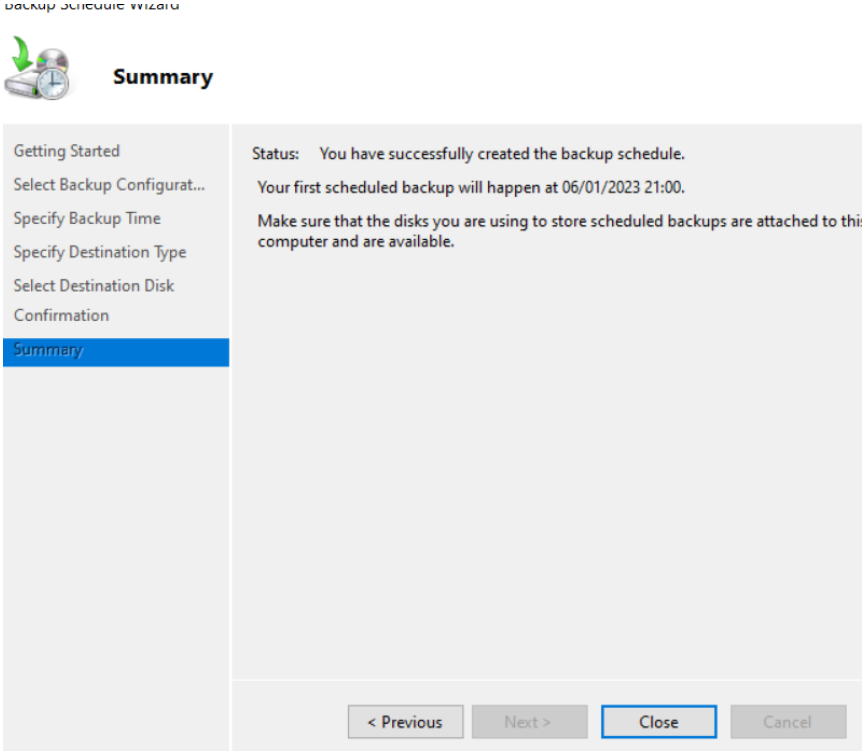
I make sure a new backup schedule of the infrastructure is taken and saved every day at 09.00 PM. Backup schedueles are recommended to be done every 24-48 hours. I have choosen everyday. *(Herrod, 2021)*



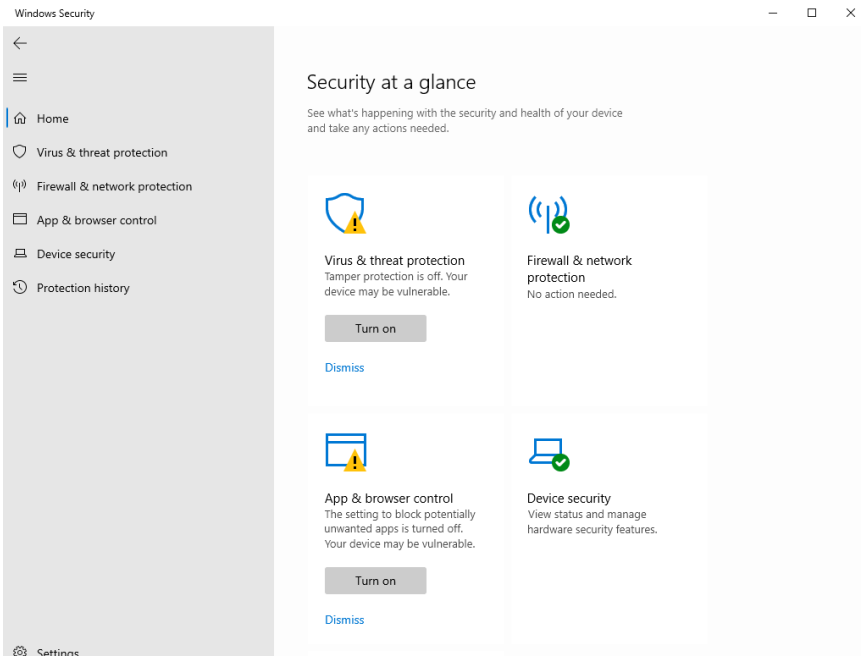
I have chosen to keep the backups on the share network domain folder to limit access for the backups to only domain members.



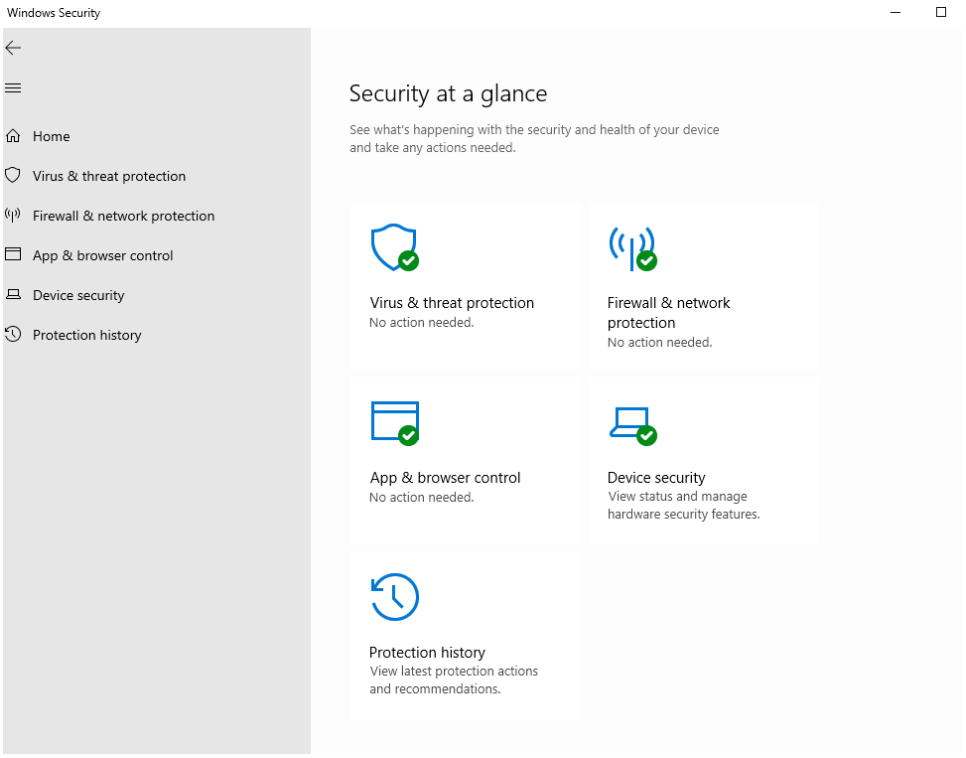
I have successfully created the backup schedule.



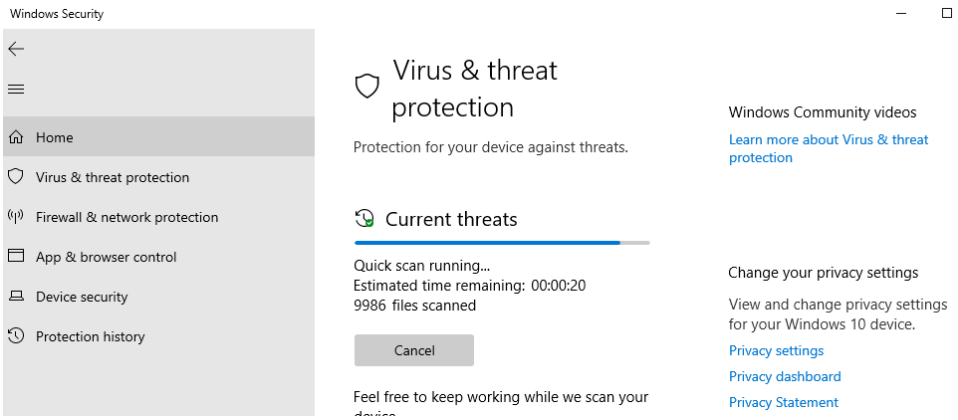
I now go on to open the “Windows Security” on server3 to see the status. I have the option to turn on “Virus and Protection” and “App and browser control”. I turn them both on. I do the same thing on server1 and server2 to make sure all servers are running their security features.



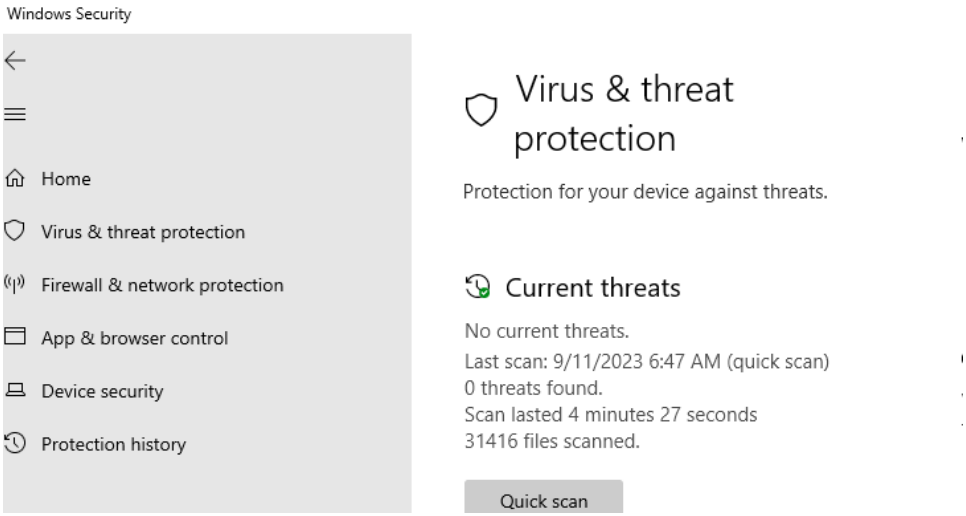
Now all features are running and ready to take on digital threats.



I do a quick scan all server1, server2 and server3 to see of there are any threats facing my servers at this moment.

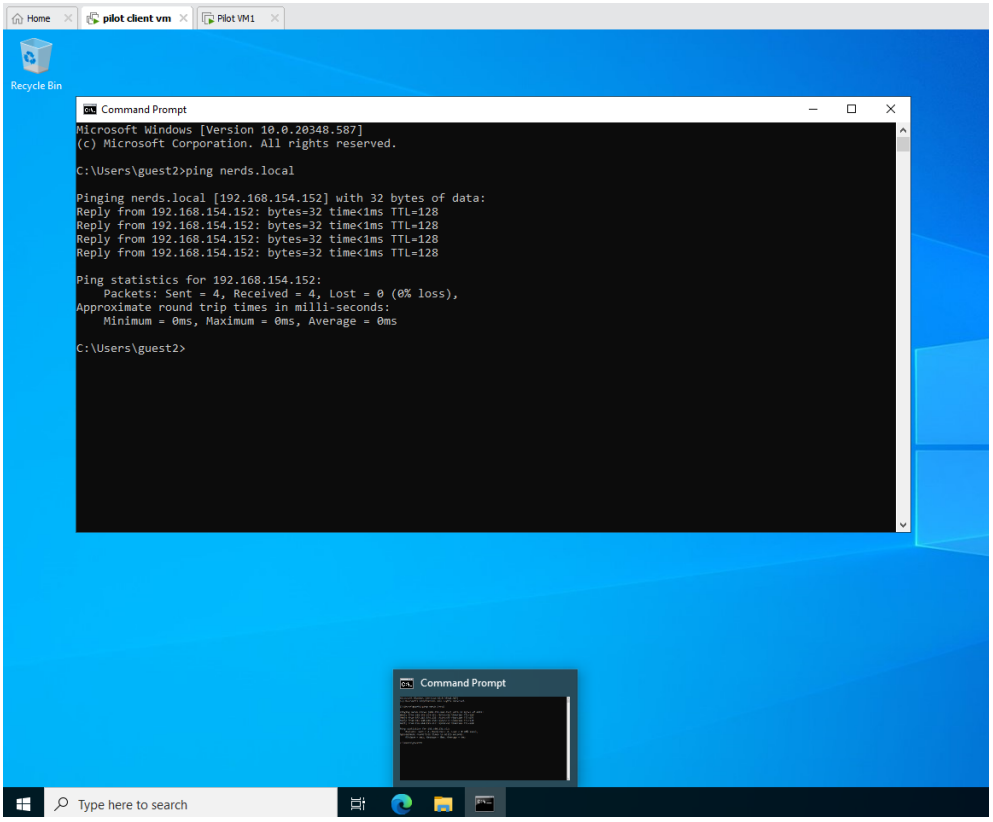


It came out clean on all 3 servers. There are No current threats.

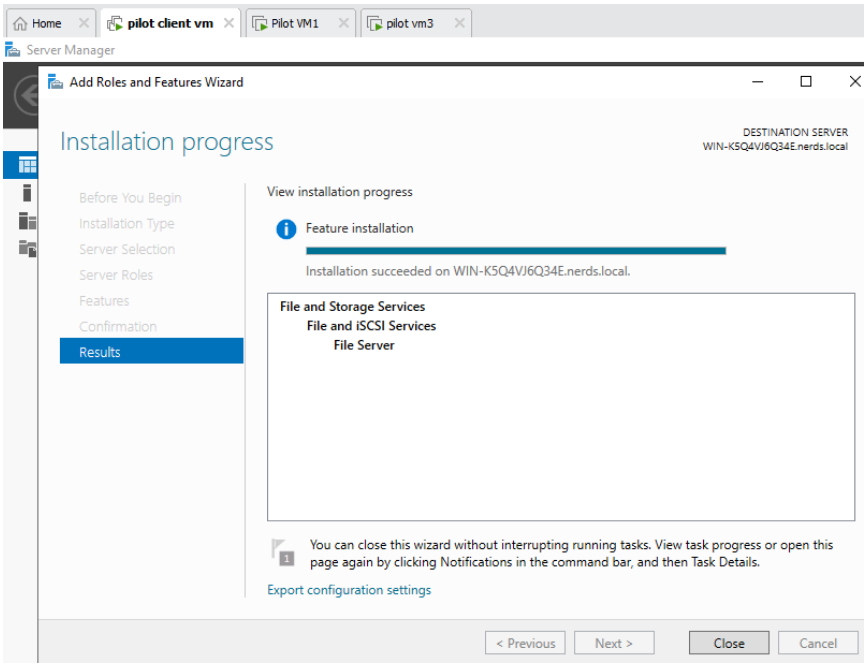


File server

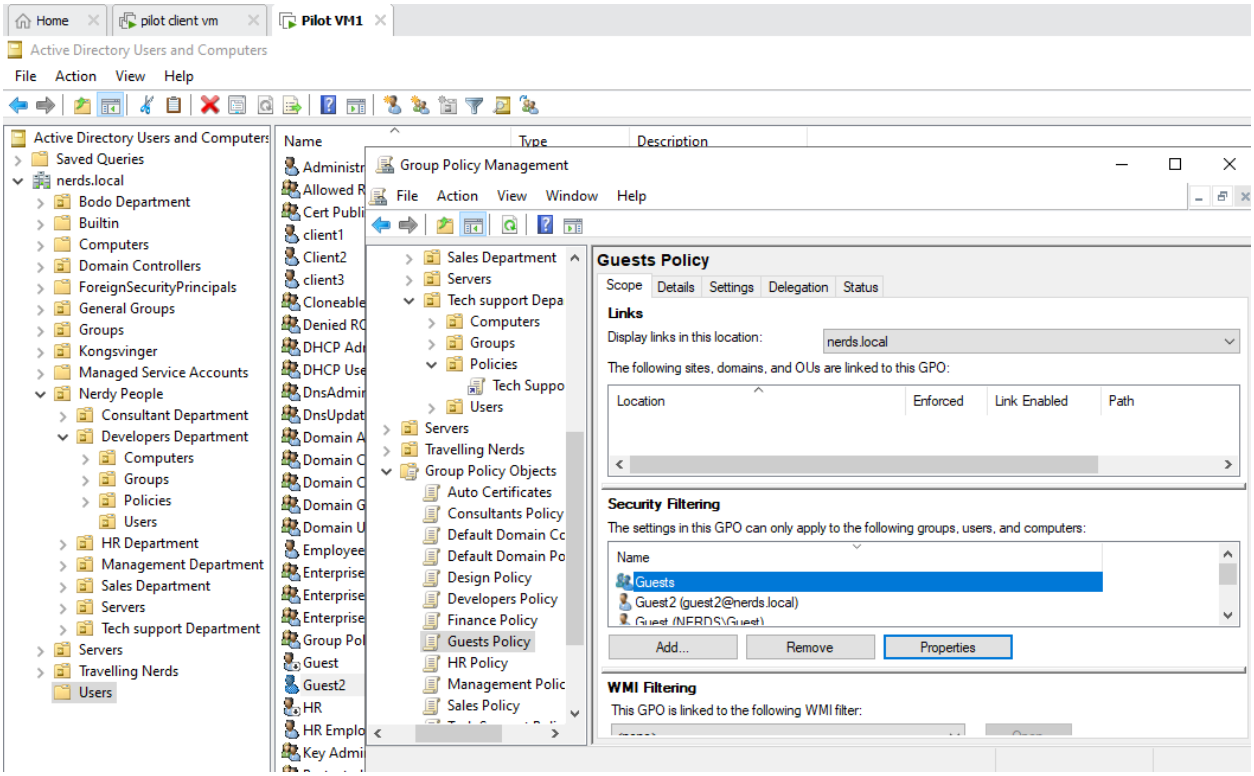
For a guest file server I created a new vm server for guest usage. I configured the static ip and joined the domain.



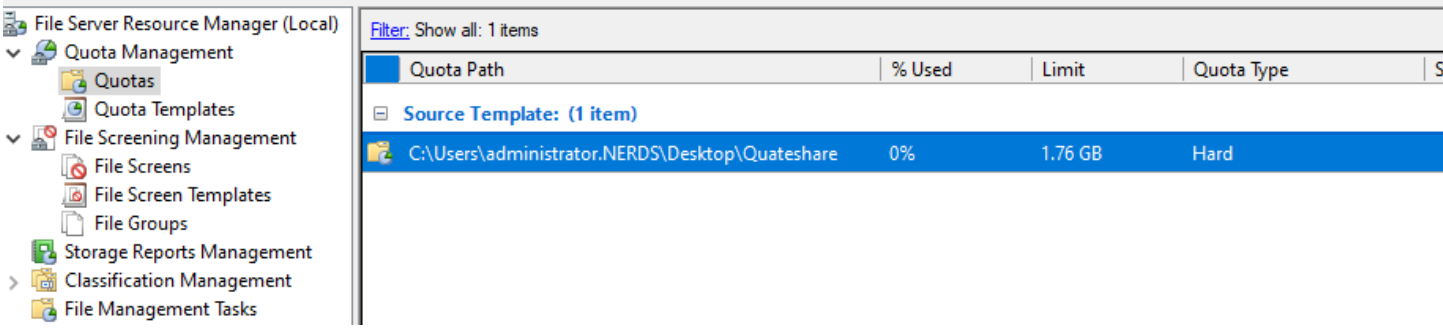
I install the feature “File server” from server manager



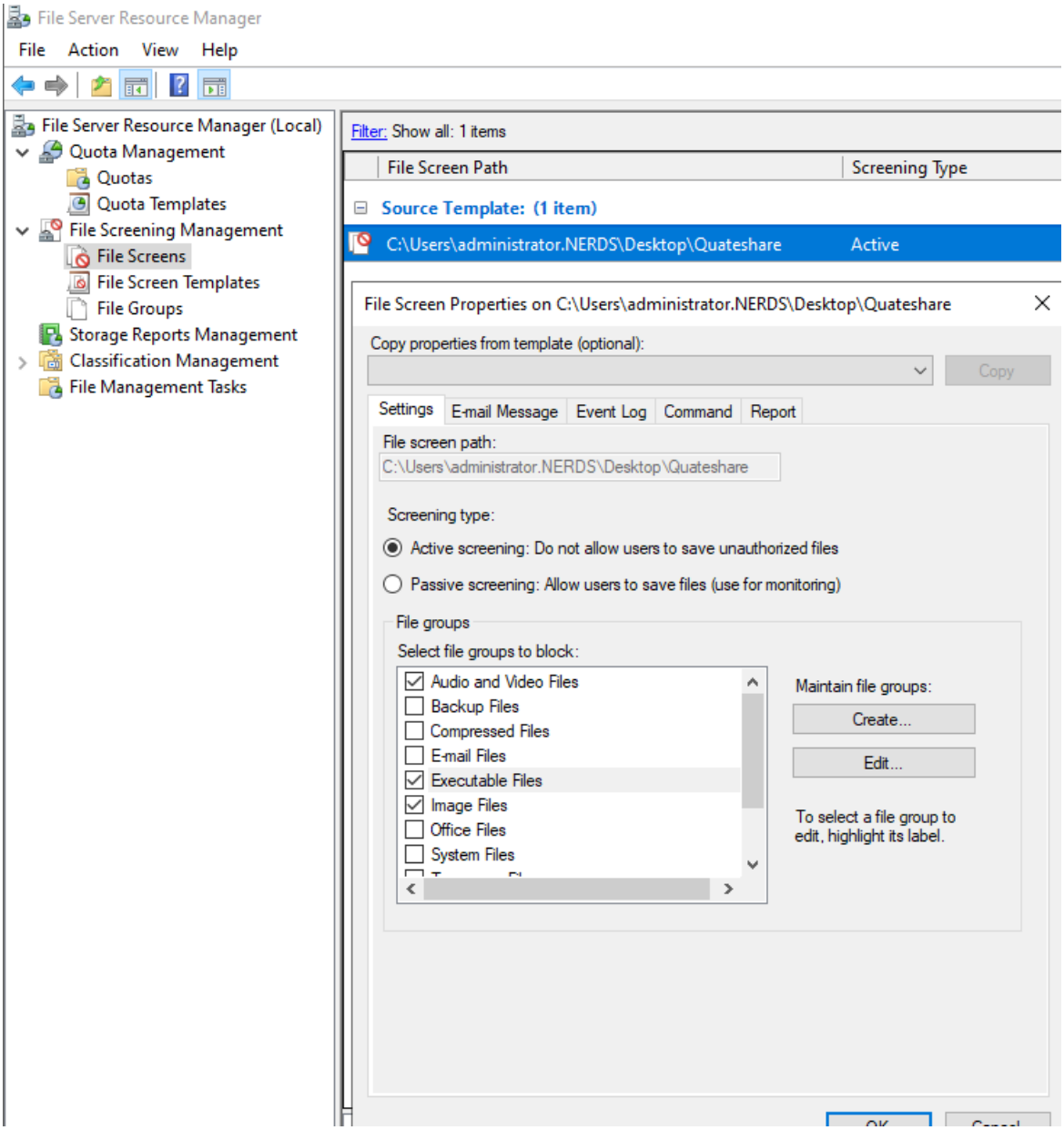
While it is installing, I create a new group policy for the guests accounts where I can set basic permissions.



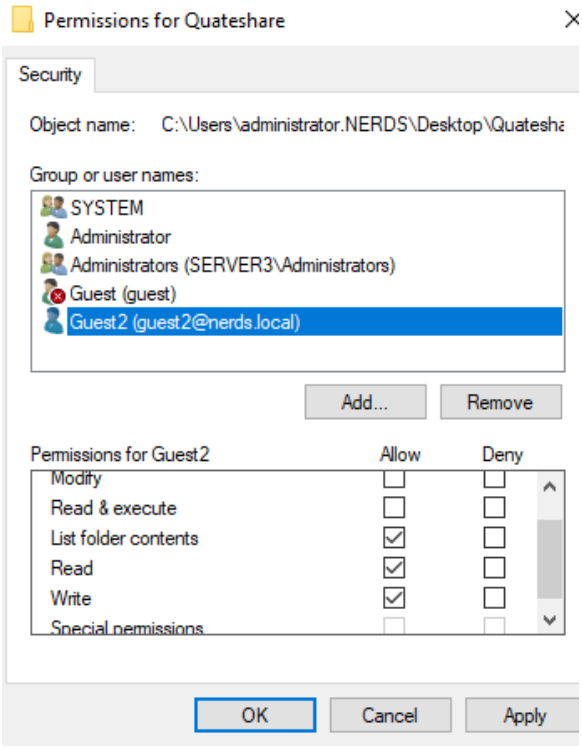
In order to set more spesific permissions inlcuding ability to save certain files, I must create a Quota folder and use that same path to create file screening permissions.



I create file screening using the same path as the quota, I set the permissions to block “Audio & Video”, “Executable files” and “Image files”. I also let “Active Screening” on to prevent users to save these files.



Lastly I go into the actual Quota folder that I named “Quotashare”. Open propertied and enter security section and add the guest accounts. Which are “Guest” and “Guest2”. Set basic permissions here as well



Summary and conclusion

As part of a practical assignment, I designed and implemented a complete server infrastructure for two merging companies, Travelling Nerds and Nerdy People, using Microsoft Server with Desktop Experience. The solution involved configuring core services such as Active Directory, DNS, DHCP, file sharing (DFS), and certificate services, in line with the companies' organizational structure and specific access requirements. I set up users, groups, and permissions to ensure secure and efficient access management across all departments. In addition, I implemented scheduled backup routines across three critical servers to ensure data security and business continuity. All configurations and processes were documented thoroughly throughout the project.

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