

## INFO813 Practical project documentation template (Engineering journal)

### Stage Number 4

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When doing practical work it is common practice and extremely useful to document the steps you took. This assists you make your learning more tangible and organize it. The more detail you can provide the better it is so that if ever you want to configure it in the future you have a personal record documented.

The project book gives the main implementation steps. However this documentation report requires you document what you did at each implementation step as you are doing the practical project. It is not advised to do this at the end otherwise you are likely to forget what you did. You can alter the format of this template as long it includes all the relevant information

Please write this in your own words as it is a record of your work. Copied material is not accepted.

Describe the Design of your project and justify your design. (100 words)

My project includes a Windows 10 22H2 Pro client, a Windows Server 2022 configured as an IIS web server and DHCP server, a FortiGate firewall for routing and security, and a TrueNAS server hosted on Hyper-V as the Network Attached Storage (NAS) solution. The NAS is configured with user-specific datastores, ensuring users can save information securely and access their allocated storage. Windows Server Backup is used to synchronize server folders with the NAS weekly, maintaining data redundancy and safeguarding against data loss. The Windows 10 client receives automated IP configuration via DHCP and accesses the organization's webpage hosted on the IIS server. Group policies are implemented to provide role-specific desktop wallpapers, restrict control and command prompt access for non-administrative users to enhance security, and enforce password policies across all users. This design provides a realistic, secure, and practical solution by replacing a simulated topology with a functional TrueNAS server. It ensures data integrity, aligns with enterprise best practices, and provides hands-on experience with real-world configurations while meeting all assignment requirements.

Describe the key features of one competing/alternative technology and compare it to the one implemented in the project (Pros and Cons). (200 words)

#### **Comparison of TrueNAS and Synology NAS**

##### **Key Features of Synology NAS:**

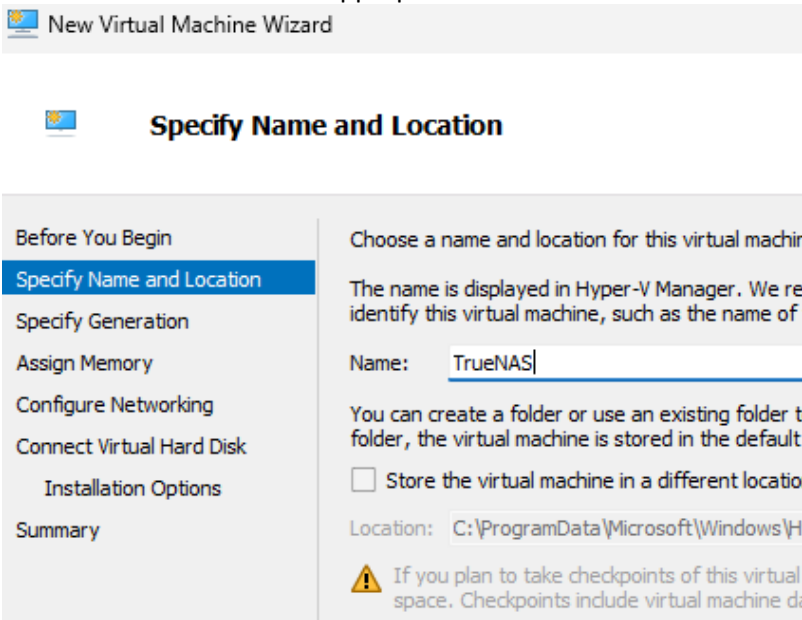
Synology NAS is a popular network-attached storage solution offering user-friendly software and hardware integration. Its DiskStation Manager (DSM) operating system provides a web-based interface with features like file sharing, data synchronization, and robust multimedia management. Synology NAS supports RAID configurations, integrated backup tools, and third-party app support, making it ideal for personal and small business use.

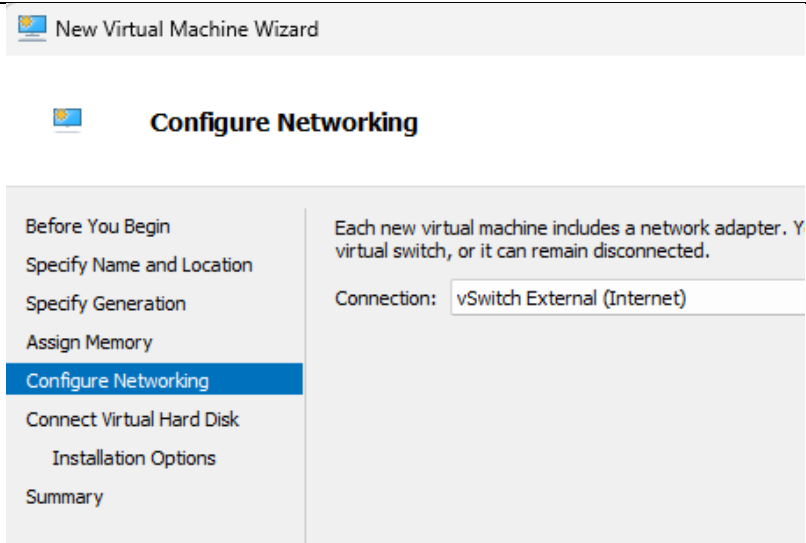
##### **Comparison with TrueNAS:**

- **Ease of Use:** Synology NAS offers a highly intuitive interface with a shallow learning curve, while TrueNAS requires more technical expertise for initial setup and management.
- **Cost:** TrueNAS can be installed on existing hardware, making it cost-effective, whereas Synology requires purchasing proprietary hardware.
- **Flexibility:** TrueNAS provides more customization options and supports ZFS for advanced file system management. Synology's features are streamlined but less customizable.
- **Performance:** TrueNAS, leveraging ZFS, offers superior data integrity, scalability, and snapshot capabilities, making it suitable for enterprise-level deployments. Synology NAS is optimized for small to medium-sized businesses but lacks TrueNAS's robustness for heavy workloads.
- **Backup and Synchronization:** Synology excels in seamless integration with cloud services and user-friendly backup solutions, while TrueNAS offers powerful but more complex backup configurations.

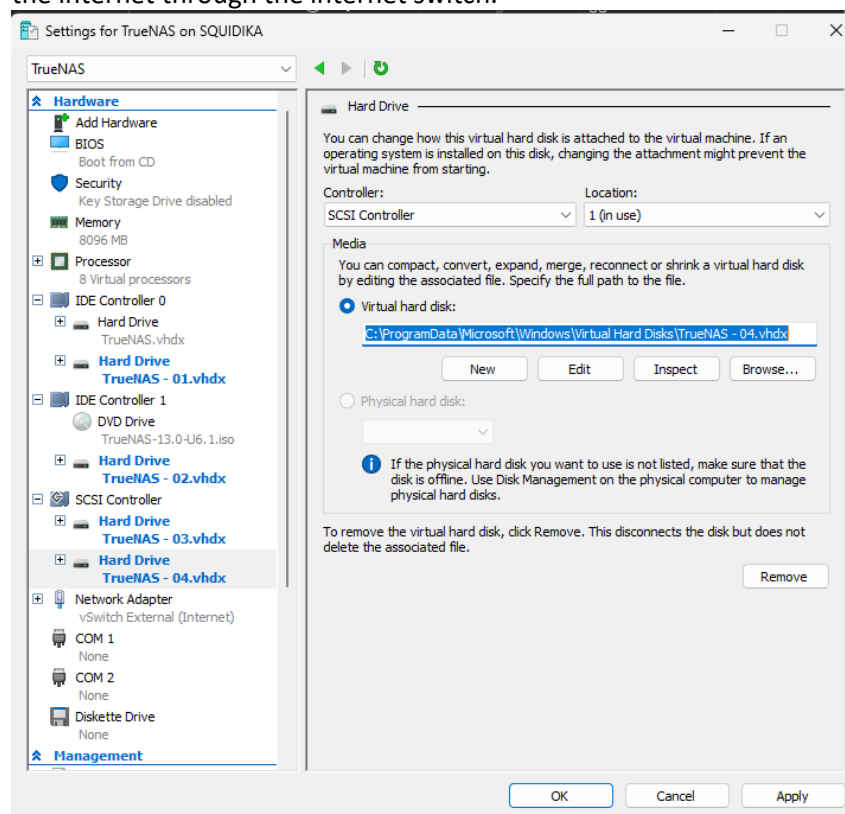
#### Conclusion:

TrueNAS is better for enterprise environments requiring scalability, flexibility, and advanced file system management. Synology NAS is ideal for users seeking an all-in-one, user-friendly solution with minimal setup.

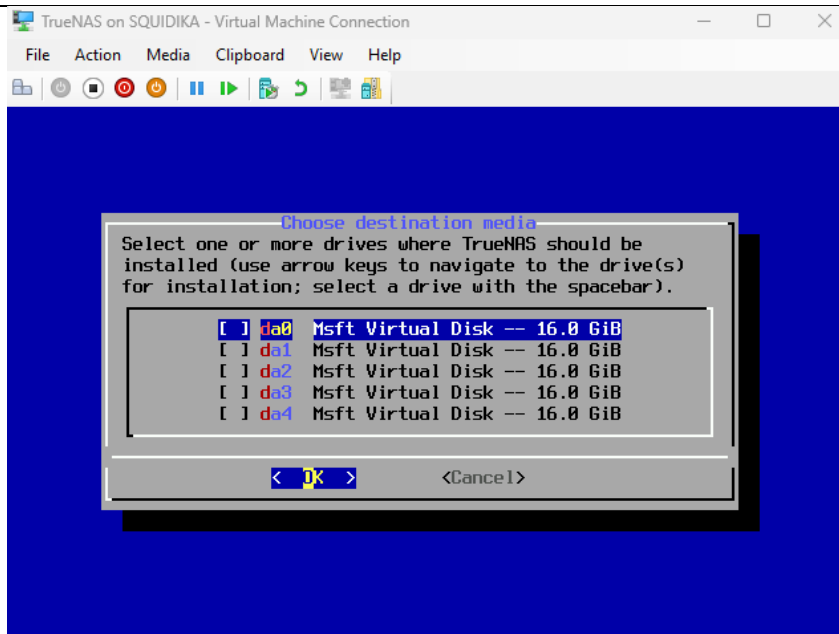
Section summary	Implementation details at each step e.g. screenshots, written steps, value of settings, commands used, results, answers to questions etc where applicable.	Justification if needed
TASK 1	<ul style="list-style-type: none"> <li>• Configure your Network attached storage (NAS) server with datastores for each user to save information. Ensure users can save information to the appropriate datastores</li> </ul>  <p>Create new virtual machine named TrueNAS in Hyper-V</p>	



We want to access the NAS server from the browser, so we give it access to the internet through the internet switch.

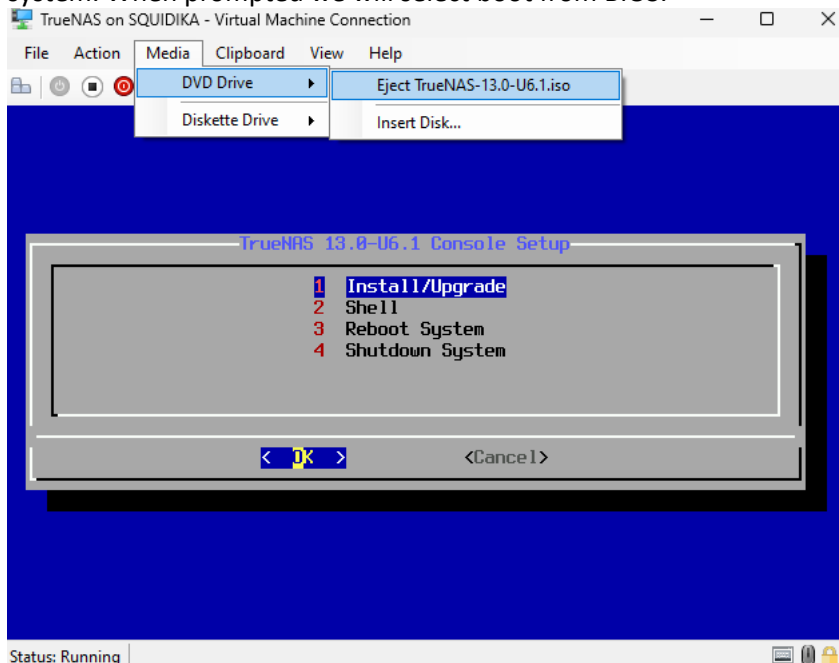


As this is a network attached storage, we will need multiple hard drives attached to the server, as well as a drive to maintain the operating system of the server.

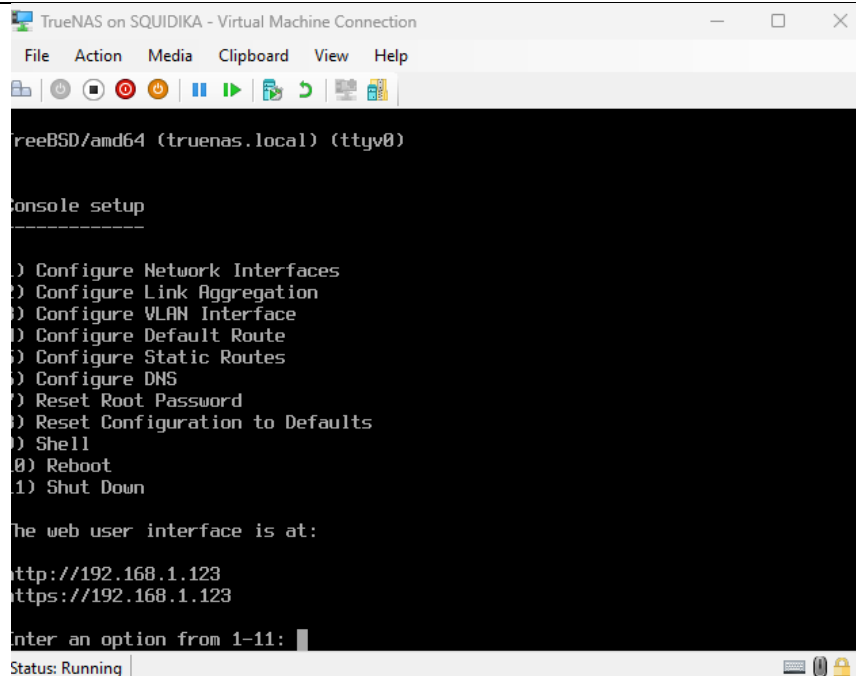


Status: Running

Start the virtual machine, and select hard drive 0 to host out operating system. When prompted we will select boot from BIOS.



When installation is complete, we must eject the TrueNAS iso, and reboot the virtual machine.



```
TrueNAS on SQUIDIKA - Virtual Machine Connection
File Action Media Clipboard View Help

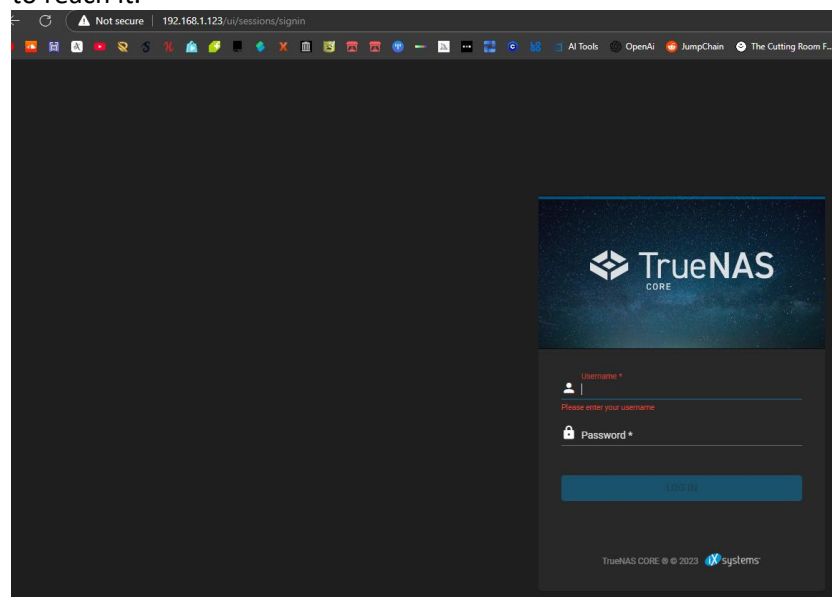
treeBSD/amd64 (truenas.local) (ttyv0)

console setup
-----
1) Configure Network Interfaces
2) Configure Link Aggregation
3) Configure VLAN Interface
4) Configure Default Route
5) Configure Static Routes
6) Configure DNS
7) Reset Root Password
8) Reset Configuration to Defaults
9) Shell
10) Reboot
11) Shut Down

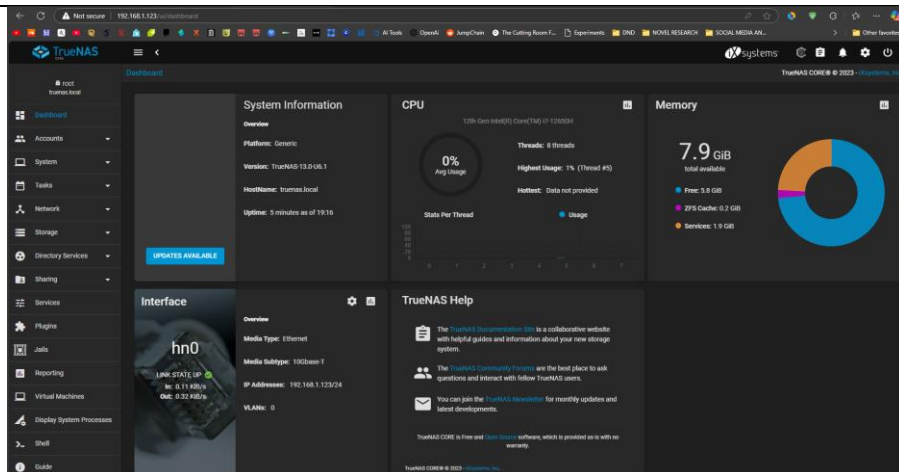
The web user interface is at:
http://192.168.1.123
https://192.168.1.123

Enter an option from 1-11:
Status: Running
```

When reboot is complete, the TrueNAS server should generate an IP address using one taken from your home router, we can use the browser to reach it.

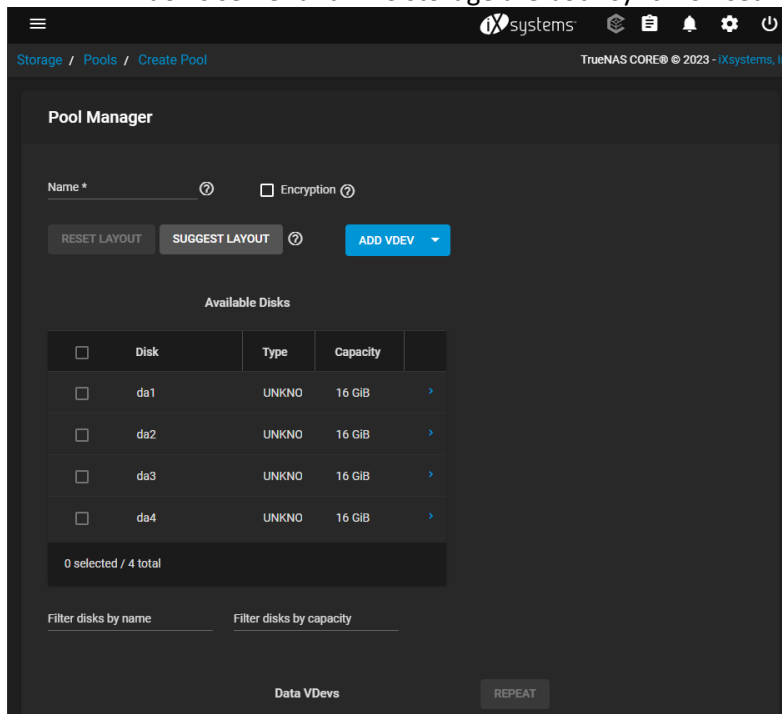


Accessing the web ui through the server ip address. We use the default username and root password we set during creation to login. In this case, username: root password: eve

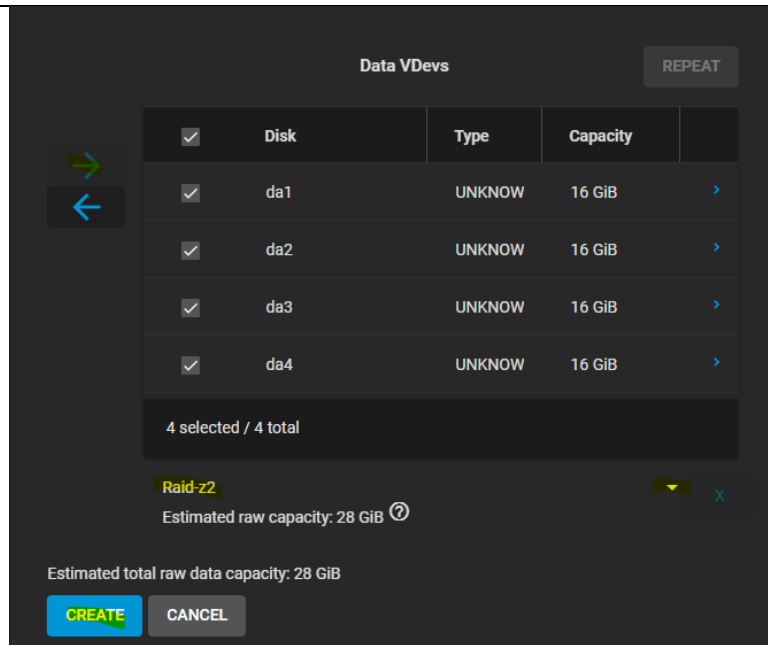


## TASK 2

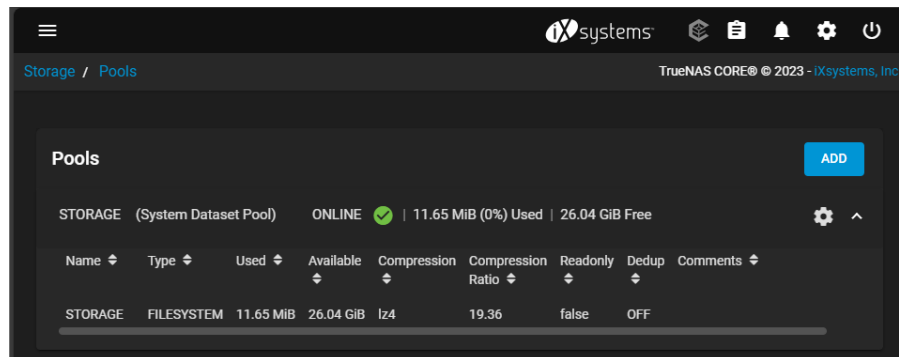
- Use Windows server backup service to backup any work saved on the Windows server folders to the NAS server once a week. I.e the windows server and NAS storage are both synchronised.



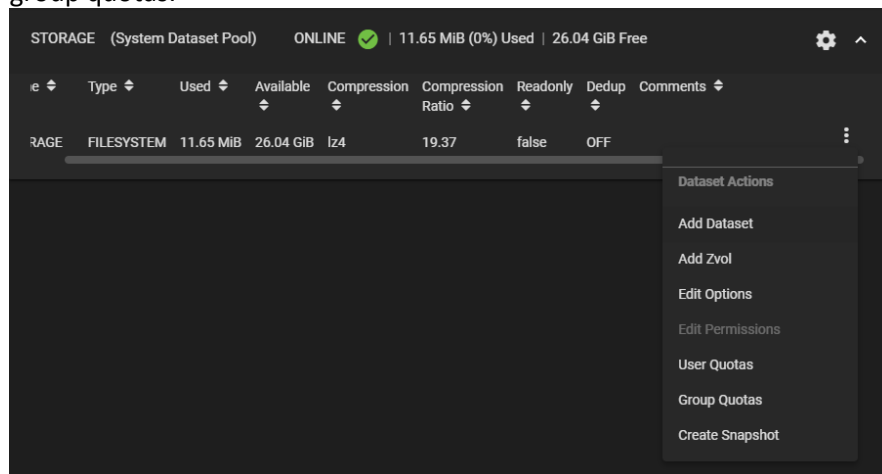
Now that the TrueNAS server is set up, we need to create pools for our hosts to interact with and access.



Press the blue arrow on the top to move all drives into the Data VDEVs that we want to add to the storage pool. Depending on the amount of drives, we can also set the type of RAID we want to assign this pool. We will use the default Raid v2.



The pool is now created, and we can assign it data points, such as user or group quotas.



Now we must enable the share with our windows host by going to the sharing pane.

Sharing / SMB / Add

TrueNAS CORE © 2023 - iXsystems, Inc.

**Basic**

Path \*  
/mnt/STORAGE

Name  
STORAGE

Purpose  
Default share parameters

Description

☒ Enabled

SUBMIT CANCEL ADVANCED OPTIONS

We must select the storage pool that we created before this.

Accounts / Users

TrueNAS CORE © 2023 - iXsystems, Inc.

**Users** Filter Users COLUMNS ADD

Username	UID	Builtin	Full Name
root	0	yes	root

1 - 1 of 1

Now we must create a new user for our admins to access and configure.

Accounts / Users / Add

TrueNAS CORE © 2023 - iXsystems, Inc.

**Identification**

Full Name \*  
ADMIN

Username \*  
admin

Email  
admin

Password \*  
\*\*\*\*\*

Confirm Password \*  
\*\*\*\*\*

**User ID and Groups**

User ID \*  
1000

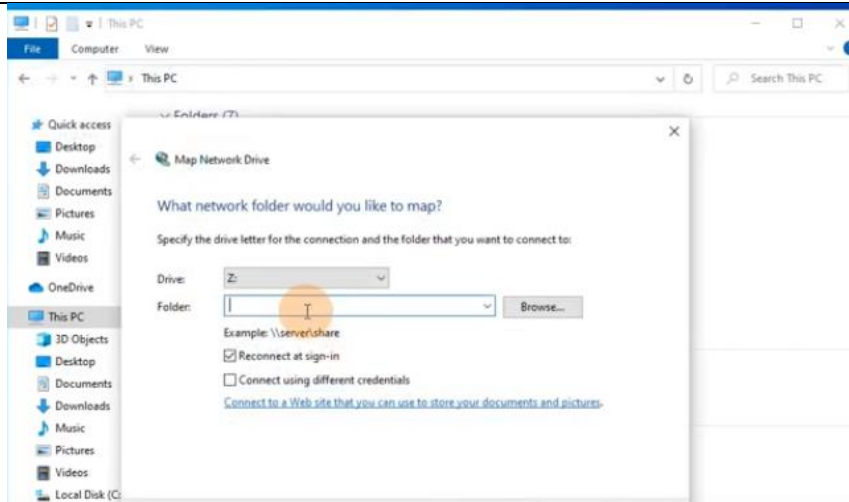
☒ New Primary Group

Primary Group

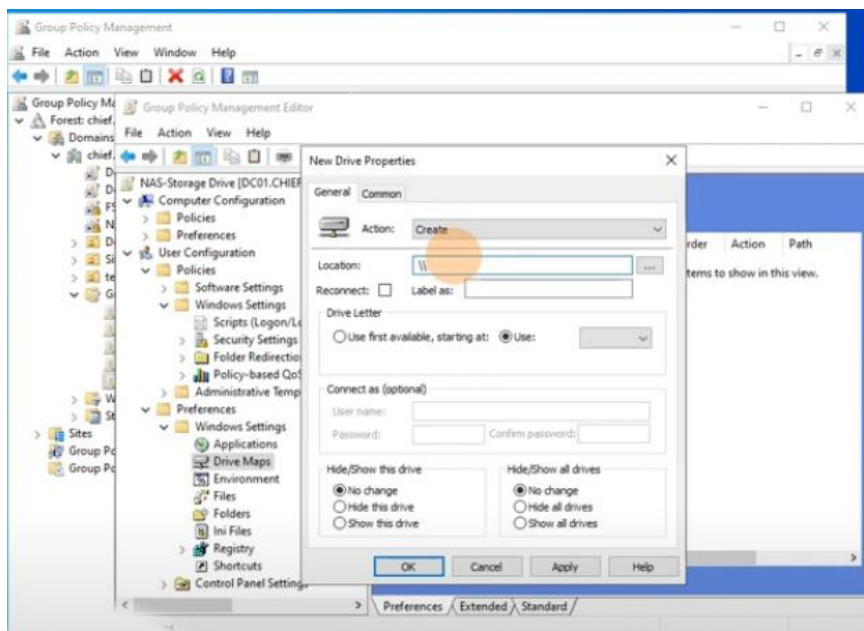
Auxiliary Groups

Creating a new admin account.





Now that is complete, we can go to our windows server and add the NAS storage as a new network drive. We point it towards the IP address of our TrueNAS storage \\192.168.10.255\



We go into our group policy manager, and add it to our default windows settings drive maps, so our hosts can access it using GPO.

List the three most useful Internet resources that you used (provided by the tutor)

<https://www.youtube.com/watch?v=WjLaK8yQAag>

<https://kb.netgear.com/19864/How-do-I-map-a-network-drive-in-Windows>

<https://www.youtube.com/watch?v=juMz3WcZB4U>

List all (at least three) Internet resources that you found and used that were not provided by the tutor)

<a href="https://www.youtube.com/watch?v=G3TJzimUt38">https://www.youtube.com/watch?v=G3TJzimUt38</a>
<a href="https://www.youtube.com/watch?v=juMz3WcZB4U">https://www.youtube.com/watch?v=juMz3WcZB4U</a>
<a href="https://www.youtube.com/watch?v=2xbaElRa7zM">https://www.youtube.com/watch?v=2xbaElRa7zM</a>

Reflect on at least two significant problems you came across during the implementation of this section and the solution you found. Use at least five sentence to describe each problem and five sentences to describe each solution. Demonstrate your critical thinking and problem-solving abilities.

Problem	Solution
Extra drives not installed on server and not appearing.	Re-create the drives using the hyper-v manager and assign them one by one.
TrueNAS is no longer available on the free version of EVE-NG, and requires EVE-NG pro to use.	We re-create the lab on Hyper-V instead and virtualize the server.