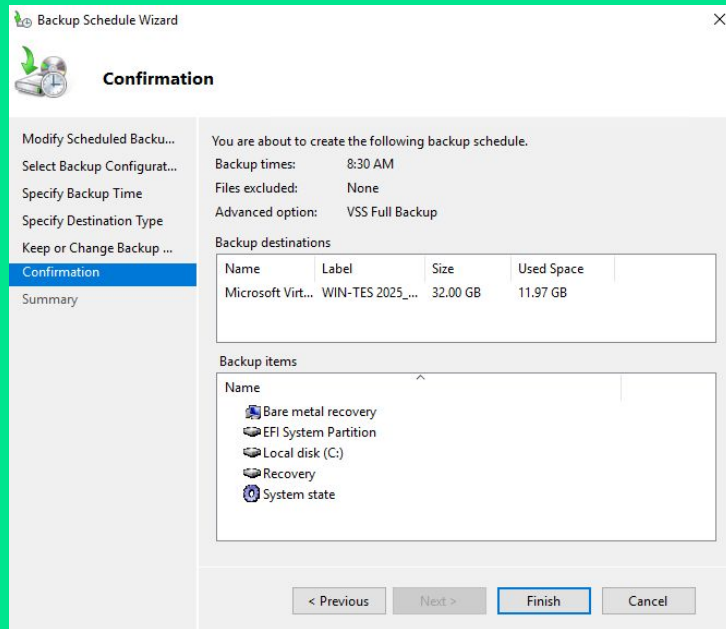


The Usefulness of Windows Server & Backups

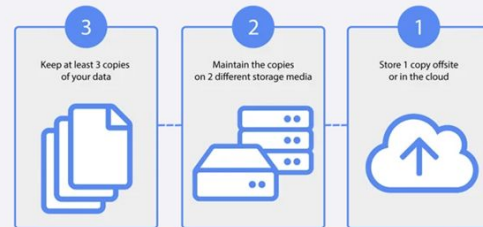
Trey Atwood

What are the best backup practices?

Ensuring that your backups are reliable is important. Some of the best practices to ensure that your backups are going to be reliable are; to make sure you have multiple backups. Having more than one backup ensures that in case of one of your backups being corrupted you have another one ready to upload. It's a simple solution but an effective one. Another practice is to make sure that you store your backups somewhere offsite, ensuring that if something were to happen to the servers that the backups are stored elsewhere and wouldn't be affected. Implementing the "3-2-1" backup rule; maintain three copies of your data, store two of these copies on different storage devices, and keep one copy offsite. This strategy insures that you will have a safe backup that will be able to be implemented correctly and well. Using built in windows features is another good practice, features like WSB can create automated backups daily, weekly, or monthly to your specifications.



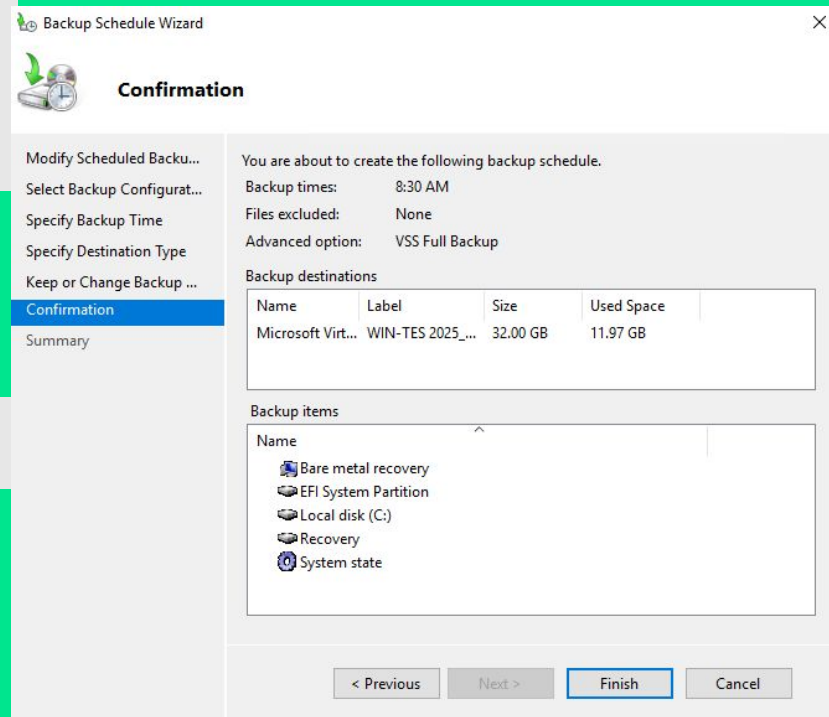
The 3-2-1 Backup Rule:



- Have 3 copies of your data
- Stored on different types of media
- With 1 backup kept offsite

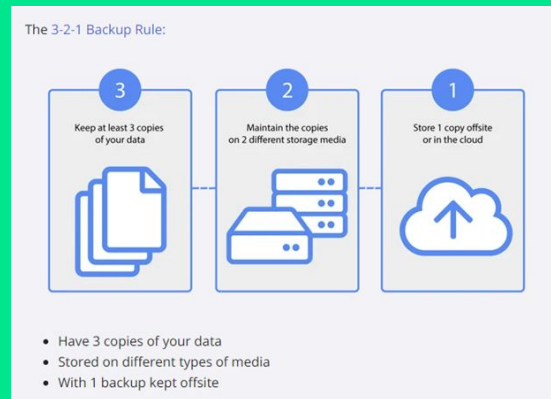
What are the backup options for a windows server?

The native windows server backup options are limited, but they still enable you to be able to perform a full server backup. In the WSB feature in Server Manager you can create a custom configuration to enable you to pick and choose what is saved and where it is saved to. WSB is best used if its a small operation, that only has a few servers and only needs for basic backup features. Options like day and time of day for the save, as well as where the backup will be stored are what's available with WSB.



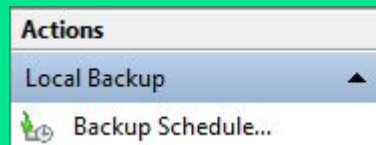
My recommended options for windows backups

My recommendations for windows backups are as follows, ensure that you are following the “3-2-1” backup rule. Ensuring that you always have at least one copy of your backup stored off-site in case the site is destroyed is vital. Using a third party software like Veeam Backups, using Veeam you have more features as to what you can save in a backup, it allows you to backup VMs, SQL and Windows servers. Store saves in a secure cloud, doing so gets rid of the hassle of having an off-site backup hard drive somewhere external of the company. Allowing you to download from the cloud streamlines the process of having to rebuild a server if something were to happen.



How to perform a windows backup

Performing a windows backup is easy. Inside Windows Server Manager there's an option called Windows Server Backup. This is a basic backup function, and is simple to use. First you want to create a new backup schedule, to do this you click "Backup Schedule", inside this window hit next, make sure "Full Server" is selected hit next. On the next screen you can select what time and day you want the backup to be saved automatically. For this we have it set daily at 8:30 AM, hit next. Make sure you have "Back up to ... for backups", hit next. Ensure keep current backup destinations is selected, hit next then finish and you successfully set up an automated windows server backup.



What type of configuration do you want to schedule?

☒ Full server (recommended)

I want to back up all my server data, applications and system state.

Backup size: 12.00 GB

How often and when do you want to run backups?

☒ Once a day

Select time of day: 8:30 AM

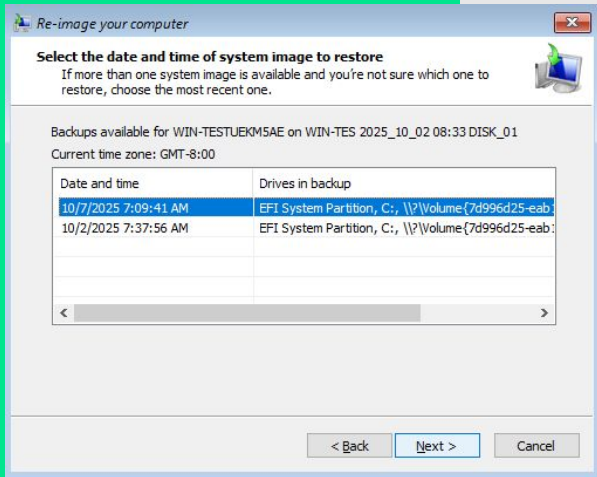
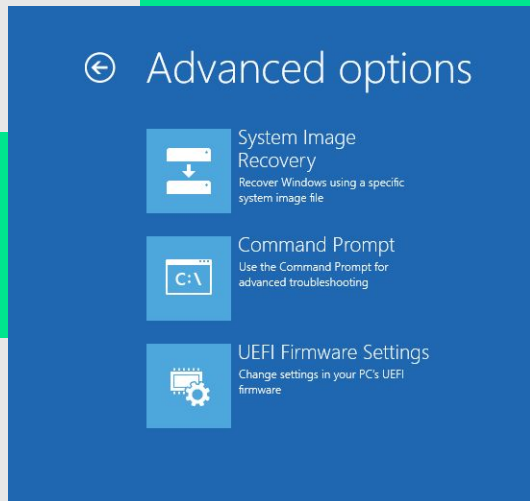
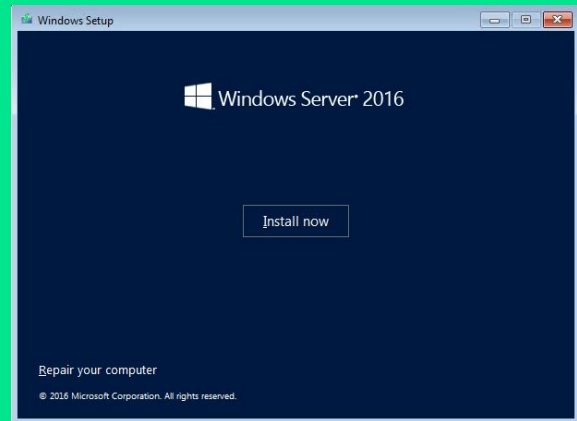
Where do you want to store the backups?

☒ Back up to a hard disk that is dedicated for backups (recommended)

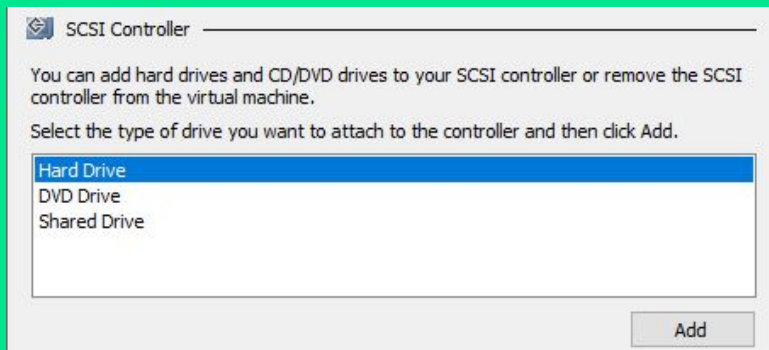
Choose this option for the safest way to store backups. The hard disk that you use will be formatted and then dedicated to only store backups.

How would you recover a server from a disaster?

Recovering a server from disaster is more difficult than saving a backup, recovering a server starts with buying new equipment for the server. Once you have the basic needs for a new server setup that's when your backups come into play. You'll need a Windows Server OS on a thumb drive, and plug that into your server. Upon startup press space, and a screen saying to "install now" will popup, instead click "Repair your computer" and this will start the process to upload a backup. Follow the troubleshooting steps, and when prompted to select your backup from the cloud, or hard drive that you have plugged into the computer select the most recent backup that you have saved. The only situation you wouldn't want the most recent backup is if you were just recently hit with a ransomware attack, in this case the backup is likely still encrypted from the attack and you should choose the next most recent backup.

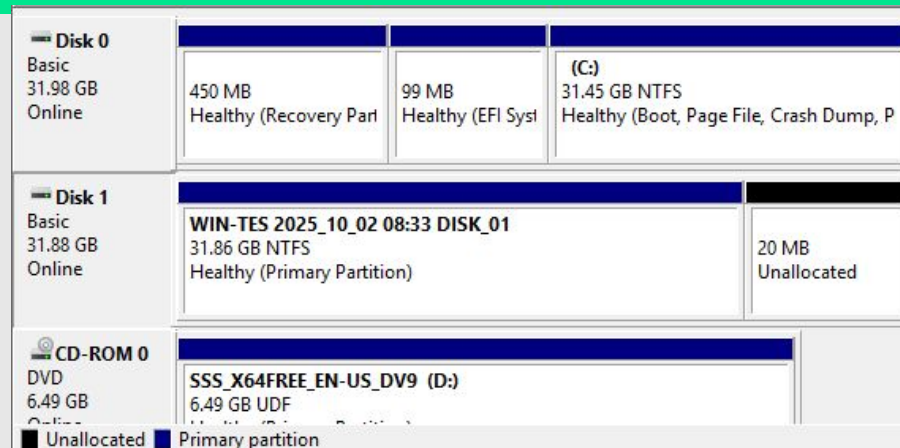


In order to start we need to add a new drive on our windows server to upload our backups to.



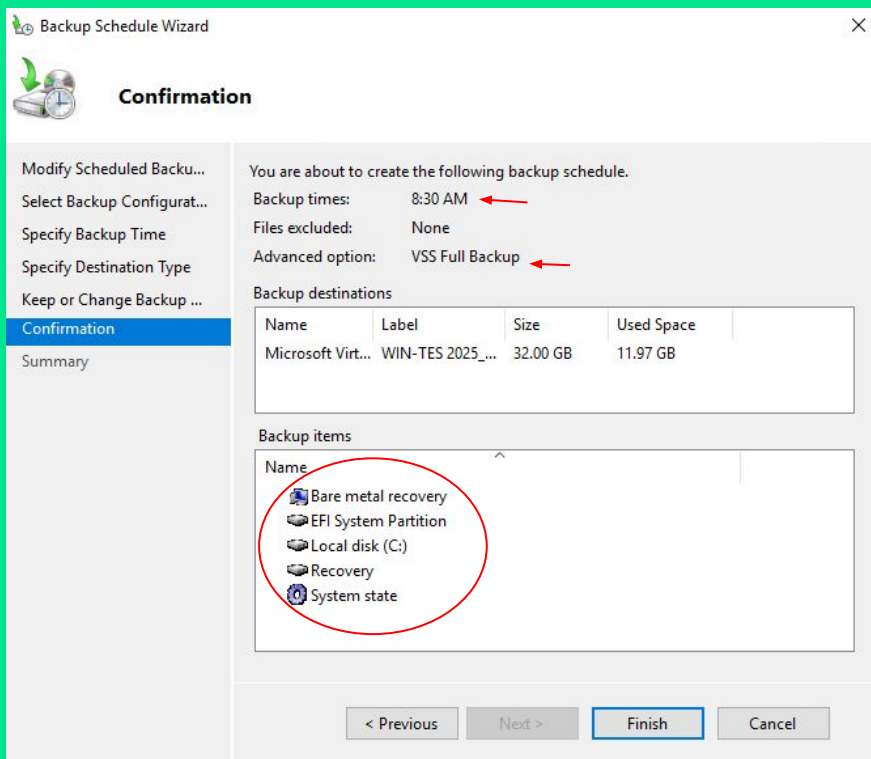
Inside the Hyper-V manager we right click on the windows server, click settings then select the SCSI Controller and add a new hard drive. This is essentially is us going to the store and buying a blank hard drive, we select add and follow the wizards instructions. We select Dynamically Expanding for the disk type, name it Server Backup, and allocate 32 GBs for the size of the drive. Now that we created the new disk, we need to configure its partitions inside the VM.

Now that we've configured a new disk we need to activate it. Now inside the windows server we need to go to Computer Management.



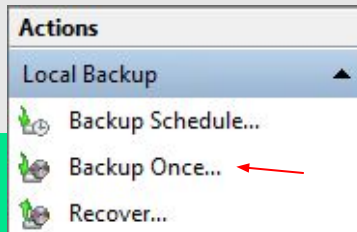
Here we see the disk management section of the computer management window. Disk 1, is the new disk that we just created. I went ahead and initialized and created a new simple volume. On the computer it is our new "E:" drive.

Now that we have finished setting up the new disk we need to configure our windows server backups.



Inside the Windows Server Backup tool on the windows server, we need to setup a schedule for our windows server to backup. In order to do this we need to create a new backup schedule, select "Full Server" for the configuration type, next we set a time for the backup to start I set it for 8:30 AM. Next we specify where we want to store the backups we want them to store onto the disk we just configured.

Now that we have a schedule set up, let's backup the server once since it's passed 8:30 just so we have a backup ready.

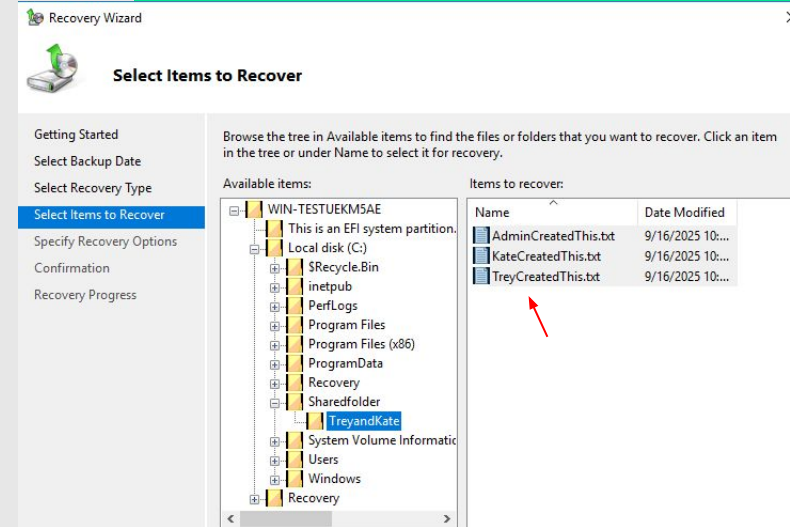
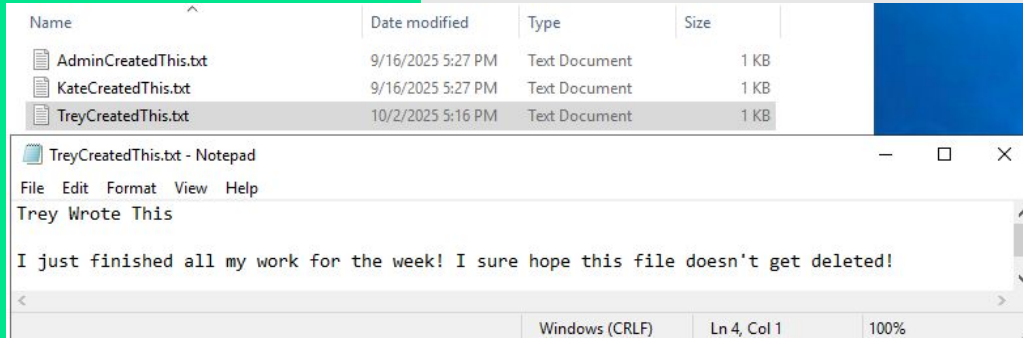


Click Backup Once, and create a backup using the scheduled backup options we just configured. This will take about 5 minutes and once it's done this steps complete.

Having the system backed up obviously helps out if there were to be an extreme accident, like a fire, or if you somehow lost all the equipment on your server and need to rebuilt it. But the most common use that you would use a backup for is replacing files that were accidentally deleted by users.

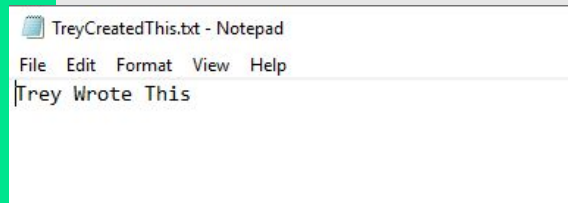
I need to call the IT guy and have him replace my file now, I think we have backups.

- He wasn't happy



I was working inside the shared folder, and just finished all my work for the week. In my .txt file in the shared folder I let everyone know that I finished my work for the week!

I was turning off my computer ready to go home and somehow accidentally deleted all my work for the week! I lost all my hard work!



All my hard works gone! But I saved everything before I finished my work!

Regardless of if you saved your work, the backup only stored what was completed at the time of the backup. If you deleted your file after the backup completed all work that was completed isn't going to be saved when the files returned from the latest backup.

Oh no! Our server room is on fire! No ones in the office to extinguish it! I hope the fire department can get there in time to save it!



The fire department got there but it was too late. Everything burned to the ground, we lost everything. All of our files, data and top secret information is lost. This is horrible.

This is going to cost a lot of money, I need to get our IT guy he'll know what to do.



This is fixable, it'll be a long costly process but I can fix this. I need to take a trip to Microcenter to get the basic parts that we need to rebuild this.

Thankfully we shipped out our backup hard drives across the country to a random location in the desert, we need to start there.

Ok, I've gotten the backup drive, as well as some parts to start the rebuild on our servers. We need to start by reinstalling windows server on our servers, insert the thumb drive into the computer and boot it up.

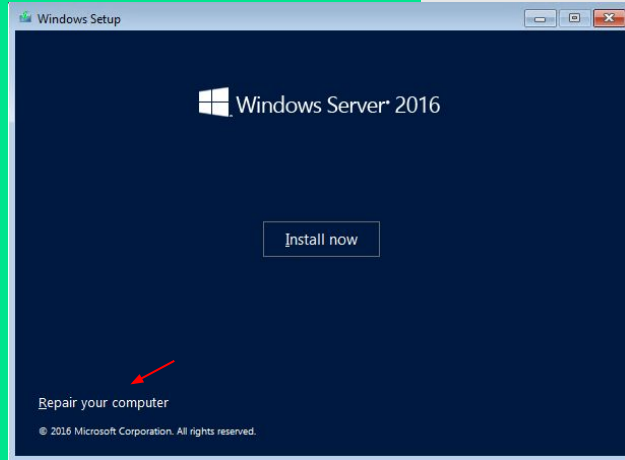
This screen will popup quickly make sure you're pressing space to get passed this screen. If you don't do it fast enough restart the computer and press space quickly.

Press any key to boot from CD or DVD.....

>>Start PXE over IPv4.

Once we get passed the black screen we will be prompted with a windows setup box that will look like this.

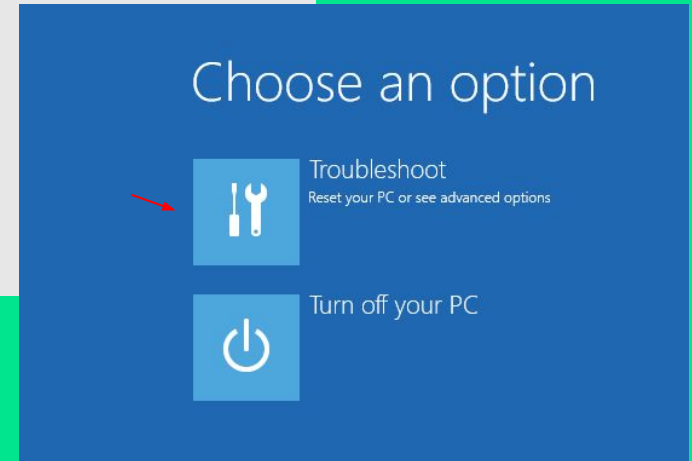
We will keep the defaults in English, and click next



After hitting next this screen will pop up, DO NOT hit install now, instead hit “repair your computer” or press R on the keyboard.



This window will pop up asking us to choose an option, click troubleshoot and we will continue, do not hit turn off your pc as you will need to repeat all the steps.



← Advanced options



System Image Recovery

Recover Windows using a specific system image file



Command Prompt

Use the Command Prompt for advanced troubleshooting

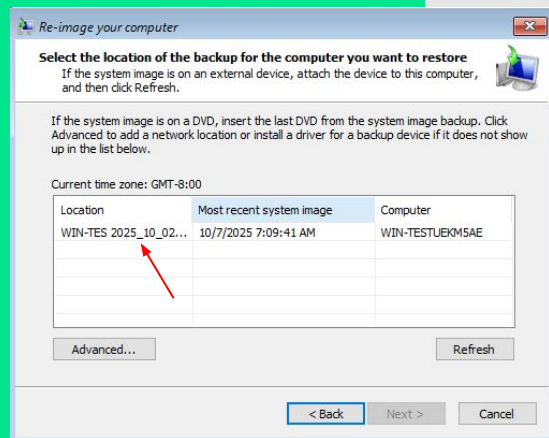
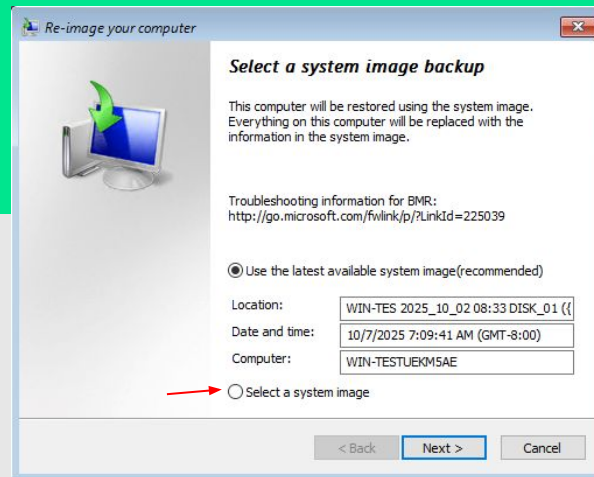


UEFI Firmware Settings

Change settings in your PC's UEFI firmware

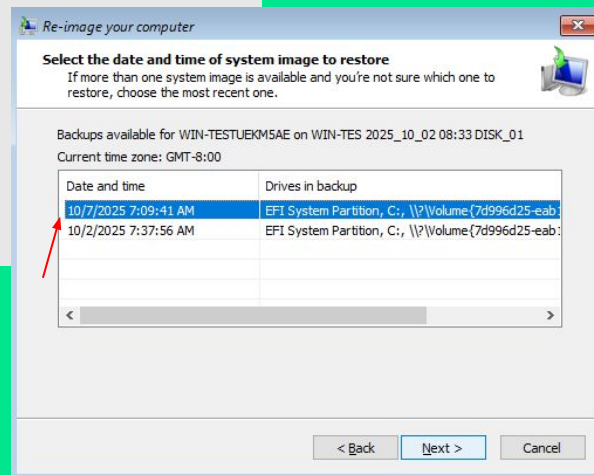
After hitting troubleshoot this is what will pop up next. We want to press “System Image Recovery”, as this will allow us to choose our drive that has our server backups on it.

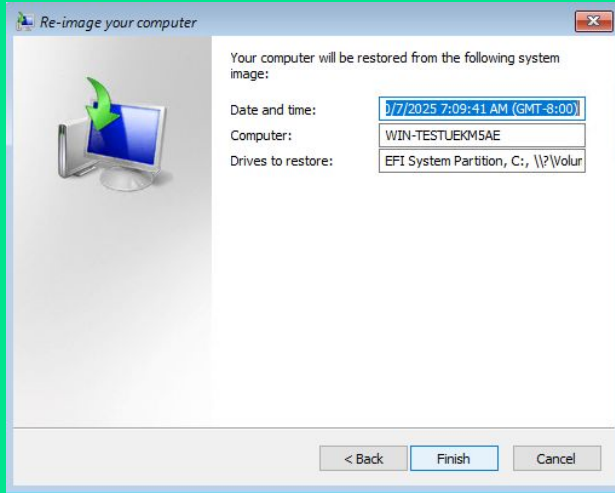
This window will pop up next, it'll say “Re-image your computer”, make sure for this step you have the backup drive plugged into the computer so it will get recognized. Click “Select a system image” at the bottom to continue



You'll now see this screen, this prompts you to select the drive that you want to download your backups from. Since we have our backup drive plugged into the computer we will select it here.

After selecting our backup drive, we will see all of the backups that were on the drive. Here we have two backups to choose from. We will always select the most recent backup, unless we were recently hit with a ransomware attack, we will select one from a later date so we will have access to everything.

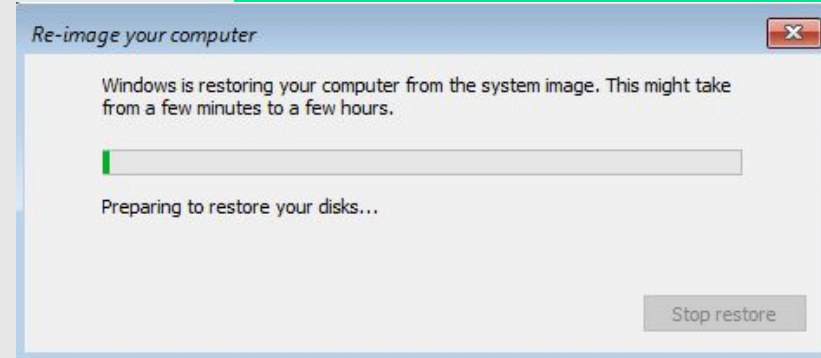




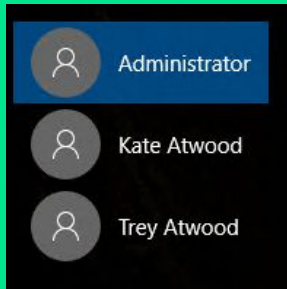
This last window will pop up now, this is confirming the date and time of the backup that you want to install.

Click finish and it will start to upload the backup onto the new server.

The download will start and since our backup isn't too big it won't take long at all.



*** After this is done downloading, before you restart the system make sure you eject the thumb drive that you had windows installed on ***

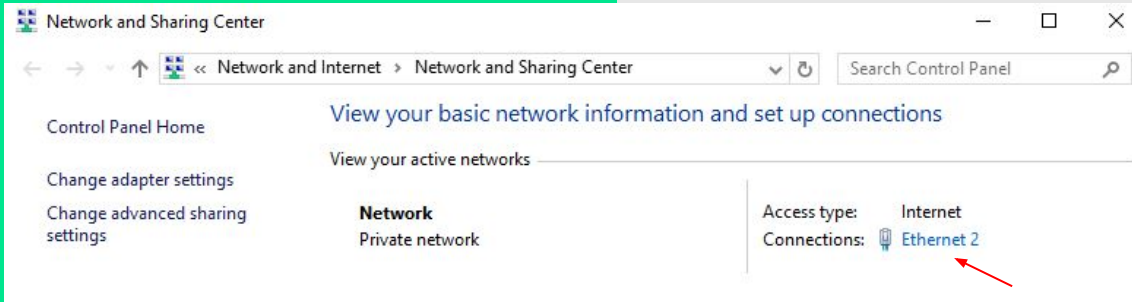
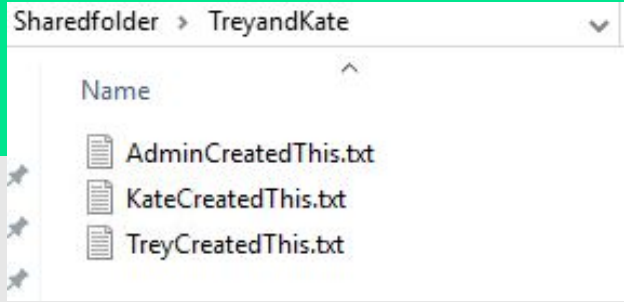


Once the upload is complete, we will now be able to login to the system. You can see that our three users are here already, the backup saved all the information and uploaded it onto the new server.

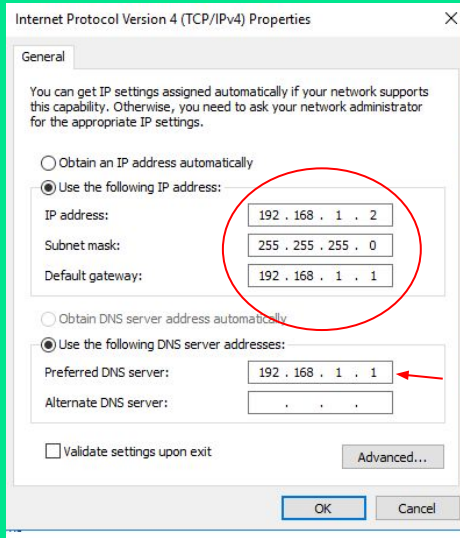
Take a look around the system, to make sure that all the files are there. We can quickly check to make sure that our shared folder is back.

As you can see all of the hard work that we put in here is back! We recovered all the important files!

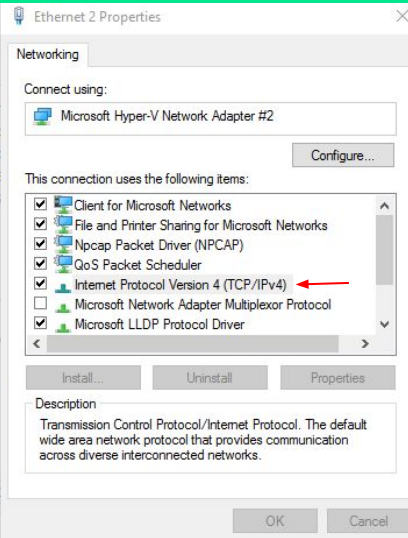
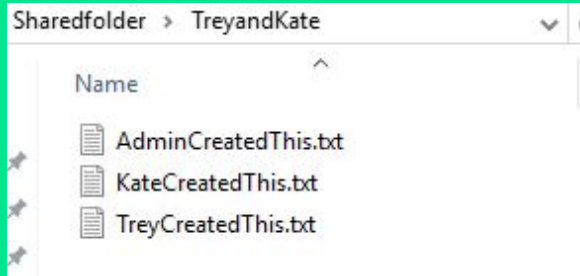
It's important to remember that we are going to have to reconfigure the shared folder so people on the new network can access it. As it stands now no one else will be able to connect to the shared folder. We need to configure the network settings.



Right click on the ethernet icon in the bottom right of the windows taskbar, and select "Network and Sharing Center". Here we will click on "Ethernet 2" in the top right corner.



Once you complete these steps you'll be able to access the shared folder again and see all its content. Logging in with the same credentials as before, since the backup included our users and their permissions it will all be working as normal.



We want to go into the properties of “Ethernet 2” and select “Internet protocol version 4 (TCP/IPv4)”. The window to the left is where we will manually input the IP address, and default gateway to access the shared folder.

We will put “192.168.1.2” for the IP address, and “192.168.1.1” for the default gateway. “192.168.1.2” is our IP address for our new recovered system, and “192.168.1.1” is the default gateway that goes through our PFSense.

After completing all these steps, your new server will have all the information and data from the last backup of your old server.

Scenarios like this aren't fun, but having backups of all the old data is vital. As if you were to not have any backups of your old systems you would have to rebuild the entire server from scratch. That wouldn't only be a hassle to do but it would also cost a lot more money. Money will already be tight having to buy new equipment for the servers, there likely wouldn't be much room in the budget to rebuild the systems.