

MODERNISE YOUR OLD NETGEAR READYNAS ULTRA WITH A SYNOLOGY MAKEOVER

About the Author:

Ricky El-Qasem - Cloud and Automation
Nut. Webmaster @

- read.virtualizeplanet.com
- blog.cloudnative.com
- retro-rick.djsho.co.uk
- www.deeplyminimal.com

Developer of tools such as *vDisk Informer*
and *vRealize Lego Icon Changer*.



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Background

I recently purchased another Synology NAS box and to populate it I ripped out the disks from 1 of the 2 Netgear ReadyNas Ultra 4s I have. This then freed up the ReadyNas I was thinking what to do with it. I remembered a blog article from a few years back about running Synology DSM on a ReadyNas so I started to do some digging. The blog was by Migoo, but I knew it was some years old that I had to take his basic principal and update it. The hack is to use Xpenology to create a bootable USB disk, boot your ReadyNas from USB and install Synology DSM on the ReadyNas.



Why do it?

Well back in the day, ReadyNas Ultra models were sturdy NAS devices that you could use for your home and you can create iSCSI LUNs so it can be used by VMWare. The issue is that Netgear dropped updating them and the application and services were limited. VMware introduced vStorage API for Array Integration (VAAI) which made things like VM cloning super quick, and when you compared a NAS device with and without VAAI it was a no-brainer. It could be the difference between waiting minutes vs hours in some cases. Unfortunately ReadyNas Ultra's didn't have VAAI which newer NAS boxes like Synology offered that feature. Apart from the VAAI Synology is packed full of apps and features. So this post was my experience of making Synology DSM work on an old ReadyNas Ultra 4.

WARNING & DISCLAIMER

- THIS PROCESS COULD SERIOUSLY MESS UP YOUR NAS BOX. I WILL NOT BE HELD LIABLE FOR ANY DAMAGE
- THIS PROCESS WILL DELETE WHAT IS ON THE EXISTING DISKS
- READ THE INSTRUCTIONS CAREFULLY BECAUSE THERE IS AN OPTION TO MAKE THE CHANGE PERMANENT SO GET IT RIGHT FIRST TIME.
- I TESTED THIS ON A READYNAS ULTRA 4 BUT HAVE TO PRESUME IT WILL WORK ON ULTRA 2 AND ULTRA 6
- I WASN'T ABLE TO PERFORM A FORMAL UPDATE AFTER INSTALLATION, SO YOU NEED TO GET THE LATEST DSM FILE FOR YOU BOOT-LOADER MENTIONED LATER. DO NOT TRY TO DO A FORMAL UPDATE.

Disks

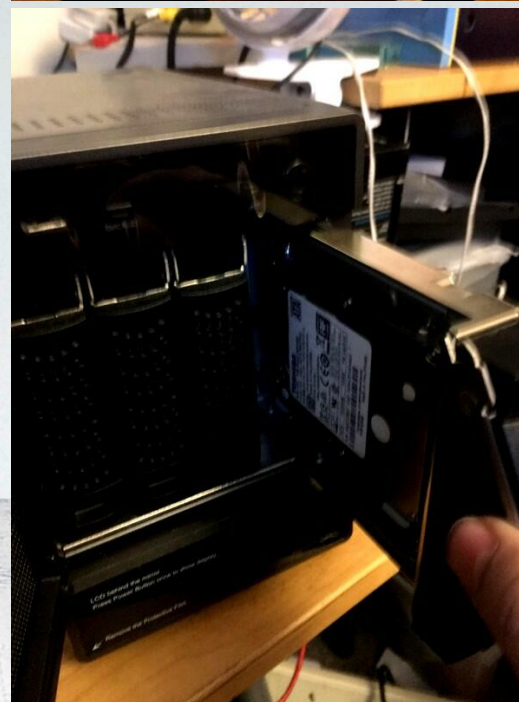
Well in my scenario I had none because I'd pinched them for my new Synology. However I remember I had a few laptop disk. Only to find that the ReadyNas HDD caddies are only suited for 3.5" disks.

But then I found these

https://www.amazon.co.uk/gp/product/B00F3QFKNS/ref=oh_aui_detailpage_o00_s00?ie=UTF8&psc=1

These allow you to convert 2.5" HDD to 3.5" HDD so that the caddy has the ports where they would be normally on a 3.5" HDD.

So let's get the 2 laptop HDDs in the mounts and in the HDD caddies.



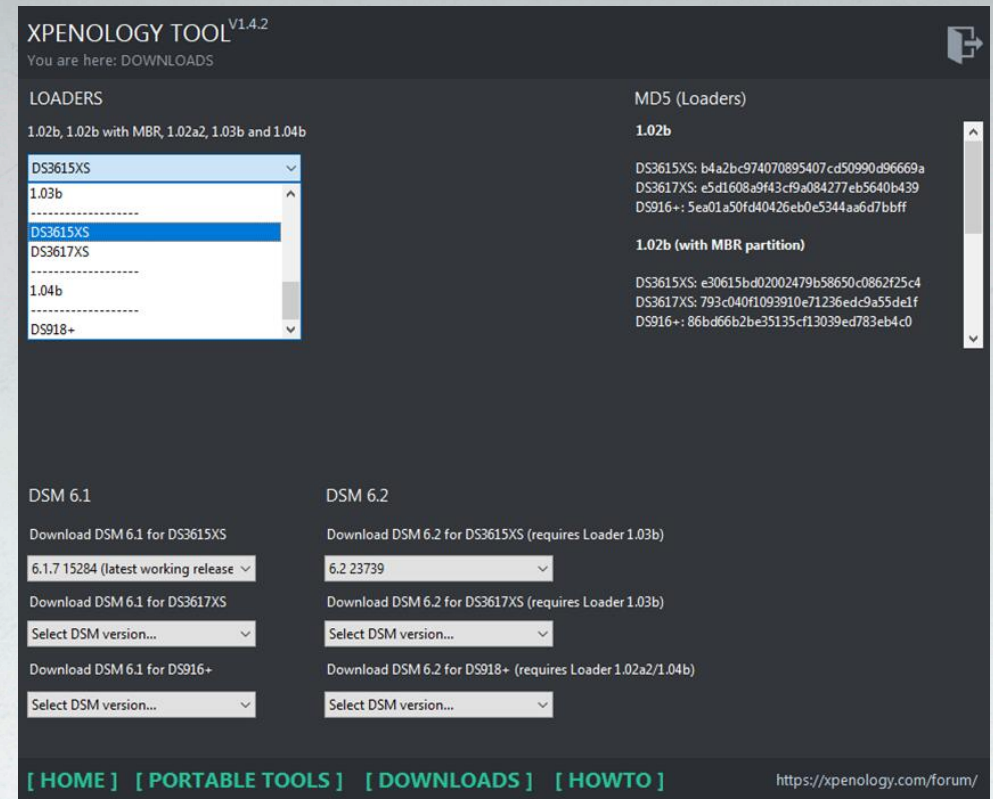
Then you need to prepare a USB disk. I just purchased a 16GB SanDisk. I think you can get away with a lot smaller than the one I purchased.



Then head over to xpenology.com and download the latest Xpenology tool. Search for Xpenology Tool for Windows x64. This is where the instructions differ from the original Migoo post.

In the Xpenology tool click on **>downloads<** first download the 1.03b loader for DS3615XS. This will download a zip/img file which you'll later use to prepare the USB disk

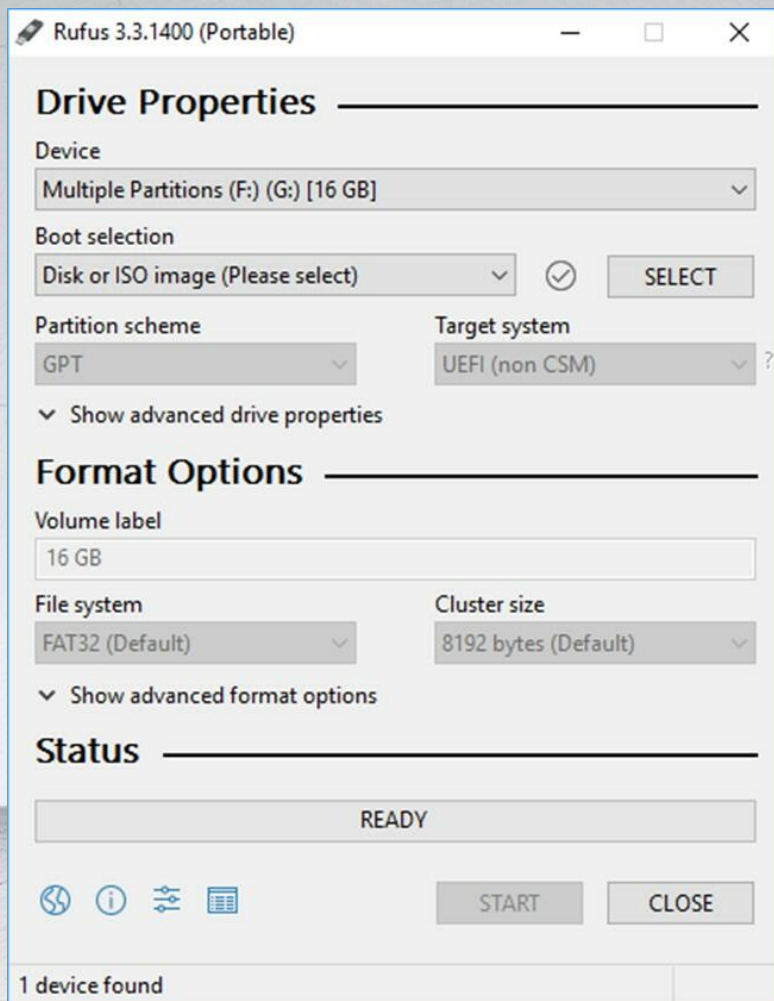
Then download the DSM 6.2 under the menu that states for DS3615XS that you require loader 1.03b. This will download a .pat file which you'll use to install DSM on your disks.



We need to build a boot loader on a USB disk to start with. This will be used to bypass the ReadyNas flash boot loader.

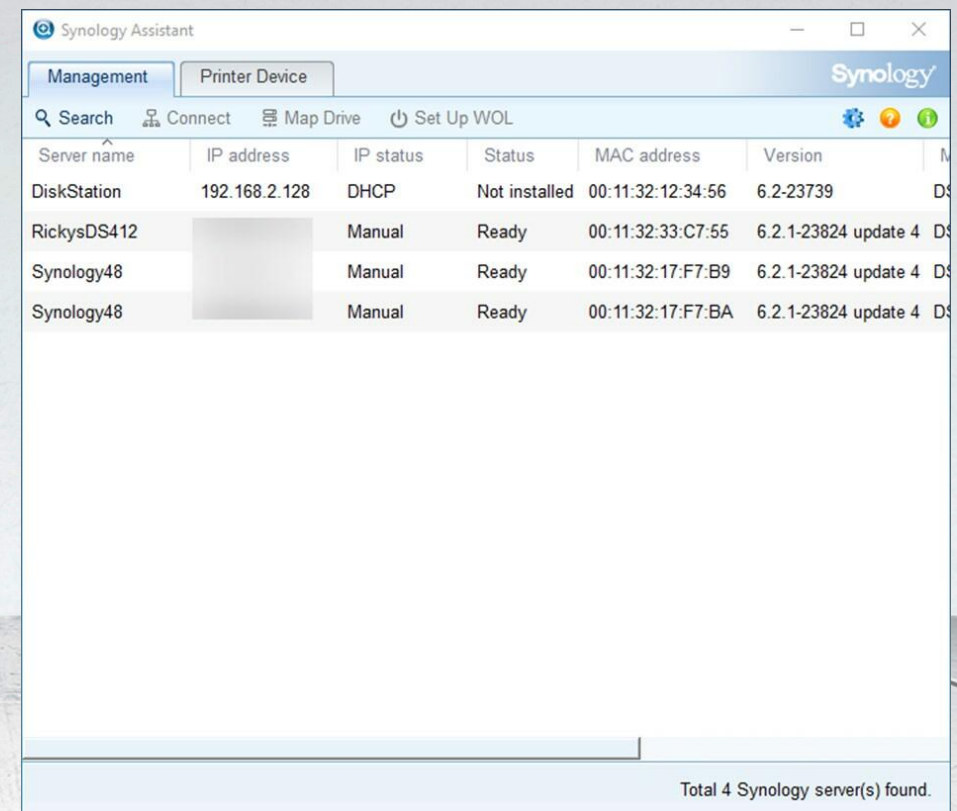
Now back in the Xpenology tool click on > **POTABLE TOOLS** < and load Rufus. We use Rufus to put the bootloader on to the USB Disk.

Make sure you have your USB disk selected and hit the SELECT button to choose the .img file which is the 1.03b loader and might be zipped up that you downloaded in the previous steps.

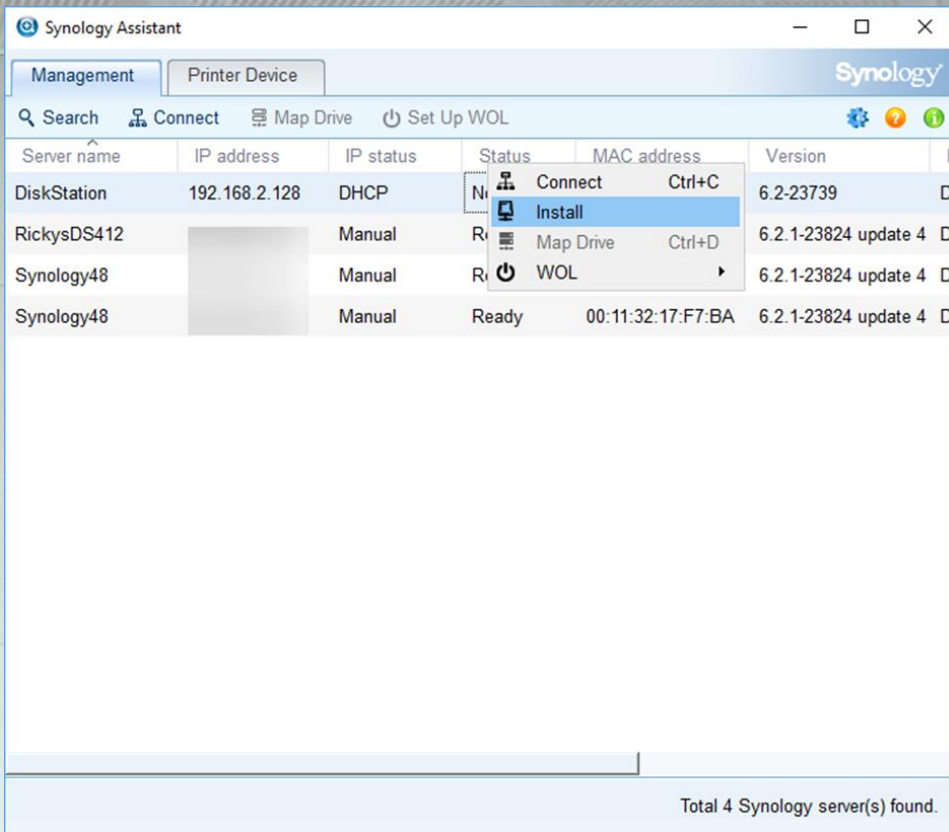


HIT > **START** < button. This will format your USB disk with the Xpenology bootloader. Once finished take the USB disk out and place it in the front USB port in your ReadyNas. Power off the ReadyNas. Now holding the >**backup**< button next to the USB disk, power on the ReadyNas making sure you keep the backup button pressed for **30 seconds**. You'll know when to release the button after 30 seconds as your USB disk light will **flash**.

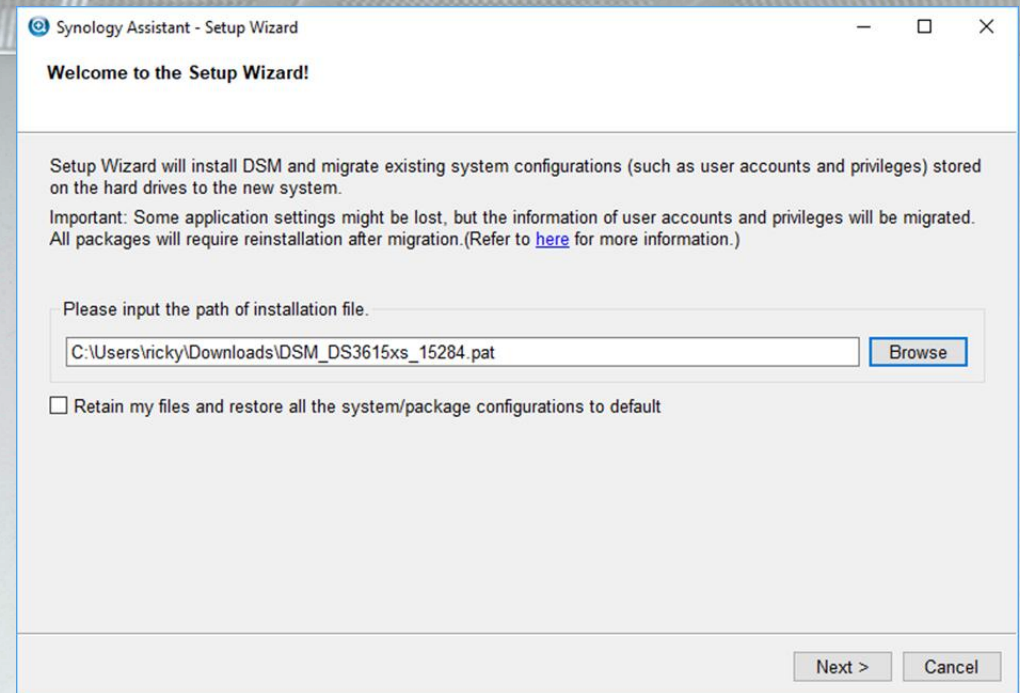
Now jump back to the Xpenology tool > **portable tools** < and load up the **Synology Assistant** which you will use to discover your ReadyNas now running the Synology loader. You may have to wait a few minutes before its discovered. Hit the **search** button. After the short while you should see the ReadyNas pop up as a DiskStation:



If you right click under the Status heading (where it says Not Installed) you should get the option to Install DSM.



In the next dialogue window you now need to select the DSM file which ended in .pat that you downloading earlier.



Click **Next**

Next, you'll be asked to specify a password. This will be your admin password so don't forget it.

Synology Assistant - Setup Wizard

Enter server information

Administrator's account: admin

New password: [password field]

Confirm new password: [password field]

Server name: ReadyNASology1

☒ Create a Synology Hybrid RAID (SHR) volume after installation

Hint:

Maximum password length is 127 characters. It can be any displayable character, including letters, numbers, signs, space...etc.

Server name may contain letters, numbers, underscores and minus signs. The first character must be a letter.

< Back Next > Cancel

Next, specify what IP address you want to give the primary NIC in your ReadyNAS. You add a second later when finished.

☐ Get network configuration automatically (DHCP)

☒ Use manual configuration (recommended)

IP address: 192.168.1.42

Subnet mask: 255.255.0.0

Default gateway: 192.168.1.1

DNS server: 192.168.1.48

Suggested settings are provided for Synology Server based on your current network settings. Follow the suggestions if you do not wish to enter your network settings manually.

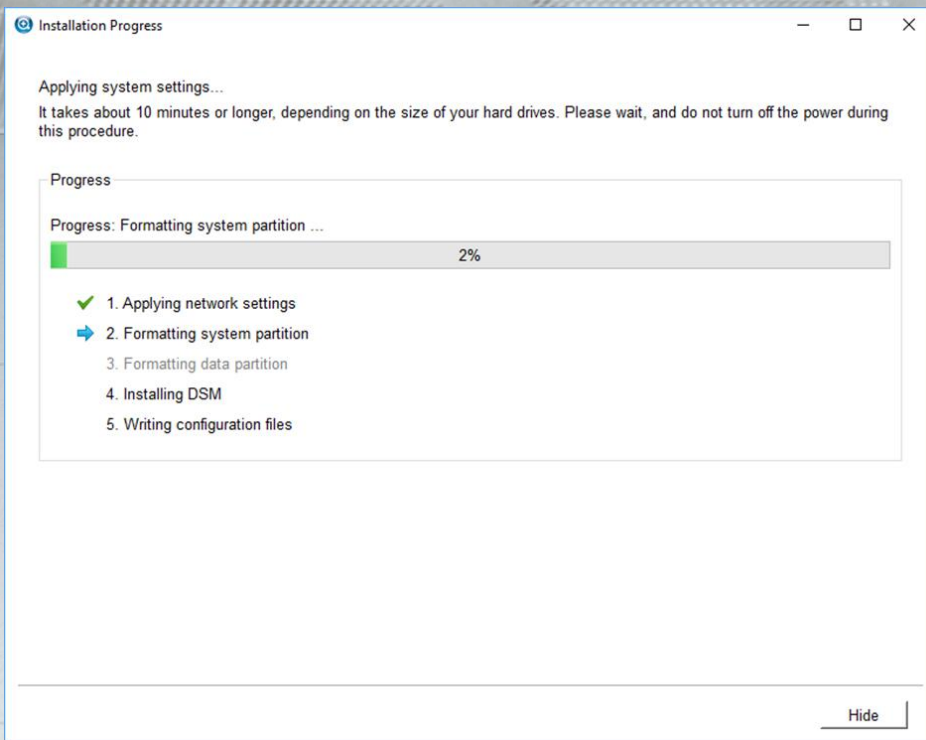
Click ok to the warning prompt .

Warning

Note! All data in the hard drive(s) will be deleted while creating a SHR volume.

OK

And DSM will start to be installed.....



After it's finished you will see an option to connect to the DiskStation or you can just browse using Chrome or IE to the IP you specified earlier. Now you have a working ReadyNas with DSM installed on it..

Now from here, you have 2 options:

- The **red pill** - Leave it as is but every time you reboot the NAS you will have to do the whole "hold the backup key for 30 seconds to boot the USB disk" routine
- The **blue pill** - with the following instructions upload the bootloader on the built-in flash on the ReadyNas and you can dispose of the USB disk. WARNING THIS IRREVERSIBLE.

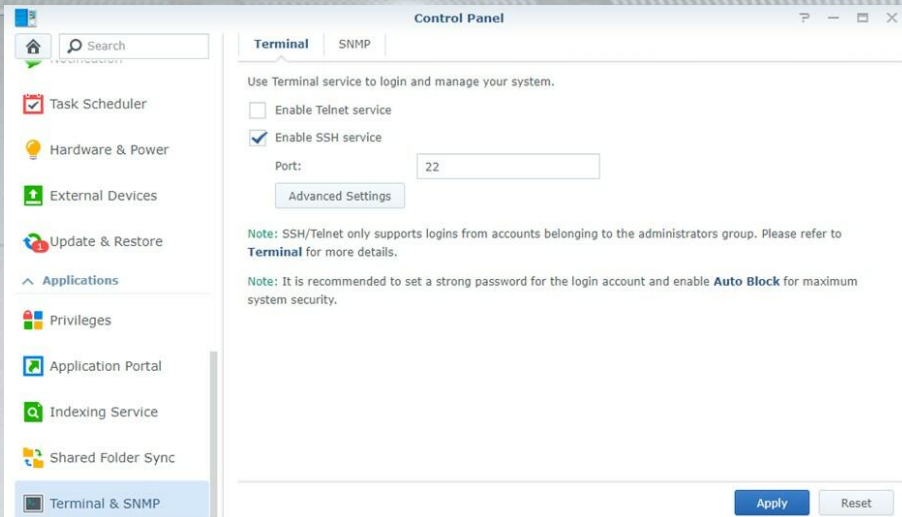


WARNING: PART WAY THROUGH, A REBOOT WILL OCCUR. WHEN THIS HAPPENS YOUR NAS WILL TRY TO BOOT BACK IN TO THE OLD READYNAS FLASH. SO YOU NEED TO CATCH THIS AS YOU NEED ONCE AGAIN THE READYNAS TO BOOT FROM THE USB. AS THE REBOOT HAPPENS ACTUALLY TURN OFF THE READYNAS. THEN HOLDING THE >BACKUP< BUTTON NEXT TO THE USB DISK POWER ON THE READYNAS MAKING SURE YOU KEEP THE BACKUP BUTTON PRESSED FOR 30 SECONDS. YOU'LL KNOW WHEN TO RELEASE THE BUTTON AFTER 30 SECONDS AS YOUR USB DISK LIGHT WILL FLASH.

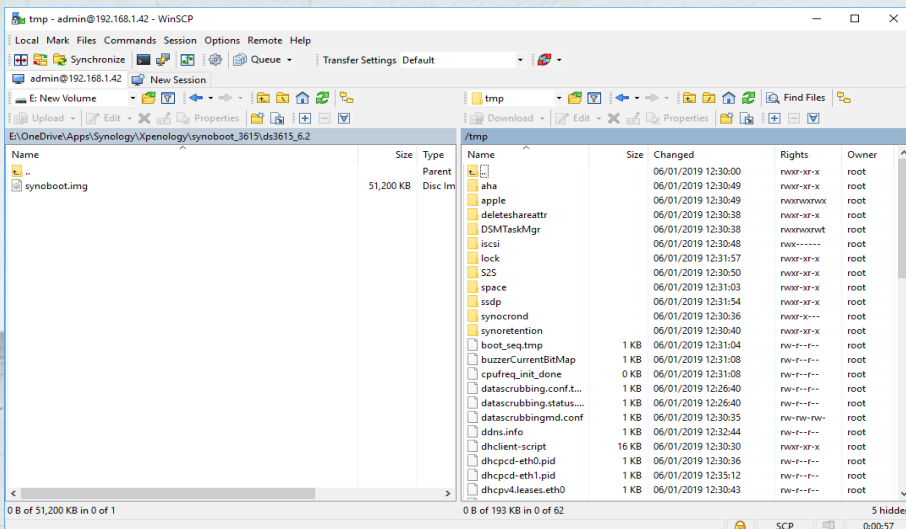
Making the modification permanent.

So you are brave and went for the blue pill.

First step is in the DSM console > control panel > enable SSH use.



Next, fire up WinSCP and copy the synobotxxx.img bootloader file into the /tmp folder on the NAS device.



Now SSH into the NAS box and first of all unmount any USB devices:

```
#sudo umount /dev/sdu
```

First time you sudo it will ask for your password

```
#sudo umount /dev/sdu1
```

Next copy the synobot img file from /tmp to /dev

```
#sudo cp /tmp/synobot.img /dev
```

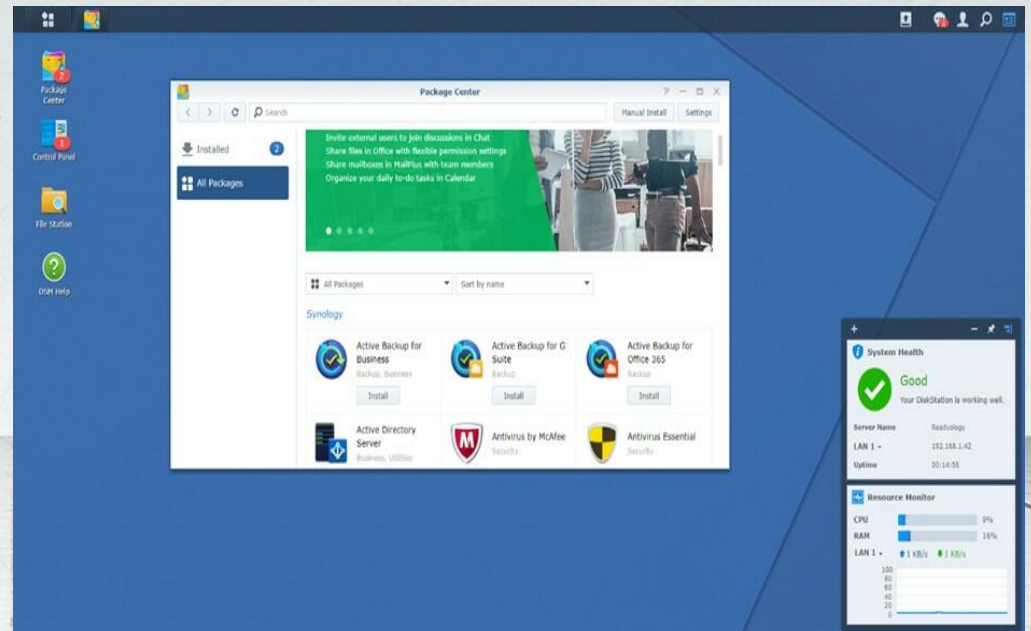
Next permanently mount the img file in the ReadyNas flash

```
#sudo dd if=/dev/synobot.img of=/dev/sdu
```

Now in the DSM console shutdown your DSM.

After it powers off, pull the USB disk out and power it on again.

After about 3 mins you are set to go.



If it all goes wrong I suggest first of all removing any partitions of the USB disk you used earlier and starting a fresh from steps to use Rufus to prepare the USB disk as mentioned on page 5 and boot up the NAS using the backup key as mentioned earlier. I had to do this a few times while I worked out what was the correct process.

Controlling the fan

Because the architecture and components of the ReadyNas differ from a Synology device you will notice that while running DSM the ReadyNas fan runs at full speed constantly. To get the fan operating correctly we will use a shell script called **fancontrol** that is a passed a configuration file with parameters that were derived by installing an ipkg package named **sensors**.

First we need to do is install the ipkg bootstrap so we can install ipkg packages. To download the correct version we need to determine the CPU architecture of your ReadyNas with the command:

```
~ # uname --machine  
x86_64
```

Then use wget to download the relevant file, use chmod to make it executable, install ipkg and then remove the downloaded file as we wont need it anymore:

```
#wget http://ipkg.nslu2-linux.org/feeds/optware/  
syno-i686/cross/unstable/syno-i686-bootstrap_1.2-  
7_i686.xsh  
  
#chmod +x syno-i686-bootstrap_1.2-7_i686.xsh  
  
#sudo sh syno-i686-bootstrap_1.2-7_i686.xsh  
  
#rm syno-i686-bootstrap_1.2-7_i686.xsh
```

Now from the DSM console reboot your ReadyNas,. Once booted SSH back in to the ReadyNas, update ipkg, install mktemp and sensors.

```
#sudo ipkg update  
  
#sudo ipkg install mktemp  
  
#sudo ipkg install lm-sensors
```

Now run the sensors command which will list the sensors it can detect in your ReadyNas. Pay attention to the temp sensor that is reporting the temperature which is close to the room temperature in my case it was temp2.

```
#sensor
```

Now run the following command to create the sensors file.

```
#sensor -s
```

Now run the pwmconfig command to generate the config file needed for fantrol

```
#pwmconfig
```

Would you like to generate a detailed correlation (y)? y

Part way through this process it will try to test your fans. Make sure you answer **no** to pwm2 and pwm3 if you only have 1 fan.

When requested for a sensor I selected temp2 which was the first choice.

On the last menu use the option to show the configuration file which will show you a completed configuration for one fan/sensor. Then save and exit.

Now you need to create a file called S99fancontrol in /usr/local/etc/rc.d/

This file is used to start up fancontrol when your ReadyNas starts. Be careful here because I was getting errors that I think was related to carriage returns in the text format of the file. Make sure you use a good editor for creating Linux type shell scripts. The file needs to look this:

```
1  #!/bin/sh
2  # S99example.sh
3  # optional description
4  FANCONTROL=/opt/sbin/fancontrol
5  case $1 in
6  start)
7      if [ -x "$FANCONTROL" ] ; then
8          echo "start fancontrol"
9          $FANCONTROL &
10     fi
11     ;;
12 stop)
13     echo "stop fancontrol"
14     kill -TERM `cat /var/run/fancontrol.pid` > /dev/null 2>&1
15     logger -p daemon.error "$0 stop fancontrol"
16     sleep 1
17     ;;
18 *)
19     echo "usage: $0 { start | stop }" >&2
20     exit 1
21     ;;
22 esac
```

To make sure you get it right I have included a copy of my file that I know works in the zip file with this document.

Now using WinSCP copy s99fancontrol.sh to /tmp

If for some reason you start to get error with the file try the following command to remove the carriage returns that are not needed :

```
#tr -d '\r' < /tmp/S99fancontrol.sh > /tmp/
S99newfancontrol.sh
```

Now copy this file into /usr/local/etc/rc.d and make it executable with chmod

```
#sudo cp /tmp/s99fancontrol.sh /usr/local/etc/rc.d
#sudo chmod 755 /usr/local/etc/rc.d/
S99fancontrol.sh
```

From the DSM console reboot your NAS and you should have a working fan system.

Things not covered

To use Synology services like quickconnect you need a legitimate serial number. Since DSM is opensource if you follow this guide your ReadyNas will be running DSM in a legitimate way and most of the applications and features work out of the box without issuing a serial number so I would consider forgoing trying to serialise the box. Don't forget to NOT update the DSM from the control panel. It wont work. Use the same process to install DSM with the USB disk to update it. Thanks



Head over to read.virtualizeplanet.com for more interesting stuff.

Thanks for reading and don't hesitate to contact me if you need advice.