howest hogeschool

PROXMOX

Microsoft Azure Stack HCI

CITRIX

Document Research Project

Research Project

User Manual – Vandale Ward, De Herdt Mathias & Demuynck Simon

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1 General information

1.1 Introduction

This document has been prepared by Vandale Ward, De Herdt Mathias and Demuynck Simon, third year students at Howest in the field of MCT – IoT Infrastructure Engineer.

In our second semester we have a module called research project in which we have chosen a research question in our field of education. During this module, which lasts three weeks, we will fully research, elaborate and document our research question.

For our research question we have chosen for: “What alternatives exist to VMware vSphere for server virtualization in an enterprise environment and how can an existing VMware environment be migrated to it?” Each of us has chosen a different platform and we are going to work this out in detail. Ward chose Proxmox, Mathias chose Azure Stack HCI and Simon chose Citrix.

What do we want to achieve with this research question? We are looking what platforms are there as alternative for vSphere and on the other hand how do we migrate to them. This is what we are trying to answare with our research question.

1.2 Objective of this document

This document describes in detail how system administrators can migrate their VMware environment to one of our chosen platforms.

1.3 Target audience

System administrators that are looking to migrate their environment to another platform without getting to technical.

1.4 Research question

What alternatives exist to VMware vSphere for server virtualization in an enterprise environment and how can an existing VMware environment be migrated to it?

1.5 Chosen platforms

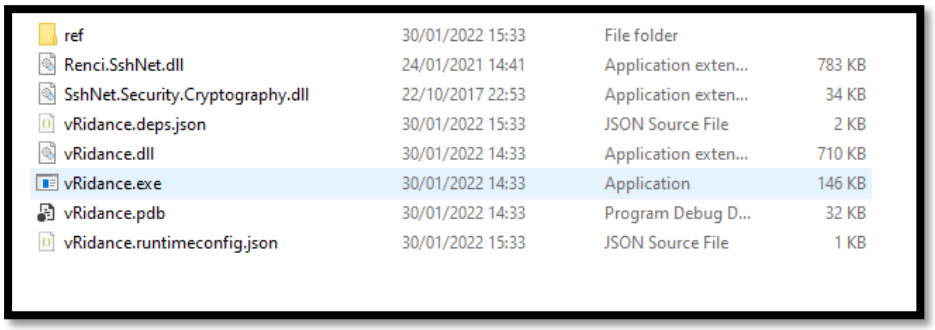
- Proxmox
- Azure Stack HCI
- Citrix

2 vRidance Setup

2.1 Installing the vRidance Tool

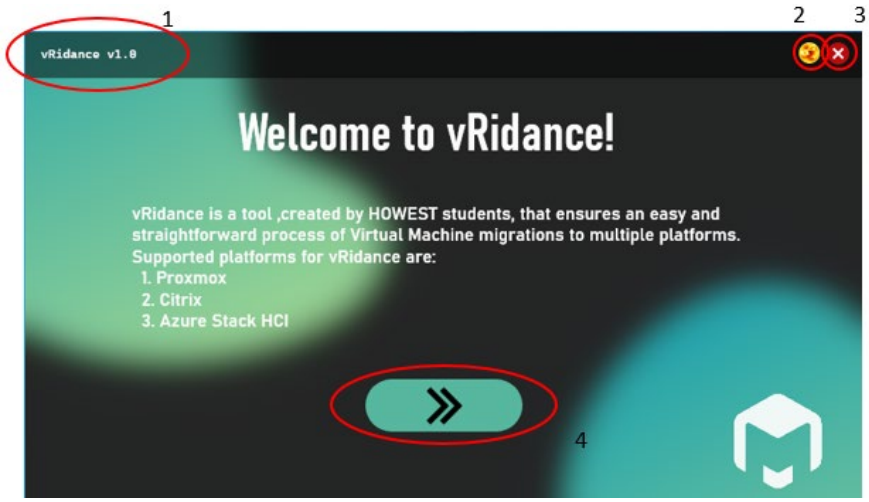
To install the vRidance tool, head over to our github repository and download the latest version.

After downloading, you are prompted with the following files;



2.2 How to use vRidance

After you have downloaded the vRidance Tool from our github repository, you can double click the vRidance.exe to start up the program. You will be prompted with the following screen;



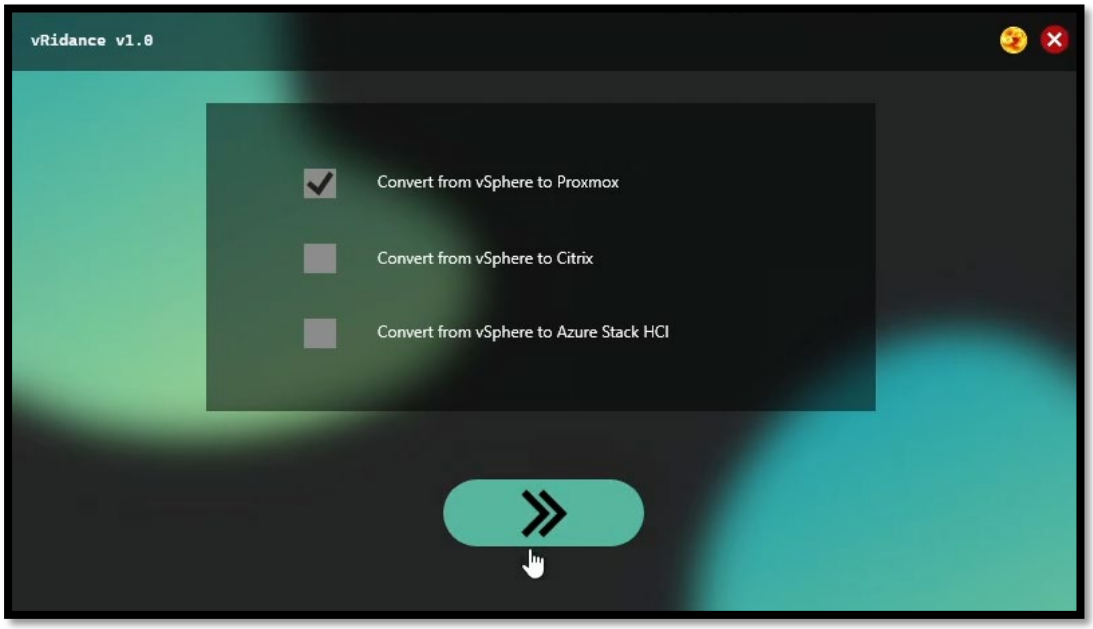
1. Version
2. Toggle button for light/dark themed UI
3. Close button
4. Next button

You can click on the Next button to continue to the next page.

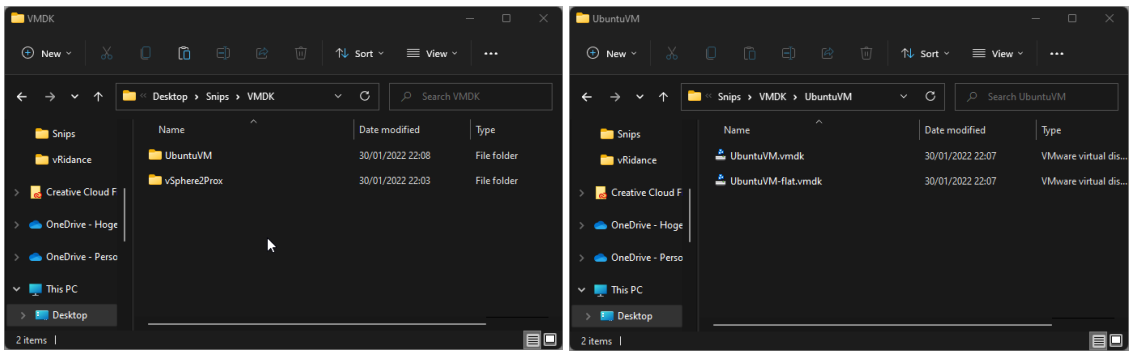
You will be prompted with the following screen;

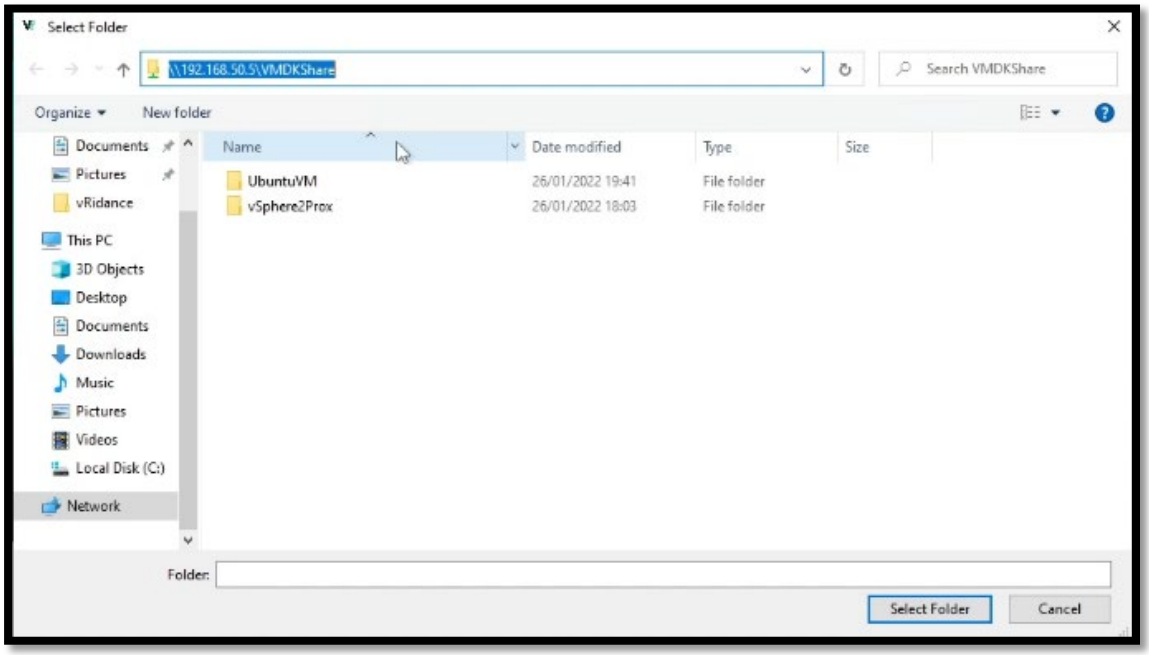
3 Proxmox

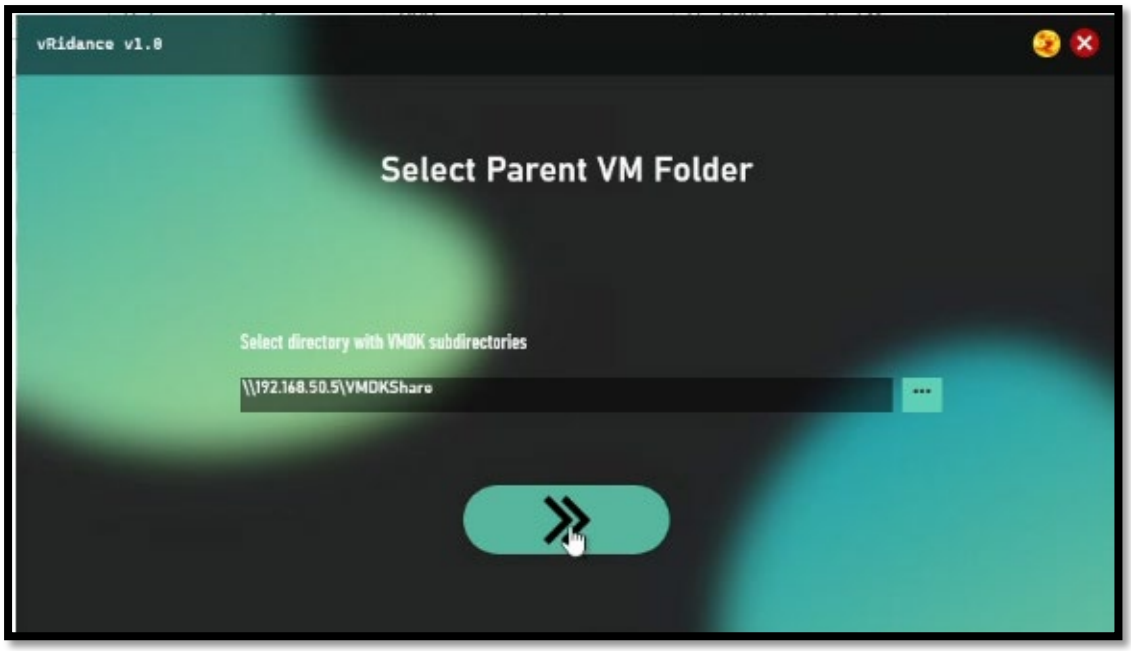
3.1 Migrating VMs to Proxmox VE

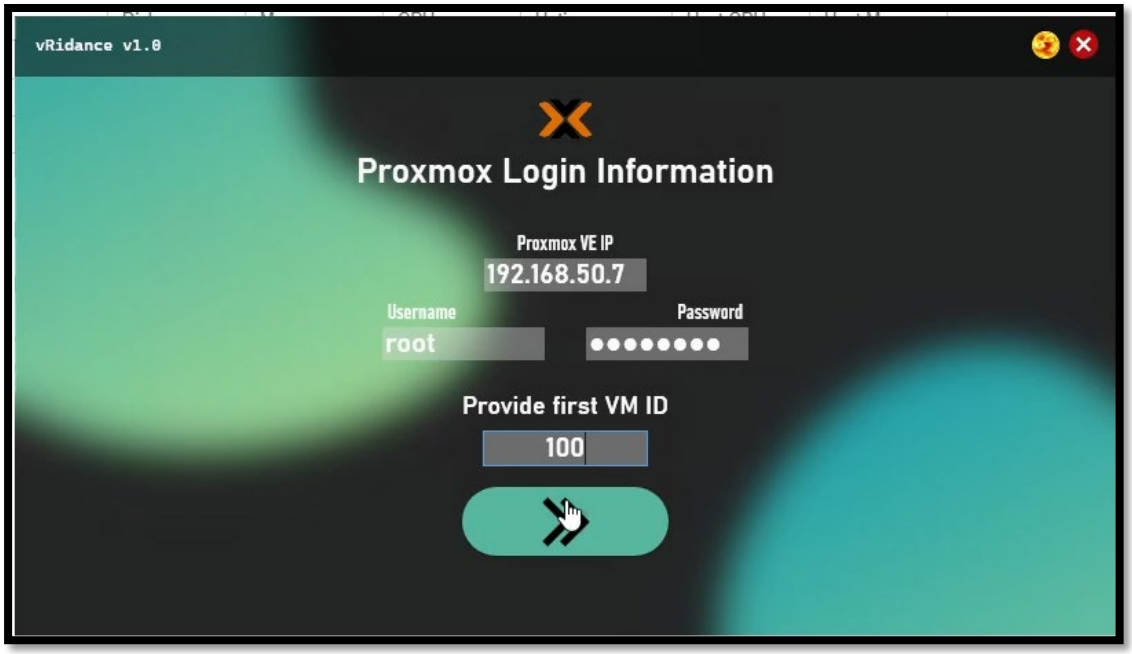


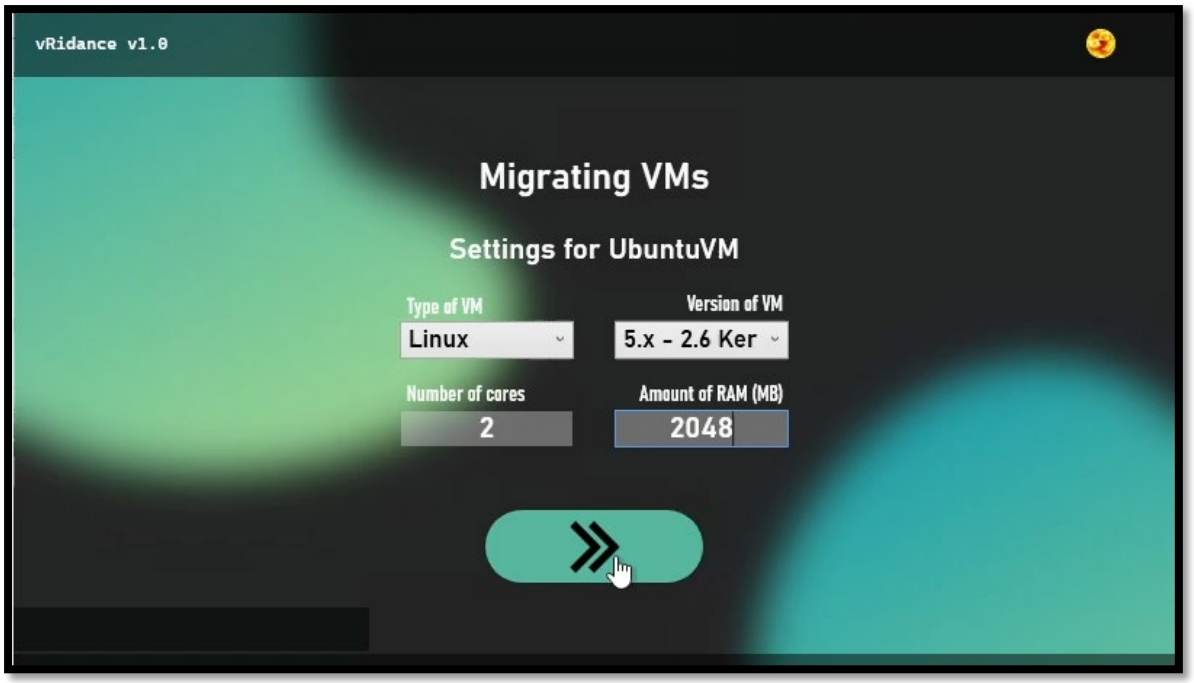
The next step will be choosing the directory that contains all the VMDK files that we want to migrate to Proxmox. It is important that our directory contains subdirectories of the VM we want to create. In each subdirectory we'll place the corresponding ***.VMDK** and ***-flat.VMDK** files. The directory should look like this.






vRidance v1.0
Select Parent VM Folder
Select directory with VMDK subdirectories
\\192.168.50.5\VMDKShare

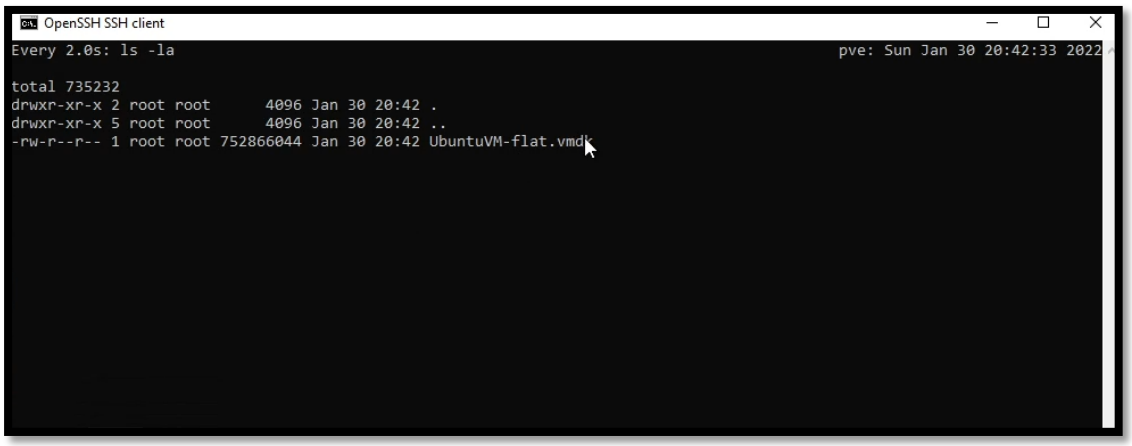

vRidance v1.0
Proxmox Login Information
Proxmox VE IP
192.168.50.7
Username
root
Password
Provide first VM ID
100

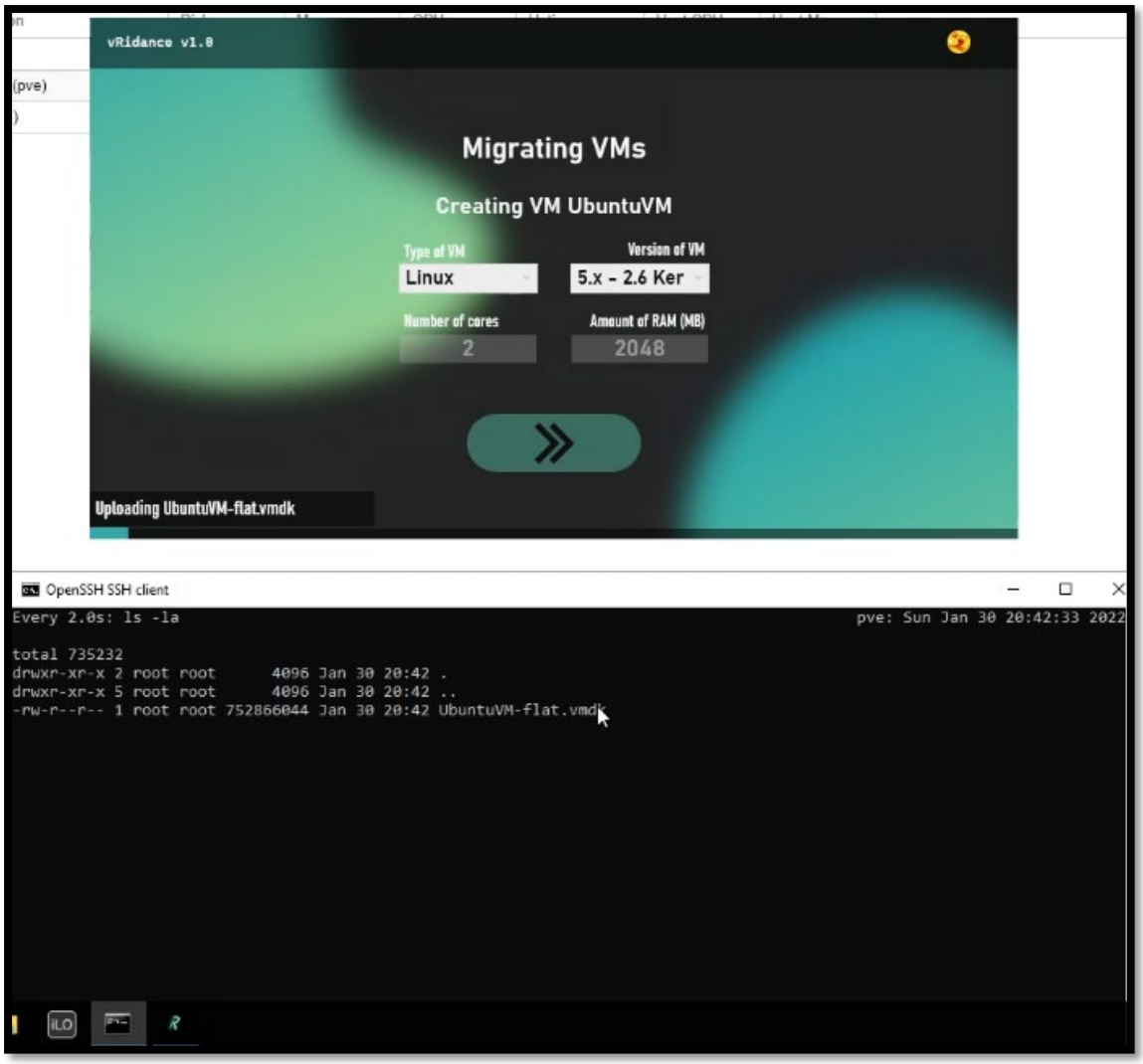


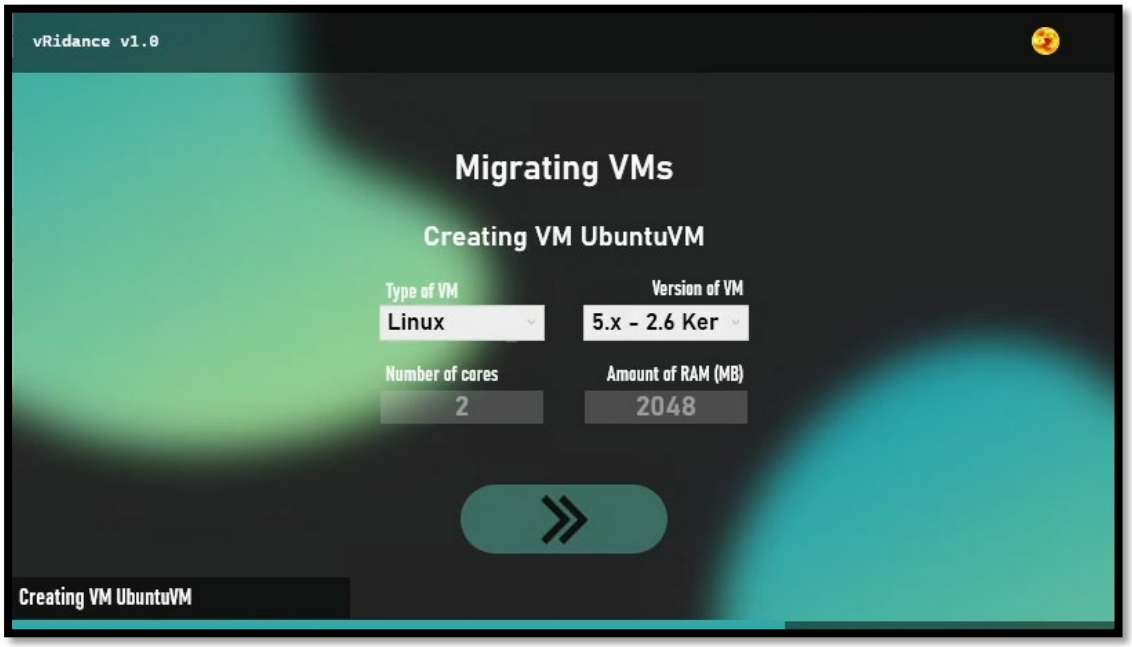
- 5.x – 2.6 Kernel
- 2.4 Kernel

In our case we will be choosing the 5.x – 2.6 Kernel with 2 cores and 2 GB (2048 MB) of RAM.

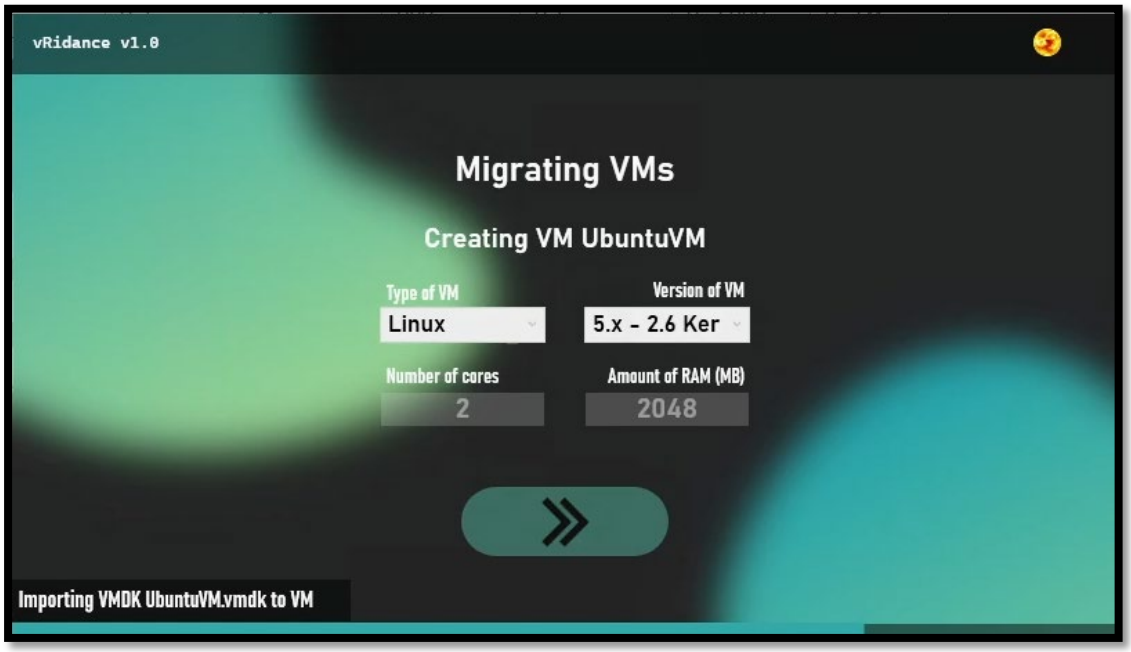
Click next to start the migration of the VM.

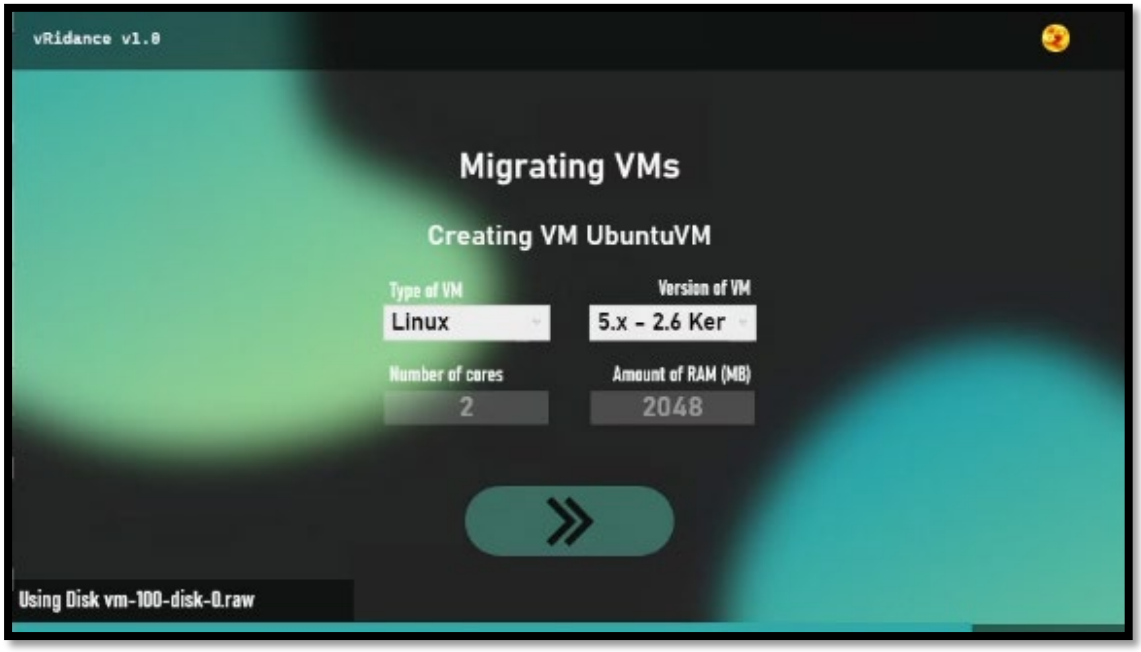


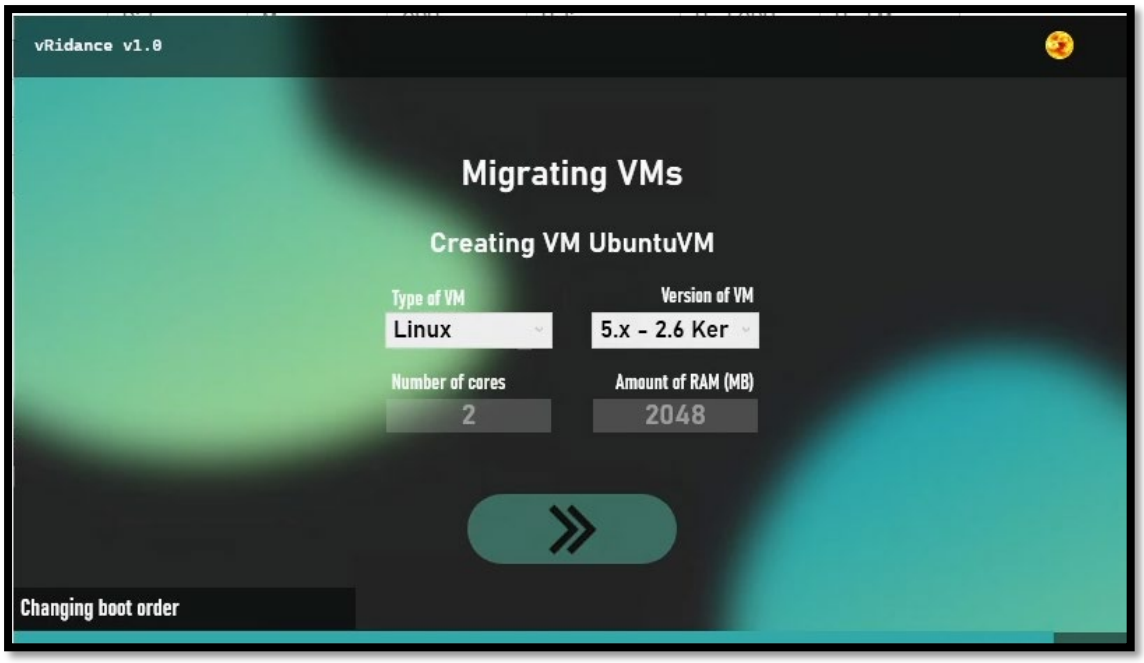

vRidance v1.0
Migrating VMs
Creating VM UbuntuVM
Type of VM
Linux
Version of VM
5.x - 2.6 Ker
Number of cores
2
Amount of RAM (MB)
2048
Uploading UbuntuVM-flat.vmdk
OpenSSH SSH client
Every 2.0s: ls -la
pve: Sun Jan 30 20:42:33 2022
total 735232
drwxr-xr-x 2 root root 4096 Jan 30 20:42 .
drwxr-xr-x 5 root root 4096 Jan 30 20:42 ..
-rw-r--r-- 1 root root 752866044 Jan 30 20:42 UbuntuVM-flat.vmdk
iLO

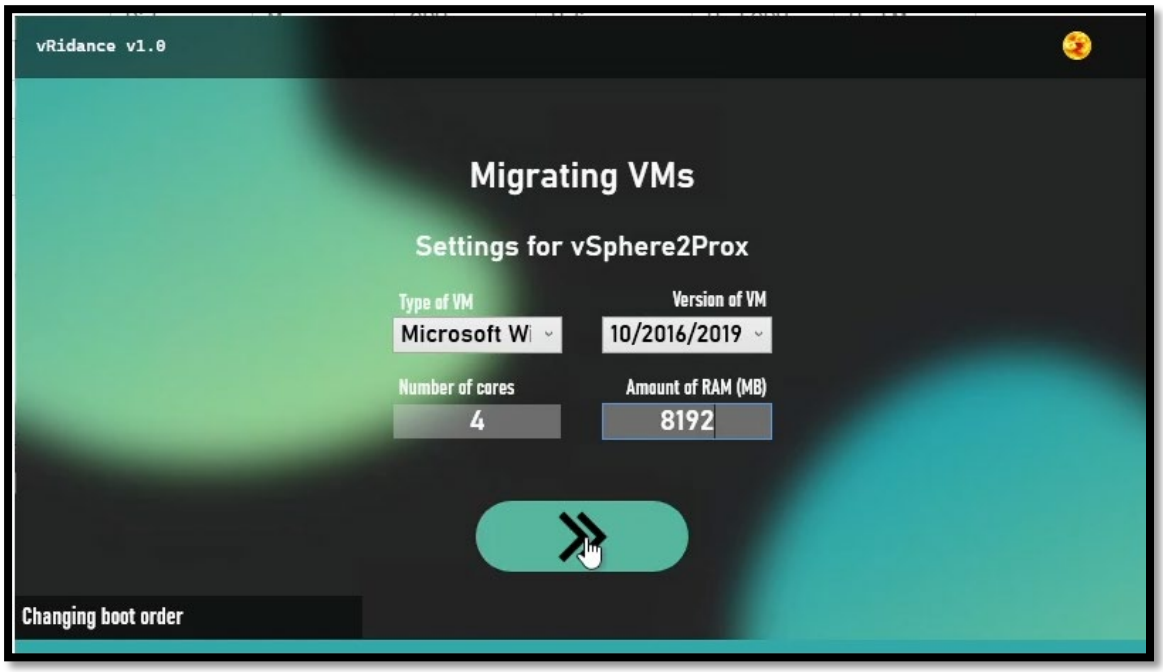

vRidance v1.0
Migrating VMs
Creating VM UbuntuVM
Type of VM
Linux
Version of VM
5.x - 2.6 Ker
Number of cores
2
Amount of RAM (MB)
2048
Creating VM UbuntuVM

Once the two files have been uploaded, the program will create a VM with the settings we've provided.





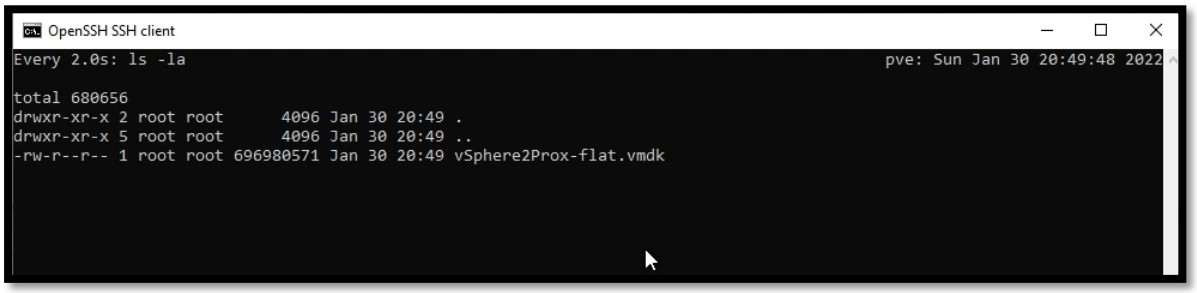


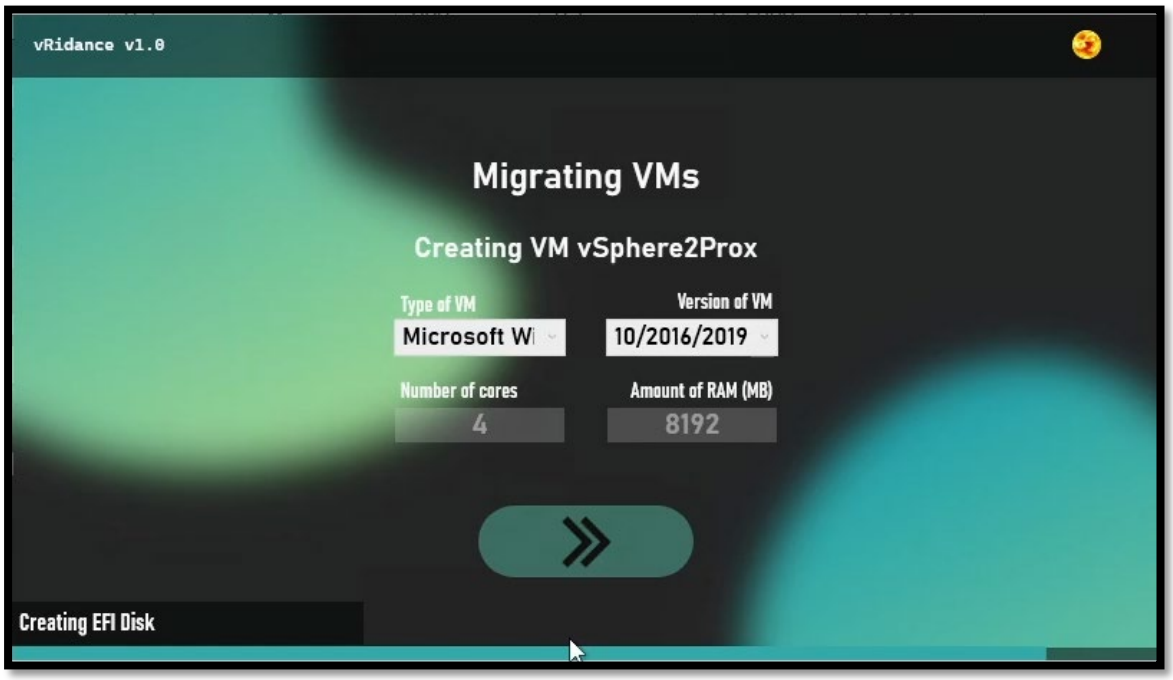


In the previous steps I've shown the different versions of VMs that you can have with "Linux". Now we'll be creating a Windows Machine. If you select the "Microsoft Windows" type, you will have the following versions to chose from:

- 11/2022 (Windows 11 / Windows Server 2022)
- 10/2016/2019 (Windows 10 / Windows Server 2016 & 2019)
- 8.x/2012/2012r2 (Windows 8 / Windows Server 2012 & 2012r2)

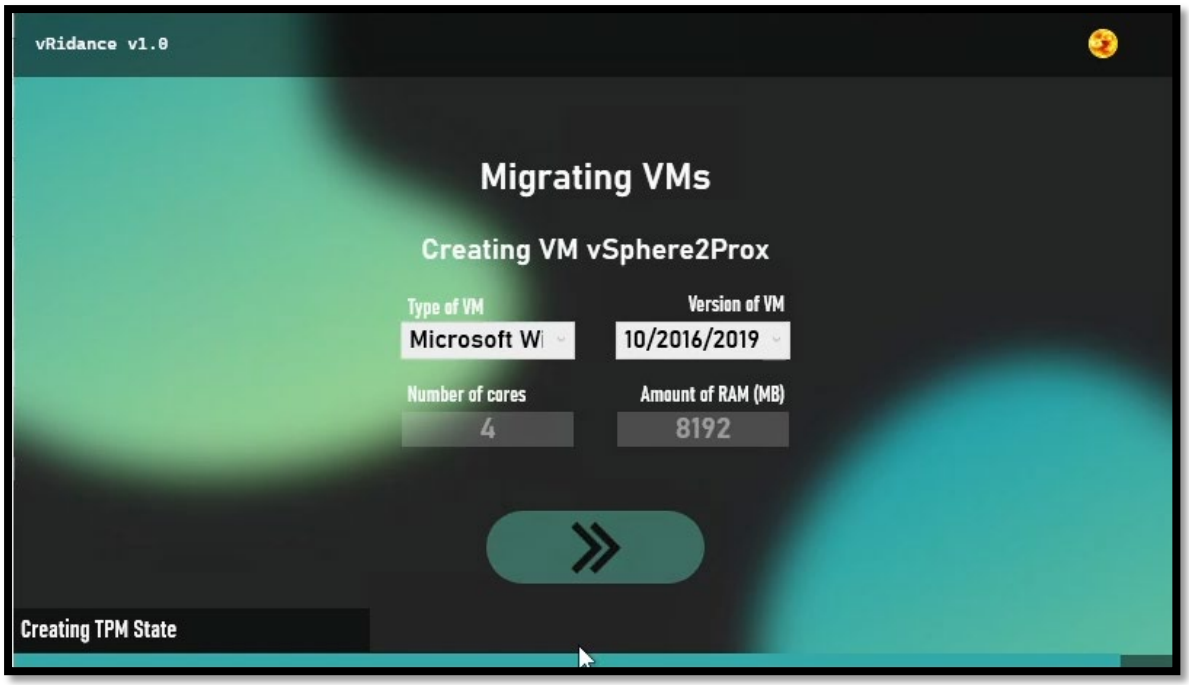
- 7/2008r2 (Windows 7 / Windows Server 2008r2)
- Vista/2008 (Windows Vista / Windows Server 2008)
- XP/2003 (Windows XP / Windows Server 2003)
- 2000 (Windows 2000)

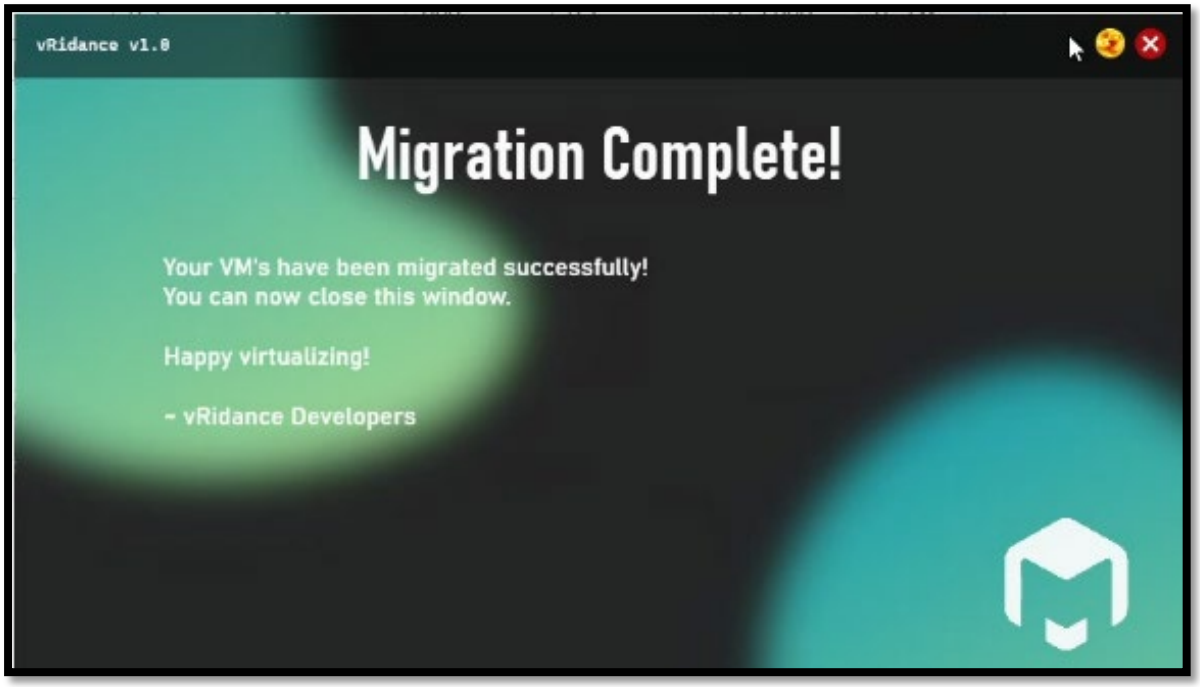




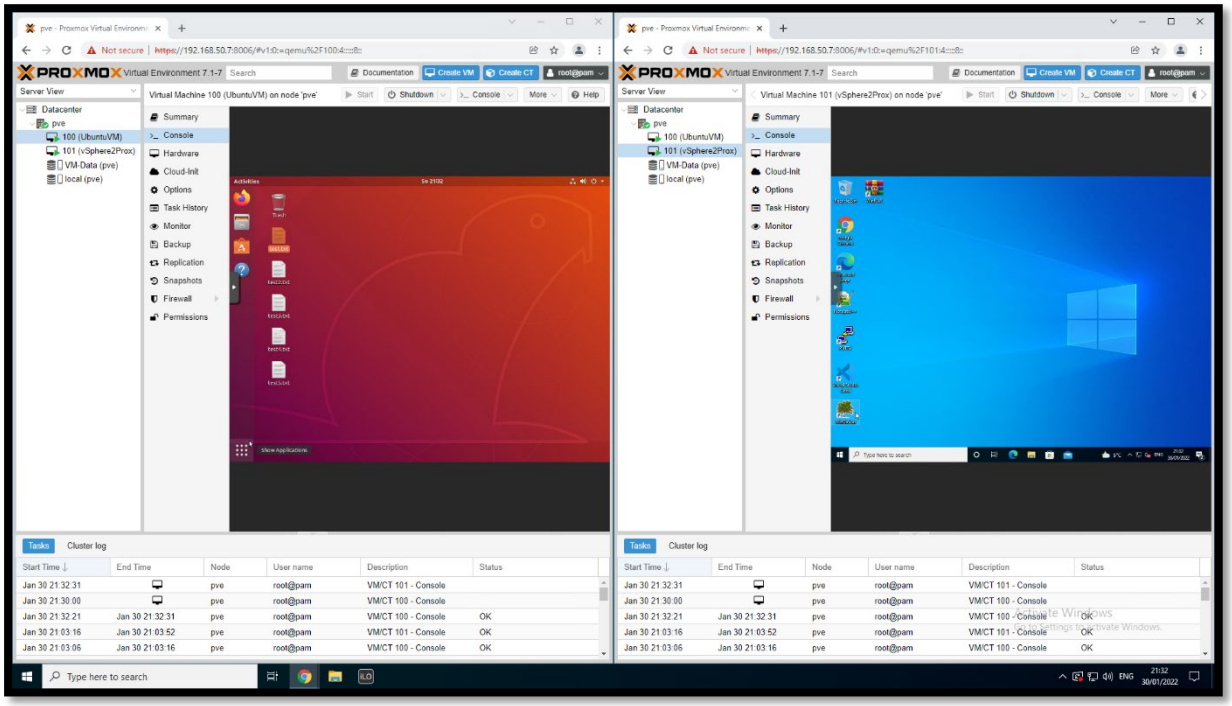
1. Uploading the ***-flat.vmdk** file
2. Uploading the ***.vmdk** file
3. Creating the VM
4. Importing the disk
5. Using the disk
6. Changing the boot order

The Windows VM that I want to migrate is using an UEFI boot mode. With UEFI, we'll need an EFI disk. This step will create one.


vRidance v1.0
Migrating VMs
Creating VM vSphere2Prox
Type of VM
Microsoft Wi
Version of VM
10/2016/2019
Number of cores
4
Amount of RAM (MB)
8192
Creating TPM State


vRidance v1.0
Migration Complete!
Your VM's have been migrated successfully!
You can now close this window.
Happy virtualizing!
- vRidance Developers

3.2 Logging in to the Proxmox VE Web Interface



On the Ubuntu VM, you can see that the files created on the vSphere VM have also been successfully migrated. In this case every file has the same data in it, but there is no data loss.

The Windows VM is connected to a domain. Because Windows has detected a new network card, the DNS configuration has been wiped. There is a script running on startup that changes the DNS server on the detected Network Interface to the IP of the Domain Controller.

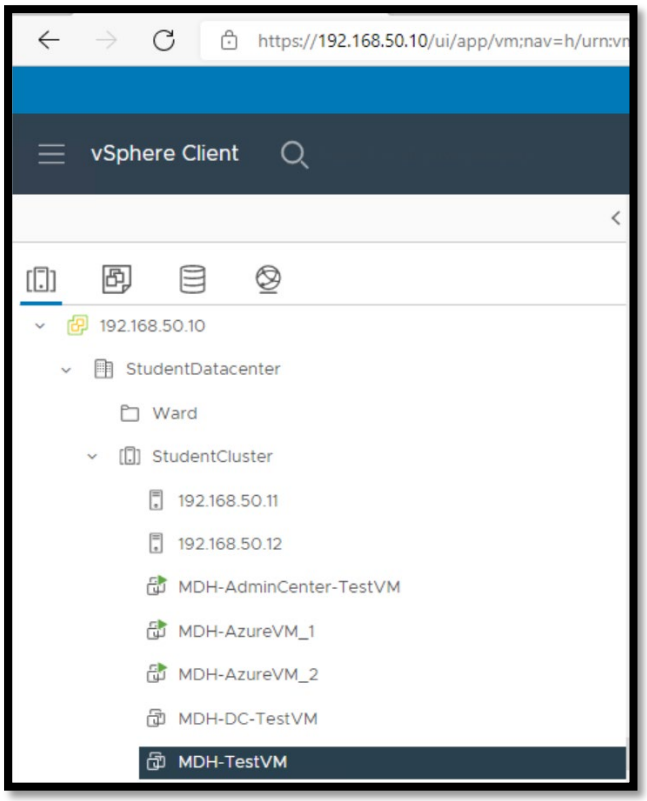
But this was it! You've successfully migrated your virtual machines from vSphere to Proxmox without a hassle. Happy virtualizing!

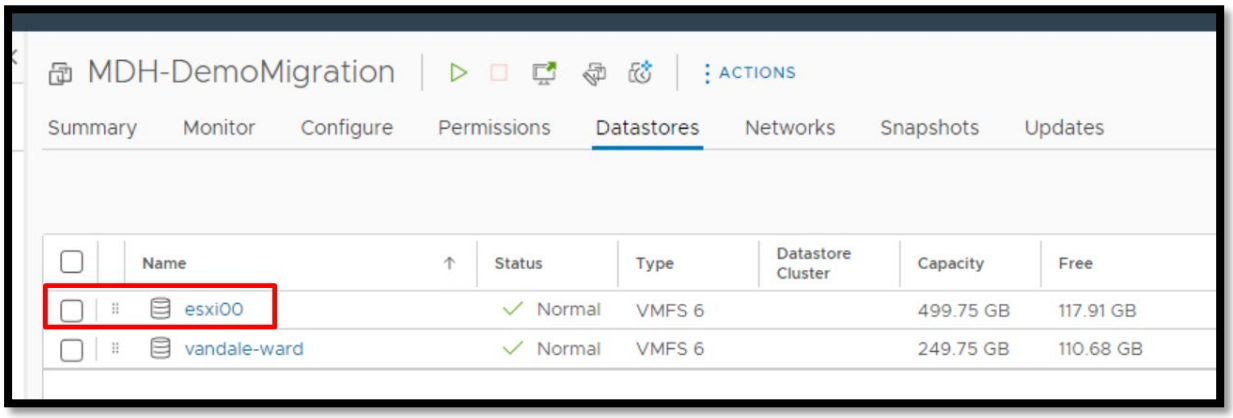
4 Azure Stack HCI

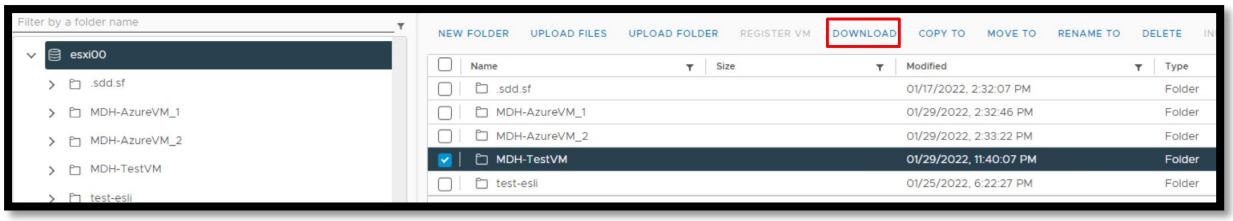
In this chapter we will demonstrate how you can migrate your VMs from vSphere to Azure Stack HCI.

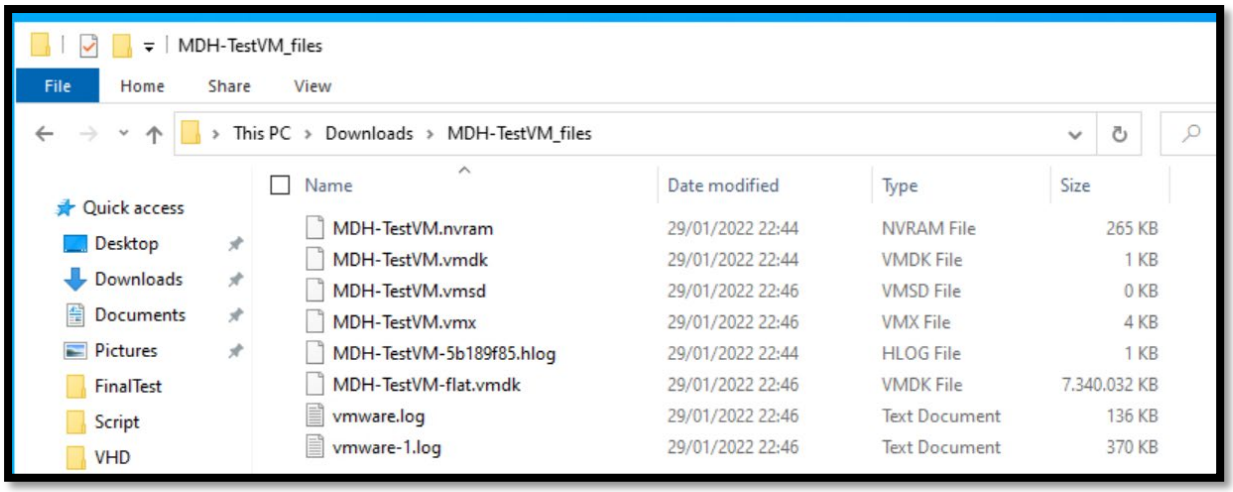
4.1 Select your VM

Log into your vSphere environment and locate a VM you want to migrate.









In order to migrate we need to convert the MDH-TestVM.vmdk file to a vhd file. Vhd is supported on Azure Stack HCI and vmdk is not.

But first we need a tool that converts these files.

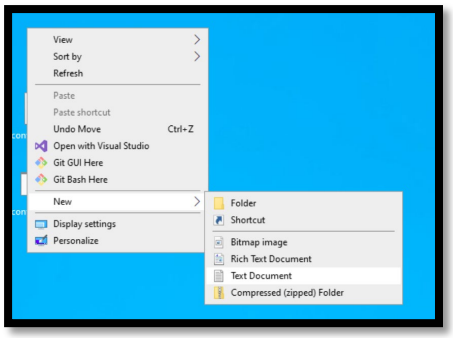
[StarWind V2V Converter - Converting VM Formats (starwindsoftware.com)]

Fill in your details and check your mailbox, there will be a download link waiting for you. Than simply install StarWind V2V Converter.

Now on the desktop create a new txt file and call it “!Converter.cmd”. Edit the file and past the following:

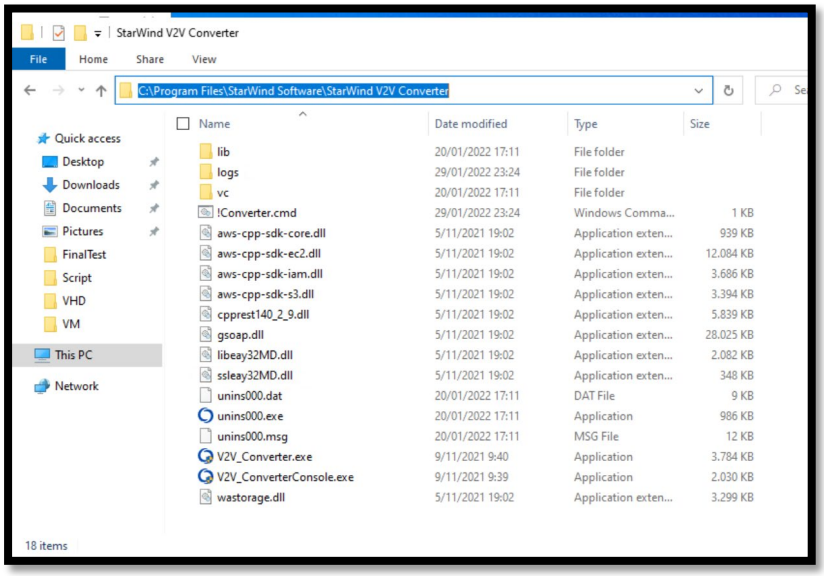
```
SET vmdkFilePath=""
SET vhdFilePath=""

V2V_ConverterConsole.exe convert in_file_name=%vmdkFilePath% out_file_name=%vhdFilePath%
```

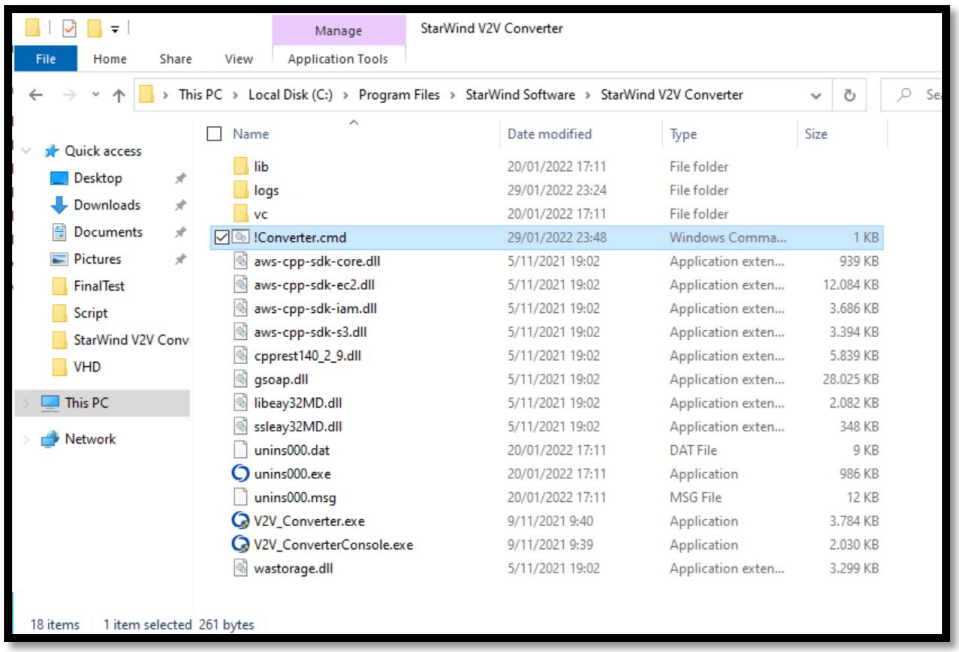
Or in the sources folder we provide you can copy and paste !Converter.cmd in the StarWind V2V Converter folder, see further in the document for the path.



You can save and close the file. Now go to this path:

C:\Program Files\StarWind Software\StarWind V2V Converter

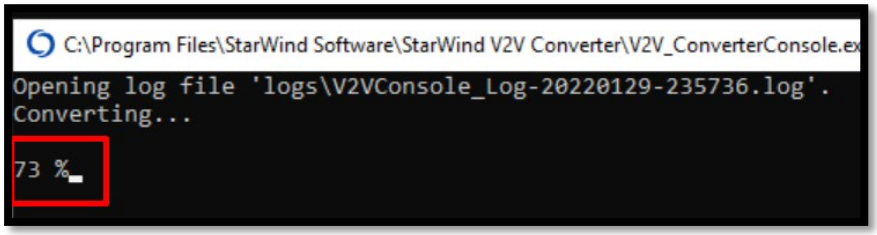


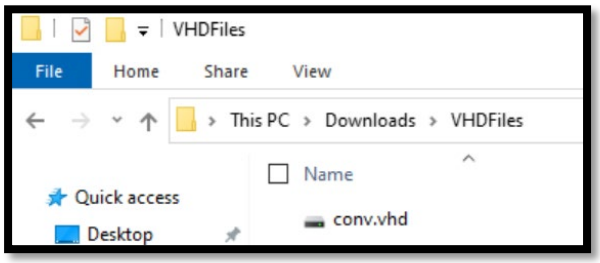


Now we have to specify the paths.

- vmdkFilePath = is the current location of the vmdk file you just downloaded from the VM
- vhdFilePath = is the location where you want to store the vhd file

```
SET vmdkFilePath="C:\Users\mathias\Downloads\MDH-TestVM_files\MDH-TestVM.vmdk"
SET vhdFilePath="C:\Users\mathias\Documents\VHD-Conv\conv.vhd"

V2V_ConverterConsole.exe convert in_file_name=%vmdkFilePath% out_file_name=%vhdFilePath% out_file_type=ft_vhd_thin
```





Now cut and paste the vhd file in to the cluster storage. We must copy past this because if we convert and immediately place it onto the cluster storage we must wait upto 3 hours to complete. And there is a lot that can go wrong, if we even lose connection the vhd file can go corrupt so the safest solution is to just copy and past them into the cluster storage.

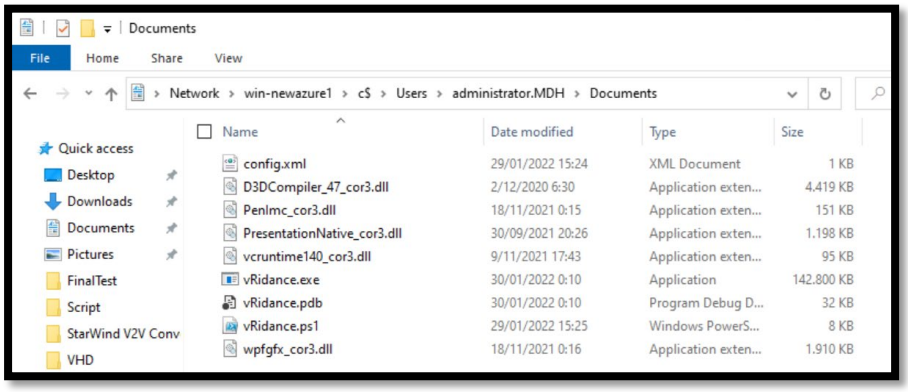
\\win-newazure1\c$\ClusterStorage\Volume01\VHD\

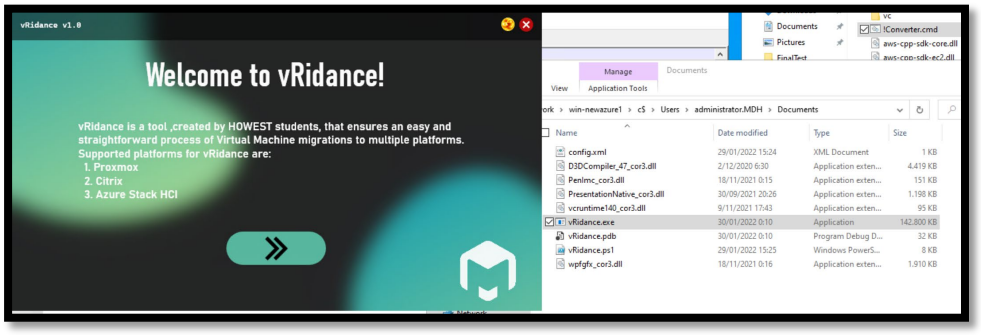
4.3 Migrate VM

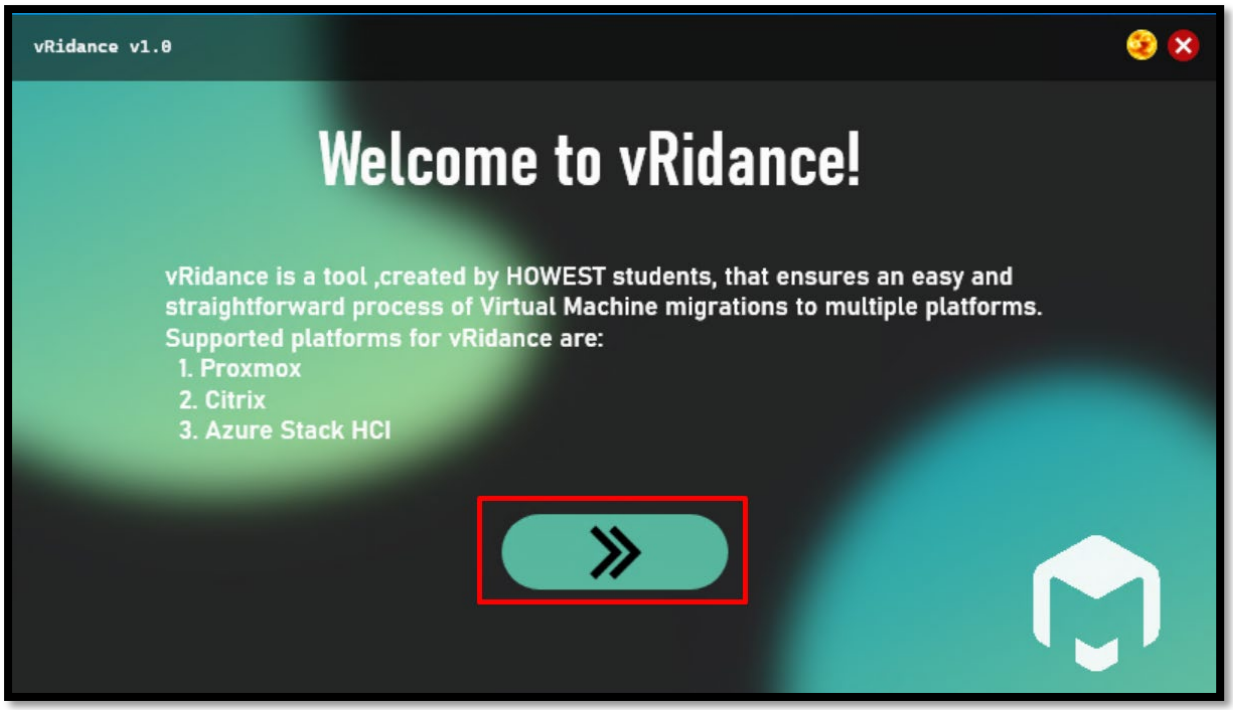
Open your mgmt machine where you can access Windows Admin Center and your Azure nodes.

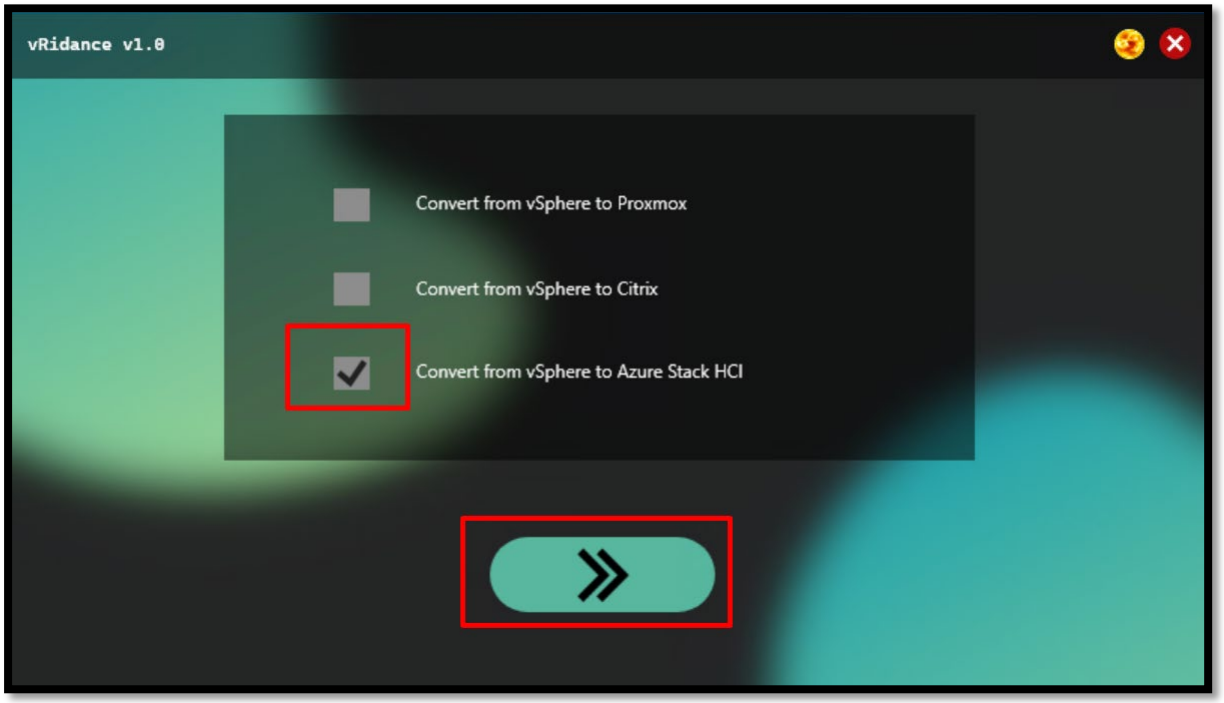
In the sources folder we provided you can find all the necessary files. Simply place them on one of your nodes. In my case I put them here:

\\win-newazure1\c$\Users\administrator.MDH\Documents

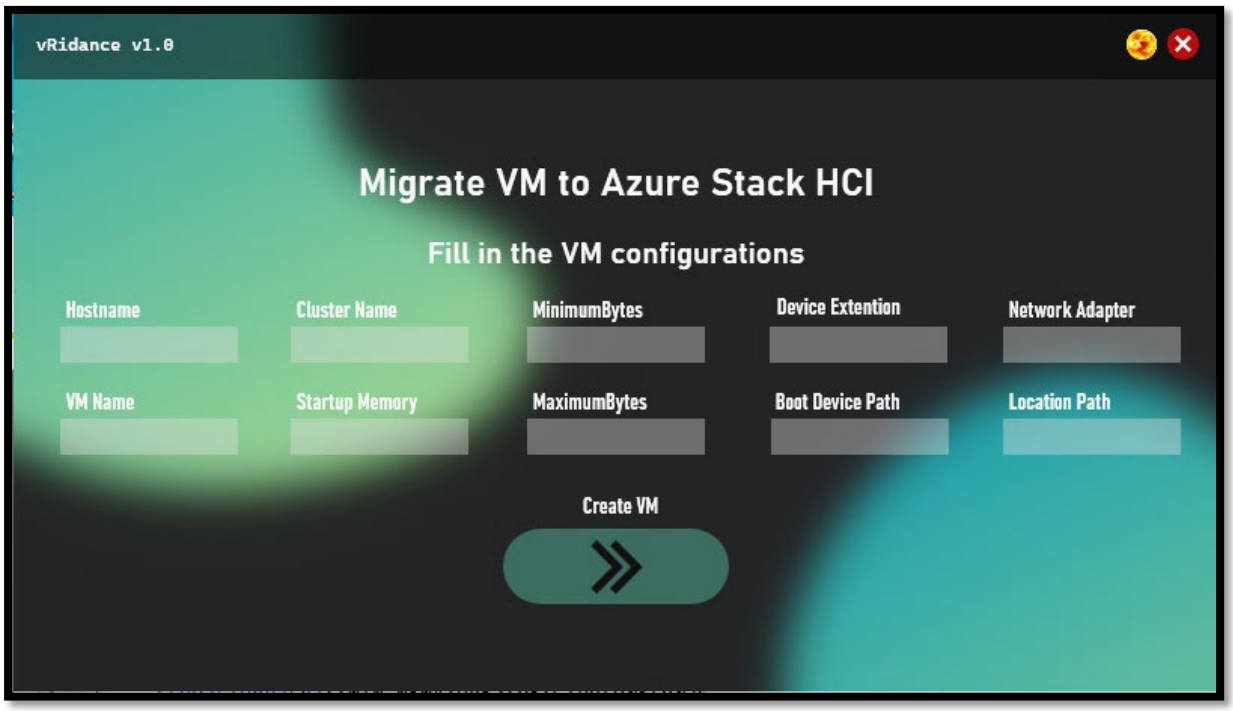





vRidance v1.0
Welcome to vRidance!
vRidance is a tool ,created by HOWEST students, that ensures an easy and straightforward process of Virtual Machine migrations to multiple platforms.
Supported platforms for vRidance are:
1. Proxmox
2. Citrix
3. Azure Stack HCI


vRidance v1.0
Convert from vSphere to Proxmox
Convert from vSphere to Citrix
Convert from vSphere to Azure Stack HCI

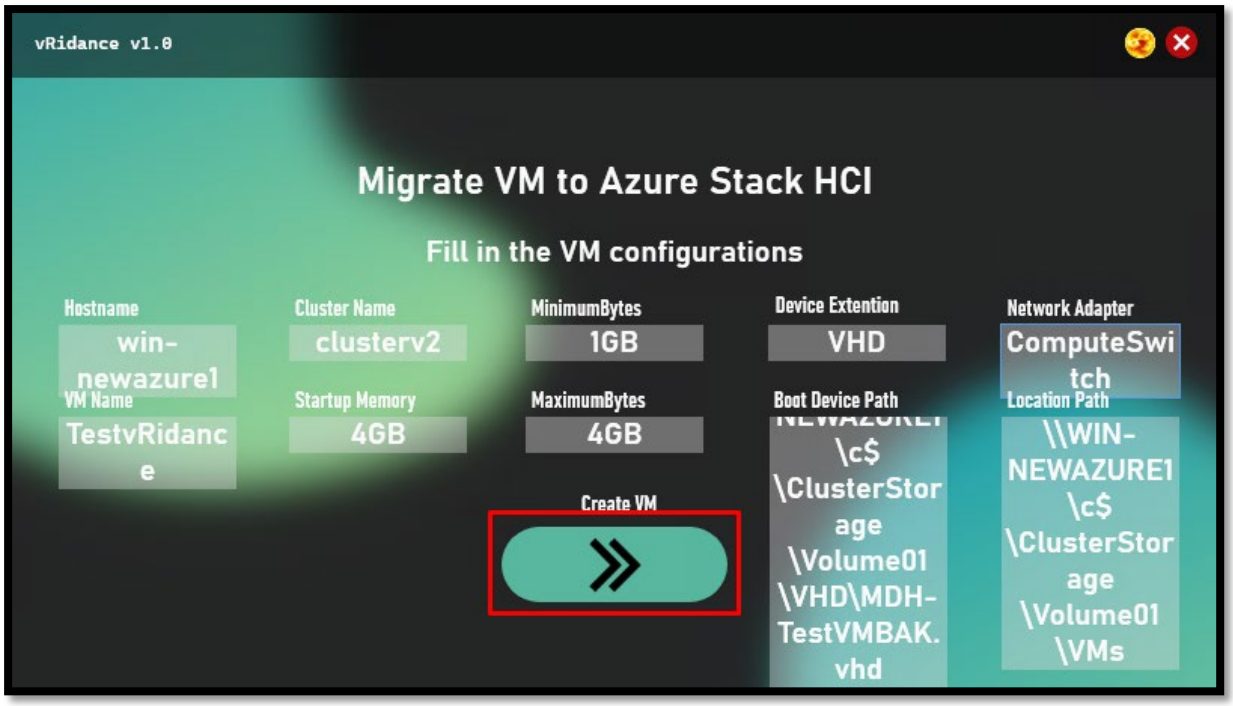
In this window we fill in all the configurations for the VM.



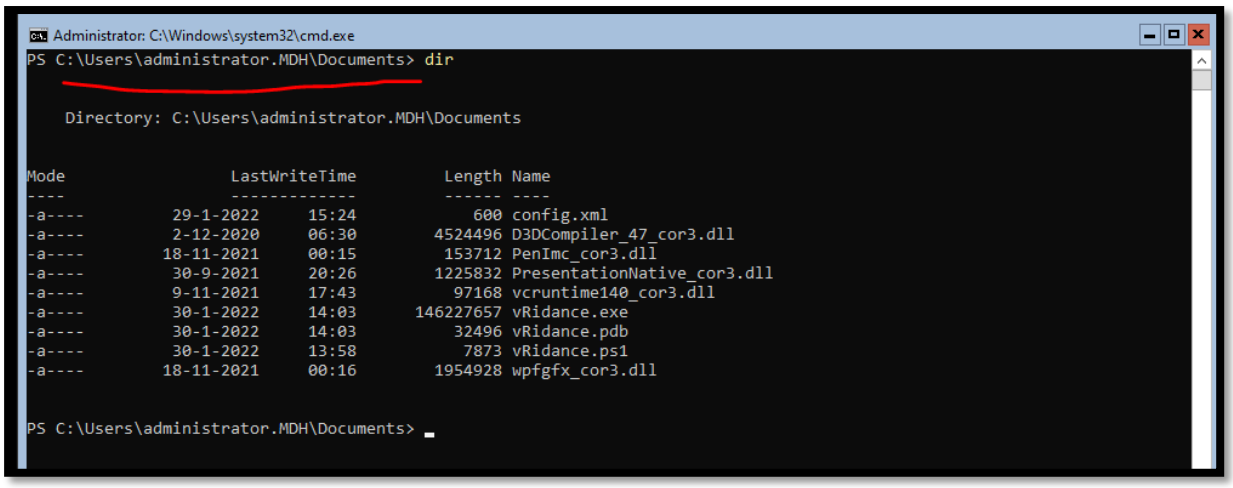
- VMName = Name of the VM
- ClusterName = Name of the cluster where we place the VM
- StartupMemory = How much memory we give at startup
- MinimumMemory = Minimum memory we give to the VM
- MaximumMemory = Maximum memory we give to the VM
- Device Extention = Extention of the harddisk file
- Boot Device Path = Location of the harddisk file
- Network adapter = Name of the network adapter
- Location Path = Location where we store the VM

Example:

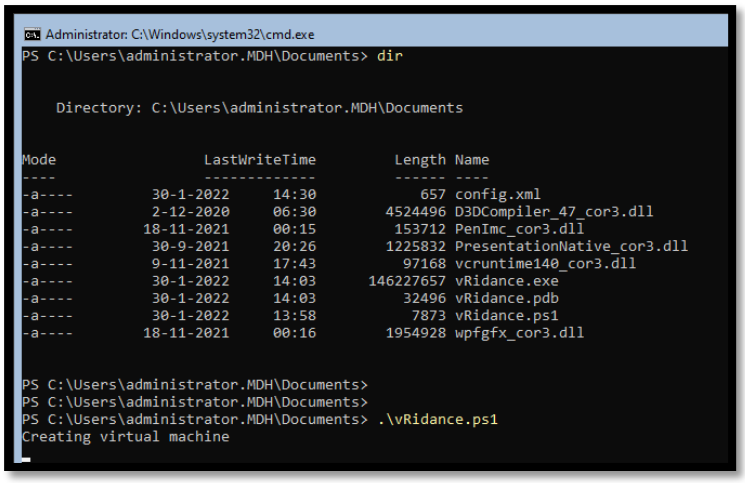
- Hostname = Win-newazure1
- VMName = WindowsServer2022-001
- ClusterName = ClusterV2
- StartupMemory = 4GB
- MinimumMemory = 1GB
- MaximumMemory = 4GB
- Device Extention = VHD
- Boot Device Path = c:\diskpath\disk.vhd
- Network adapter = ComputeSwitch
- Location Path = c:\storagepath\

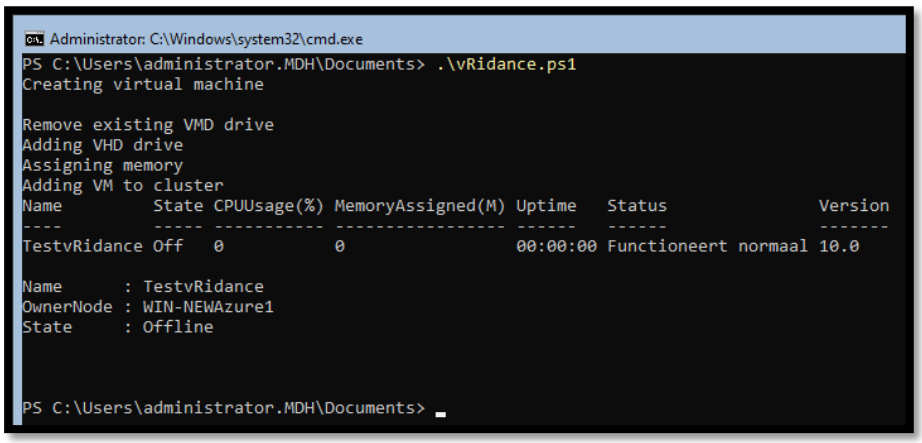


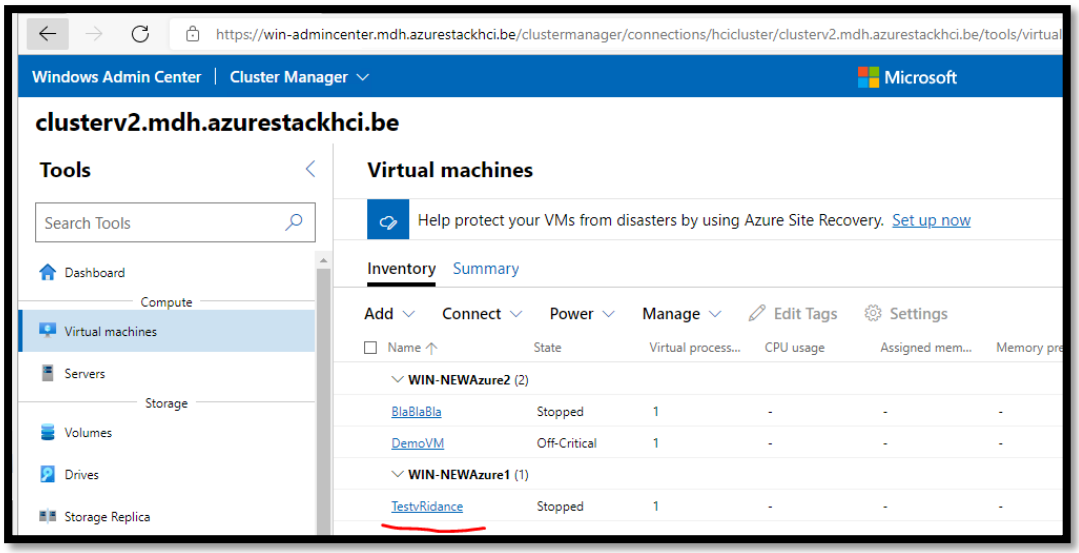
In the source folder copy and past all these files inside the document folder of the user.



Now we use a mgmt machine to start and complete the GUI. The GUI makes the config.xml file and after that we go to the Azure Node VM (the hostname we specified) and run vRidance.ps1

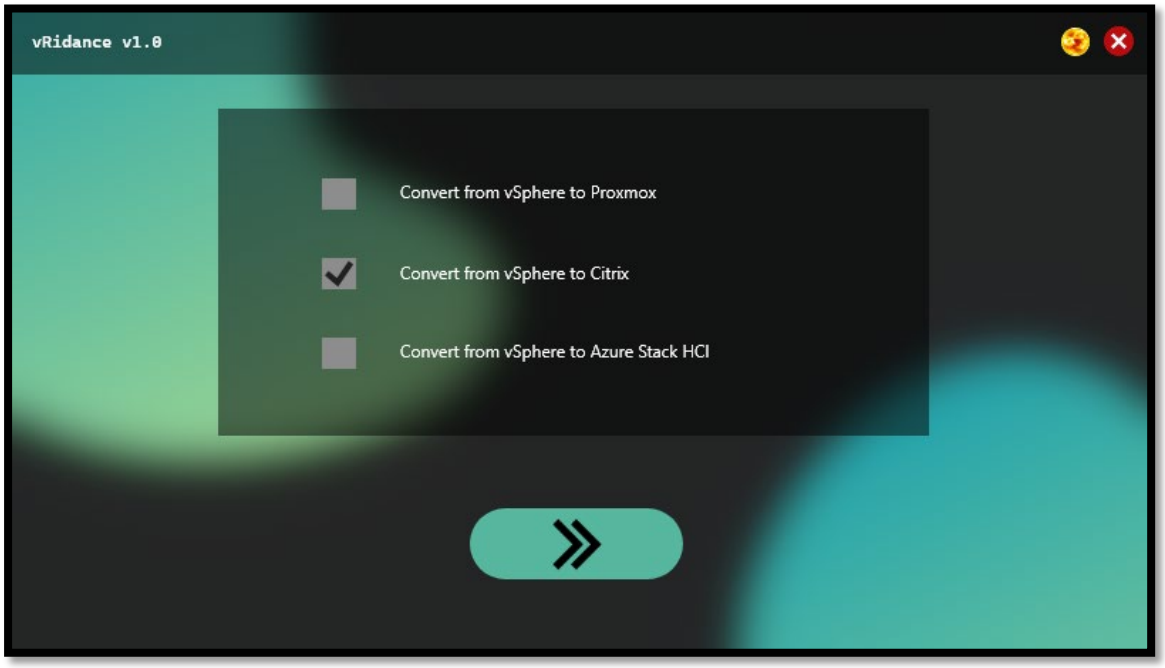

Administrator: C:\Windows\system32\cmd.exe
PS C:\Users\administrator.MDH\Documents> dir
Directory: C:\Users\administrator.MDH\Documents
Mode LastWriteTime Length Name
-a---- 30-1-2022 14:30 657 config.xml
-a---- 2-12-2020 06:30 4524496 D3DCompiler_47_cor3.dll
-a---- 18-11-2021 00:15 153712 PenImc_cor3.dll
-a---- 30-9-2021 20:26 1225832 PresentationNative_cor3.dll
-a---- 9-11-2021 17:43 97168 vcruntime140_cor3.dll
-a---- 30-1-2022 14:03 146227657 vRidance.exe
-a---- 30-1-2022 14:03 32496 vRidance.pdb
-a---- 30-1-2022 13:58 7873 vRidance.ps1
-a---- 18-11-2021 00:16 1954928 wpfgfx_cor3.dll
PS C:\Users\administrator.MDH\Documents>
PS C:\Users\administrator.MDH\Documents>
PS C:\Users\administrator.MDH\Documents> .\vRidance.ps1
Creating virtual machine

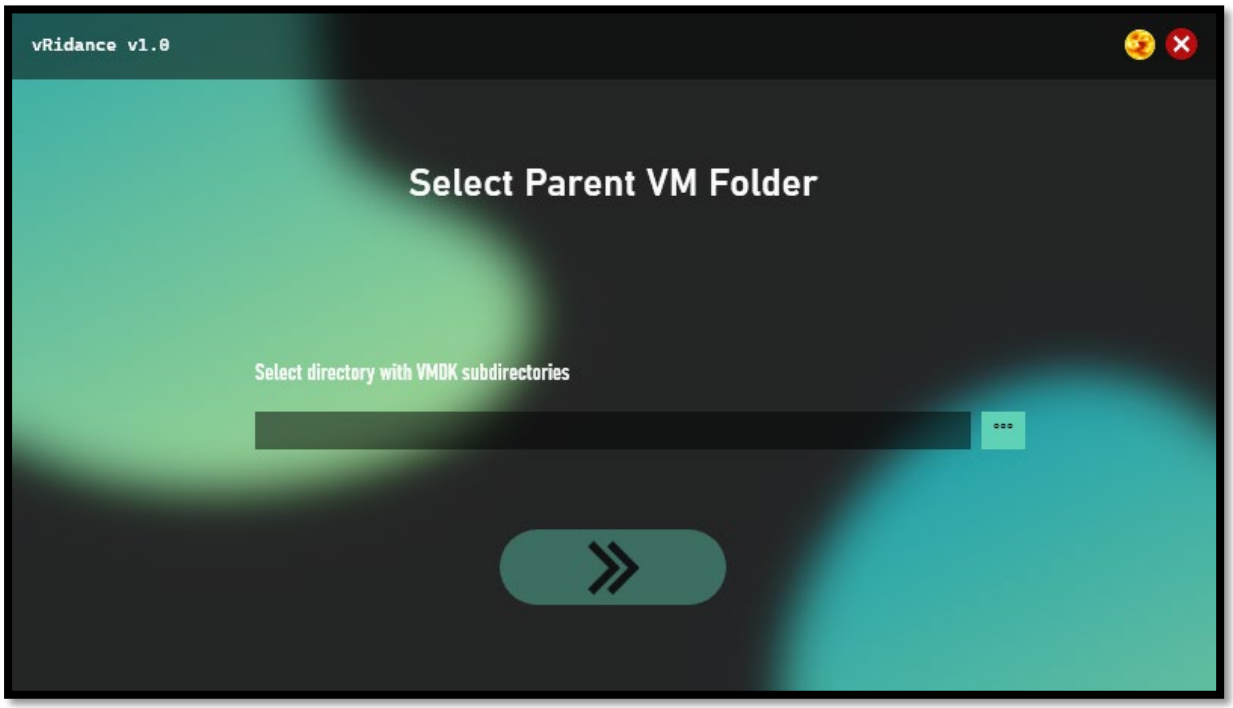

Administrator: C:\Windows\system32\cmd.exe
PS C:\Users\administrator.MDH\Documents> .\vRidance.ps1
Creating virtual machine
Remove existing VMD drive
Adding VHD drive
Assigning memory
Adding VM to cluster
Name State CPUUsage(%) MemoryAssigned(M) Uptime Status Version
TestvRidance Off 0 0 00:00:00 Functioneert normaal 10.0
Name : TestvRidance
OwnerNode : WIN-NEWAzure1
State : Offline
PS C:\Users\administrator.MDH\Documents>

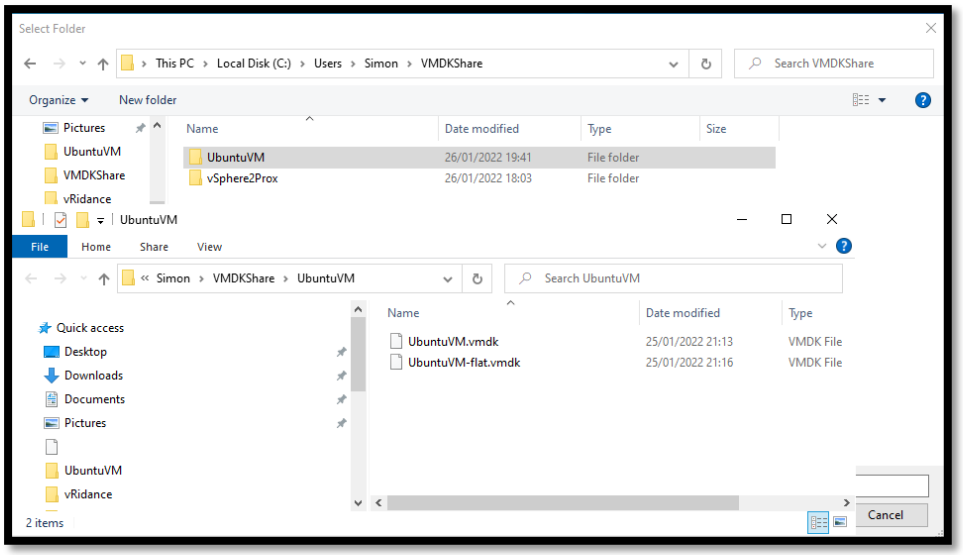

https://win-admincenter.mdh.azurestackhci.be/clustermanager/connections/hcicluster/clusterv2.mdh.azurestackhci.be/tools/virtual
Windows Admin Center | Cluster Manager
Microsoft
clusterv2.mdh.azurestackhci.be
Tools
Search Tools
Dashboard
Compute
Virtual machines
Servers
Storage
Volumes
Drives
Storage Replica
Virtual machines
Help protect your VMs from disasters by using Azure Site Recovery. Set up now
Inventory
Summary
Add
Connect
Power
Manage
Edit Tags
Settings
Name
State
Virtual process...
CPU usage
Assigned mem...
WIN-NEWAzure2 (2)
BlaBlaBla
Stopped
1
DemoVM
Off-Critical
1
WIN-NEWAzure1 (1)
TestvRidance
Stopped
1

5 Citrix

5.1 Migrating to Citrix

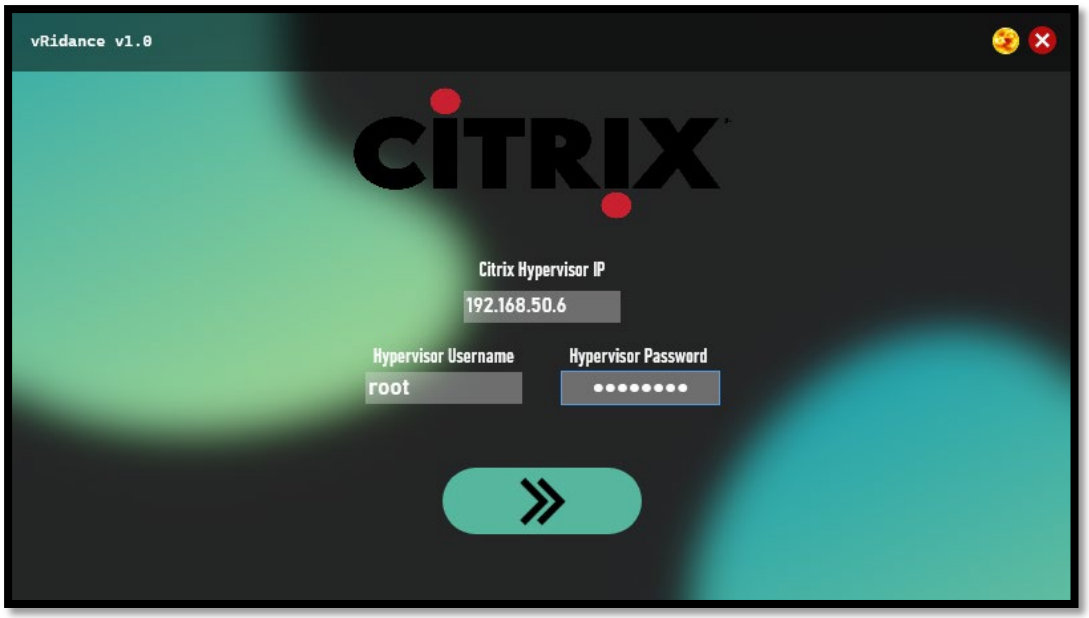


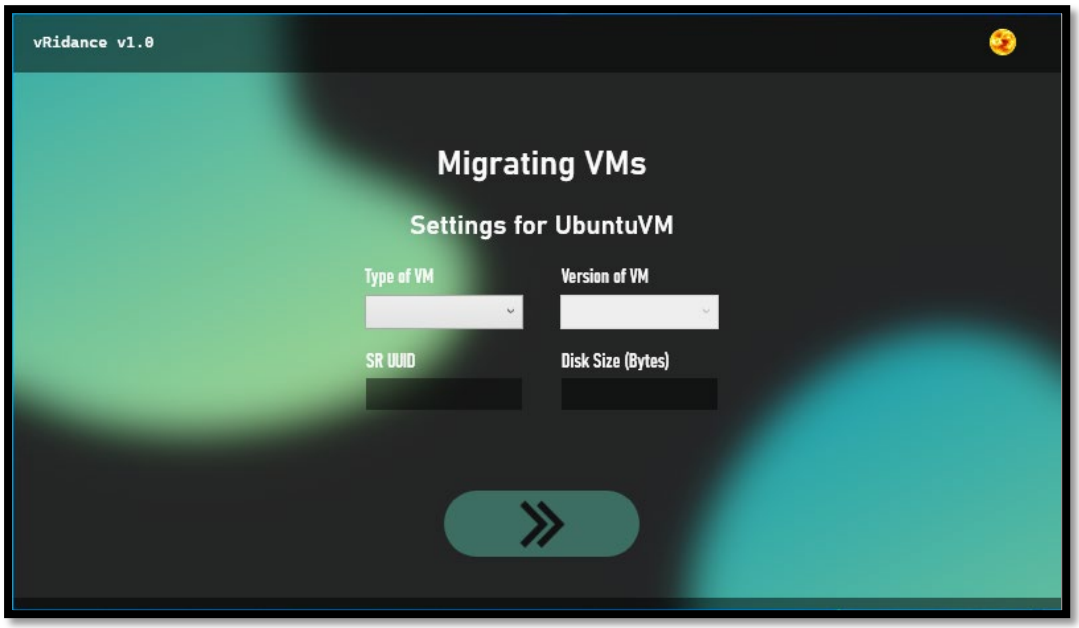


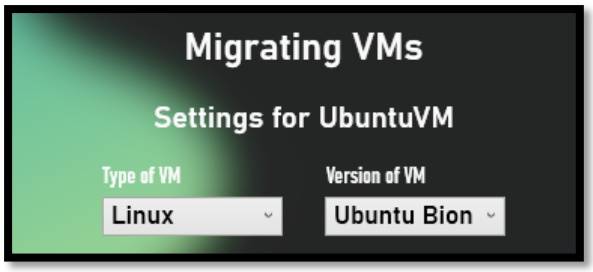


Do note, the Child directory containing the VMDK files will be the name of your imported VM. (UbuntuVM, vSphere2Prox) Choose your names wisely as they will be useful at a later stage during the migration.

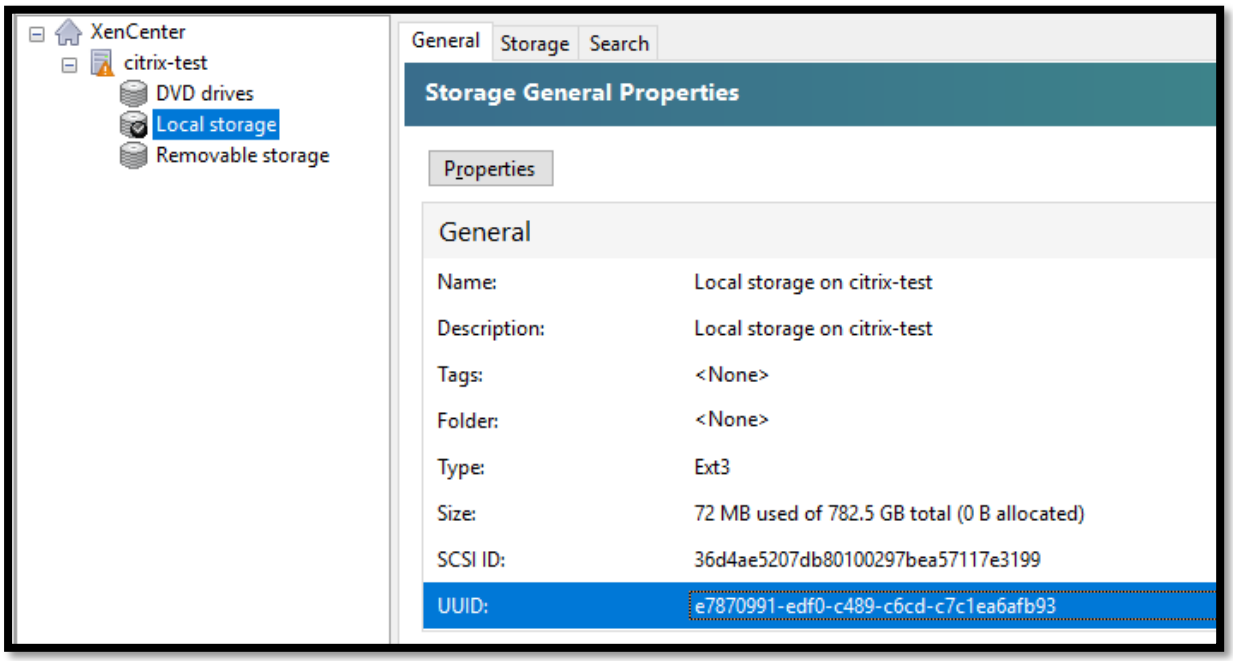
After selecting the VMDK Directory, you can click on the Next Button. You will then be prompted with the following screen;


vRidance v1.0
CITRIX
Citrix Hypervisor IP
192.168.50.6
Hypervisor Username
root
Hypervisor Password
••••••••


vRidance v1.0
Migrating VMs
Settings for UbuntuVM
Type of VM
Version of VM
SR UUID
Disk Size (Bytes)



The storage UUID can be found on Citrix Xencenter under your preferred storage. I'm using local storage for this tutorial.

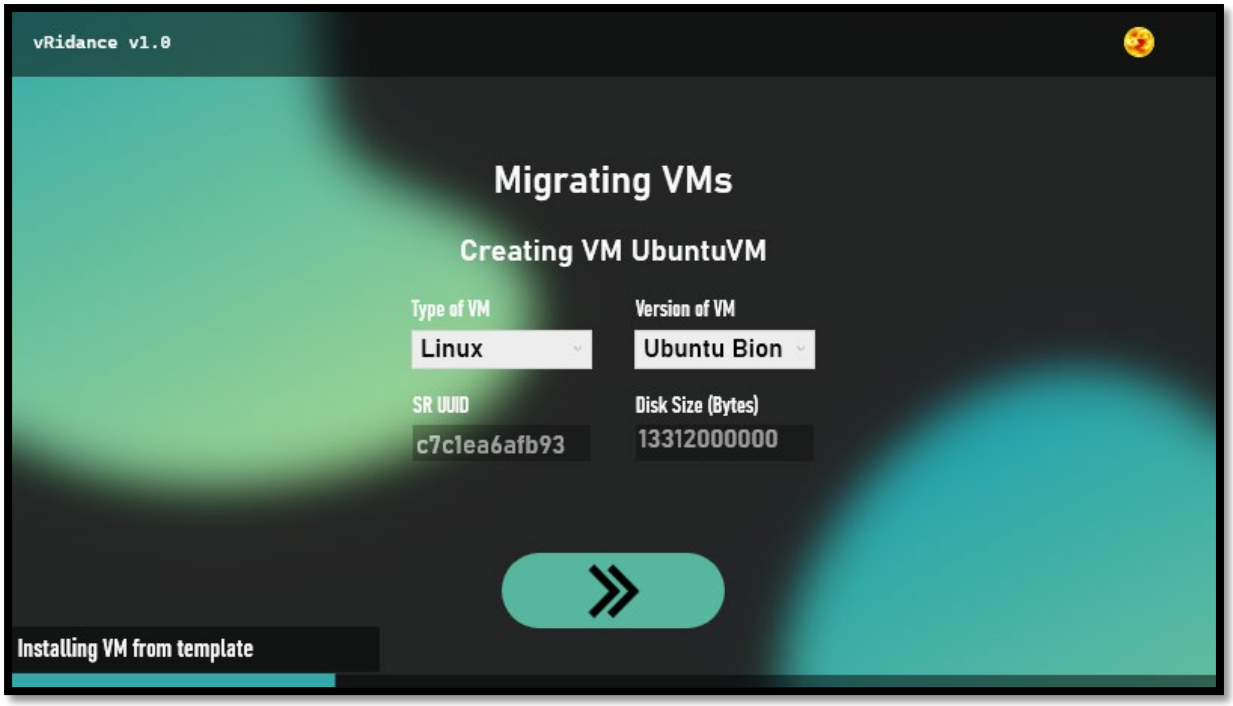


https://whatsabyte.com/P1/byteconverter.htm

Paste your Bytes value in the Disk Size box.

You can now click on the Next Button. Your UbuntuVM will automatically be created into your Citrix XenCenter. After the UbuntuVM Migration, it will continue to the next child directory in the VMDK share (vSphere2Prox VM, which is a windows machine)

When clicking on the Next Button a progressbar will appear and info will be displayed on what is happening. A screenshot of the working migration is provided below so you can have a look first.



You can leave this running until the progressbar is full. It will then move on to the next, where you will need to select the Type, Version, SR UUID and Disk Size again for the new machine.

After all the migrations are successful you will be prompted with a next (and final) screen prompting your migrations have been successful.