Vmware

- How to Create VMFS Datastore on Vmware OS bootdrive
- <u>Vmware ESXi NUT Client Installation and Configuration</u>
- Create OVA using vmware ovftool on ESXi or Vcenter
- In-Guest UNMAP, EnableBlockDelete and VMFS-6
- How to Increase Virtual Machine Disk Size in VMware
- Reduce Virtual Machine Disk Size (VMDK) on VMWare ESXi

How to Create VMFS Datastore on Vmware OS bootdrive

Normally a vmfs partition is already created by ESXi on the boot drive. You can verify by going logging into the ESX Web GUI and navigating to **Storage --> Devices --> Boot disk** (**Figure 1**).

Figure 1

vmware" ESXi"				root@.	-	Help 🗸 🝳 Search	
"E" Navigator	Storage						
▼ 🗐 Host	Datastores Adapters Devices Persistent Memory						
Manage							
Monitor	🖺 New datastore 🖻 Increase capacity 📃 Rescan 🛛 🤁 Refresh	Actions				Q Search)
🕶 🛱 Virtual Machines 📃 2	Name	✓ Status	~ Туре ~	Capacity ~	Queue Depth v	Vendor	~
* 🚯 👘	Local NVMe Disk (t10.NVMeWDC_CL_SN720_SDAQNTW2D51	I2G2D2000 🔗 Normal	Disk (SSD)	476.94 GB	1023	NVMe	
Monitor							1 items
More VMs							
- 🗐 Storage 📃 1							
t10 NVMe WDC CL							

Clicking on the drive will show the **Partition diagram** of the boot drive and the vmfs partition is usually partition **3**. Make a note of the **UUID** of the device and the partition number (**Figure 2**).

Figure 2

Local NVMe	Disk (t10.NVMeWD0	C_CL_\$N720_\$DAQNTW2D512G2D2000E50F1	F444A441B00)				
🗐 New data	istore 🔳 Increase capa	city Ce Refresh 🏟 Actions					
i Ti	Local NVMe Disk (110.NVMe WDC CL SN720 SDAQNTW2D512G2D2000 E50F1F444A441B00)						
	Туре:	Disk					
Acres 10	Model:	WDC CL SN720 SDA					
	Path:	/vmfs/devices/disks/t10.NVMeWDC_CL_SN720_	SDAQNTW2D512G2D2000				
	Capacity:	476.94 GB					
	Partition Format	9P* 010000000453530465f314634345f344134345f3142	30300057444320434c				
	UGID.	010000000000000000000000000000000000000	103000314443204340				
▼ Partitions	;						
▶ 1: EFI Syst	tem	3 MB (3 blocks)		1. EFI System (3.97 MB)			
2: Basic Da	ata	4 GB (4094 blocks)		5. Basic Data (249.98 MB)			
► 3: VMFS		469.56 GB (480831 blocks)		6. Basic Data (249.98 MB)			
► 5: Basic Da	ata	249 MB (249 blocks)		7. VMware Diagnostic (109.98 MB)			
▶ 6: Basic Da	ata	249 MB (249 blocks)		8. Basic Data (285.98 MB)			
► 7: VMware	Diagnostic	109 MB (109 blocks)		9. VMware Diagnostic (2.5 GB)			
• 8: Basic Da	ata	285 MB (285 blocks)		2. Basic Data (4 GB)			
▶ 9: VMware	Diagnostic	2.5 GB (2559 blocks)		3. VIVIES (409.50 GB)			

Create a vmfs datastore named **datastore-ssd** on the the boot device using the **UUID** and the partition number you noted above using the command below (Device format is /vmfs/devices/disks/ vm1.<**UUID**>:**3**):

vmkfstoolscreatefs vmfs6 -S datastore-ssd
/vmfs/devices/disks/vml.010000000453530465f314634345f344134345f314230300057444320434c:3

If successful, you should get an output similar to below:

create fs					
deviceName:'/vmfs/devices/disks/vml.010000000453530465f314634345f344134345f31423030005744432043					
4c:3', fsShortName:'vmfs6', fsName:'datastore-ssd'					
deviceFullPath:/dev/disks/t10.NVMeWDC_CL_SN720_SDAQNTW2D512G2D2000E50F1F444A441B00					
:3 deviceFile:t10.NVMeWDC_CL_SN720_SDAQNTW2D512G2D2000E50F1F444A441B00:3					
ATS on device					
/dev/disks/t10.NVMeWDC_CL_SN720_SDAQNTW2D512G2D2000E50F1F444A441B00:3: not					
supported					
Checking if remote hosts are using this device as a valid file system. This may take a few seconds					
Scanning for VMFS-6 host activity (4096 bytes/HB, 1024 HBs).					
Creating vmfs6 file system on					
"t10.NVMeWDC_CL_SN720_SDAQNTW2D512G2D2000E50F1F444A441B00:3" with blockSize					
1048576, unmapGranularity 1048576, unmapPriority default and volume label "datastore-ssd".					
Successfully created new volume: 5fc102ac-257939bc-7e5b-0cc47ac8166c					

Additionally, the datastore you created should appear under **Storage --> Datastores** in your ESXi Web Gui (**Figure 3**).

Figure 3

vmware [,] Esxi ^{,,}					root@I		not e Help +	Q Search
📲 Navigator 🗆	Storage							
🕶 🖥 Host	Datastores Adapters Devices Persistent Memory	/						
Manage Monitor	🔠 New datastore 📧 Increase capacity 🛛 🍄 Register a VM	🛱 Datastore brows	er C Refresh	The Actions			Q	Search
👻 🔂 Virtual Machines 🛛 2	Name	Drive Type V	Capacity ~	Provisioned ~	Free ~	Type ~	Thin provisioning $ \sim $	Access ~
* 🗗 🗇 👘	atastore-ssd	SSD	469.5 GB	4.06 GB	465.44 GB	VMFS6	Supported	Single
Monitor								1 items
More VMs								
→ 🗮 Storage 📃 1								

Vmware ESXi NUT Client Installation and Configuration

Requirements

- You must have a NUT server connected to a UPS and configured in your environment.
- SSH must be enabled on your ESXi installation
- Community acceptance level must be enabled on your ESXi installation in order to install the client

Download

Download the latest NutClient-ESXi-x.x.x-x.x.offline_bundle.zip package from:

https://github.com/rgc2000/NutClient-ESXi/releases.

Install

- Secure copy the **NutClient-ESXi-x.x.x-offline_bundle.zip** to your ESXi server's /tmp directory by either using WinSCP/pscp in Windows or scp in Linux.
- Set ESXi Community Acceptance level:

esxcli software acceptance set --level=CommunitySupported

If you get the following error:

[AcceptanceConfigError]

Secure Boot enabled: Cannot change acceptance level to community.

Please refer to the log file for more details.

You must disable Secure Boot in your computer BIOS and re-try the installation again.

• Install bundle:

esxcli software vib install -d /tmp/NutClient-ESXi-x.x.x-x.x.v-offline_bundle.zip

• If installation was successful you should see the following output:

Installation Result	
Message: Operation finished successfully.	
Reboot Required: false	
VIBs Installed: Margar_bootbank_upsmon_x.x.x-x.x.x	
VIBs Removed:	
VIBs Skipped:	

• You can now delete the files in the /tmp directory and disable the SSH service if desired.

ESXi Configuration

 In the ESXi Web client, navigate to Host —> Manage —> System —> Advanced Settings. In the Search box enter UserVars.Nut (Figure 1).

Figure 1

System Hardware	Licensing	Packages	Services S	Security & users				
Advanced settings	🥒 Ed	iit option C	Refresh 🐴 A	ctions		Qu	serVars.Nut	×
Autostart	Key 🖌		8	Name	8	Value ~	Default ~	Overr∽
Time & date	User\	/ars.NutFinalDela	ау	NUT seconds to	wait on low bat	600	5	True
	User\	<mark>/ars.Nut</mark> MailTo		NUT send mail n	otification to thi	dino.edwards	root@	True
	User\	<mark>/ars.Nut</mark> Passwor	d	NUT password to	o connect to re	apc	upspas	True
	User\	<mark>/ars.Nut</mark> SendMai	i	NUT send mail n	otification (1=y	1	0	True
	User\	<mark>/ars.Nut</mark> UpsNam	e	NUT remote ups	name (eg: ups	ups@192.16	upsna	True
	User\	<mark>/ars.Nut</mark> User		NUT username t	o connect to re	apc	upsuser	True

• Configure the following variables:

NutUpsName: Name of the UPS on the NUT server (in the form of inverter_name@server_name or server_ip). Several inverters can be entered separated by a space. There will be no system shutdown until the last UPS still standing has given the shutdown command.

NutUser: Name of the NUT server login account

NutPassword: NUT Server Connection Account Password

NutFinalDelay: Seconds to wait after receiving the low battery event to shut down the system

NutSendMail: Set to 1 for the NUT client to send an e-mail to each important event of the UPS

NutMailTo: E-mail address to send UPS events to

 In the ESXi Web client, navigate to Host -> Manage -> Services -> NutClient -> Actions -> Policy -> Start and Stop with Host (Figure 2).

Figure 2

System	Hardware	Licensing	Packag	jes	Services	Security & users	\$	
Start	🔲 Stop 🏻 👩	Restart CR	efresh	۰	Ac Status			Q Search
Name 🔺	~	Description	~	Nu	tClient		~	Firewall rules ~
DCUI		Direct Console U	JI	1 9	Restart			None
lbtd		Load-Based Tea	ming	🕨	Start			None
lwsmd		Active Directory	Serv	•	Stop			None
ntpd	Start	and stop with firew	all ports	2	Policy	•		ntpClient
NutClient	Start	and stop with host			торреа	upsmon		NutServer
pcscd		and stop manually	ۍ ا	🔳 S	topped	Base system		None
sfcbd-watc	hous	onn oorror		▶ R	lunning	Base system		CIMHttpServer, CIM
enmnd		SNMP Server		– 9	tonned	Race cyctem		como

 In the ESXi Web client, navigate to Host -> Manage -> Services -> NutClient -> Actions -> Start (Figure 3).

Figure 3

System	Hardware	Licensing Pack	ages Services	Security & users			
Start	🔲 Stop 🏼 👩	Restart C Refresh	Actions	Source	(Q Search	
Name 🔺	~	Description ~	NutClient		~	Firewall rules	~
DCUI		Direct Console UI	Restart			None	
Ibtd		Load-Based Teaming	Start	والس		None	
lwsmd		Active Directory Serv	Stop Start	this service		None	
ntpd		NTP Daemon	Relicy			ntpClient	
NutClient		NutClient	Stopped	upsmon		NutServer	
pcscd		PC/SC Smart Card D	Stopped	Base system		None	

- Use the ESXi host configuration tab in the vSphere Client to decide how to start and stop (or suspend) virtual machines. This order will be respected by the UPS shutdown procedure.
- The clean shutdown of the OS in the virtual machines is only possible if the vmware tools are installed.
- To uninstall the NUT client, use the following command:

esxcli software vib remove -n upsmon

• To update the NUT client, use the following command:

esxcli software vib update -d /tmp/NutClient-ESXi-x.x.x-x.x.offline_bundle.zip

• To estimate the time needed for the server to shut down on UPS alert, type the command below on the host ESXi (by ssh or on the console). The shutdown procedure is immediately started:

/opt/nut/sbin/upsmon -c fsd

 If the NUT Client is configured correctly, the ESXi /var/log/syslog.log should have a message similar to below where ups@UPSHOST is the ups name and the UPS host you setup earlier :

2019-09-22T13:28:07Z upsmon[2111424]: Communications with UPS ups@UPSHOST established

Create OVA using vmware ovftool on ESXi or Vcenter

- Download ovftool for Windows 64 from vmware.com and install.
- From an elevated command prompt, navigate to c:\Program Files\VMware\VMware OVF Tool
- Run any of the following commands depending on your environment:

Vcenter Example (local)

ovftool --noSSLVerify vi://[USERNAME]@[VHOST]/[DATACENTER]/vm/[MACHINE_NAME] C:\ova\[OVA_MACHINE_NAME].ova

ESXi Example (Share):

ovftool --noSSLVerify vi://[USERNAME]@[ESXI_HOST]/[MACHINE_NAME] \\[FILE_SERVER]\[SHARE]\[MACHINE_NAME].ova

In-Guest UNMAP, EnableBlockDelete and VMFS-6

Original Article URL: <u>https://www.codyhosterman.com/2017/08/in-guest-unmap-</u>enableblockdelete-and-vmfs-6/

Credit: Cody Hosterman

EnableBlockDelete with VMFS-5

I have a Ubuntu VM with a thin virtual disk on a VMFS-5 volume.

Image not found or type unknown
age not found of type unknown

Furthermore, I have EnableBlockDelete DISABLED on the ESXi host (set to 0). It is important to note that this is a host-wide setting.



In my VM, I will put ext4 on the virtual disk then mount it:

Image not found	l or type unknown		

We can see through sg_vpd that UNMAP is supported on this virtual disk:

root@Ubuntu16:~# sg_vpd /dev/sdb -p lbpv |grep "Unmap" Unmap command supported (LBPU): 1

Now I will put some data on the file system. A couple of OVAs.



root@Ubuntu16:/mnt/unmap# df -h /mnt/unmap Filesystem Size Used Avail Use% Mounted on

/dev/sdb 16G 3.9G 11G 26% /mnt/unmap

My file system reports as having 3.9 GB used. My VMDK is 4.4 GB in size.



There is about 400 MB of capacity that was written when the file system was created, which explains the difference between those.

The underlying array reports 3.7 GB used. Smaller due to data reduction. Since the OVAs are compressed already, there isn't a ton of data reduction to do.

Image not found or type unknown

Okay, so let's delete the OVAs.



We can see the file system is now down to 44 MB used:

root@Ubuntu16:/mnt/unmap# df -h /mnt/unmap
Filesystem Size Used Avail Use% Mounted on
/dev/sdb 16G 44M 15G 1% /mnt/unmap

But if we look at the VMDK, it is still 4.4 GB:



And the array is unchanged too.



So we now have dead space in the VMDK and on the array, because those blocks are no longer in use by the guest. So, in Linux, to reclaim space you can either mount the file system with the discard option so UNMAP is triggered immediately upon file deletion, or you can manually run it with fstrim. I did not mount with the discard option, so I will run fstrim.



root@Ubuntu16:/mnt/unmap# fstrim /mnt/unmap -v
/mnt/unmap: 3.9 GiB (4131360768 bytes) trimmed

Now if we look at my VMDK, we will see it has shrunk to 400 MB:



But my array is still reporting it as used. This is because EnableBlockDelete is not turned on. The UNMAP in the guest only makes the VMDK size accurate by shrinking it down. But the underlying physical device is not told.

Image not found or type unknown

So at this point (since it is VMFS-5) I have to run esxcli storage vmfs unmap to reclaim it.

esxcli storage vmfs unmap -l vmfs5



Once complete, we can see the capacity reclaimed on the array:



So this is the default behavior. Let's enable EnableBlockDelete and repeat the process.



I will copy the data back to the file system, which will grow the virtual disk again and write data back to the FlashArray. We can see we have 3.9 GB used again on my file system.

root@Ubuntu16:/mnt/unmap# df -h /mnt/unmap
Filesystem Size Used Avail Use% Mounted on
/dev/sdb 16G 3.9G 11G 26% /mnt/unmap

My virtual disk is back to 4.4 GB:



My array reduced it to 1.7 GB:



So now to delete the data and run fstrim. My virtual disk shrinks to 400ish MB again:



My space on my array is reclaimed immediately this time! No need to run esxcli to unmap.



I ran fstrim at 12:33:00 and the space was reclaimed on the array automatically by 12:33:55.

Great! So now, back to the original question, what about VMFS-6?

EnableBlockDelete and VMFS-6

As you are likely aware, VMFS-6 introduced automatic UNMAP. So you no longer need to ever use esxcli to run UNMAP on the VMFS.

So let's repeat the test.

I moved my VMDK to my VMFS-6 datastore:



I will not go through every step again, let's just start from the "we just deleted the files" step, but we have yet to run fstrim. So we have dead space.

VMFS-6: EnableBlockDelete Disabled, Auto-UNMAP Enabled

In this test, I have EnableBlockDelete disabled on my host and auto-UNMAP enabled on the datastore.







If I use vsish, I can see no automatic UNMAPs have been issued to this datastore from my host.



Note "UNMAP IOs" and "Unmapped blocks" are both zero.

So I run fstrim. My VMDK is back down to 400 MB:



If we look back at the array, we see the space reclaims, but not quite as fast, took a few minutes.



Since EnableBlockDelete was disabled and auto-unmap was enabled we can see this was autounmap. We can further show that by looking back at vsish:



62 UNMAP I/Os and 3878 blocks reclaimed. So we don't need to turn on EnableBlockDelete in the case of VMFS-6!

VMFS-6: EnableBlockDelete Enabled, Auto-UNMAP Disabled

In this test, I have EnableBlockDelete enabled on my host...



...and auto-UNMAP disabled on the datastore:



Let's run through the process again. I refreshed my environment so counters are reset etc. Add the VMDK, put data on it, delete the data and run fstrim:

The VMDK shrank back down:



But if we look at the array, nothing happens.



So this shows that EnableBlockDelete is ignored for VMFS-6 volumes. So in this situation we would have to enable automatic UNMAP to reclaim this space, or run the standard esxcli manual UNMAP.

Conclusion

So what does this tell us. A couple things.

- In order to have full end-to-end UNMAP with VMFS-5 volumes, you need to enable EnableBlockDelete.
- For VMFS-6 automatic UNMAP takes care of the VMFS reclamation portion for you.

An interesting thing here is that automatic UNMAP invokes fairly quickly. When you delete a VM or a virtual disk, automatic UNMAP can possibly take 12-24 hours to reclaim the space. But with inguest UNMAP, as soon as the VMDK shrinks, automatic UNMAP kicks in fairly quickly-in a few minutes. Mimicking the behavior of EnableBlockDelete. Which is great-you don't lose functionality by moving to VMFS-6.

I will note, that this was done with 6.5 U1. From my understanding there was a bug in 6.5.0 that EnableBlockDelete was actually honored with VMFS-6 and it would issue UNMAP when a VMDK shrank when the setting was enabled. The problem was that UNMAP was issued twice, as the EnableBlockDelete-invoked UNMAP did not prevent the automatic async UNMAP from issuing reclaim. So UNMAP was issued twice.

This behavior was changed in 6.5 P1 and of course in 6.5 U1.

How to Increase Virtual Machine Disk Size in VMware

Original Article: https://woshub.com/increase-virtual-disk-vmware/

Increase the Size of VM Disk (VMDK) in VMware

For example, you have a virtual machine with a single virtual hard disk file (vmdk) of 40GB, and you plan to increase this virtual disk size to 50GB.

1. Connect to your vCenter server or a standalone ESXi host using the vSphere Web Client;



- 1. Find the virtual machine and open its settings (Actions -> Edit Settings);
- Find the virtual disk you want to extend. In this example, the VM has only one Hard Disk

 with a size of 40 GB. Specify the new disk size in this field and save the settings. Note
 that the maximum disk size available for this type of datastore (VMFS, NFS, vSAN) is
 specified in the Maximum size field;

Edit Settings	srv01
---------------	-------

Virtual Hardware VM Op	tions		
> CPU	2 ~		
> Memory	2.046875	GB	~
 Hard disk 1 	40	GB	~~
Maximum Size	89.5 GB		
VM storage policy	Datastore Def	ault	

Make sure that your VMFS datastore has enough free space. If required, you can increase the size

of the VMFS datastore in VMWare ESXi/vCenter.

You can also use the VMware PowerCLI module cmdlets to increase the size of the virtual machine VMDK disk. Install the PowerCLI module on your Windows or Linux computer:

Install-Module -Name VMware.PowerCLI

Connect to your vCenter server or ESXi host:

Connect-VIServer hostname

Run the following command to expand the virtual disk:

Get-HardDisk VMTest1 | where {\$_.Name -eq "hard disk 1"} | Set-HardDisk -CapacityGB 50 -ResizeGuestPartition -Confirm:\$false

C:\>	Get-VM	vm01	I	Get-HardDisk	-Name	'Har
Capaci	tyGB	Pe	rs	istence		
200.00	0	Pe	rs	istent		[data

Then you can use the **Invoke-VMScript** cmdlet to extend a partition in the guest operating system:

Invoke-VMScript -VM VMTest1 -ScriptText "echo select vol c > c:\diskpart.txt && echo extend >> c:\diskpart.txt && diskpart.exe /s c:\diskpart.txt" -GuestUser \$guestUser -GuestPassword \$guestPass -ScriptType BAT

Earlier, we showed an example of how to use the Invoke-VMScript to automatically install Windows updates in VMware VM templates.

Don't forget to terminate the PowerShell management session once you're done:

Disconnect-VIserver -Confirm:\$false

Now that you have increased the virtual disk size in the VMware console, you need to extend the partition in the guest OS

Extend a Partition in a Windows Virtual Machine

You must start the Disk Management console (**Computer Management-> Storage-> Disk Management**) and run the **Rescan Disk** command for the guest Windows OS to see the additional space.

📅 Disk Management											
File	Action	View	Help								
() e	Refresh										
Volur	Re	scan Di	sks								

Next, select the partition you want to extend and click **Extend Volume**.



Specify how many MB of unallocated space you want to add to the selected Windows partition (in the field **Select the amount of space in MB**).

Select Disks You can use space on one or more disks to extend the volume.

Available:		Selected:
	Add >	Disk 0 10456 MB
	< Remove	
	< Remove All	
Total volume size in megabytes (N	1B):	40215
Maximum available space in MB:		10456
Select the amount of space in MB	e -	10456

Now click Next -> Finish and check if your C drive has been successfully extended.

(C:) (Disk 0 partition	1)	Simple Simple	Basic Basic	NTFS
Disk 0 sic .98 GB 1line	10 He	0 MB aithy (EFI Sy:	(C:) 39.27 GB Healthy (NTFS Boot, Page F

When extending a system partition (C:\ drive), you may find that it is followed by a <u>Windows</u> <u>Recovery Environment partition</u> instead of unallocated space. In this case, the Extend Volume option will not be available in the Disk Manager (greyed out).

Disk 0 Basic 43.98 GB Online	100 MB Healthy (EFI Sy:	(C:) 39.27 (-R. M Health	Dpen Explore	ery Part	4.00 GB Unallocated
DVD (D:)			Mark Partition as Active Change Drive Letter and Paths Format		
			Extend Volume		
			Shrink Volume		

In that case, you won't be able to extend your C: drive unless you delete or move the Recovery partition to the end of the drive. We have described this procedure in the article Extend Volume option is grayed out in Windows.

Windows XP and Windows Server 2003 don't support the online extension of the system C: volume. You can use Dell's **ExtPart** tool to expand the system partition without rebooting.

To extend the system partition in Windows 2003/XP, copy the tool to the guest operating system and run it with the following parameters:

extpart.exe c: 1020

, where **c:** is the name of the volume you want to extend, and **1020** is the size (in MB) you want to extend the disk by.

C:\WINDOWS\system32\cmd.exe										
C:\tools\dell\ExtPart>extpart.exe c: 1020										
ExtPart - Utility to extend basic disks (Build 1.0.4) (c) Dell Computer Corporation 2003										
Current volume size Current partition size	:	10236 10236	MB MB	<10733 <10733	957632 958144	bytes) bytes)				
New volume size	:	11256	MB	<11803	244032	bytes)				

You can also extend the offline VM disc partition in other ways:

- Boot your virtual machine from any LiveCD (for example, GParted), and increase the partition;
- Connect a virtual VMDK file to another VM and extend the partition on that machine;
- Use the VMware vCenter Converter tool to reconfigure the volume size.

How to Extend Partition in Linux Virtual Machine?

Now let's look at how to expand the disk partition if you have a Linux family guest operating system installed in your virtual machine.

The first thing to do is to make sure that Linux sees the new disk size. To start a rescan, run the command:

\$ echo 1>/sys/class/block/sdd/device/rescan

Use the cfdisk tool to show the available virtual hard disk space:

\$ sudo cfdisk

This example shows that the /dev/sda drive has 2 GB of free space. Select the partition you want to extend (which is /dev/sda3 in this example) and chose **Resize** from the bottom menu.

	[Delete]	Resize] [Ouit	1 [Type	1 [Help	1	[Wri	te	1	r	Dung
Filesystem UUID: Filesystem:	PcHhqz-jYsC-01 LVM2_member	NU-RZcT-AxCI-HILM-	-32QI0q								
Partition UUID: Partition type:	F3222E08-4335- Linux filesyst	4506-BA45-AEB3E28F em (0FC63DAF-8483-	25E2 4772-8E79-3D	69D84	77DE4)						
Free space	41940992	46137310	41963	19	1	26					
/dev/sda3	2101248	41940991	398397	44		19G	Linux	fi	les	sys	tem
/dev/sda2	4096	2101247	20971	52		1G	Linux filesyste			tem	
/dev/sda1	2048	4095	28	48		1M	BIOS	boo	t		
Device	Start	End	Secto	rs	5	Size	Туре				
	Lab	el: gpt, identifie	r: 0EF6DDE1-	4033-	49CE-A2	CD-E	BD1D4E	96/	138		
		Size: 22 GiB. 23	622320128 by	tes.	4613734	4 se	ctors				
			Disk: /dev	/sda							

Then click **Write** to apply the changes to the partition.

				Disk	:: /dev	/sd	a				
		Size: 22 G	iB, 236	22326	128 by	tes	, 4	6137344	s	ectors	
	La	ubel: gpt, ide	ntifier	: ØEF	6DDE1-	403	3-4	9CE-A20	D-I	EBD1D4	E96A38
Device	Start	End			Sector	s		Si	ze	Туре	
/dev/sda1	2048	4095			204	8			1M	BIOS b	poot
/dev/sda2	4096	2101247		2097152					1G	Linux	files
/dev/sda3	2101248	46137310		4	403606	3		2	1G	Linux	files
Partition UUI Partition type	D: F3222E08-4335 e: Linux filesys	5-4506-BA45-AE tem (0FC63DAF	B3E28F2 -8483-4	5E2 772-8	E79-30	69D	847	7DE4)			
Filesystem UUII Filesyster	D: PcHhqz-jYsC-C m: LVM2_member	01NU-RZcT-AxCI	-HILM-3	2QI0q	I						
	[Delete]	[Resize] [Quit] [Туре	1	[Help	1	[Wr:	ite]

In my case, I need to extend the partition in an Ubuntu 22.04 LTS virtual machine. By default, this version of Ubuntu is installed on LVM volume:

\$ sudo lsblk

rooc@srv-ubune1:/nome/sy	sops# LSD	LK				
NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
loop0	7:0	0	63.2M	1	loop	/snap/core20/17
loop1	7:1	θ	67.8M	1	loop	/snap/lxd/22753
loop2	7:2	θ	91.9M	1	loop	/snap/lxd/24061
loop3	7:3	0	55.6M	1	loop	/snap/core18/26
loop4	7:4	Θ	55.5M	1	loop	/snap/core18/24
Loop5	7:5	e	49.6M	1	loop	/snap/snapd/178
Loop7	7:7	θ	49.8M	1	loop	/snap/snapd/179
Loop8	7:8	0	63.3M	1	loop	/snap/core20/17
sda	8:0	0	22G	Θ	disk	
-sdal	8:1	θ	1M	Θ	part	
—sda2	8:2	θ	1G	Θ	part	/boot
sda3	8:3	Θ	21G	Θ	part	
Lubuntuvg-ubuntu1	v 253:0	θ	19G	θ	lvm	/

Before you can extend an LVM volume, you need to increase the physical volume (PV):

\$ sudo pvresize /dev/sda3

Once that's done, you can extend the logical volume (we'll use all the free space available):

\$ sudo lvextend -I +100%FREE /dev/mapper/ubuntu--vg-ubuntu--lv

root@srv-ubun01:/home/sysops# sudo lvextend -l +100%FREE /dev/mapper/ubuntu--vg-ubuntu--lv Size of logical volume ubuntu-vg/ubuntu-lv changed from <19.00 GiB (4863 extents) to <21.00 Gi Logical volume ubuntu-vg/ubuntu-lv successfully resized.

The next step is extending the file system:

\$ sudo resize2fs /dev/mapper/ubuntu--vg-ubuntu--lv

Check free disk space in Linux:

\$ df -h

root@srv-ubun01:/home/sysops# df -	h				
Filesystem	Size	Used	Avail	Use%	Mounted o
udev	1.9G	Θ	1.9G	0%	/dev
tmpfs	391M	6.4M	385M	2%	/run
/dev/mapper/ubuntuvg-ubuntulv	21G	18G	1.7G	92%	/
tmpfs	2.0G	Θ	2.0G	θ%	/dev/shm

If you do not have LVM volumes, you can use the <u>parted</u> tool to extend partitions in Linux:

\$ sudo parted

Let's check how much unallocated space you have on the disk:

print free

As you can see, Free Space = 2149MB

sysops@	srv-ubun	01:~\$ su	do parte	d		
GNU Par	ted 3.3					
Using /	dev/sda					
Velcome	to GNU	Parted!	Type 'he	lp' to	o view	
(parted) print	free				
Model:	VMware,	VMware V	irtual S	(scs:	i)	
Disk /d	ev/sda:	23.6GB				
Sector size (logical/physical): 512B/512B						
Partiti	on Table	: gpt				
Disk Fl	ags:					
Number	Start	End	Size	File	system	
	17.4kB	1049kB	1031kB	Free	Space	
1	1049kB	2097kB	1049kB			
2	2097kB	1076MB	1074MB	ext4		
3	1076MB	21.5GB	20.4GB			
	21.5GB	23.6GB	2149MB	Free	Space	

To extend the /dev/sda3 partition, run:

resizepart 3

Specify a new partition size (in this example, we need to specify the **End** size from **the Free Space** block):

End? [21.5GB]? 23.6G

(parted) resizepart 3								
End? [21.5GB]? 23.66								
(parted) p								
Model:	VMware,	VMware	Virtual S	(scsi)				
Disk /dev/sda: 23.6GB								
Sector	512B/512B							
Partition Table: gpt								
Disk Flags:								
Number	Start	End	Size	File syst				
1	1049kB	2097kB	1049kB					
2	2097kB	1076MB	1074MB	ext4				
3	1076MB	23.6GB	22.5GB					

Then exit the parted:

quit

All that remains is to grow an ext4/3/2 file system.

\$ sudo resize2fs /dev/sda3

Reduce Virtual Machine Disk Size (VMDK) on VMWare ESXi

Original Article: https://woshub.com/shrinking-vmdk-virtual-disk-vmware-esxi/

In this article, we will look at how to reduce the size of a virtual machine's hard disk (VMDK) in VMware ESXi. From the vSphere Client GUI, you cannot reduce the size of a virtual disk (only the option to <u>increase the VM disk size</u> is available). An error occurs when you try to specify a smaller VM disk size: Enter a disk size which is larger than its original capacity.

can't reduce wmwarekvmrdisk size from vsphere client

This guide is not an officially supported solution for reducing the size of the VMDK disk in VMWare. I have used this method over a dozen times and it works reliably.

Before you can reduce the size of the virtual disk on the VMWare ESXi datastore:

• Delete all virtual machine snapshots;

• Backup the virtual machine, or at least make a copy of the *.**vmdk** and the *-**flat.vmdk** files of the virtual hard disk you want to shrink. In the ESXi console, run the following commands:

cp vmname.vmdk backup_vmname.vmdk cp vmname-flat.vmdk backup_vmname-flat.vmdk



Reducing the virtual disk file in VMware is a two-step process:

- Shrink the partition size within the guest OS;
- Reduce the size of a VMware virtual machine's VMDK file on VMFS (NFS) datastore.

How to Shrink Disk Partition in the Guest OS

First of all, reduce the size of the disk partition in the guest operating system

If the VM has a Windows guest OS installed:

- 1. Open the Disk Management console (diskmgmt.msc);
- 2. In this case, the <u>WinRE</u> Recovery Partition is to the right of the partition we want to shrink. To shrink the partition in Windows, there should be no other partitions to the right of the partition you are trying to shrink. You need to either move the **winre.wim** recovery image from a separate partition to the system one, or move the recovery partition to the

beginning of the partition table (both options are described in detail in the post: \underline{Cannot}

extend volume blocked by a recovery partition); Ganpottshrink disk inkguest windows due to recovery partition

- 3. You can now reduce the size of the main partition. In modern versions of Windows, you can reduce the size of the partition without rebooting; in older versions, you have to use the sdelete tool. Click on the partition and select **Shrink Volume**; shripk@dumerinpWindows
- 4. Suppose you need to reduce VM disk size by 40GB. In the **Enter the amount of space to shrink in MB** box, type 40960 MB (40 GB × 1024) and click **Shrink**; specifythenameyuatuofinspace to shrink in MB
- 5. When the shrink task is complete, 40GB of **unallocated** space will appear to the right of your main partition.windows partitioneunallocated space

For the Linux VMs, you can boot the virtual machine from a **GParted** LiveCD **(GNOME Partition Editor)** if you need to reduce the size of the root partition. Shrink partitions using the GParted GUI's Resize/Move menu. Move partitions if necessary. To apply changes, select Edit -> Apply all operations. The tool will resize partitions and reduce the file system using Rezise2fs.

reduce partition ja guest linux

Boot the Linux guest VM and check that everything is working correctly.

You can resize mounted non-root partitions directly from the Linux guest using <u>parted</u>. The scenario is different when using LVM logical volumes.

Reduce the Size of a VMware Virtual Machine Disk (VMDK)

You can now reduce the size of the VMDK file on the VMware VMFS file system.

- 1. Shut down the VM;
- 2. Use <u>SSH to connect to the ESXi host</u> on which the virtual machine is registered;
- 3. Navigate to the directory where the VM vmdk file is located (you can find the path to the VMDK file in the virtual disk properties in the vSphere client):

cd /vmfs/volumes/datastore/test-VM

May are rundile an Managudatastore

4. List the virtual disk configuration file (*.vmdk) using the *cat* command:
cat test_vm_3.vmdk
The size of the vmdk disk is set in the **#Extent description** section (after the RW

symbols). In this case, it is **167772160** (80 GB *1024*1024*1024 / 512);

- I want to reduce my VMDK disk by 40 GB. This means that I have to specify 83886080 in the Extent description section. This value is calculated as follows: 167772160 (current disk size) - 83886080 (40 GB*1024*1024*1024 / 512);
- 6. Edit the virtual disk configuration file using vi: # vi test_vm_3.vmdk
- 7. Use the down arrow key to scroll to the line containing the disk size and press i (to edit it). Specify the new size of the virtual disk. Press ESC to exit the edit mode and then type :wq -> Enter to save the changes;

shrijakarmaki fileysizenonarmware datastore

8. The remaining step is to migrate the VM to another datastore using Storage VMotion. The virtual machine properties will show the new virtual disc size after the virtual machine files are moved.

Tip. If you have only one ESXi host, the easiest way to update the disk size in the vSphere Client is to simply re-register the virtual machine. Click on the VM and select **Unregister**.

ungegister.wmware.wmown

Then go to the Storage section, find the VMFS/NFS datastore where the VM is located -> click Datastore Browser, find the VM directory, click on the VMX file, and select **Register**.

register woware permusing its vmx file

Or you can clone the VMDK file using this command:

vmkfstools -i test_vm_3.vmdk test_vm_3_newsize.vmdk

Then delete the original VMDK file and clone the disk again, to revert to its original name:

rm test_vm_3.vmdk rm test_vm_3-flat.vmdk vmkfstools -i test_vm_3_newsize.vmdk test_vm_3.vmdk

Make sure that the new size of the virtual disk is now displayed in the VM properties.

newesize another yistual disk is now displayed in the vmware VM properties

Then start the VM, logon to the guest OS, and check that the unallocated space has disappeared, and the disk size has been reduced.

ShagakoafHanduDyjweukolume in Windows

Shrink a VMDK Disk Using VMware vCenter Converter Standalone

You can reduce the size of virtual machine hard disks using the **VMware vCenter Converter Standalone**. This free GUI tool allows you to clone a source VM and set the size of the new disk to be smaller than the original (there must be free space on the guest file system).

Cons:

- V2V conversion is quite slow;
- There must be enough free space on the datastore to save a new VM;
- A new MAC address is assigned to the new VM.

Pros:

- Simple graphical interface;
- An exact copy of a VM is created;
- The source VM won't be corrupted by incorrect disk resizing actions.

Note. The source VM you want to resize must be shut down.

Run VMware Converter and specify the ESXi host or vCenter address.

what where the compact vcenter

Select the source VM.

selectornation convertenown

Set the virtual hardware settings for your new (destination) VM.

setgVMotpropertiese unknown

Go to the disk edit mode (Data to copy -> Edit).

editediskrapropertiesuinnomware converter

Select the copy mode: Select volumes to copy.

copy all disks and mainstain layuout

Specify the new virtual disk size for your new VM. In my example, 48 GB on the virtual disk is occupied by the guest OS, and the total disk size is 150 GB. We will reduce the size of the virtual disk to 60 GB.

majottaindisk size um converter

Shigakoar MMDK wsing MMware Converter

Run the VM conversion process. When finished, turn off the source VM and power on the new one. Check that the virtual disk size has been reduced. The original VM can then be removed.