

How to convert VM running Windows 10/2016/2019 from BIOS to UEFI

Article # 000008326 | Last modified on Sep 27th 2023

Summary: How to convert VM running Windows 10/2016/2019 from BIOS to UEFI.

Versions affected: ALL AOS Version

Third-Party Apps on AHV

Description:

Requirements

- AOS 5.10 and older have limited support of UEFI VMs. Starting from AOS 5.11, Nutanix fully supports VMs natively created on AHV.
- Windows 10/2016 or newer.
- Windows Installation media build 1703 or newer (for offline conversion)

How to perform the conversion

We will use the official Microsoft tool "MBR2GPT.EXE" to convert the VM disk from **MBR** to **GPT**. "MBR2GPT.EXE" has been introduced with build 1703.

Note: Online conversion is possible only if you are running build 1703 or later.

Limitations

Conversion of operating system disks that have earlier versions of Windows 10/2016 installed, such as versions 1507, 1511, and 1607 is possible, but you have to perform an offline conversion. You must use a Windows Installation media build 1703 or newer. You can find out more on the official Microsoft documentation: <https://docs.microsoft.com/en-us/windows/deployment/mbr-to-gpt>

Documentation

UEFI support for VM in AOS 5.11: <https://portal.nutanix.com/#/page/docs/details?targetId=AHV-Admin-Guide-v511:vmm-vm-uefi-support-c.html>

Solution:

As per the statements indicated above we have two different procedures we may follow:

- Online Conversion: Build 1703 or later
- Offline Conversion: All builds

Note: Offline conversion requires a Windows Installation media build 1703 or newer

How to find the Windows Build ID number

Open a Powershell console and run this command:

```
PS C:\Users\Administrator> Reg Query "HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion" /v ReleaseId
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion
    ReleaseId    REG_SZ    1607
```

Online Conversion (Build 1703 or newer)

1. To check the partition style (MBR or GPT) open Powershell as Administrator and run following command:

```
PS C:\Users\Administrator> get-disk

Number Friendly Name Serial Number HealthStatus OperationalStatus Total Size Partition
                                           Style
```

0	NUTANIX VDISK NFS_3930529414_f70c2910_28cd_...	Healthy	Online	100 GB MBR
---	--	---------	--------	------------

2. Convert the OS volume from MBR to GPT. **These changes cannot be undone!**

```
PS C:\Users\Administrator> MBR2GPT.EXE /convert /allowfullOS
```

```
MBR2GPT will now attempt to convert the default boot disk.
```

```
If conversion is successful the disk can only be booted in GPT mode.
```

```
These changes cannot be undone!
```

```
MBR2GPT: Attempting to convert disk 0
```

```
MBR2GPT: Retrieving layout of disk
```

```
MBR2GPT: Validating layout, disk sector size is: 512 bytes
```

```
MBR2GPT: Trying to shrink the OS partition
```

```
MBR2GPT: Creating the EFI system partition
```

```
MBR2GPT: Installing the new boot files
```

```
MBR2GPT: Performing the layout conversion
```

```
MBR2GPT: Migrating default boot entry
```

```
MBR2GPT: Adding recovery boot entry
```

```
MBR2GPT: Fixing drive letter mapping
```

```
MBR2GPT: Conversion completed successfully
```

```
MBR2GPT: Before the new system can boot properly you need to switch the firmware to boot to UEFI mode!
```

3. Check if the partition style changed to GPT:

```
PS C:\Users\Administrator> get-disk
```

Number	Friendly Name	Serial Number	HealthStatus	OperationalStatus	Total Size	Partition Style
0	NUTANIX VDISK	NFS_3930608392_5b6b4d3d_279e_...	Healthy	Online	100 GB	GPT

4. Shutdown the VM.

5. Follow the instructions below to change the VM Boot Configuration.

Offline Conversion

1. Shutdown the VM.

2. Insert installation media iso into CDROM.

3. Attach the Nutanix VirtIO package ISO.

4. If needed, change the boot order to boot from the CD-ROM.

5. Boot from the Windows Installation Media.

6. Once the ISO booted up click to "Repair your computer" > "Troubleshooting" > "Command Prompt":

Windows Setup



Windows Server® 2019

Install now

[Repair your computer](#)

© 2018 Microsoft Corporation. All rights reserved.

Choose an option



Troubleshoot

Reset your PC or see advanced options




Turn off your PC



← Advanced options



System Image Recovery
Recover Windows using a specific system image file



Command Prompt
Use the Command Prompt for advanced troubleshooting

7. Load the VirtIO SCSI driver, otherwise the system won't be able to see the OS disk. You can find the VirtIO ISO disk letter with **diskpart**. Run **diskpart** and list the volume:

```
X:> diskpart
DISKPART> list volume
```

```
DISKPART> list volume
```

Volume ###	Ltr	Label	Fs	Type	Size	Status	Info
Volume 0	D	SSS_X64FRF_	UDF	CD-ROM	4618 MB	Healthy	
Volume 1	E	Nutanix Vir	UDF	CD-ROM	46 MB	Healthy	

In the example above the letter assigned to the VirtIO ISO is the "E".

8. Change location to *E:\Windows Server 2016\amd64* and load the driver *vioscsi.inf* with the command **drvload**:

```
X:> E:
E:> cd E:\Windows Server 2016\amd64
E:\Windows Server 2016\amd64>drvload vioscsi.inf
```


E:\Windows Server 2016\amd64>dir

Volume in drive E is Nutanix VirtIO 1.1.4
Volume Serial Number is 2C62-E28B

Directory of E:\Windows Server 2016\amd64

02/21/2019	02:35 PM	<DIR>	.
02/21/2019	02:32 PM	<DIR>	..
07/25/2018	10:00 AM	1,804,632	WdfCoInstaller01011.dll
07/25/2018	10:00 AM	10,413	balloon.cat
07/25/2018	10:00 AM	2,605	balloon.inf
07/25/2018	10:00 AM	978,944	balloon.pdb
07/25/2018	10:00 AM	44,216	balloon.sys
07/25/2018	10:00 AM	10,307	netkvm.cat
07/25/2018	10:00 AM	16,785	netkvm.inf
07/25/2018	10:00 AM	1,183,744	netkvm.pdb
07/25/2018	10:00 AM	130,232	netkvm.sys
07/25/2018	10:00 AM	889,040	netkvmco.dll
07/25/2018	10:00 AM	22,016	readme.doc
07/25/2018	10:00 AM	10,721	viornng.cat
07/25/2018	10:00 AM	2,893	viornng.inf
07/25/2018	10:00 AM	978,944	viornng.pdb
07/25/2018	10:00 AM	31,952	viornng.sys
07/25/2018	10:00 AM	92,880	viornngci.dll
07/25/2018	10:00 AM	91,856	viornngum.dll
02/19/2019	03:01 PM	10,408	vioscsi.cat
02/19/2019	03:01 PM	3,172	vioscsi.inf
02/19/2019	01:45 PM	724,992	vioscsi.pdb
02/19/2019	03:01 PM	73,328	vioscsi.sys
07/25/2018	10:00 AM	9,921	vioser.cat
07/25/2018	10:00 AM	2,920	vioser.inf
07/25/2018	10:00 AM	1,241,088	vioser.pdb
07/25/2018	10:00 AM	60,624	vioser.sys
		25 File(s)	8,428,633 bytes
		2 Dir(s)	0 bytes free

E:\Windows Server 2016\amd64>drvload vioscsi.inf

DrvLoad: Successfully loaded vioscsi.inf.

E:\Windows Server 2016\amd64>_

- Now you should be able to see the OS Disk.
- Run **diskpart** and list volume once again. You should see the NTFS partition:

```
E:\Windows Server 2016\amd64> diskpart  
DISKPART > list volume
```

```
E:\Windows Server 2016\amd64>diskpart  
Microsoft DiskPart version 10.0.17763.1  
Copyright (C) Microsoft Corporation.  
On computer: MININT-VEID6GK  
DISKPART> list volume
```

Volume ###	Ltr	Label	Fs	Type	Size	Status	Info
Volume 0	D	SSS_X64FRE_	UDF	CD-ROM	4618 MB	Healthy	
Volume 1	E	Nutanix Vir	UDF	CD-ROM	46 MB	Healthy	
Volume 2	C	System Rese	NTFS	Partition	500 MB	Healthy	
Volume 3	F		NTFS	Partition	99 GB	Healthy	

- Check whether the partition is MBR with the following commands:

```
DISKPART> list disk  
DISKPART> list volume  
DISKPART> select volume <volume-id-number>  
DISKPART> detail partition
```

"Partition Type: 07" indicates a MBR partition:

```

DISKPART> list disk

Disk ###  Status             Size         Free          Dyn  Gpt
-----  -
Disk 0    Online             100 GB       1024 KB

DISKPART> list volume

Volume ###  Ltr  Label          Fs          Type          Size         Status       Info
-----  -
Volume 0    D    SSS_X64FRE_    UDF         CD-ROM        4618 MB      Healthy
Volume 1    E    Nutanix Vir    UDF         CD-ROM         46 MB        Healthy
Volume 2    C    System Rese    NTFS        Partition     500 MB        Healthy
Volume 3    F                                NTFS        Partition     99 GB         Healthy

DISKPART> select volume 3

Volume 3 is the selected volume.

DISKPART> list partition

Partition ###  Type          Size         Offset
-----  -
Partition 1    Primary       500 MB       1024 KB
* Partition 2    Primary       99 GB        501 MB

DISKPART> detail partition

Partition 2
Type : 07
Hidden: No
Active: No
Offset in Bytes: 525336576

Volume ###  Ltr  Label          Fs          Type          Size         Status       Info
-----  -
* Volume 3    F                                NTFS        Partition     99 GB         Healthy

DISKPART>

```

- Go back to X: (installation media) and then to `X:\Windows\System32` and run:

```
X:\Windows\System32>MBR2GPT.EXE /convert /disk:<disk-id>
```

```
X:\Windows\System32>MBR2GPT.EXE /convert /disk:0

MBR2GPT will now attempt to convert disk 0.
If conversion is successful the disk can only be booted in GPT mode.
These changes cannot be undone!

MBR2GPT: Attempting to convert disk 0
MBR2GPT: Retrieving layout of disk
MBR2GPT: Validating layout, disk sector size is: 512 bytes
MBR2GPT: Trying to shrink the system partition
MBR2GPT: Trying to shrink the OS partition
MBR2GPT: Creating the EFI system partition
MBR2GPT: Installing the new boot files
MBR2GPT: Performing the layout conversion
MBR2GPT: Migrating default boot entry
MBR2GPT: Adding recovery boot entry
MBR2GPT: Fixing drive letter mapping
MBR2GPT: Conversion completed successfully
MBR2GPT: Before the new system can boot properly you need to switch the firmware to boot to UEFI mode!

X:\Windows\System32>_
```

Note: In the above example we use the disk:0, but check with **diskpart** if the VM has multiple disks. In that case change the disk ID accordingly.

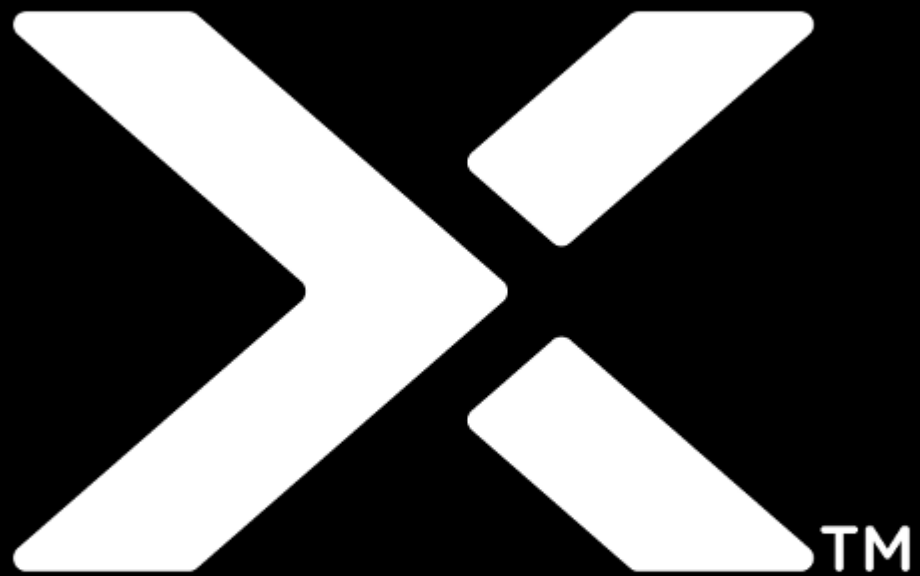
- Shutdown the VM.
- Follow the instructions below to change the VM Boot Configuration.

Change the VM Boot Configuration

1. Shutdown the VM.
2. Login to any CVM in the cluster to change VM's boot type:

```
nutanix@cvm:~$ acli vm.update <vm_name> uefi_boot=true
```

3. Power on the VM, open the console and you should see the Nutanix UEFI Screen



Press F2 for EFI Boot Manager

: