



AMD StoreMI FAQ & Knowledgebase

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BASICS

What is StoreMI for AMD Ryzen?

StoreMI for AMD is Real-time Tiering software with Machine Intelligence. It blends 2 different classes of storage media (fast and capacity) into a single volume that appears to the operating system as the C: drive. Active data is automatically moved to your fast storage media and stored there and your inactive data is kept on the capacity storage. Your storage activity is dynamically monitored and learns how you use your system. The result is you get the performance benefits of your fast storage and the combined capacity of both the fast and capacity drives. Since it is fully automated, you do not need to worry about manually moving data between 2 drives.

How is it different from a disk cache solution like Optane?

StoreMI uses your SSD as the primary drive while a cache solution uses your SSD to accelerate a slow HDD. StoreMI uses your SSD (fast drive) as primary storage, so it reads and writes directly to the SSD. Active data remains there permanently until something more active is promoted to the fast tier. The AMD version of StoreMI supports up to 256GB SSDs, so it is more than adequate for storing all your active data. Data that is not active, is moved to the capacity storage (usually HDD) only if more space for active storage is needed. Cache temporarily moves active data into the SSD, but the data in the cache is flushed on a regular basis. Due to architecture constrictions, caches tend to be limited in how large they can be, and the capacity of the cache is not added to the capacity of the volume.

How much CPU is utilized?

StoreMI utilizes only about 1-2% of the CPU. Unlike cache, which must manage lookup tables, StoreMI is a mapping technology

How do I buy StoreMI for AMD Ryzen?

StoreMI is included with every AMD socket AM4 motherboard with a 4xx series chipset, and with every socket sTR4 motherboard with the X399 chipset.

What Systems does this Support?

The current version is designed for desktops and is not suitable for notebooks. A notebook version is expected later this year.

What are the system requirements?

Your system must meet the minimum configuration: AMD Ryzen, Socket AM4 motherboard with a 4xx-series chipset or socket sTR4 motherboard with the X399 chipset, with 4G RAM (6G RAM to support the RAM cache), and the Windows 10 operating system. StoreMI for AMD Ryzen Desktop is supported on AMD Ryzen/A-series/Athlon Desktop Processors (in socket AM4 motherboards) and Ryzen Threadripper processors (in sTR4 motherboards).

Pre-Install Checklist

If converting an SSD or NVMe boot drive that is larger than 256GB, additional steps are required. See the section **Expand the Capacity of an existing SSD Boot Drive** for additional information.

Check the following prior to upgrading your system to StoreMI:

Your system meets the minimum configuration: AMD Ryzen, 4xx series motherboard with a minimum of 4G RAM (6G RAM to support the RAM cache).

Secure Boot is NOT enabled. Consult your system documentation for further details.

There are no other SSD caching or AMD software RAID solutions installed.

The BIOS SATA disk settings are set to AHCI, not RAID



Microsoft's *chkdisk* or other third-party disk scan tools run error free on the boot drive
A new unused SSD or HDD is available – see Appendix A for supported configurations

What are some suggested configurations?

Performance Option 1: You installed Windows on a relatively slow mechanical hard drive. With StoreMI™, if you add an SSD or NVMe drive later, you will enjoy the speed of an SSD when you boot your PC, or load programs and data that you most often employ.

Performance Option 2: You installed windows on a fast SSD drive, but are running out of capacity. If you add a large mechanical hard disk, StoreMI™ will recognize that the programs you use most should stay resident on the speedy SSD, and move the data that is rarely accessed to the mechanical hard disk. This gives you the best of both worlds: high performance with large capacity.

Performance Option 3: For the fastest booting and storage, a large conventional SSD paired with bootable 3D Xpoint or NVMe drive for incredible booting speed, application launch, and data access performance. Of course, these are only three simple scenarios to illustrate the benefits of StoreMI. The software is also able to add DDR4 RAM to the drive pool for the fastest possible responsiveness, advanced 3D Xpoint and NVMe SSDs for incredible boot times and speedy transfers, and large mechanical hard disks for giant capacity. The bottom line is, AMD StoreMI™ for AMD Ryzen™ delivers an incredible combination of storage speed and storage size.

How does this differ from RAID?

StoreMI works by intelligently moving data based on usage patterns back and forth between two different kinds of media, creating a mixed storage media virtual disk that costs significantly less than buying a large capacity SSD, and offering similar performance benefits. RAID stripes data across several similar sized and types of disk drives or SSDs allowing data to be read or written simultaneously to several devices in the RAID disk set in parallel. RAID can also mirror data to identical drives for redundancy purposes or use more advanced parity schemes to support one or more drive failures.

Does this software report any information?

No. StoreMI only works with small chunks of block level data and does not work with files or user data. It does not record any personal information.

What is your warranty?

The warranty is 90 days, as outlined in our End User License Agreement (EULA)

How do I get support?

Read this FAQ carefully as you may be able to solve issues based on the information here. If not addressed here, please go to [AMD.com/support](https://www.amd.com/support) for more help.

Should I backup before I install the software?

Always backup your data as a good habit when using any computer or installing new system software or hardware.

Will this make my games and applications faster?

If you are adding an SSD to a system with an HDD, the system will perform at SSD speeds. If you are adding an HDD to a system with an SSD, the system will continue to perform at SSD speeds, but you will enjoy the added capacity without needing to manually manage data across both drives.



Will this improve boot times?

A mechanical hard drive will boot about as fast as an SSD once it has been fused with an SSD using AMD StoreMI. After re-booting the system at least once, the blocks will be promoted to the Fast Tier and your OS/System will load more quickly compared with a Hard Drive alone. Further boots will help StoreMI learn which blocks to move to the fastest tier of storage, improving speed even further.

What does the RAM cache do?

The optional RAM cache uses 2GB of your systems DRAM as an additional caching layer on top of your StoreMI. It is intended for accelerating read intensive applications. The RAM cache requires a minimum of 6GB of system DRAM. Results are highly dependent on your application and operating environment and you are encouraged to experiment by turning it on or off to see if it helps your particular environment. To see the immediate effect, you can also try benchmark applications such as CrystalMark, which can show the benefit with and without the RAM cache turned on or off. Note, you can freely turn the RAM cache on and off without rebooting your system.

Does the software work with a Processor other than Ryzen?

StoreMI for AMD Ryzen Desktop is supported on AMD Ryzen/A-series/Athlon Desktop Processors (in socket AM4 series 4xx motherboards) and Ryzen Threadripper processors (in sTR4 motherboards).

I am an editor that reviews PC hardware. Is a copy of StoreMI for AMD available to use in my reviews?

Please fill out the press form and include your full name, job title, publication, and the country in which you are based. We will contact you or your editor

Can I create a solution using 2 SSD drives?

Yes. A good use case would be either an Optane or NVMe SSD for the performance tier and a SAS/SATA SSD for the capacity tier. This would be a very high performance solution.

Is the solution certified by Microsoft?

Yes. StoreMI is derived from the Enterprise Server environment and has been certified by Tier 1 OEMS, and is certified by Microsoft.

Will I lose data on the StoreMI if the power turns off unexpectedly?

No. StoreMI uses technology derived from server class products that protects data during migrations between tiers. For normal IO operations, data accesses are treated the same as for a normal non-StoreMI disks i.e. StoreMI will not acknowledge back to the application or file system that data is written until the physical device(s) acknowledges the write has completed to the StoreMI layer. IMPORTANT NOTE: it is always advisable to backup data regularly in case the physical device itself fails.

What happens if I pull out one of the drives in my bootable StoreMI or it fails?

The same occurs if you pull out a regular non-StoreMI boot drive while it is running or it experiences a hardware failure. The system will crash (or appear sluggish if the drives are degrading slowly) as it can no longer access portions of the disk it needs to operate.

Are there any plans to create a version of StoreMI that can support RAID or other forms of disk level redundancy?

We are continuing to develop and enhance the StoreMI product and expect to add support for redundancy over the next year. Please check back regularly for updates.



COMPATABILITY

What processors are you compatible with?

StoreMI for AMD Ryzen Desktop is supported on AMD Ryzen/A-series/Athlon Desktop Processors (in socket AM4 motherboards using an 400-series AMD chipset) and Ryzen Threadripper processors (in sTR4 motherboards using an X399 chipset).

What drives are you compatible with?

All commercially available industry standard small and large form factor SATA hard drives and SSDs, and industry standard NVMe SSDs.

Are you compatible with Optane drives?

Yes. Optane hardware can be used as the Fast Tier of a StoreMI. Of course, AMD StoreMI software does not work with Intel SRT, though.

How many drives does this work with?

StoreMI for AMD works with 2 physical drives.

Are third party AHCI add in cards compatible?

Not for bootable StoreMIs. Some third party cards may work however with data (non-boot) StoreMIs.

Can I run StoreMI on external USB drives, SCSI drives or NAS?

No. StoreMI supports SATA or NVMe direct attached drives only.

What size of SSDs are supported?

StoreMI for AMD supports a 256GB Fast Tier (SATA SSD or NVMe). The remaining capacity will be mounted as a standalone virtual SSD device. If the SSD is larger, than 256GB, then the rest of the SSD will appear as a separate data drive which may be formatted as a separate volume e.g. note that users who want larger SSD support can purchase AMD FuzeDrive for Ryzen.

What drive configurations do you support?

SATA Hard Drive and SATA SSD (M.2 or SATA cable)
NVMe SSD and SATA hard drive
NVMe SSD and SATA SSD

My OS is on my SSD. Can I add a hard drive?

Yes! For example, you can increase the size of your 256GB SSD boot drive to 1TB or more by adding a 1TB or higher hard drive and expanding the capacity of your boot drive.

Can I use an NVMe or Optane drive plus a regular SATA SSD as a StoreMI?

Yes! Use smaller NVMe or Optane drives with larger, capacity SSDs to create very large virtual SSDs.



Will StoreMI work on my notebook computer?

Not at this time. Currently it only works with the AMD Ryzen desktop chipsets. As outlined above, StoreMI for AMD Ryzen Desktop is supported on AMD Ryzen/A-series/Athlon Desktop Processors (in socket AM4 motherboards using a 400-series AMD chipset) and Ryzen Threadripper processors (in sTR4 motherboards using an X399 chipset).

Does this work with secure boot?

Yes However, secure setup or converting your existing secure boot disk drive may require additional expert steps. See your system documentation on how to support secure boot for your particular system.

Does this work with legacy BIOS or EFI BIOS?

Both legacy and EFI systems and boot drives are supported.

Does this work with Virtual Machines?

A VM can be installed on top of a StoreMI setup. The current version will not however support installation inside a virtual machine.

Is Hibernate, sleep, and crash dump supported?

To ensure full support for hibernate and crash dump, all devices must be attached to the same physical motherboard controller. For hibernate to work in multiple controller setups (e.g. NVMe + SATA HDD), at least one of the devices must be attached to the SATA controller the AMD AHCI driver is installed. Sleep typically works with any combination.

I have an AMD X399- or 400-series chipset system with Linux. Is there Linux support?

Not at this time. AMD is currently exploring support for Linux and will announce support when ready.

Do you support encryption?

The AMD software does not itself support encryption. However, it does work with most operating system level (e.g. bit locker) or storage device based encryption schemes.

What about compatibility to security aspects like encryption and password protection?

Our software acts at the level underneath the file system at the block layers just like an SSD or HDD driver. All of the security aspects occur in layers above our software. We are a block level translation device that only acts on commands and relocates fixed blocks of data, so we have no exposure to nor introduce any additional security issues. We also support secure boot with signed drivers from Microsoft.



CONFIGURATION

What do I do if I am in RAID mode? How about IDE?

RAID mode is not supported by the AMD software. The system will need to be converted to a standard AHCI SATA based bootable system before StoreMI can be installed and configured.

Are you compatible with RAID?

No

Can I update my OS?

Yes

How do I install a new OS on a system with StoreMI installed?

Please see the Advanced Setup Guide

Are Dynamic disks, storage spaces, ReFS and extended MBR supported?

Only regular basic disks are supported.

How do I expand my partition?

See the Quick Install Guide. (Go to the Disk Manager, click on the StoreMI and expand it to fill the rest of the space.) Please see the knowledge base article on expanding partitions.

Can I install StoreMI if my system already has data on the C: and D: drives?

Yes, However, if the C: (boot) and D: (data) volumes are on different disks AND you wish to use the existing drives without adding a new SSD or HDD, then you will need to first free up the D: by first backing up the D: data to a separate drive, verify all important data has been successfully backed up, delete all data on the D: drive, then continue to convert them to a StoreMI. Once the C: has been converted to a StoreMI using the drive D: used to occupy, and the StoreMI has been expanded to use the capacity of both the C: and D:, the data can then be restored back to the new larger C: (or if the applications require the D: for any reason simply create a D: partition on the new StoreMI).

Do you require Java?

Yes. It is automatically installed when StoreMI is installed.

Do you backup my data?

No, we simply accelerate or expand capacity boot or data drives. We recommend that every user backs up their data using the backup utility of their choice. Always backup your data as a good habit when using any computer.

Can I remove my drives after I have installed your software?

Once installed, you cannot remove any of the drives as the StoreMI will no longer function. Both drives are required. If wishing to remove just the SSD (fast device), use the Remove Acceleration function of the StoreMI utility as described in the Quick Install Guide.



Can I still defrag my system?

Yes

What about TRIM commands

Yes, TRIM is supported when there is an SSD in the mix.

How do I troubleshoot issues or contact support?

Read this FAQ carefully as you may be able to solve issues based on information here. If not addressed here, please go to AMD.com/support for more information.

How and why do I run a CHKDSK?

CHKDSK is a built in Microsoft utility for checking that a disk drive has no file system errors. Open a Command Line or Powershell Window and type `> chkdsk` for more information on how to use. It is highly recommended that chkdsk be run prior to converting an existing boot drive that has been used for some time to a StoreMI.

How do I get my data off the drives to replace with a new Hard Drive?

Follow the normal procedure for backing up a drive using a new/larger drive than the StoreMI and/or a USB backup drive with a larger capacity than the StoreMI. Back up the entire drive using your favorite Backup software, replace the drive and restore the backup image back to the standalone new replacement drive. Make sure it boots ok. Using the StoreMI utility, delete the previous StoreMI (or open up an Administrator Command Line and type `ecmd --delete_all`). You should now be able to recreate the StoreMI.

How do I change the size of the fast media or the slow media?

Changing the size of the fast or slow media is not directly supported. If you wish to change the SSD or NVMe device (the fast tier device), use the Remove Acceleration feature of the StoreMI utility, replace or add a different SSD (can be a different size, smaller or larger than the original), re-run the StoreMI utility and re-run Accelerate My Bootdrive.

How do I uninstall the software?

Please download the StoreMI user Guide

How do I know the software is working?

See the Checking Status portion of the Quick Install Guide which shows how to access the system tray quick status check. If accelerating a HDD based operating system, you will also know it is working if your applications and boot times improve after several reboots and program launches.

I installed the SW and created a StoreMI. How do I Un-tier?

Use the Remove Acceleration feature of the StoreMI utility.

I set up a StoreMI, but made an error when choosing the Fast Tier (HDD) and the Slow Tier (SSD). How do I reverse them?

The system will automatically select the correct devices and check the performance prior to creating the StoreMI. In the highly unlikely event the drives were reversed, use the Remove Acceleration function of the StoreMI utility and try to repeat the Accelerate (or Expand) My BootDrive operation.



I reinstalled Windows and StoreMI. Why does it say I already have a StoreMI before I create one?

You most likely installed Windows on top of the raw disk drives without first cleaning them completely of all metadata. StoreMIs use hidden parts of the disk that a normal Windows partition erase cycle during setup does not wipe clean properly. This can result in a boot drive with old StoreMI metadata on it.

See:

[Cleaning Disks Previously Used as a StoreMI during Windows Setup](#)

If you have already installed Windows on top of an old StoreMI set of disks and the StoreMI utility is not allowing you to re-transform an existing boot drive, exit the StoreMI utility and issue the following command from an Administrator command line prompt:

```
> ecmd --delete_all
```

Restart the StoreMI utility, and you should now be able to properly convert the boot or data drive.



What happens when I expand a legacy boot drive capacity by more than 2TB?

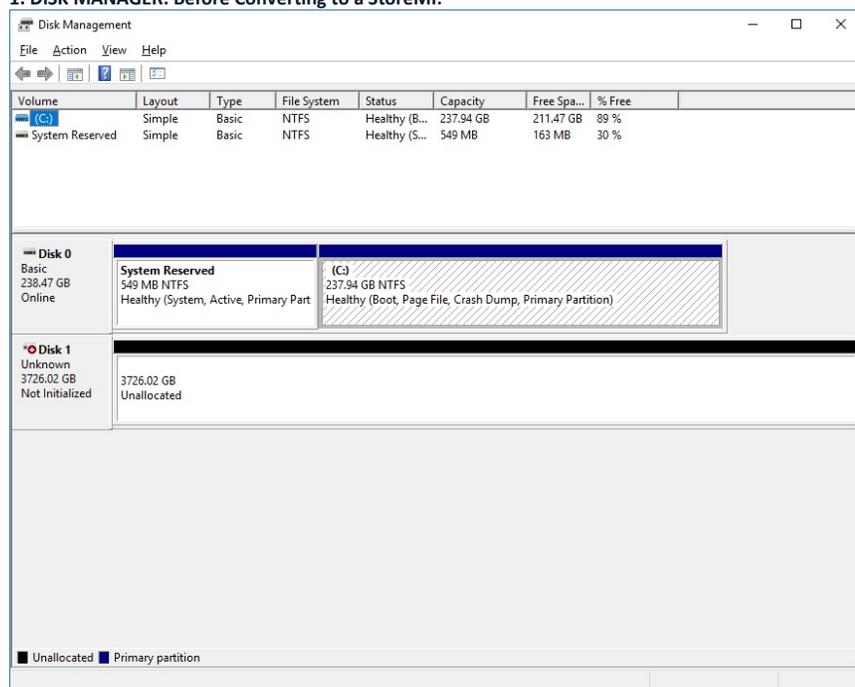
For systems running in legacy boot mode, all disk sizes are limited by the OS to 2TB in size. This can cause some confusion when expanding boot drives to greater than 2TB.

To work with boot or data drives greater than 2TB you MUST upgrade your system first to UEFI boot mode with a UEFI Windows boot drive, which will most likely involve a reinstallation of your OS. A search on the Internet of "Installing Windows 10 in UEFI mode" provides many useful tips on how to upgrade/install your OS in UEFI mode.

Below illustrates what happens when you attempt to expand a small 256GB NVMe boot drive with a legacy (not UEFI) boot drive using the StoreMI WITHOUT upgrading your OS to UEFI. If using a hard drive for example that is 4TB, we see that 1.9GB of the drive becomes unusable due to the Microsoft OS limit of 2TB.

If you wish to stay with the legacy operating system, then it only makes sense to add a HDD that when combined with the SSD capacity is 2TB or less.

1. DISK MANAGER: Before Converting to a StoreMI:



Legacy boot OS pre-Fuze

The above shows the existing legacy boot drive (an SSD in this case) and the empty 4TB drive we wish to expand the boot drive with.

2. DISK MANAGER: After Converting to a StoreMI:



Disk Management

File Action View Help

Volume	Layout	Type	File System	Status	Capacity	Free Spa...	% Free
(C:)	Simple	Basic	NTFS	Healthy (B...	237.94 GB	201.87 GB	85 %
System Reserved	Simple	Basic	NTFS	Healthy (S...	549 MB	163 MB	30 %

— Disk 0
Basic
Online

— Disk 1
Basic
Online

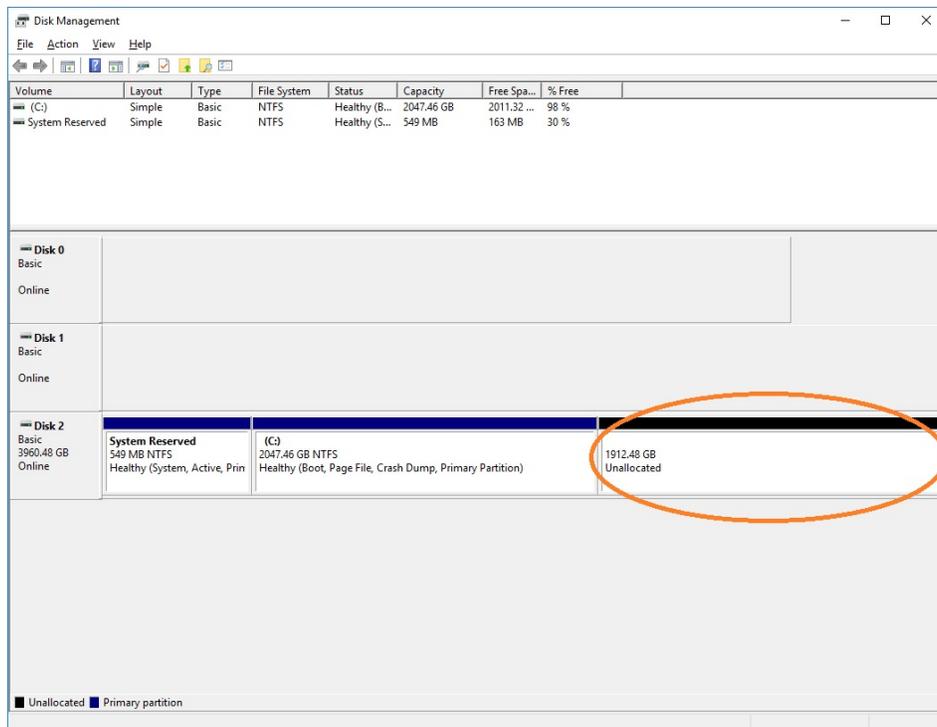
— Disk 2
Basic
3960.48 GB
Online

System Rese	(C:)	1809.53 GB	1912.48 GB
549 MB NTFS Healthy (Syst	237.94 GB NTFS Healthy (Boot, Page File, Cra	Unallocated	Unallocated

■ Unallocated ■ Primary partition

Legacy Boot StoreMI Post Conversion

3. DISK MANAGER: After Expanding the C: Drive (limited to 2TB by legacy boot environment):



Expanded C: Limited by 2TB Legacy Boot - Unable to Use Additional

The highlighted area is unusable because the legacy operating system limits any physical drives to 2TB. As a StoreMI looks like a standard disk drive to Windows, it too will be limited.

Where can I (re) download the StoreMI for AMD Ryzen software?

The latest version of the software may be downloaded at main <http://www.AMD.com/support> page. A compatible motherboard is required to enable the software.

Why Can't I Use Software RAID with StoreMI ?

StoreMI contains a full AHCI chipset driver in order to be compliant with hibernate and other Microsoft Windows hibernate and crash dump requirements.

The AHCI controller on the motherboard is what interfaces with the SATA devices (M.2 and regular SATA cabled devices).

The issue is that AMD's (and Intel's) software RAID implementations implement and require full control over the full AHCI stack also, so the StoreMI AHCI driver and RAID AHCI drivers cannot co-exist in the same system.



Where does this leave StoreMI and RAID? We are currently exploring ways to support AMD software RAID stacks and will update when we have more information.

What Happens If One of My HDD or SSD Fails in a StoreMI?

StoreMIs do not have any built in redundancy. If one or more drives fail, the effect is the same as a single or RAID 0 disk failing i.e. the StoreMI will no longer function. For a bootable StoreMI, the system will BSOD or slowly degrade in performance if the drive fails slowly (which is more typically than instant failures).

If the drive is simply unplugged, then replugging the drive usually returns the drive to full operation.



General Support

System Information Required for Support Tickets

Before contacting support, please ensure you have read the FAQ, the online knowledgebase and also the User Guide to see if these help.

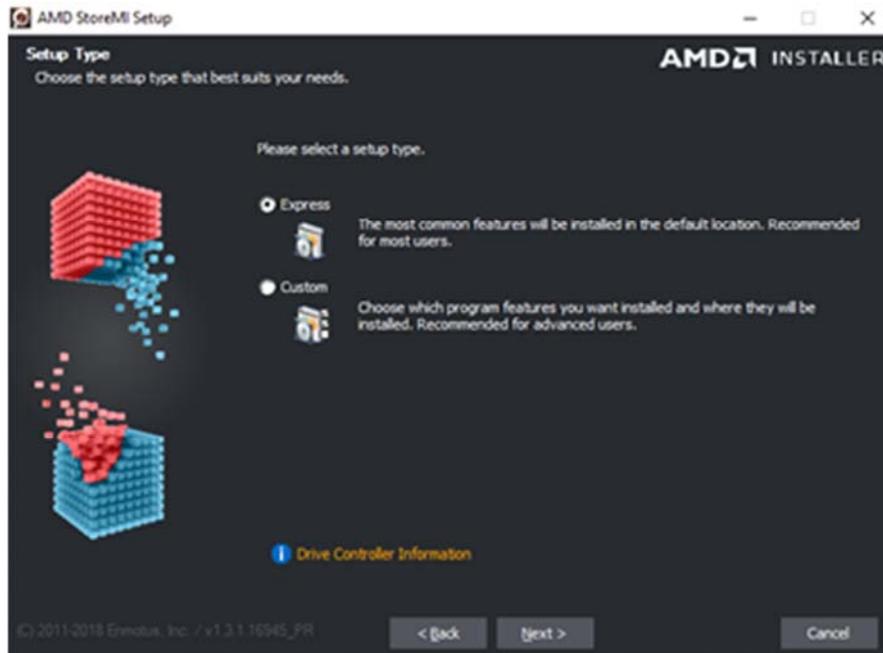
If they do not answer your questions, then when submitting a ticket to the AMD support team, if possible, please provide the following to help us respond more quickly to your question(s) :

All tickets:

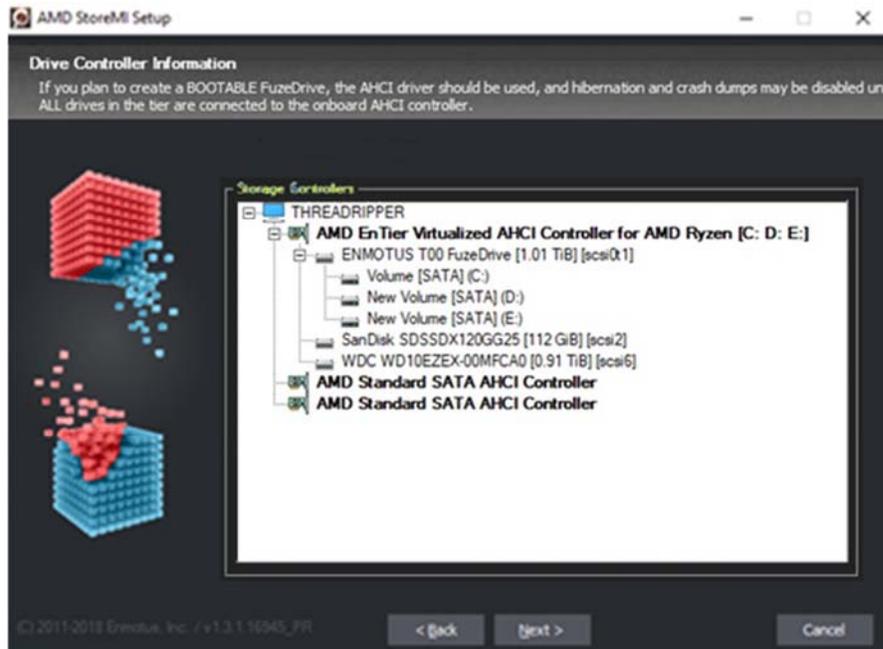
1. CPU, motherboard make and model
2. Motherboard information and date purchased.
3. Exact steps that led to your issue.
4. Exact system configuration, drives and their port connections

Additional information if troubleshooting functional issues:

1. Run the Windows system info utility, export the information to a text file and attach with your ticket submission. You can do this by opening a Windows Start, type msinfo32 into the "Type here to search" or Run dialog box.
2. Run the Windows Disk Management utility and take a screen shot of all visible disk drives.
3. Right click on the AMD icon in the lower right and select Drive Controller information. Select all, save as a text file to include with your system information.



The output should look something like the following screen capture. Use Alt-PrtScr (or other screen capture), save the image as a file and upload with the other information.



Then go back to the prior screen and exit the installer.

Commented [AD1]:
Commented [AD2R1]: Remove and insert a StoreMI screenshot

Installation

Unable to create StoreMI after reinstalling Windows

See:

[I reinstalled Windows and StoreMI. Why does it say I already have a StoreMI before I create one?](#)

What happens when I expand a legacy boot drive capacity by more than 2TB?

For systems running in legacy boot mode, all disk sizes are limited by the OS to 2TB in size. This can cause some confusion when expanding boot drives to greater than 2TB.

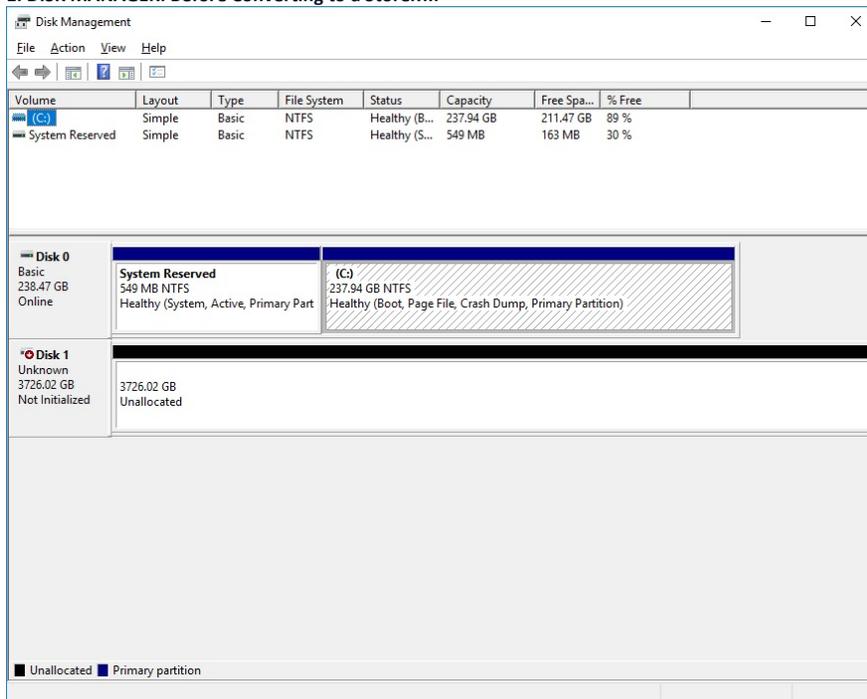
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Legacy boot OS pre-Fuze

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2. DISK MANAGER: After Converting to a StoreMI:



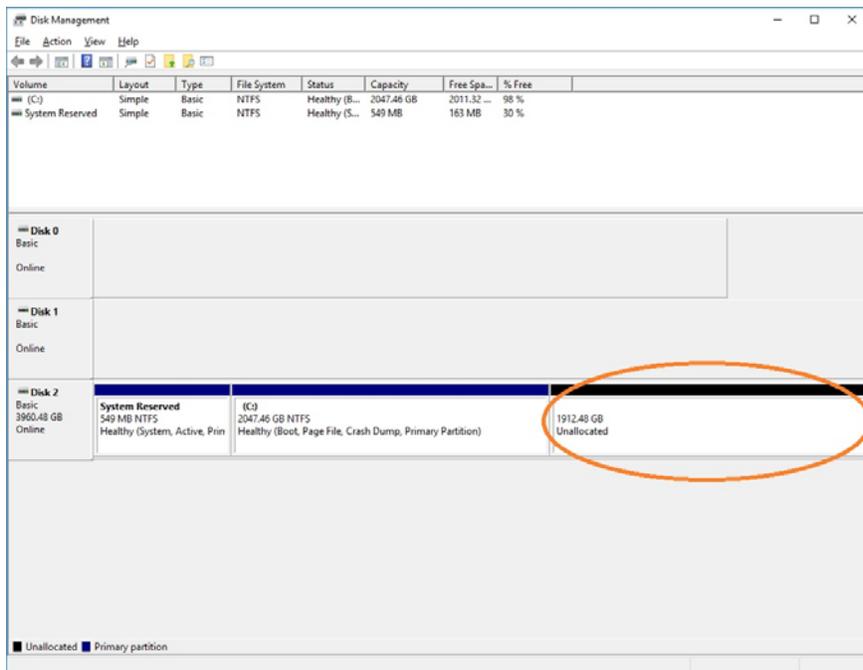
The screenshot shows the Windows Disk Management console. At the top, a table lists the volumes on Disk 2:

Volume	Layout	Type	File System	Status	Capacity	Free Spa...	% Free
(C:)	Simple	Basic	NTFS	Healthy (B...	237.94 GB	201.87 GB	85 %
System Reserved	Simple	Basic	NTFS	Healthy (S...	549 MB	163 MB	30 %

Below the table, the disk layout is visualized. Disk 2 is shown as a Basic disk with an Online status. It contains three partitions: a small System Reserved partition (549 MB NTFS), a large C: drive (237.94 GB NTFS), and a large unallocated space (1809.53 GB). A legend at the bottom indicates that black represents unallocated space and blue represents a primary partition.

Legacy Boot StoreMI Post Conversion

3. DISK MANAGER: After Expanding the C: Drive (limited to 2TB by legacy boot environment):



Expanded C: Limited by 2TB Legacy Boot - Unable to Use Additional

The highlighted area is unusable because the legacy operating system limits any physical drives to 2TB. As a StoreMI looks like a standard disk drive to Windows, it too will be limited.

Enabling StoreMI in Windows Recovery and Windows PE Environments

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Scope

The following article provides manual steps for enabling StoreMI in a typical Windows recovery (or PE) environment. It also addresses the situation when the BCD (EFI) or legacy boot configuration are no longer functioning correctly and how they may be potentially reset or recreated.

The reader is encouraged to consult Microsoft or other third party documentation on recovering Windows as there may be many reasons a Windows system may no longer boot properly.

This is an expert guide and requires a high level of proficiency in Windows command line and disk volume environments.

Copy Driver Files to USB Device

STEP 1a: Copy the contents of the \Program Files\AMD\Drivers folder to a USB stick

Use a FAT32 formatted USB key and copy the Drivers folder to the root of the USB key. The following sub-directories should be present:



Drivers\virtahci7
Drivers\virtahci8

STEP 1b: If the Drivers directory is not available, download the drivers ZIP file attached to this article (scroll to end to see attachment).

EFI Boot Drive Windows Recovery (or Win PE Environments):

STEP 2: Navigate to the Troubleshoot, Advanced options, Command Prompt to get to a command line window.

STEP 3: Plug in the USB key. This will be assigned it's own C:, D:, etc.

STEP 4: Determine which drive letter the USB key was assigned. The simplest method to find the driver letter is to type C: at the command prompt, check for Drivers directory. If not present type D:, and repeat. Continue until you find the Drivers directory. Alternatively, you can use DISKPART and use the list volume command to see which volumes are visible.

Change the directory where you copied the Drivers folder to.

For Windows 8 (unsupported) or 10: change to the **virtahci8** directory.

For Windows 7 (unsupported): change to the **virtahci7** directory

STEP 5: Load the AMD driver by typing the following:

```
> drvload envirtahci.inf
```

Give it around 20 seconds to load the driver.

If the StoreMI NTFS file structure is intact, you should now see a new drive letter added to the list. If not, then the StoreMI may not be able to load.

Mount the StoreMI EFI Partition

If the StoreMI correctly mounted with the drvload command, you will now need to mount the Windows EFI partition on the StoreMI boot volume.

STEP 6a: Mount the EFI partition by typing the following:

```
> mountvol s: /s
```

If successful, you should be able to change to the S: volume and see an EFI directory.

If not, try STEP 6b instead.

STEP 6b: If Step 6a did not work, run DISKPART from the command line prompt and type the following:

```
> list vol
```

You should see something like the following:

```
DISKPART> list vol
```

Volume ###	Ltr	Label	Fs	Type	Size	Status	Info
Volume 0	C		NTFS	Partition	1046 GB	Healthy	Boot
Volume 1		Recovery	NTFS	Partition	450 MB	Healthy	Hidden
Volume 2			FAT32	Partition	100 MB	Healthy	System
Volume 3	D	DRIVER	FAT32	Removable	14 GB	Healthy	

Identify the EFI volume. This is typically the 100MB FAT32 volume labelled "System".

Assign the EFI partition a volume by typing the following (assumes EFI is vol 2 from our example above – change for your specific system):

```
> sel vol 2  
> assigned letter="S:"  
> exit
```

Repairing the Microsoft Boot Record and BCD store

STEP 7: Change to the S: EFI volume and repair the boot record:

```
> cd /d s:\EFI\Microsoft\Boot  
> bootrec /fixboot  
> bootrec /rebuildbcd  
(answer with Y at the prompt)
```

Legacy Boot Drive Windows Recovery (or Win PE Environments):



If booting into Window Recovery or PE in a legacy environment, do the following:
Follow STEPS 2-5 above for the EFI, then do the following:
STEP 6 (legacy): fix the boot record and boot tables using the following commands:
> bootrec /fixmbr
> bootrec /fixboot

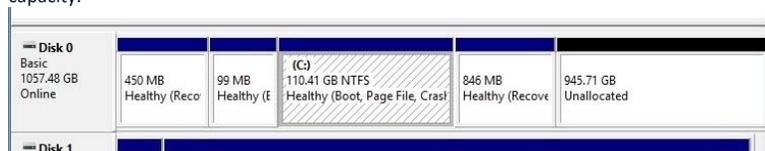
Expanding a Boot Drive's Partition With Recovery Partition using MiniTool

NOTE: the following uses third party software not supported by AMD. Please contact MiniTool if there are any issues or questions with using their software.

Summary

In some cases, a boot drive places a recovery partition at the end of a boot drive. Following a transform to a full tier StoreMI, it is quite common for this recovery partition to prevent the user from expanding the boot drive volume (C:) to take advantage of the additional capacity.
The following example shows how to expand a boot drive that looks like the following in Disk Manager in Windows following a transform to a StoreMI.
NOTE: If wishing to Remove an SSD or fast tier device from a StoreMI, you can follow the opposite steps as summarized at the end of this article.

Below is an example of how the drive may look after converting to a StoreMI and the additional capacity has been added. An unallocated region of the disk is created which may be used for the additional capacity.



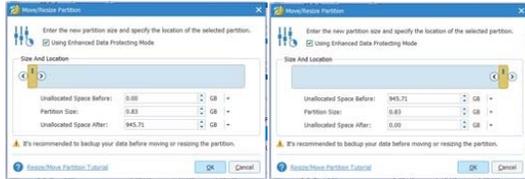
Partition	Size	File System	Health
Recovery	450 MB		Healthy (Reco)
	99 MB		Healthy (E)
(C:)	110.41 GB	NTFS	Healthy (Boot, Page File, Cras)
	846 MB		Healthy (Recove)
Unallocated	945.71 GB		

STEP 1: Download and install Minitool if not already on the system (www.minitool.com)

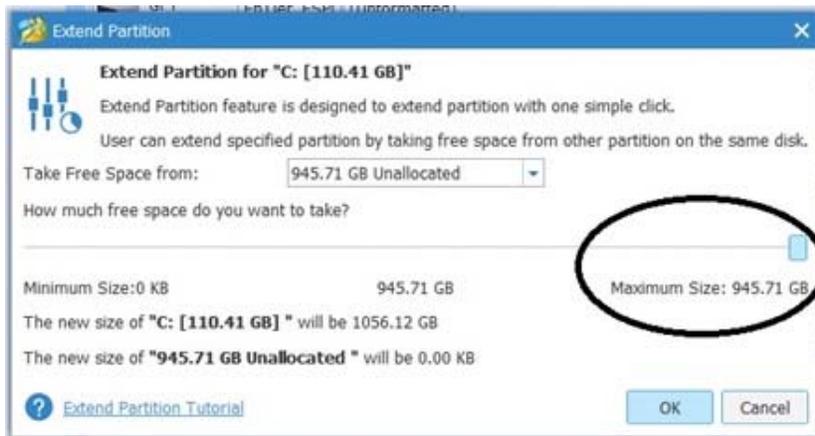
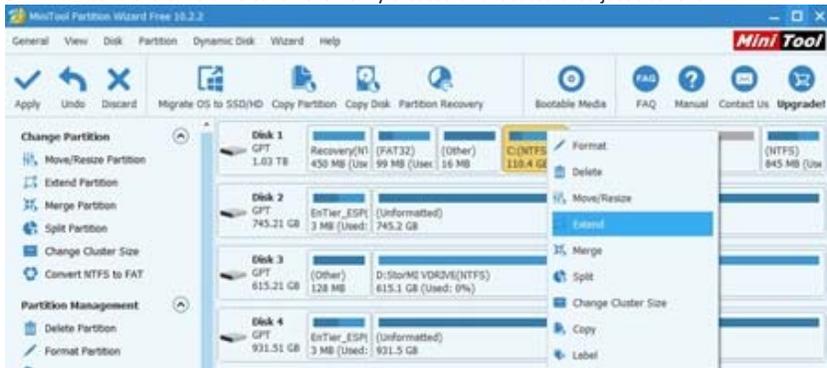
STEP 2: Run Minitool and identify the recovery partition that needs to be moved.



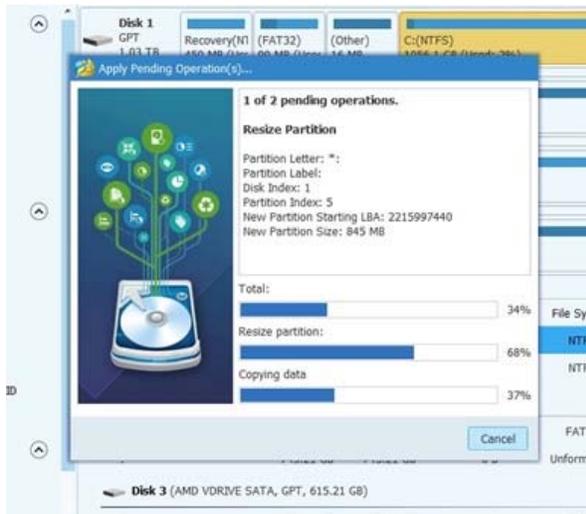
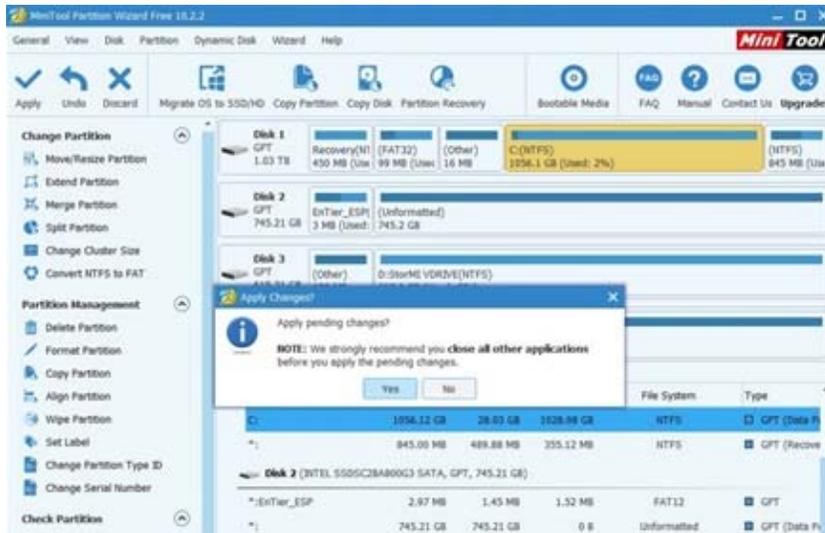
STEP 3: Move the Partition to the End of the StoreMI



STEP 4: Extend the C: volume to full the newly created unallocated area just above it



STEP 5: Apply all the Changes



STEP 6: On completion, close MiniTool and Check in Disk Manager that the C: is now expanded correctly

Disk	Partition	File System	Size	Usage	Label
Disk 0 Basic 1007.48 GB Online	Recovery(N)	(FAT32)	450 MB	99 MB (Used)	Healthy (Recovery Partition)
	(Other)	(Other)	16 MB	16 MB	Healthy (EFI System)
	C:(NTFS)	(NTFS)	1056.12 GB	28.03 GB (Used: 2%)	Healthy (Boot, Page File, Crash Dump, Primary Partition)
	(NTFS)	(NTFS)	845 MB	845 MB (Used)	Healthy (Recovery Partition)
Disk 1					



Manually Reducing the Size of the StoreMI to allow for a Remove operation.

The current versions of the StoreMI software do not support automatic relocation of the recovery partition. If you encounter an issue with "Remove Acceleration" or "Remove StoreMI", the following steps can be taken to create the room needed at the end of the drive to support the removal of the fast tier (i.e. the SSD in most cases).

STEP 1: Run Minitool.

STEP 2: Using Minitool's shrink option, reduce the size of the C: volume by the size of the SSD that is to be removed e.g. 256GB. Add 2 GB for additional padding (i.e. 130GB).

STEP 3: Use Minitool's option to move the recovery partition so that is located right next to the resized C:.

STEP 4: You should now have an unallocated space at the end of the drive. Retry the Remove StoreMI option.

Migrating Windows 10 from an SSD to a HDD

Summary

If you are using StoreMI with an SSD larger than 256GB, the software will not support the ability to directly convert the SSD boot OS drive to a StoreMI and expand its capacity if the SSD is greater in size than 256GB. The software can only direct convert operating systems on an SSD that you wish to retain as the fast drive in the storage tier if they are smaller than the 256GB limit. If using the SSD as a slow tier device (e.g. you are adding an NVMe SSD to an existing SATA SSD OS boot drive) then this limit does not apply.

If you wish to stay with an SSD larger than 256GB, the software will not support your SSD OS transform to a StoreMI, it is still possible to use a portion of your current SSD OS boot drive to accelerate Windows. This is accomplished by using a migration tool such as Macrium Reflect (www.macrium.com) to first migrate your OS to the slower capacity device you are trying to create a StoreMI with.

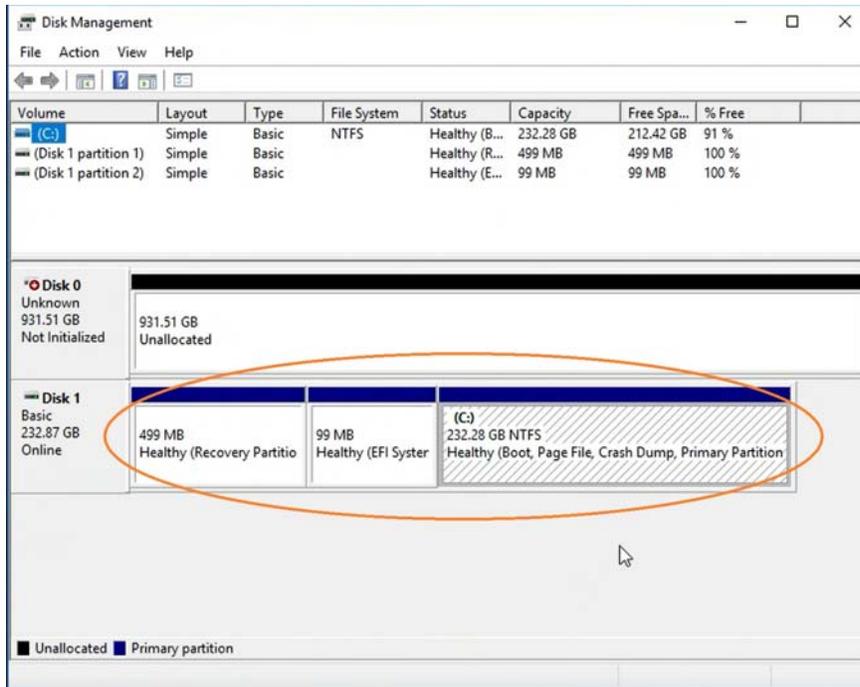
NOTE, your system will start with HDD performance for a short while until it has fully warmed and migrated all the boot and application files to the SSD, after which your system will perform at SSD rates again.

Steps to Migrate from SSD to HDD

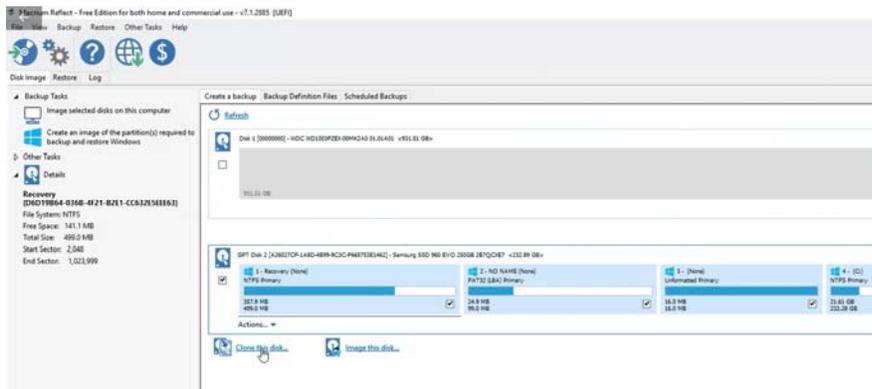
The following outlines how this may be done using the Macrium Reflect software as an example. Please note, this material is provided for reference only. Please contact Macrium directly if you have questions about their software.

It is assumed that there is a blank hard drive (or other slow tier device) available for this exercise.

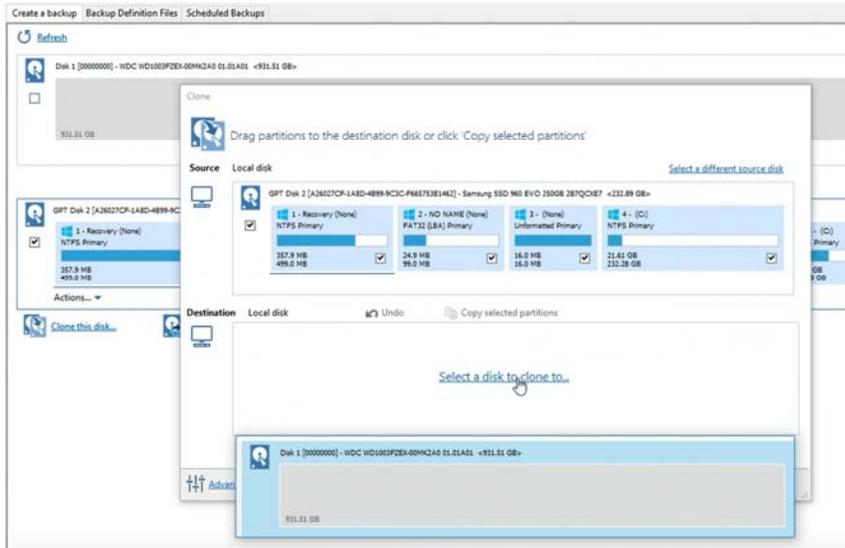
STEP 1: Open Disk Manager, and the view should look something like the following:



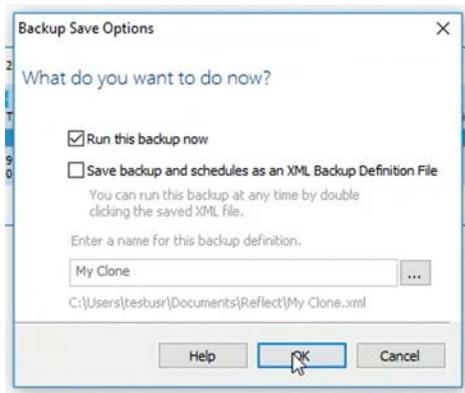
STEP 2: Run Macrium. You should see something like the following:



STEP 3: Under the SSD Drive, Select "Clone the disk".



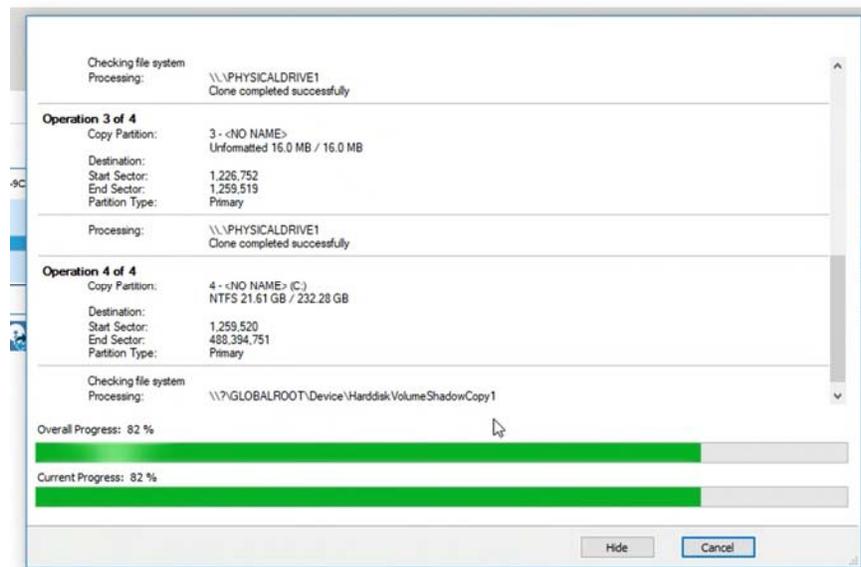
STEP 4: Select the Hard Drive to Clone to and when presented with the Backup Save Options, deselect "Save backup and schedules as XML....".



STEP 5: Press OK and the Clone Process will Proceed (may a while depending on how much data is on the SSD).



"ZEX-00MK2A0 01.01A01 <931.51 GB>

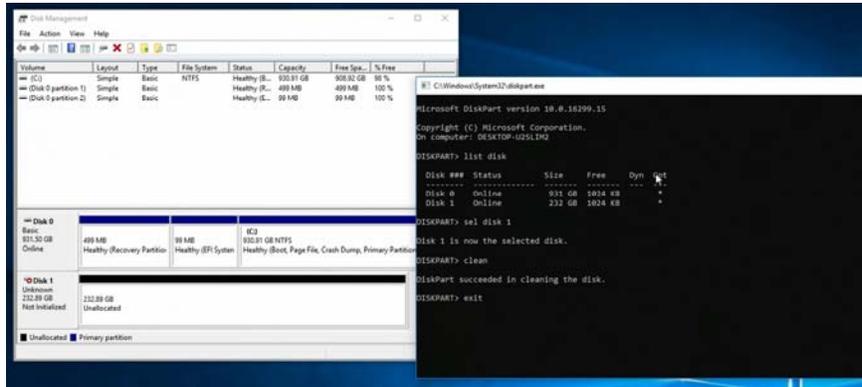


STEP 6: Once the clone operation successfully completes, reboot the PC, enter setup and select the HDD as the boot drive. For example:



NOTE: your BIOS display may look different. Look for Boot Options and HDD boot order menu.

STEP 7: After you have satisfied yourself that the HDD boot drive is a successful clone of the SSD, proceed with wiping the SSD. Open an Administrator Command Prompt and use Diskpart to select the SSD and use the clean command. For our example above, we wish to clean disk 1 (the SSD).



You may also use Disk Manager to expand the size of the boot volume. If you have a recovery partition, see the following KB for more information on how to handle expansion for this case. Note, you may wish to wait until the StoreMI has been added before you expand with a recovery partition.

Expanding a Boot Drive's Partition With Recovery Partition using MiniTool

STEP 8: You may proceed with creating the StoreMI using the Accelerate My BootDrive or Create Bootable StoreMI option.

Dealing with Legacy Boot Drives and the 2TB Limit

Legacy boot devices are supported by the StoreMI software. However, Microsoft and PC BIOSes have a limitation of 2TB size when using legacy mode and/or MBR based partitions.

Learn more about this limitation from Microsoft at <https://support.microsoft.com/en-us/help/2581408/windows-support-for-hard-disks-that-are-larger-than-2-tb>.

When expanding an SSD or HDD boot drive in legacy mode, if the total size of the StoreMI exceeds 2TB, even though the StoreMI will present a disk that is > 2TB, you will be unable to expand the C: boot volume beyond the 2TB limit.

Example 1: If we have a 2TB legacy boot HDD that was being completely used, and you wish to add a 512GB SSD to it to create a StoreMI, the boot volume cannot be expanded to take advantage of the additional capacity added as the boot volume is already at its limit regardless of the StoreMI license limit. The additional capacity can however be used as a D: or other letter drive that will also benefit from the StoreMI tiering.

While there are lengthy unsupported procedures online to convert the boot drive from legacy to UEFI boot mode, it is usually safer to reinstall the OS as a UEFI boot volume, the convert to a StoreMI. As UEFI allows volumes > 2TB, you will then be able to take full advantage of the additional capacity added to the boot drive.

Example 2: If we have a 1TB legacy boot HDD and adding a 256GB SSD, we can transform the HDD AND expand it to 1.25TB as it is still under the 2TB limit.



15) Recommended Configuration for a New Windows Installation

Table of contents

[Summary](#)

[Steps to Move the Recovery Partition and Expand the Boot Volume](#)

The simplest method to install Windows onto a StoreMI is as follows:

1. Ensure that the BIOS SATA settings are set to AHCI (not RAID) and secure boot is set to off. For boot volumes > 2TB make sure your BIOS is set to boot in UEFI mode and not legacy as legacy mode will limit the size of your boot drive to 2TB.

2. Install the Windows OS onto the **slowest** media (not the fastest). For example, if fusing an SSD and a HDD, install the OS onto the HDD. This will avoid many of the issues with any SSD capacity limits. Preferably, make sure no other drives are connected when installing Windows as some versions of Windows will attempt to use multiple drives instead of just the one.

IMPORTANT: ensure that the OS and newly added drives are attached to one of the AMD SATA controller ports for all SATA StoreMIs. In some motherboards (e.g. Asrock ThaiChi X370), the ports marked as SATA3_A1 or _A2 are attached to the Asmedia SATA controllers). If unsure, check with your motherboard or system documentation.

2. Once Windows is fully installed and all the motherboard system drivers have been added (except any storage drivers), install the StoreMI software and reboot.

3. Make sure that the drive being added (the SSD in our case) is completely empty and has no data on it. Delete any existing partitions if necessary using Disk Manager or diskpart on the command line, making sure to backup any data you need to keep first.

3. Run the StoreMI configuration utility and select the option to **Accelerate My BootDrive**. If you correctly cleaned the SSD drive and these are the only two drives in the system, the utility should automatically select the two drives. The system will reboot.

4. Open the Disk Manager, and find the StoreMI virtual disk drive. It will be the one that contains the C:. Expand the C: to fill the rest of the drive if supported. If there is a reserved partition preventing the C: expand, use a third party tool such as Minitool to move the reserved partition to the end of the StoreMI disk and expand the C: to fill the new space opened up. See **Expanding a Boot Drive's Partition With Recovery Partition using MiniTool** article for more information.

16) Unable to Select Accelerate or Expand My BootDrive

If all the select options in the StoreMI utility are grayed out or inaccessible, first try floating your mouse cursor over the button to see if there are any useful tips as to why this may be occurring.

The inability to select usually means there are no available **blank** drives that the utility can fuse with the operating disk. For example, your system may have a C: on the HDD and a D: on the SSD but no other drives. As there is data on both drives, there is no way to combine the drives without first migrating data off the drive with the D: volume on it.

The possible remedies in this case are:

1. Add a new blank SSD (if HDD is the boot drive) or HDD (if SSD is the boot drive) if you need to retain the existing file systems.

or



2. Backup the data on the non-boot drive to a separate backup drive (USB, or other), then delete all data off the non-boot drive so it is blank. You can now use the blank drive to combine with the remaining boot drive, expand the resulting StoreMI to increase the capacity of the C: boot drive, and copy/restore the data from the D: to the new larger C:

Troubleshooting StoreMI Installation

If your StoreMI software does not appear to be installing correctly, you may need to change some system settings and/or remove third party disk caching utilities.

Important: Remove Third Party Disk Caching Software

StoreMI is not designed nor guaranteed to work with any third party disk caching software as it requires full access to the raw disk devices. Please remove all caching software from the disks you plan to use for StoreMI before attempting to convert existing disks and back up any data before conversion. Example third party software includes Samsung RAPID or Crucial Momentum Cache.

BIOS Settings

Check the following in the system BIOS:

1.
 - 1.. Check that the SATA controller in the BIOS is set to AHCI and not RAID

The software will not work with RAID enabled. For some secure boot environments, it may be necessary to add the AMD driver and boot loader to a list of trusted devices. More information coming soon or search for secure boot.

Multiple Disk Drives or Multi-boot Options

If using multiple drives check the system boots with just the original boot drive with the software installed (pre-conversion to StoreMI) or both drives (post-conversion to StoreMI). Sometimes additional non-StoreMI devices may affect the boot order.

AHCI Controller Attachment

It is highly recommended that the boot device(s) be attached to the AMD controllers on the motherboard and not any third party AHCI controllers, as we have seen some issues with connecting to non-AMD controllers. The AMD controller ports are typically the low order SATA ports (e.g. 0, 1, 2...) or the M.2 slots. Check your motherboard documentation to confirm.

Re-Installing Windows onto Disks Previously used as StoreMIs

If you are having problems installing Windows onto a disk previously used as a StoreMI and cannot see the drive in the Windows setup, see the KB article [Cleaning Disks Previously Used as a StoreMI during Windows Setup](#).

Cleaning Disks Previously Used as a StoreMI during Windows Setup

When to Use

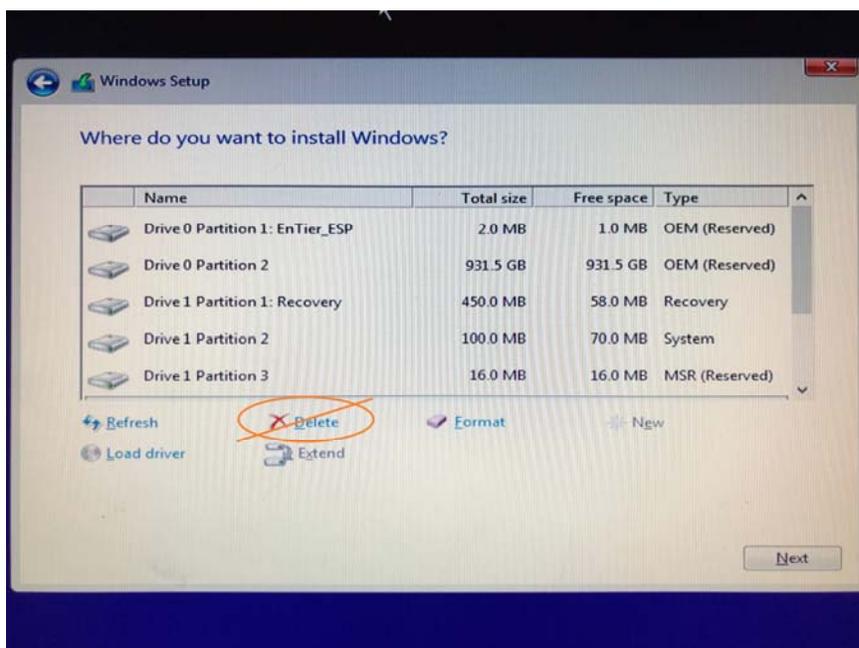
The following steps are only necessary if re-using StoreMI disks from a previous installation in a new installation and you are experiencing difficulties getting Windows to recognize the disks or trouble with getting the StoreMI software to correctly recognize the disks during a transform .



Why

AMD places metadata on the raw drives when creating a StoreMI. If you end up reusing these disks in a new bootable StoreMI installation, then it will be necessary to use the Windows built in program **diskpart** to completely clean the disks BEFORE reinstalling Windows and re-fuzing the drives.

For EFI setups, during Windows setup, using the **Delete** option presented in the Windows installer disk selection is not sufficient as it only cleans part of the disk drive and the AMD metadata is still left on the drive which can cause issues with install of a new Windows or StoreMI installation.



For Legacy BIOS setups, the disks will NOT be visible in this selection menu. We will need to run diskpart as shown below.

How to Clean the Disks

IMPORTANT: The following steps will completely erase all data from the drives. Ensure you have backed up all important data before using the following commands. Also ensure that you have selected the correct drive. Remove any drives that are not required for the installation if necessary to avoid confusion so that you only have the 1 or 2 drives used as a StoreMI connected, along with the USB or DVD Windows setup drive.

For EFI, the previously used disks will be labeled "EnTier_ESP" in the Windows disk select window. In the above example Drive 0 is one of the drives in question for example. Identify the other also (scroll down).

If you used your drives as data only StoreMIs, we will need to identify them using diskpart as they will not be visible in the Windows disk selection menu.



STEP 1: From the disk selection menu, press Shift and F10 keys at the same time to open a command line prompt.

STEP 2: Type **diskpart**, then type **list disks**.

```
Administrator: X:\windows\system32\cmd.exe - diskpart
Microsoft Windows [Version 10.0.10240]

X:\Sources>diskpart

Microsoft DiskPart version 10.0.10240

Copyright (C) 1999-2013 Microsoft Corporation.
On computer: MINWINPC

DISKPART> list disk

   Disk ###  Status         Size       Free        Dyn  Gpt
   -----  -
   Disk 0    Online         931 GB     0 B         *
   Disk 1    Online         111 GB     0 B         *
   Disk 2    Online         232 GB     0 B         *
   Disk 3    Online          28 GB     0 B         *

DISKPART> _
```

For our example, we have three disks. Disk 0 and 2 were previously used as StoreMIs. Drive 1 is an extra boot master drive we are also going to clean while in diskpart.

STEP 3: Identify the Disks previously used as a StoreMI. Use the size of the disk if necessary, and take special care NOT to accidentally select the Windows setup USB disk (for our example, Disk 3 above) or any other drives you may have left attached. It is highly recommended if you see multiple drives and you cannot clearly identify which were the StoreMI raw disks, shutdown your machine and disconnect any data drives or drives you do not want to touch, then reboot.

STEP 4: Select each of the disks and clean (i.e. delete all data and metadata off) them as follows (for the example above, disk 0 and 2 were the disks needed to be cleaned):

```
DISKPART> select disk 0
DISKPART> clean
```

```
DISKPART> select disk 2
DISKPART> clean
```

optionally for our example:

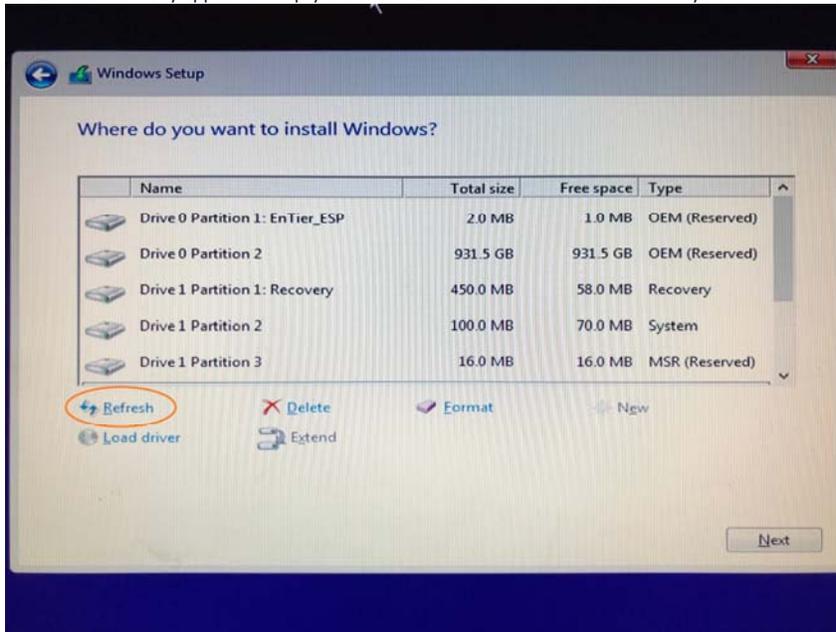
```
DISKPART> select disk 1
DISKPART> clean
```

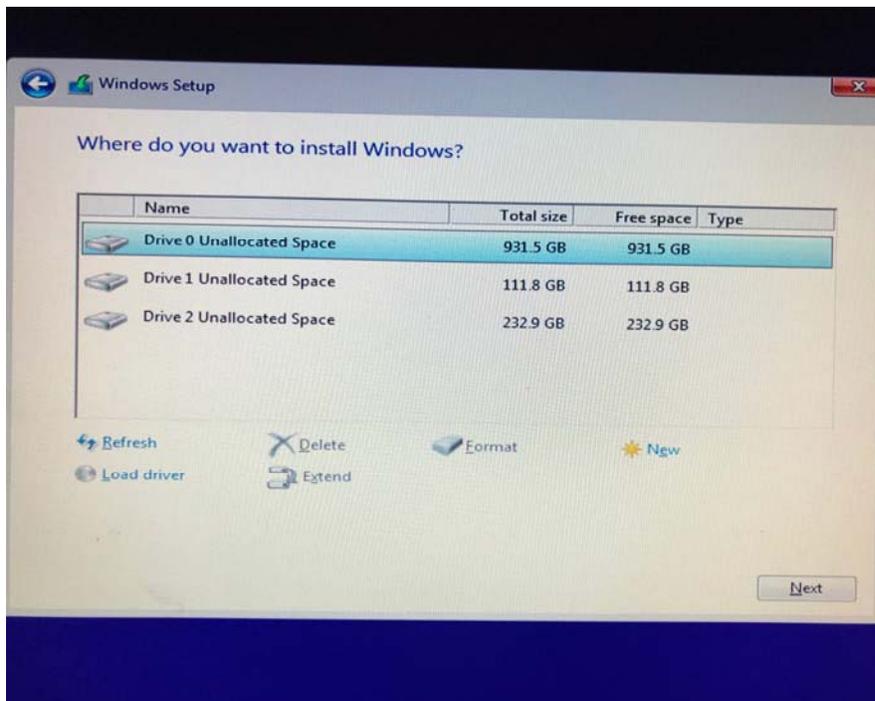


then type
`DISKPART> exit`

STEP 5: Close the command prompt window and return to the setup disk select menu

STEP 6: Refresh the disk select window to show the clean drives. Any legacy BIOS mode or data StoreMIs should now correctly appear as empty drives and all StoreMI metadata will be safely removed.





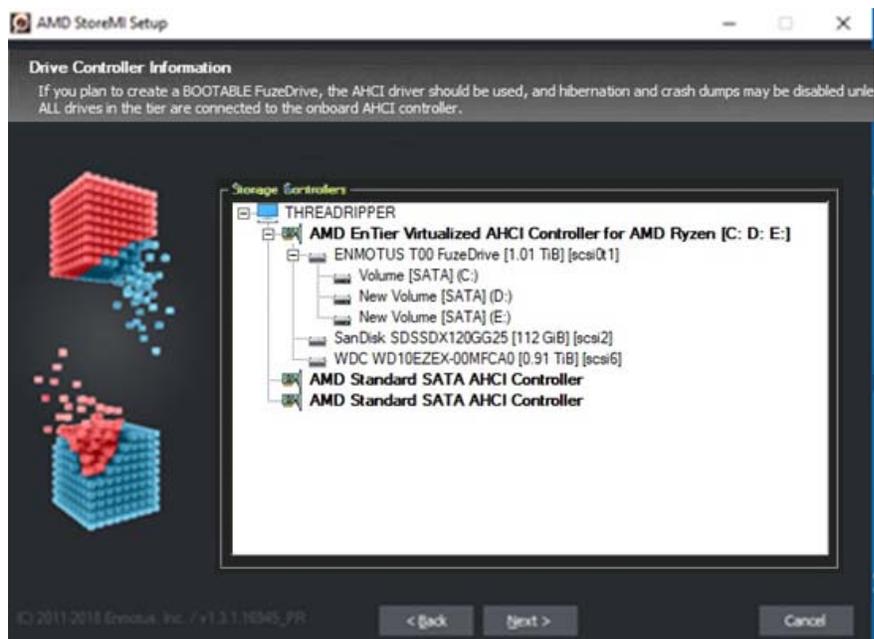
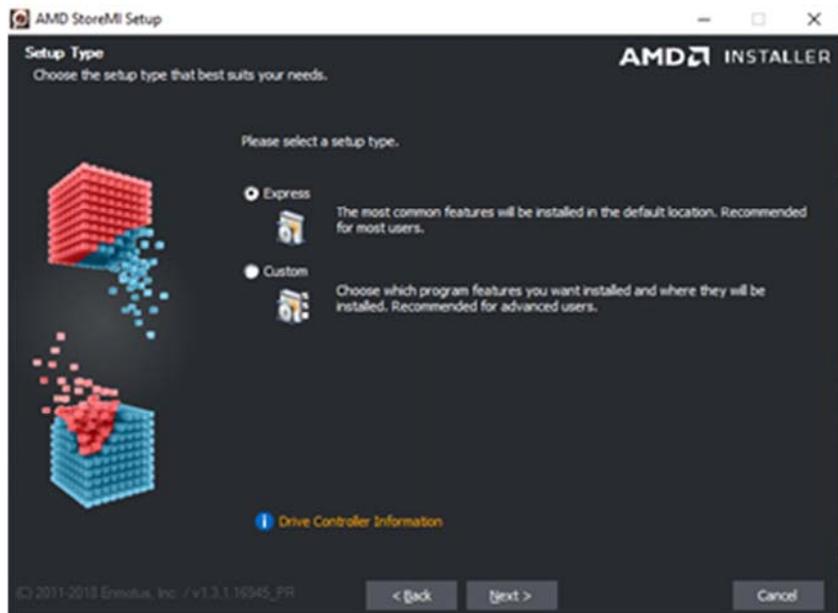
STEP 7: Proceed to install Windows on the drive of choice.

Correctly configuring and connecting drives for bootable StoreMIs

StoreMI for AMD Ryzen requires the boot drive and/or at least one of the disk drives that are part of the StoreMI to be attached to the primary motherboard AMD SATA controller. The system may not always reboot properly if the boot drive is attached to a non-AMD controller. Please consult the motherboard/system documentation to confirm which ports are connected to the primary AMD controller.

Alternatively, use the Driver Controller Information utility accessible from the StoreMI installer Express/Custom selection page to check where the boot drive and other StoreMI devices are currently attached. If necessary, move the boot drive to the AMD controller (e.g. SATA port 0 is typically attached to the primary AMD chipset AHCI controller). If using all SATA devices for the StoreMI, it is recommended that all devices are attached to the primary AHCI controller.

The StoreMI Drive Controller Information screen shot and example configuration screen are illustrated below.





Known issues

Best Practices

Controller Attachment: Ensure all devices are attached to AMD controllers and not third party controllers (e.g. Asmedia) for the best results.

Supported Devices: SSD or NVMe SSDs used with hard drives (HDDs) are the most common use case and tend to work the best. If attempting to use SSD+SSD or NVMe+NVMe combinations, the software may not be able to determine which is the fast or slow device as it relies on a performance check to determine fast and slow tier devices. We are currently working on making these cases work more cleanly. Check back frequently if interested in such configurations for updates and all-SSD configuration support.

Known Issues

Issue 1: If the Remove Acceleration option has been used to remove an SSD completely from the StoreMI AND the system is rebooted while in this state, when re-adding a new SSD, the protected partition at the beginning of the SSD will be removed and the drive becomes available as a new drive. This does not usually occur if a new SSD is re-added without rebooting. While StoreMI continues to operate in this state, the OS or application may now treat this a new drive and any format changes made to the raw SSD drive may corrupt the StoreMI data.

Checking for the Condition: Open Disk Manager and view the raw SSD device. If it shows as an unformatted drive or appears to have a fake partition on it, follow the steps outlined below. Make sure to do an Action/Refresh. If the SSD is grayed out (legacy mode) or showing the 3Mbyte AMD EFI partition, then your StoreMI is not affected by this condition. If you have not run the Remove Acceleration option, you will not see this issue.

Solution: Update to the latest version of the software (1.3.1.16779PR or later) before attempting to perform a Remove Acceleration (now called Remove StoreMI in v 1.3.1 and later). If already in this state, run the Remove StoreMI option with the updated software to remove the SSD once more then re-add the SSD to clear the condition. It is highly recommended this step be taken to clear the condition to avoid potential for accidental formatting of the raw SSD.

Issue 2: When adding an SSD to an NVMe SSD boot drive, Accelerate My Boot Drive appears instead of Expand My Boot Drive.

Description: The SSD being added to an NVMe drive is incorrectly classified.

Solution: Selecting Accelerate is OK. However, in multi-disk selection menu if it appears, make sure to select the SSD as a **SLOW** device otherwise the transform may fail. Update to the latest release if possible.

Issue 3: When adding an SSD to an NVMe SSD boot drive, Transform May Fail if SSD Selected as a FAST device.



Description: The software allows selection of the SSD as a fast device but the NVMe SSD is the fast device. In this case, the SSD should be selected as the slow tier.

Solution: Make sure the SSD is selected as the SLOW device when transforming an NVMe SSD boot drive or update to the latest release of software if experiencing this issue.

Issue 4: Cannot transform an EFI boot drive with only 2 partitions (missing recovery partition)

Description: Some backup software packages do not backup or reinstall recovery partitions, leaving only two partitions on the EFI. The StoreMI software requires at least three partitions to transform.

Solution: Currently not supported by the software. Update to the latest release at www.AMD.com/support.

Issue 5: License will not activate correctly when StoreMI is NOT installed on the C:

Solution: Install to C: only. Update to the latest release to fix.

Issue 6: If Storage Spaces devices are installed, on reboot, the system may report issues with partmgr.sys when installing the software

Solution: Use Windows recovery to roll back the system if possible. Remove the storage space device or contact AMD support for a patch release. Update to the latest release.

Issue 7: Some large capacity drives, such as the Seagate ST4000M004-2CV104 models, are mistakenly identified as SSDs and may cause your license to report the SSD capacity is too large.

Solution: No known workaround in this version. Update to the latest release.

Issue 8: Multiple Remove Acceleration and Accelerate My Bootdrive cycles may cause the system to become non-bootable.

Solution: Update to the latest release. Also see Issue 1 above.

Issue 9: PC no longer shuts down completely with a bootable StoreMI.

Description: The StoreMI software under some scenarios relocates the Windows hibernate file to a device that is attached to the AHCI controller the AMD driver is running on. This occurs on the first boot after an Accelerate or Expand my bootdrive operation. This may take up to 30 minutes or longer for large DRAM configurations. If the system is rebooted during this transition, the hibernate mapping is incomplete and is not restarted correctly on the next reboot. Note, this does not occur when all the



devices are attached to the same AHCI controller. It will occur however if Expanding the capacity of an NVMe SSD boot drive using a SATA hard disk attached to the primary AMD AHCI controller.

Solution: A fix is being implemented. For this version, disable Fast Startup in Windows per the instructions below. If that does not work, you may also need to disabled Hybrid-Sleep.

Disable Fast Startup

- 1) Type Control Panel in the search box.
- 2) Click Control Panel.
- 3) Click Power Options.
- 4) Click Choose what the power buttons do.
- 5) Click Change settings that are currently unavailable.
- 6) Scroll down to Shutdown settings and uncheck Turn on fast startup.
- 7) Click Save changes.

Disable Hybrid-Sleep

- 1) Open the Control Panel.
- 2) Click the Hardware and Sound heading.
- 3) Click the Power Options heading. ...
- 4) Click the link Change Plan Settings beneath the selected plan.
- 5) Click the link Change Advanced Power Settings. ...
- 6) Open the Sleep item by clicking the plus (+) sign.
- 7) Open the item Allow Hybrid Sleep and change the setting to off

Issue 10: NVMe + NVMe configurations are not properly supported or report license errors if the intended "slow tier" NVMe drive is larger than the SSD license limit of 256GB (basic) or 1TB (plus).

Description: During an upfront performance check, the software automatically selects the faster device as the fast tier when attempting to create a StoreMI using two NVMe devices, then informs the user it cannot proceed due to a license capacity limit.

Solution: No workaround exists for this release. A fix is being investigated for a future release of the software. Please check back when newer versions are available or contact support@AMD.com to check for availability.



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