Cloning a disk

It is possible to clone an entire hard drive or specific partitions on a hard drive. This is useful if you are upgrading to a larger hard drive. With Macrium Reflect you can boot the target disk on the same system after cloning. Cloning your hard drive creates a bootable new hard drive with the state of your computer at the time you undertook the clone. You can clone to a hard drive installed in your computer or to a hard drive installed in a USB hard-drive Caddy.

Important

Windows cannot boot from a USB connected drive. This is a restriction imposed by Microsoft. If you clone your system disk to a USB connected external drive then, to boot your clone, the physical disk must be removed from the USB caddy and attached to your Motherboard SATA port.

Deleting and re-configuring existing partitions or configuring new partitions is possible with Macrium Reflect, so you don't need to do this prior to cloning.

A Dynamic volume is a logical abstraction of the underlying physical disk and may be striped or extended over multiple physical disks. Because of this, Dyn anic volume file systems are copied not disk partitions.

If your source disk contains Dynamic Volume(s) then the background will be orange and the link will show 'Copy Dynamic Volumes...':

R	Dynamic Disk 6 [374BB0D8-F5AE-458A-A9B1-D492B272507D]								
•	1 - Windows (K:) NTFS Dynamic								
	4.63 GB 126.87 GB								



In the Clone Wizard:

- The partition selection check boxes and 'Copy selected partitions' link will not be available. Therefore, Dynamic Volumes must be dragged and dropped to the destination.
- To copy source Dynamic Volume(s) to destination Dynamic Volume(s) you must prepare the target as Dynamic and format the destination volume (s) in advance of the clone operation. This can be achieved using the Windows Disk Management Console to convert one or more physical disks to Dynamic.
- A destination Dynamic Volume cannot be resized so the 'Cloned partition properties' link will not be available if the destination is Dynamic.
- To convert Dynamic Volume(s) to standard partitions, select an unformatted or an MBR/GPT basic disk as the destination and use 'Drag and Drop' to copy the source volumes. After the clone operation you can leave the disk as a 'Basic' disk or convert to Dynamic using the Windows Disk Management Console.

See also: Bare metal restore of a Dynamic disk system

1. Select the disk you wish to clone in the main application window and Click 'Clone this disk'...



¢		Macrium Reflect -	Server Plus E	dition [UEFI]		_ 🗆 🗙
File View Backup Restore Other Ta	sks <u>H</u> elp					
Backup Restore Log						
 Backup Tasks 	Create	a Backup Backup Defir	nition Files VBSc	ript Files PowerS	hell Files MS-DOS E	Batch Files Scheduled Backups
Image selected disks on this computer.	U Re	fresh				
Create an image of the	R	GPT Disk 1 [4DE35055-08E	B-46C3-8D02-E71FE	B27680D] - Msft V	irtual Disk 1.0 <40.00	D GB>
partition(s) required to backup and restore Windows.		1 - Recovery (Nor NTFS Primary F	2 - NO NAME (N AT32 (LBA) Primai	\rm 3 - (None) Unformatted Priman	4 - (C:) NTFS Primary	5 - (None) NTFS Primary
Create a File and Folder backup.					_	
▷ Other Tasks						
 Exchange Tasks 		15.0 MB 2 300.0 MB 9	25.5 MB	128.0 MB 128.0 MB	17.96 GB 39.04 GB	253.7 MB 450.0 MB
Backup Microsoft Exchange		Actions 🗸				
 SQL Server Tasks 		Clone this disk	😡 Ima	ge this disk		
👼 Backup SQL Databases				-		
Continuous Backup						
<table-cell-rows> Manage SQL Logins</table-cell-rows>						
Details						
Recovery {62EA5380-70C2-4998-9A58-1095A						
File System: NTFS						
Free Space: 285.0 MB						
Total Size: 300.0 MB	-					

2. In the wizard that opens Click Select a disk to clone to ...

	Select a disk to clone to	
partition	Cloned Partition Properties	
		Copy selected partitions when I click 'Next'
	Help < Back	Next > Cancel Finish

- 3. Select the hard disk you wish to clone to. In this case, there is only one disk available.
- 4. If you do not want to modify the order or size of partitions of the clone, **click Next**. This is the default behavior. Alternatively, drag the partitions you want to clone, the red arrow below shows this.

					(Clon	е				
R	Drag p	partitions to the de	estina	tion disk or	click	'Cop	y selected	l partitions			
Source	Local dis	sk							Sele	ect a differen	t source disk
	R	GPT Disk 1 [A8779CE9-FE	OB-46C1	-8BC7-73AAB095	9B32] -	Msft	Virtual Disk	1.0 <50.00 0	SB>		
		1 - Recovery (None NTFS Primary	e)	2 - NO NAM FAT32 (LBA) Pr	4E (Nor imary	ne)	3 - (Nor Unformatted	ne) Primary	4 - (C:) NTFS Primary		
		238.4 MB 300.0 MB		25.3 MB 99.0 MB		•	128.0 MB 128.0 MB		15.50 GB 49.48 GB		
Destinatio	on Loca	l disk	<u>n</u>	ndo 🗈	Copy	y sele	cted partitio	ns		ect a differer	t target disk
		GPT Disk 2 [8FB25AE7-A5	51C-4CA	B-BBFC-423CB22FE	- 356B] -	Msft	Virtual Disk	1.0 <50.00 G	iB>		
	. •	1 - (None) Unformatted Primary				2 - Da NTFS	ata (E:) Primary				
		128.0 MB 128.0 MB				100.3 49.87	3 MB 7 GB				
	>	Delete Existing part	<u>ition</u>	55	Clon	ed Pa	artition Prope	erties	Copy selected pa	artitions when	I click 'Next' 🗹
<u>∔</u> φ <u>Adva</u>	anced Op	tions						< Back	Next >	Cancel	Finish

Becomes

			Clon	e	
R	Drag pa	rtitions to the destinat	ion disk or click 'Cop	by selected partitions	
Source	Local disk				Select a different source disk
	G	PT Disk 1 [A8779CE9-FE0B-46C1	-8BC7-73AAB0959B32] - Msft	Virtual Disk 1.0 <50.00 0	ĵB≻
		1 - Recovery (None) NTFS Primary 238.4 MB 300.0 MB	2 - NO NAME (None) FAT32 (LBA) Primary 25.3 MB 99.0 MB	128.0 MB	
Destinatio	on Local o	tisk 🥢 Un PT Disk 2 [8FB25AE7-A51C-4CAB	do Copy sele -BBFC-423CB22FB56B] - Msft	cted partitions Virtual Disk 1.0 <50.00 G	Select a different target disk
Ŧ		1 - (None) Unformatted Primary 128.0 MB 128.0 MB	4 - (E:) NTFS Primary 15.50 GB 49.48 GB		400.0 MB
	×	Delete Existing partition	Cloned Pa	artition Properties	Copy selected partitions when I click 'Next' 🗹
<u>†</u> ↓† <u>Adva</u>	nced Optio	<u>ons</u>		< Back	Next > Cancel Finish

In this example, there is 400MB of free space after the copied partition. You can modify the size of each partition to fit the new disk if required.

You can delete partitions on the target disk by selecting and clicking 'Delete existing partitions'...

- 5. To modify the partition sizes, click Cloned Partition Properties and adjust the size of the partition by:

 - a. Setting the partition size precisely using the **Partition Size** entry box.b. Resize the partition automatically by clicking **Maximum size**, **Minimum size** or **Original size**.

		Part	ition Prope	erties		
Set the pro	perties for the r	restored	partition Drive Letter:	E: ¥	Partition Type:	Primary V
4 - (E:) NTFS Primary 15.50 GB 49.48 GB						
Partition Size: Free Space:	49.483 ^	GB ∨ MB ∨		Maximum Size 49.87 GB	Minimum Size 15.55 GB	Original Size 49.48 GB
Alignment:	Vista/7/SSD (1MB)	~			Start Sector: End Sector:	264,192 104,038,399
					ОК	Cancel

6. Click **OK**.

7. If required, click Advanced Options to change settings for this clone:

🗙 Delet	e Existing partition
님다 <u>Advanced Options</u>	
	Cloning Options ×
Backup	
Cloning Options	Set options for this cloned drive Set default options for disk doning. Please note that Intelligent Sector Copy will always be used if the target partition is smaller than the source partition Perform an Intelligent Sector Copy. This will only copy the sectors that are in use on the source file system. Verify File System. Verify the source file system prior to the doning operation Rapid delta clone. Only copy the differences between the source and target. Enable SSD TRIM. This increases lifetime and the performance by flagging unused blocks; avoiding slow erase operations and the read-modify-write cycle for these blocks. Perform a Forensic Sector Copy. This option will copy all sectors from the source disk, whether they are in use or not. This operation will take longer than an Intelligent Sector Copy.
	OK Cancel

Option	Description
Intelligent sector copy	Copy only file system sectors/clusters that are in use. This reduces the time to create the clone as unused file system clusters are not copied.

Verify File System	Verifying the file system prior to cloning ensures that there are no file system errors transferred to the clone.						
	Please note that this may take several minutes to complete						
Rapid Delta Clone	Copy only file system differences between the clone source and target. This increases cloning speed dramatically. As with Rapid Delta Restore (RDR) the concept of RDR has been something that has been thought about for quite some time here at Macrium Software. We wanted to build a clone solution that would effectively and rapidly copy only the differences between the source and target file systems. The advantage of this is obvious, RDC offers similar a performance increase as an Incremental disk image offers over a Full image and enables regular clones to be a viable and fast DR solution.						
	How does it work?						
	The NTFS file system resident on the clone source is compared with file system on the target disk. The two file systems are first verified that they originated from the same format command and then the target NTFS file system structures are analyzed for differences. All the NTFS file system structures are copied to the target disk and any that do not exist or have been modified on the target disk cause the data records for each NTFS file or object to be copied as well. The result is an 'Incremental' clone applying only file system changes detected between the source and the target. Note: RDC works with NTFS file systems only. All other file systems will perform a full clone Note: RDC is not available when shrinking partitions during a clone.						
Enable SSD TRIM	Enable SSD TRIM on the clone target to optimize the disk. This features provides automated SSD optimization resulting enhanced SSD performance and longevity. Writing to an unused block is much quicker than an in-use block as it avoids both the slow erase operation and the read-modify-write cycle. This results an increase of both the lifetime and the performance of the device. It is effective for all windows operating systems, even those that support SSD trim natively as the file system driver can only TRIM blocks on de- allocation; it cannot TRIM blocks written by another process. It is also effective for USB attached SSDs.						
Forensic Sector Copy	Copy every sector from the source to the target disk partition. Please note tat this option is only necessary if you want to copy unused file system space and will significantly increase the time to complete the clone.						

8. Click Next.

The options to Add Schedule, Edit Schedule or Delete Schedule is displayed.

		Clone	
Ľ.	Schedule this ((lone	
	Туре	Schedule	
	Add Schedule	Edit Schedule	
†∔† ≙	dvanced Options	Help < Back	

Click 'Add Schedule' to optionally schedule your clone

 Every Day Weekdays Every Start Time Start Date 	1 09:00 07/05/2015	days	
	Every Day Weekdays Every Start Time Start Date	Weekdays Every 1 Start Time 09:00 Start Date 07/05/2015	● Every Day ○ Weekdays ○ Every 1

9. Review the settings and click **Finish**.

10. Verify the settings in Backup Save Options and if appropriate, click OK.

Backup Save Options
What do you want to do now?
 Run this backup now Save backup and schedules as an XML Backup Definition File You can run this backup at any time by double clicking the saved XML file. Enter a name for this backup definition. My Clone
C:\Macrium\My Clone.xml
OK Cancel

Note: Saving a backup definition enables you to run your Clone at any time with a single click **Note:** You must save your backup definition if you have created Clone schedules. Your schedules cannot run if this step is missed.

If you want to run the Clone at this point, select 'Run this backup now' and click OK.

11. A Warning box appears, if appropriate click Continue.

	Confirm Overwrite ×	
WARNING: The following drives will be overwritten		
Drive	Volume	
E:\	\\?\Volume{75208f4e-70a7-11e4-8277-6002928a1000}\	
	Continue Cancel]

Important The target disk for the clone operation will be overwritten. This is unrecoverable, so please ensure that the target disk contains no valid data.

The clone operation now starts.

Incompatible Disk Selected

If you receive the error message 'Incompatible Disk Selected' when cloning then please see this article for more information: Incompatible Disk Selected

Creating a clone video