Automatic System Restore

This article describes the steps involved to setup a 'one-click' system restore. Using Macrium Reflect you can automatically and easily return a Windows PC to a previously imaged system recovery point.

- System restore is completed without any user interaction during the restore process.
- Using Rapid Delta Restore (RDR) recovery is fast!
- BitLocker encrypted drives can be restored without requiring re-encryption after restore.
- The restore can be password protected to prevent accidental or unauthorised recovery.

Add the Macrium recovery boot menu

The first step is to add the Macrium boot menu. Take 'Other Tasks' > 'Add Recovery Boot Menu' in Macrium reflect and follow the instructions here: Adding a Boot Menu option for system Image recovery.

Adding a boot menu is optional but will enable simple one-click restore when the PC starts. Without a boot menu you can still automatically restore by booting into optical rescue media or an external USB drive.

Create an image of drive C:

1. Start Macrium Reflect, select 'Image this partition only...' for drive C.

Create a b	ackup Backup Definition	Files VBScript Files Powe	Shell Files MS-DOS Batch	Files Scheduled Bac	kups	
() Refr	<u>resh</u>					
R	GPT Disk 1 [3A177438-02D6-4DE	86-9FCC-184F81DEE52A] - KINGS	TON 5V300537A240G 600ABBF0	<223.57 GB>		
	1 - Recovery (None) NTFS Primary		2 - NO NAME (None) FAT32 (LBA) Primary		3 - (C:) NTFS Primary	
	220.9 MB		42.1 MB	 ✓ 	215.97 GB	✓
	300.0 MB		100.0 MB		223.18 GB	
					Actions	
	Clone this disk	Image this disk		L	File System Properties	
					File System Properties	

2. Choose a location that will be accessible when the recovery media boots, this could be a spare partition on an internal drive or an external USB disk or flash drive.

In this example we'll choose drive 'F:\', an internal partition.

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				D	isk Image					
Source	Select S	ource Drive	(s) and Im	nage Destination						
	GPT Disk 1 [3A177438-02D6-4	DB6-9FCC-184	F81DEE52A] - KINGSTO	N SV300537A24	0G 600ABBF0 <2	23.57 GB>			
V	1 - Re NTFS Prin	covery (None) Iary		2 - NO NAME (No FAT32 (LBA) Primary	one)	3 - (Ci) NTFS Primary				
	220.9 MB 300.0 MB			42.1 MB 100.0 MB		215.97 GB 223.18 GB			<	
Total Sel	lected:	215.97 GB								
Destinat	tion									
Folde	er	F:\				×				
0		Alternative	locations							
() CD/D	VD Burner					~				
Backup	filename:	Use the Ir	nage ID as th	e file name. (Recomm	ended)					
buckup	menumer		EID}-00-00.r	nrima						
		-		-					-	
†₽† Ad	lvanced Op	<u>tions</u>			Help	< Back	Next >	Cancel	Finish	
		Back	up Save	e Options		×				
Wha	t do ya	ou want to	o do no	w?						
	Run 🖌	this backup r	now							
	Save	backup and	schedules	as an XML Backup	Definition	File				
		can run this ng the save		any time by doubl	e					

Enter a name for this backup definition.

C:\syst	em.xml		
	Help	ОК	Cancel

		'C:\System.xml'		
	Total Selected:	215.97 GB		
Destin	nation:			
	Backup Type: File Name:	Full F:\E6D6E598B1B49634-00-00.mrimg		
Opera	tion 1 of 1			
•	Hard Disk:	1		
	Drive Letter:	C		1
	File System: Label:	NTFS		
	Size:	223.18 GB		
	Free:	7.21 GB		- 1
	Used:	215.97 GB		1
				- 1
	Creating Volume Snaps	hot - Please Wait		
Saving	g Partition - <no nam<="" td=""><td>e> (C:)</td><td></td><td></td></no>	e> (C:)		
Saving		e> (C:)		
	g Partition - <no nam<br="">Reading File System Bit Saving Partition</no>	e> (C:)	Time remaining: 11 Minut	
) Verall I	g Partition - <no nam<br="">Reading File System Bit Saving Partition Progress: 80% Ti</no>	e> (C:) map		es
Dverall I	g Partition - <no nam<br="">Reading File System Bit Saving Partition</no>	e> (C:) map	Time remaining: 11 Minut Time remaining: 11 Minut	es
) Verall I	g Partition - <no nam<br="">Reading File System Bit Saving Partition Progress: 80% Ti</no>	e> (C:) map		es
) Verall I	g Partition - <no nam<br="">Reading File System Bit Saving Partition Progress: 80% Ti</no>	e> (C:) map		es

Prepare the auto restore XML file

Once the image completes we can prepare the xml file to automatically restore the image. To do this we need to step through the restore wizard but we aren't going to start the restore.

Start Macrium Reflect, click the 'Restore' tab, select the image created above and click the 'Restore Image' link.

Ima	age Re	store File	and Folder	Restore						
/	р Br	owse for ar	n image file.	🕑 <u>Re</u>	fresh	Folders to search 📀 Back	to search list			
	R	GPT Disk 1 [3A177438-02D	6-4DB6-9FCC-18	4F81DEE52A] - K	INGSTON SV300537A240G 600ABB	F0 <223.57 GB>			
	••							3 - (C:) NTFS Primary		
		300.0 MB				100.0 MB		216.14 GB 223.18 GB		
So	ort by.	🔶 <u>Back</u>	up Date	Location	<u>File Name</u>	Images that contain drive:	All Drives 🗸]		
	8	Folder: Type:	F:\ Full	634-00-00).mrimg				Browse Image	Restore Image
		Date: Image ID:	13/12/2016 E6D6E598E						Verify Image	Other Actions

Launch the 'Auto Restore' Dialog.

To launch this dialog press the 'Ctrl + Shift + S' together in the last page of the restore Wizard.

Macrium Reflect KB

Restore Summary		Auto Restore	×
Image File: Image ID: Date: Time:	\\vault\archive\p 4149F3EAE3F3C! 12 October 2017 16:07	Password protect this restore:	OK Cancel
Image Type:	Full	Leave blank for no password	Help
Source Disk:	GPT Disk 1 [63D6	Source Image File	
Geometry: Destination Disk:	13054\63\512 GPT Disk 3 [CBA	O Restore this image file. (Default)	>
Verify:	N	Restore the latest matching image in the same folder	
Delta: SSD Trim:	Y Y	Target Disk Selection	
Schedules		Match target disk on unique disk identifier. (Default) Match target disk on disk number if unique id not found	
	None	WARNING: Matching on disk number in unique la not round	
Operation 1 of 4 Restore Partition:	1 - Recovery NTES 311 4 MB /	overwriting the wrong disk if the rescue media loads disks in a different sequence.	
Drive Letter Start Sector: End Sector: Partition Type:	None 2,048 923,647 Primary	Restore xml file location File 'macrium_restore.xml' wil be saved to the root of a local drive.	
Operation 2 of 4 Restore Partition:	2 - NO NAME	Choose drive: C: V	
Drive Letter Start Sector:	FAT32 (LBA) 19.5 None 923 648	Choose a file name and location after clicking 'OK' Note: Automatic restore will ony be active if the restore	
Start Sector.	JZJ,040	xml file is named 'macrium_restore.xml' and is located in a root folder.	
Advanced Options		Set the restore xml file as 'Read Only'.	Finish

This dialog will prompt for options to automatically restore the selected image file at a later time using the Windows PE rescue media. When 'OK' is clicked a restore definition xml file will be saved.

Auto Restore	×
Password protect this restore:	OK Cancel Help
Source Image File Restore this image file. (Default) Restore the latest matching image in the same folder	пер
 Target Disk Selection Match target disk on unique disk identifier. (Default) Match target disk on disk number if unique id not found WARNING: Matching on disk number could lead to overwriting the wrong disk if the rescue media loads disks in a different sequence. 	
Restore xml file location File 'macrium_restore.xml' wil be saved to the root of a local drive. Choose drive: E: Choose a file name and location after clicking 'OK' Note: Automatic restore will ony be active if the restore xml file is named 'macrium_restore.xml' and is located in a root folder. Set the restore xml file as 'Read Only'.	

Option	Description
Passw ord:	Enter a password to protect against accidental or unauthorised running of this restore.
Sourc e Image File:	Restore this image file: This is the default operation. The image file selected will be used as the restore source. Restore the latest matching image in the same folder: The image folder will be searched for any image files that contain the partitions being restored. The latest backup date is chosen as the restore source.
Target Disk Select ion:	 Match target disk on unique identifier: This is the default operation. The unique disk id is used to ensure that the correct disk is restored to. Match target disk on disk number if unique id is not found: This option will not fail the restore if the target unique disk id cannot be found. In this case the disk with the same disk number will be chosen. Use with caution as Windows PE can enumerate disks in a different sequence and cause the wrong disk to be restored to, however, this won't be an issue if your system has only one local disk.
Restor e xml file locati on	Choose drive: Select from a list of local drives to save the restore definition file. The file will be saved in the root folder of the choser drive and will be named 'macrium_restore.xml' Choose a file name and location: If selected, a file 'save As' dialog will be shown when the 'OK' button on this dialog is clicked. This enables saving the restore definition file to any file name and to any folder. Note: For auto restore to operate the restore definition must be named 'macrium_restore.xml' and be located on a root folder on a local drive. Saving to a different name and/or location enables you to prepare several restore definitions for later use.
	Set the restore xml file as 'Read Only': At the end of an auto restore the restore definition is automatically deleted. Setting the definition as 'Read Only' prevents deletion and enables re-running of the same restore each time Windows PE starts.

How auto restore works

Local drives are scanned (from A to Z) for a restore definition **'macrium_restore.xml'** file in each drive root folder. Macrium Reflect will use the first restore definition found. This can be any local drive, including USB flash drives or optical media.

The restore definition contains instructions to locate the image file to restore from and the target disk to restore to.

It is imperative that the correct image file is restored to the intended disk. To ensure that there are no nasty surprises after restoring, Macrium Reflect will uses unique disk identifiers and sector offsets to match the source and target of the restore.

Locating the source image file folder

The default behaviour is to read the image file specified in the **<file_name>** xml node. However, It's possible that Windows PE has assigned different drive letters to local drives, in this case the following procedure is followed.

All local drives are scanned for a 'Marker' file that is created when the restore definition is saved. This Marker file has the following file name format: 'Macrium_restore_{GUID}.txt', where the GUID (Globally Unique Identifier) is retrieved from the '<search node>' in the restore xml.

<search guid="{0D6B46C4-A5ED-4578-A9C0-5539B0AB94A0}">Y</search>
<file_name>D:\backups\auto_restore\4E855CB463979BC9-01-01.mrimg</file_name>

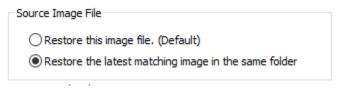
If the marker file isn't found in the **path** specified in the **<file_name>** xml node then all local drives are searched for the marker file in the same sub folder. If the marker file is found then that folder will be searched for the image file to restore.

• If no Marker file is found or is not specified in the xml then all local drive are scanned (from A to Z) to locate any images in the folder specified by the '<file_name>' xml node that contain images to restore.

Note: If the image file is located on a network path then no searching is required. Network paths are unambiguous and absolute.

Locating the correct source image file

The default behaviour is to read the specified image file in the folder in the '<image_file>' xml node. However, if 'Restore the latest matching image in the same folder' is selected in the Auto Restore dialog then the following procedure is followed:



xml attribute find_recent="Y" is added to the <file_name> xml node.

```
<file_name find_recent="Y">D:\backups\auto_restore\4E855CB463979BC9-01-01.mrimg</file_name>
```

All **matching** backup sets are loaded in the image file folder and the most recent backup date is selected and used for the restore. A **matching** backup set has the same disk and partitions specified in the restore definition file.

```
<restore_definition>
<properties>
<source_disk id="3A177438-02D6-4DB6-9FCC-184F81DEE52A">1</source_disk>
</properties>
<operation id="1">
<type>copy</type>
<copy>
<source>
<partition start_sector="2048" end_sector="616447">1</partition>
</source>
</copy>
</operation>
</restore_definition>
```

A matching image file contains the same disk identifier and partiton start and end sectors as well as partiton number.

e.g, In this case Disk identifier 3A177438-02D6-4DB6-9FCC-184F81DEE52A and partiton number 1 with start sector 2048 and end sector 616447

Locating the restore target disk

The default behaviour is to select the target disk by matching the unique disk identifier specified in the **<target_disk>** xml node. However, if **'Matc h** target disk number if unique id not found' is selected in the Auto Restore dialog then the following procedure is followed:

Target Disk Selection

Match target disk on unique disk identifier. (Default)

Match target disk on disk number if unique id not found

WARNING: Matching on disk number could lead to overwriting the wrong disk if the rescue media loads disks in a different sequence.

xml attribute number_fallback="Y" is added to the <target_disk> xml node.

<target_disk id="3A177438-02D6-4DB6-9FCC-184F81DEE52A" number_fallback="Y">1</target_disk>

The restore target disk is matched on disk number if a disk cannot be matched using the unique identifier.

Please use this option with caution as Windows PE may load disks in a different sequence to regular Windows. This may cause the wrong disk to be restored to.

That's it! Now whenever you take the Macrium System Recovery boot menu option your system will be automatically restored using the image created above.

Windows 10 Macrium Reflect System Recovery			
Change defaults or choose other opti	ions		