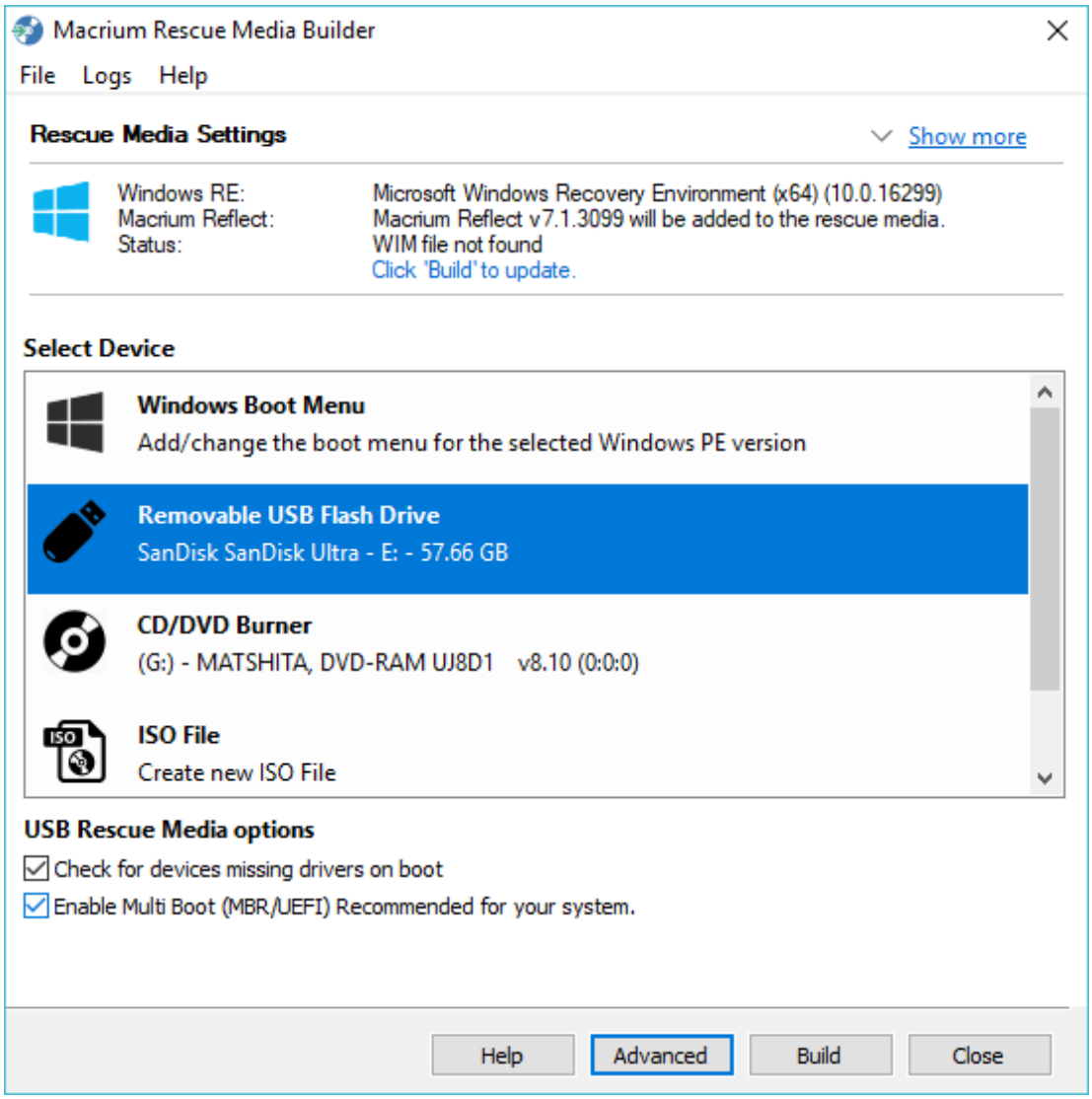
Creating rescue media

Macrium Rescue Media Builder provides a simple interface to allow for quick rescue media generation by selecting where the rescue media will be generated and then clicking a **'Build'** button.

All options for the rescue media will be suitably defaulted based on existing rescue media builds and a scan of the operating system environment.

1. Choose a rescue media target under **'Select Device'**
2. Click **'Build'**



The **'Header'** area shows the currently selected Windows PE/RE version and settings. **'Show more'** expands the view to show the selected Advanced options.

Rebuilding the Windows Image File (WIM)

If the Rescue media needs rebuilding then this will be indicated in the header area. Reasons for rebuilding:

- **A later version of Macrium Reflect** is available and needs to be added to the build.
- **A later version of Windows RE** is available. A Windows update can cause the installed version of Windows RE to be updated.
- **Any 'Advanced' settings that have changed** since the rescue media was last built. If you click 'Show more' these settings will be highlighted in blue text.
- **A 'Custom WIM' file has changed** since the last build.
- **The '\Boot\Macrium\Drivers' sub folder** contains new or changed driver files.

Pressing 'Build' will re-populate the Staging Area, mount the WIM and copy the relevant files before dismounting the WIM and continuing with

the build target operation.

WIM Rebuild Override

Overriding the default WIM rebuild behaviour may be useful to create rescue media without updating to a later release of Macrium Reflect, or, to force a rebuild to troubleshoot corrupt or non-booting rescue media or boot menu option.

The default WIM rebuild action can be overridden by **pressing the 'Ctrl' key**. Once pressed, and if appropriate, the 'Build' button becomes a 'Split' button showing either a **'Skip WIM Rebuild...'** or a **'Force WIM Rebuild...'** menu option, the opposite of the default 'Build' button behaviour.
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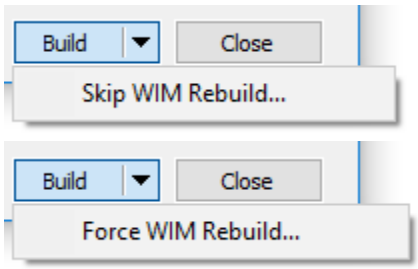


> The override menu is not displayed in the following scenarios:
>
> 1. The **'Remove boot menu'** option is selected. WIM operations are not relevant in this case.
> 2. The **WIM needs rebuilding** and the **'Current boot menu'** option is selected. In this case, the default operation of rebuilding the WIM is the only operation relevant and available.

The **'Select Device'** area shows a list of possible ways the rescue media can be created.

Target	Description
Windows Boot Menu	Will either add, update or remove an entry from the Windows Boot Menu, select from the **'Boot Menu Options'** for the desired action.
USB Flash Drive	Creates the rescue environment on an external USB flash drive. At least one partition is required on the drive with enough space for the rescue media files or the disk should be empty of partitions but be large enough for a new partition to accommodate the rescue media files.
USB HDD	Creates the rescue environment on an external USB HDD. As with the USB Flash Drive option a partition must be available with enough space or there should be enough space to create a new partition.
ISO File	Creates an ISO file suitable for either burning with third party software or booting a virtual machine from.

> Note: In the case of external USB Flash/HDD the creation process is non destructive. No existing partition will be removed from the disk, only files added to an existing partition or a new partition created.

Boot Menu Options

Selecting the **'Windows Boot Menu'** device will offer the following options

Option	Description

No boot menu	Do not add a boot menu option to the Windows boot menu. Note: This option is not visible if a Macrium Reflect rescue environment exists in the Windows boot menu
Add boot menu	Add the currently selected WinPE/WinRE environment as a Windows boot menu item. A description of the current enviroment can be seen to right of this option. Also, review the **'Header'** area further up in this document.
Remove boot menu	Remove the currently configured Macrium Reflect rescue environment Windows boot menu item.
Current boot menu	Retain the currently configured Macrium Reflect rescue environment Windows boot menu item.

USB Rescue Media Options

Selecting either **'Removable USB Flash Drive'** or **'Removable USB Hard Drive'** device will offer the following options

Option	Description
Check for devices missing drivers on boot	Scans for Mass storage or network controllers that do not have driver support and show a dialog to assist with adding and loading drivers.
Enable Multi Boot (MBR/UEFI)	Enables USB media to boot on both MBR and UEFI systems.
Create Portable Technicians Rescue Media	Adds support for running the 'Technicians Portable' form of Macrium Reflect rescue environment. Note: This will require a valid Technicians license key

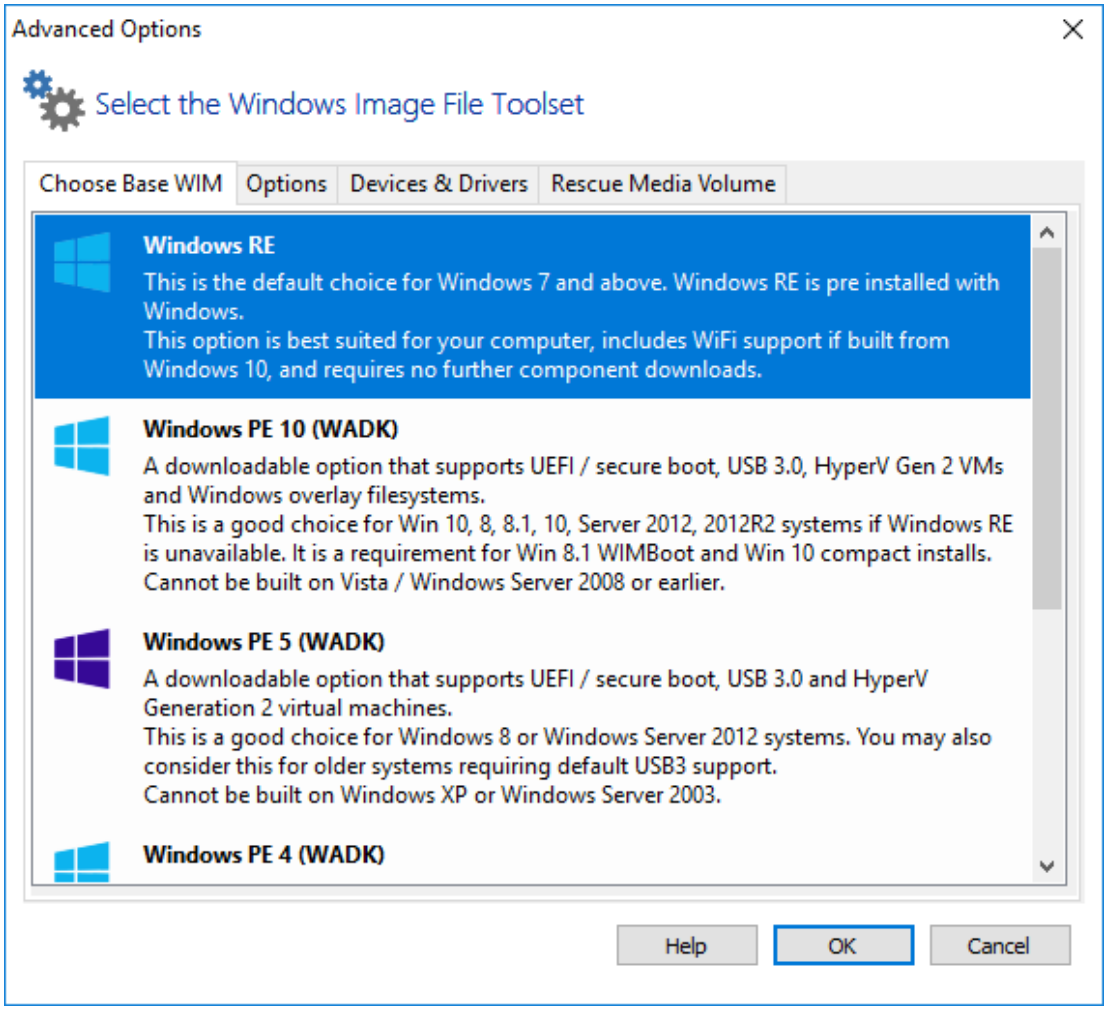
ISO/CD/DVD Rescue Media Options

Selecting **'ISO File'** or '**CD/DVD Burner'** device will offer the following options

Option	Description
Check for devices missing drivers on boot	Scans for Mass storage or network controllers that do not have driver support and show a dialog to assist with adding and loading drivers.
Prompt for key press to continue boot sequence	Shows a simple prompt during boot, pressing any key will boot from the ISO media and not pressing any key will boot from the normal volume.

Advanced Options

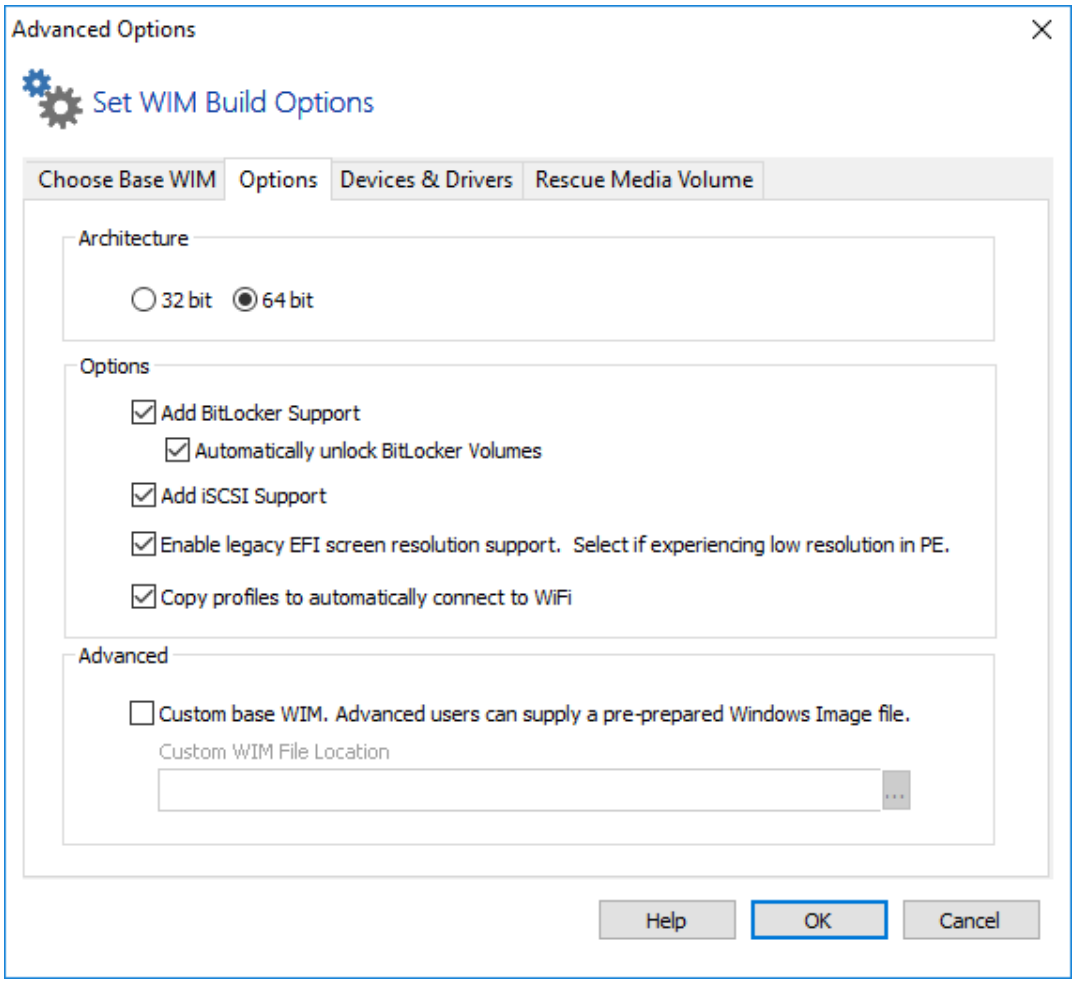
The **'Advanced'** button opens options to change PE version and choose additional features for the rescue media build.



The default Windows PE version selected on a fresh installation:

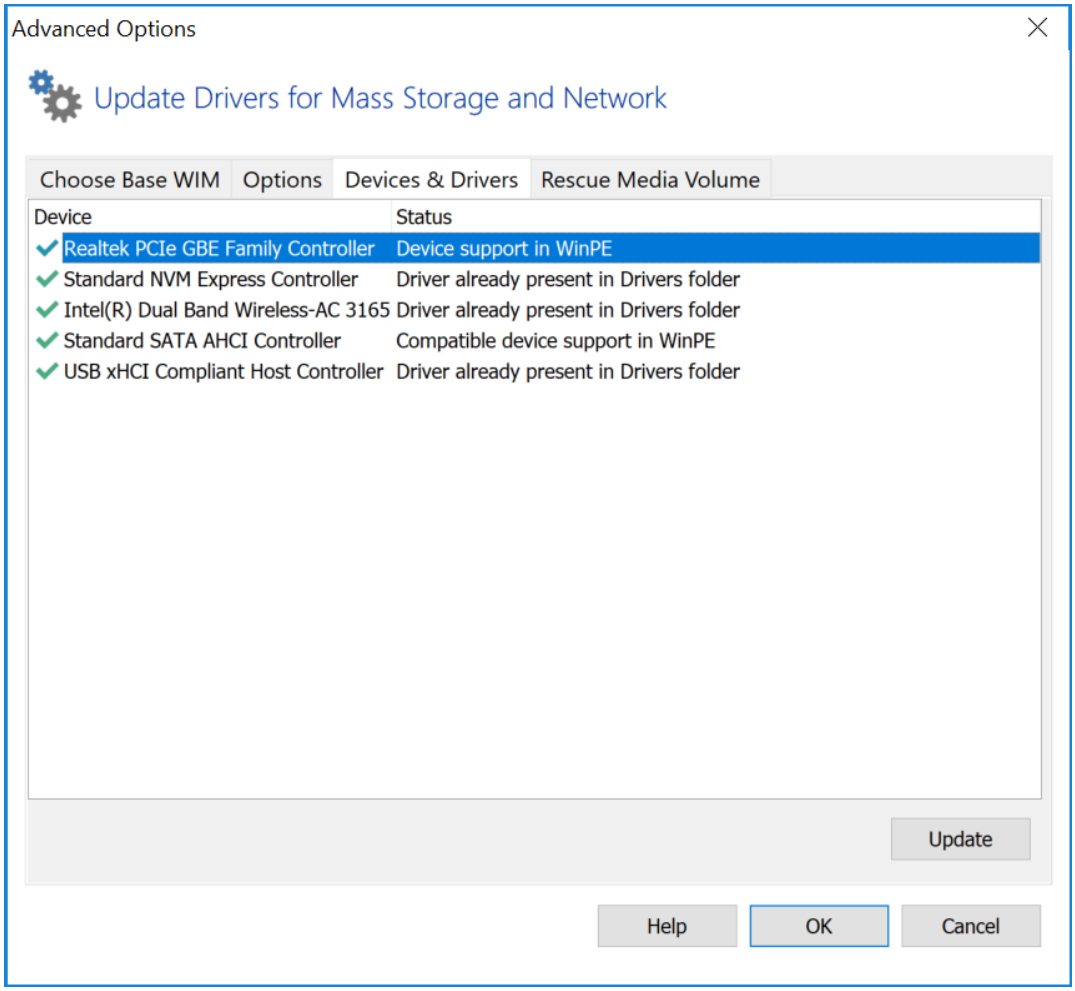
OS	Default Rescue Environment
Windows XP/Server 2003	Windows PE 3.1
Windows 7/Server 2008	Windows RE if available otherwise Windows PE 3.1
Windows 8.0/8.1/Server 2012/R2	Windows RE if available otherwise Windows PE 5
Windows 10/Server 2016./17	Windows RE if available otherwise Windows PE 10

Note: If you have already built rescue media with an earlier version of Macrium Reflect then that PE version will be defaulted



Option	Description
Architecture	Choose from 32 or 64 bit. WinRE is only available for the same architecture as the current Windows OS. It's only necessary to choose an alternative architecture when creating rescue media to boot a different PC.
iSCSI Support	Enables restoration and clones to iSCSI connected disks. Please note that adding these components may several minutes to the creation process. See Adding iSCSI support to Windows PE for more information on using iSCSI in Windows PE
BitLocker	Add Support: Add the components required to run 'managebde.exe' and unlock BitLockered drives to Windows PE. Auto Unlock: Automatically unlocked BitLockered drives when the rescue media starts. Also see: Adding BitLocker support to Windows PE and BitLocker Restore Outcomes

Legacy EFI Screen Resolution	Select this option if you are experiencing very low, less than 1024 x 768, screen resolution in PE 10 or WinRE. Some early UEFI BIOS chipsets are incompatible with Windows 10 Pre-Installation Environment graphics output. Selecting this option will cause the PE 5.0 EFI microcode to be used instead of PE 10 when starting the rescue environment.
Copy WiFi Profiles	Select this option to copy WiFi profiles, including passwords, to the rescue media. If possible a WiFi connection will be automatically established when Windows RE starts. **Note:** This option, and WiFi support, is only available in Windows RE 10. WiFi profiles are encrypted to prevent unauthorised access.
Custom base WIM	Use your own customized WIM for the rescue media. This is an advanced topic not covered in this help.



Mass Storage and Network devices will be listed showing the current state of driver support. Drivers can be added for devices missing driver support as well as updating drivers previously added to the rescue media.

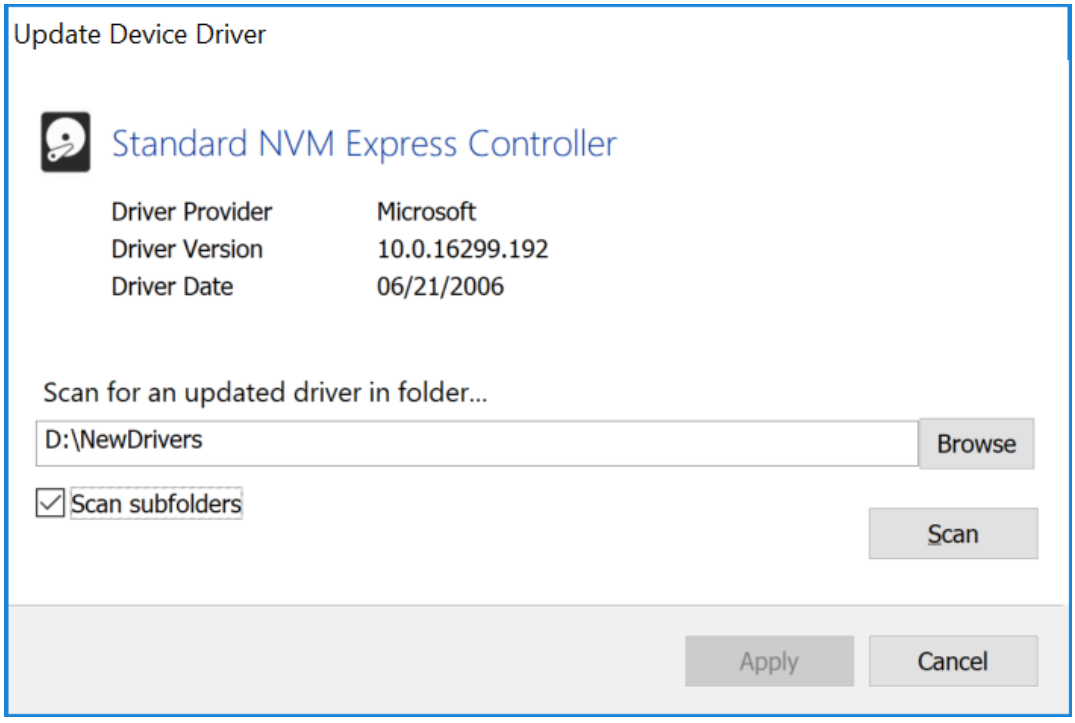
The status of a device can be one of the following

Device Status	Meaning
Device Detected	The device has no drivers and will not function in WinPE/WinRE. If you require this device then drivers should be added.

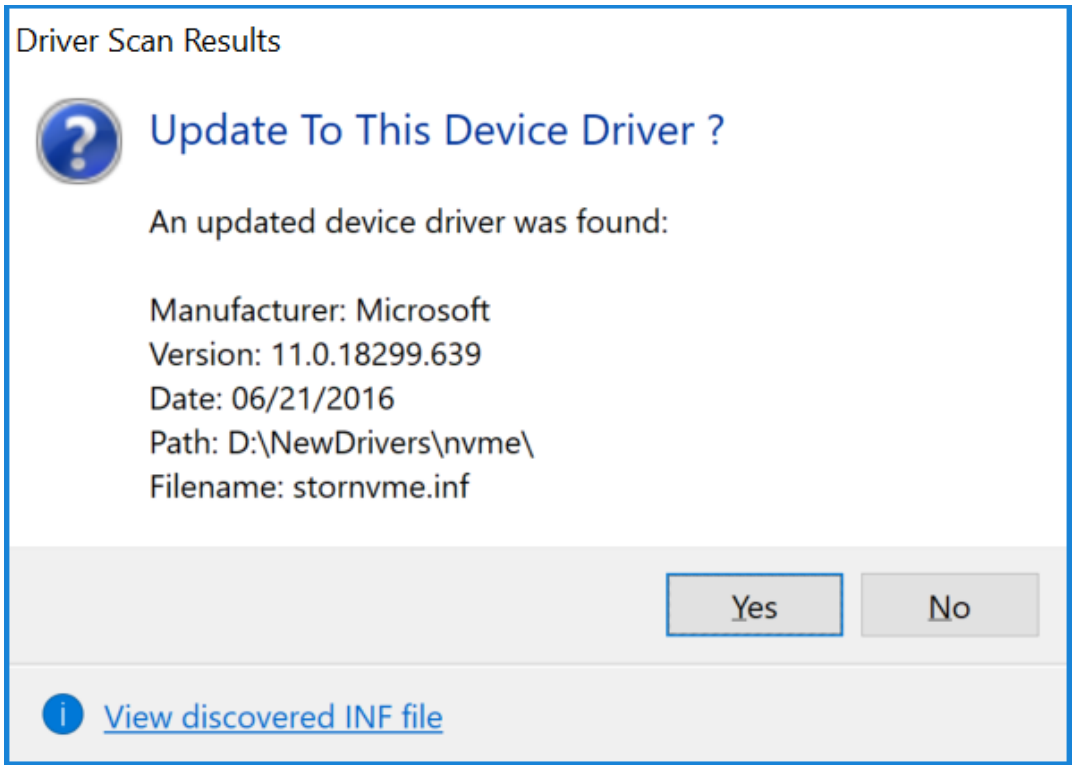
Device support in WinPE	The device has a supporting driver in WinPE/WinRE. Generally you do not need to update this form of driver.
Compatible device support in WinPE	The device has a compatible driver in WinPE/WinRE. Again, this driver generally does not require updating.
Driver already present in Drivers folder	A driver has been previously added to the Macrium Reflect rescue media for this device.
Copy host driver	For Vista based and later operating systems if a device is found without driver support then the operating system will be scanned for a compatible driver. If discovered the host OS driver will be added to the rescue media. Note: If no compatible device is found then the status will remain at Device Detected

How To Update Drivers
Note: Click Update or double click a device to add or update a driver for a device.

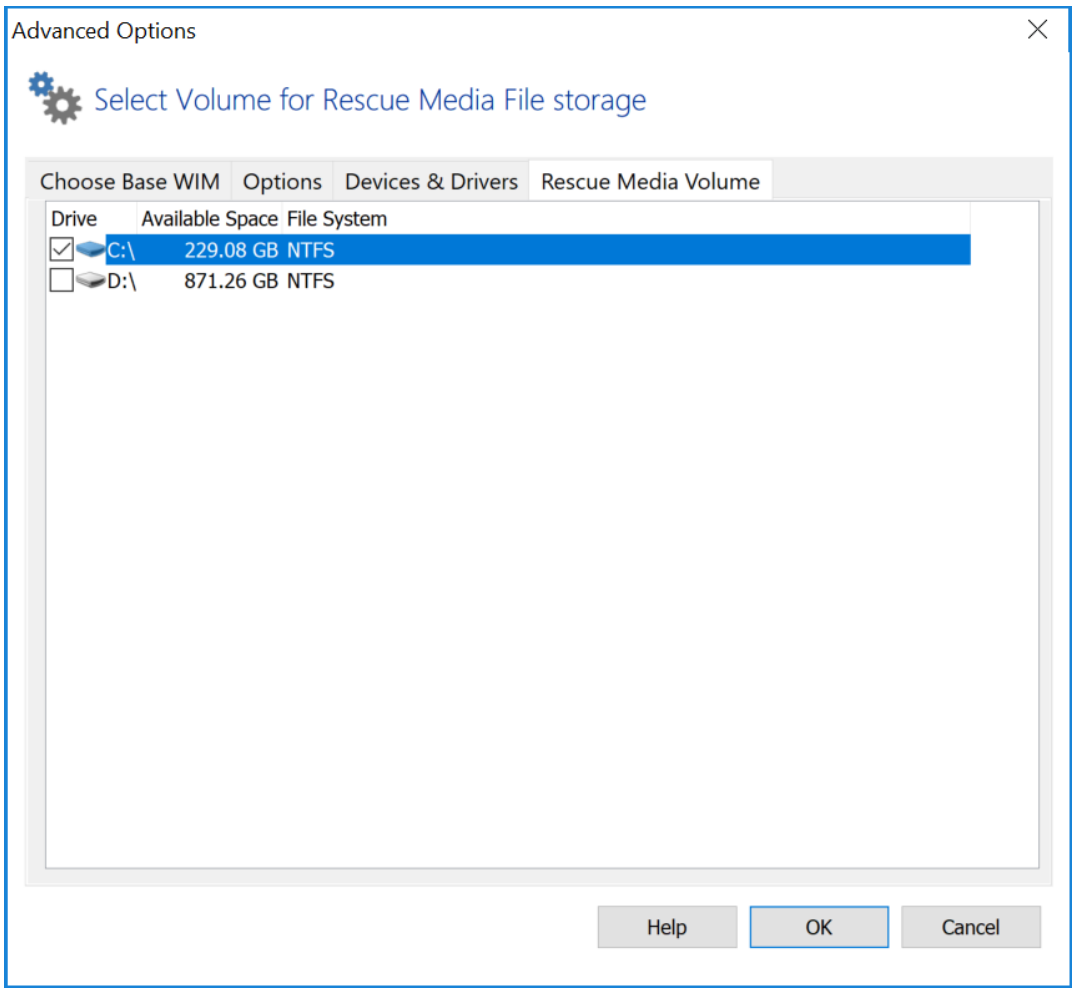
WiFI Device Support
Note: WiFi device support will only be available in WinRE based rescue environments, even if drivers are added for the device.



This dialog will show the current driver information for a device. To update the driver, click Browse, select a folder and click the Scan button (optionally select to scan subfolders before starting the scan). The folder willk be checked for an updated driver based on either version number or date and if discovered, a prompt will be shown for update confirmation.



Once an updated driver has been found and selected, click Apply to save the updated driver or Cancel to retain the current driver.



Macrium Reflect Rescue Media files can be stored on a different volume, this tab allows for selection of the preferred volume. Select a volume by clicking the check box and then Click OK. Rescue media files will now be stored on that volume, any existing Macrium Reflect rescue media files from previous builds will be moved to a newly selected volume.

> Note: This option is not available in Windows XP

USB Flash Drive Formatting

	The following partition is required on the USB flash drive for booting the Macrium Reflect rescue media:		
	Boot	**Type**	**Min Partition Size**
	Multi-Boot MBR / UEFI	FAT32	1.2 x Size of Rescue Media PE files
	MBR Only	FAT32 or NTFS	1.2 x Size of Rescue Media PE files

The Rescue Media PE files vary in size dependant on PE/RE version. 1GB will be sufficient for all PE and RE versions as of May 2018. If there is insufficient free space then the build may fail.

Rescue Media Builder will first attempt to non-destructively copy the PE/RE files to an existing partition, then non-destructively create a new partition if necessary. If this is not possible then you will be prompt to destructively format the drive.

The Flash drive is prepared and files copied according to the following steps...

1. The flash media is first searched for a partition of sufficient size and the required file system type as defined in the above table. If found then the **PE/RE files are copied to the Flash drive**.

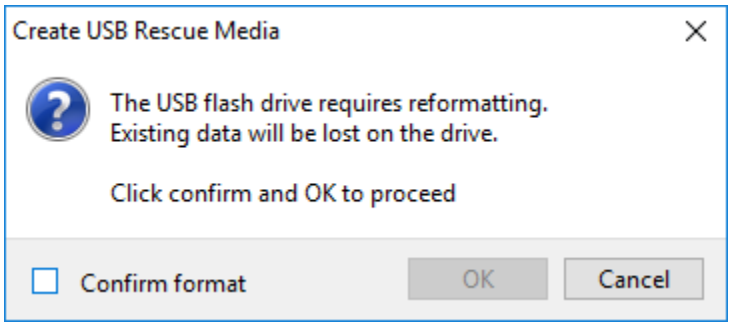
   > **Note:**
   >
   > For **Multi-Boot** (MBR/UEFI) rescue media the suitable partition is determined in the following sequence:
   >
   > The current **'Active'** partition is checked for suitability.
   > If not found, the first suitable FAT32 partition is used. This partition is then marked 'Active'
   >
   > For **non Multi-Boot** (MBR) rescue media the suitable partition is determined in the following sequence:
   >
   > The current **'Active'** partition is checked for suitability.
   > If not found, the first suitable FAT32 partition is used. This partition is then marked 'Active'
   > If not found, the first suitable NTFS partition is used. This partition is then marked 'Active'

2. If no suitable partition/file system is found and the rescue media creation is **Multi-Partition Aware** then the flash drive is searched to locate unallocated space to create a **1GB FAT32 partition.**

   > USB flash Rescue media is considered **Multi-Partition Aware** if the **host** OS is **Windows 10 Release 1709 or later** and the target **Win PE/RE WIM** is also **Windows 10 Release 1709 or later** . In all other cases only a single partition will be allowed on flash media.

   There can be a maximum of 4 primary partitions on the drive.
   If a partition is successfully created and formatted then it is marked **'Active'** and the **PE/RE files are copied**.

3. If the rescue media creation is **not** Multi-Partition Aware or if the partition in step 2 cannot be created then **Rescue Media Builder** will prompt to format the Flash Drive. This is destructive and **all existing data will be lost on the drive**:



   Partition and File System Created

Multi-Partition Aware	Type	Size
Y	FAT32	1GB
N	FAT32	32GB or the maximum size of the flash drive

   If a partition is successfully created and formatted then it is marked **'Active'** and the **PE/RE files are copied**.