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Significant Booting Challenges on EFI Systems when Upgrading to Windows 8

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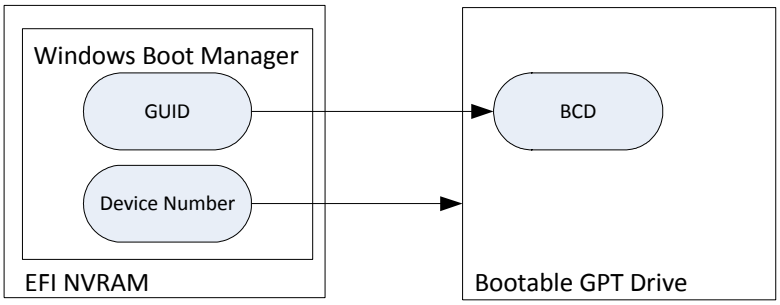
The new Windows 8 and Server 2012 will be the base operating systems for upcoming new computers, laptops and servers. UEFI is the recommended platform for all of them. In spite of all of its advantages, many users are still not familiar with UEFI. There are known issues which may arise when you decide to manage EFI boot options or migrate to an EFI-based computer from another one. In most of these cases, your OS will simply not boot.

Challenge #1 - Connecting your system disk to another MB port and Windows is not available!

What didn't used to be a problem on old BIOS-based computers is a major issue on new EFI-based ones. Let's see why this happens.

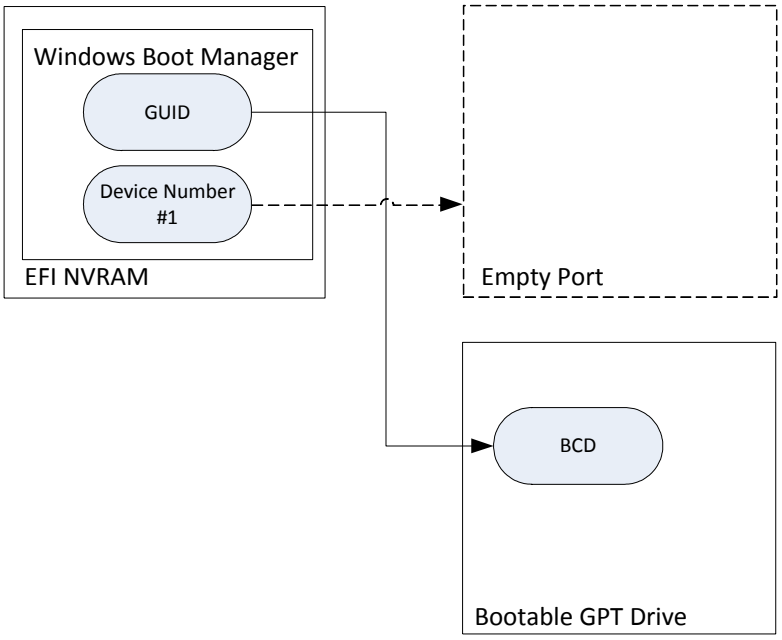
Most modern EFI implementations have strict rules for internal bootable device organization. An EFI boot entry for Windows, that is Windows Boot Manager, also has its own restrictions and peculiarities which make all operations with bootable devices and volumes on EFI-powered machines with Windows even more complicated.

Let's have a look on how Windows Boot Manager in UEFI is linked to a specific device.



Windows Boot Manager contains several records: a bootable GPT drive ID and a device number. They are used by UEFI to resolve which device to use for OS booting.

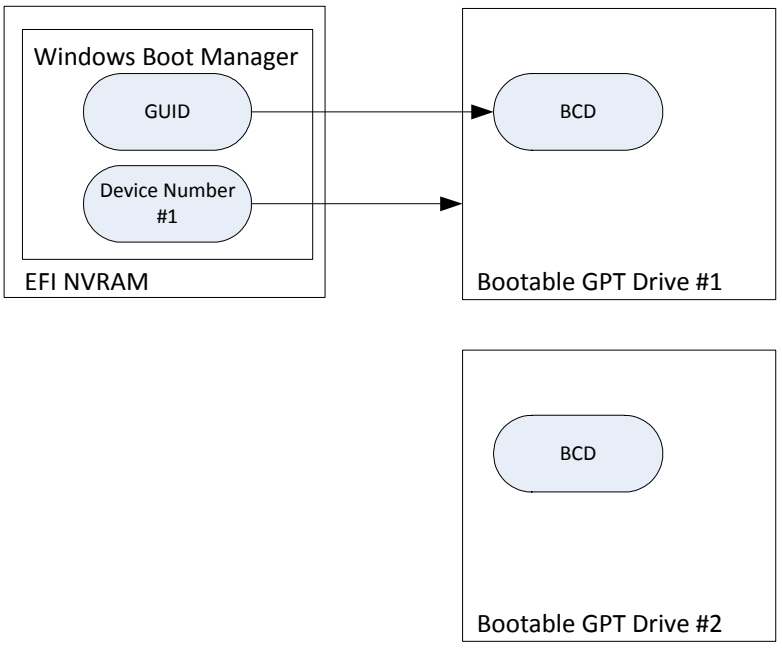
So here is the problem: Assume that you have disconnected a bootable GPT drive with Windows from one SATA port on your motherboard and connected it to another one. You will get the following configuration:



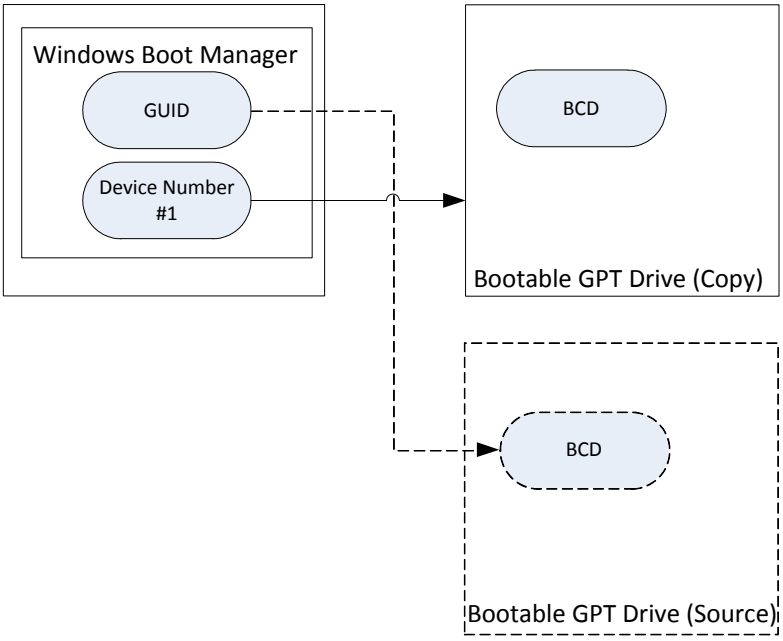
As you may see, Windows Boot Manager now has an incorrect device number record. Actually, it simply points to your previous SATA port. The drive ID is correct, as it is unique for every connected storage device. It is possible that Windows will not boot until you connect the drive back to the original port or change the device number record in the Windows Boot Manager entry.

Challenge #2 – You cannot boot Windows copy on EFI-based computer

The second challenge is replacing a bootable GPT HDD with Windows with larger or faster disk. Your migrated/copied OS will be unbootable due to incorrect links in UEFI.



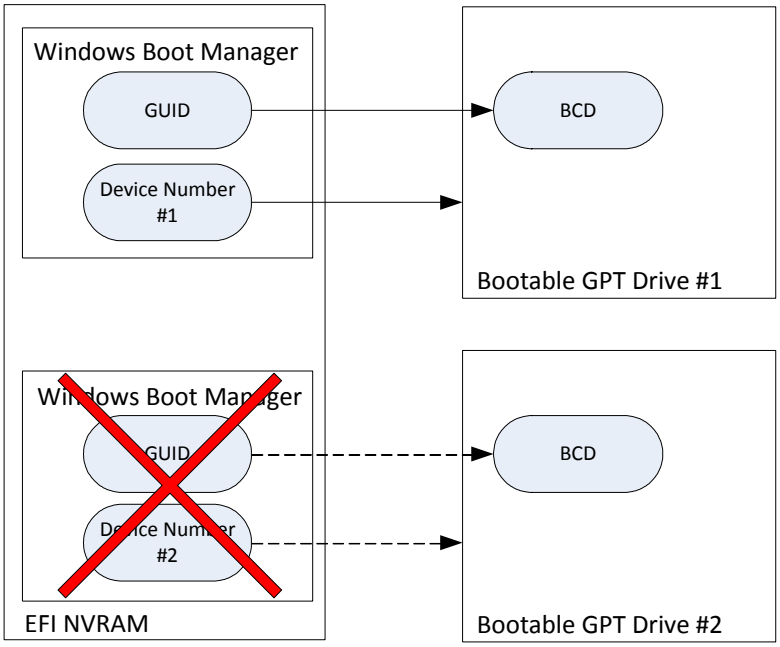
Even if you replace your source drive with your target drive, your system will not boot because of an incorrect drive ID record in Windows Boot Manager. Instead, it will still be indicating that your original source disk is the bootable one.



This means that you will need to update this record in order to get Windows back on rails.

Challenge #3 - Windows dual-booting is more complicated

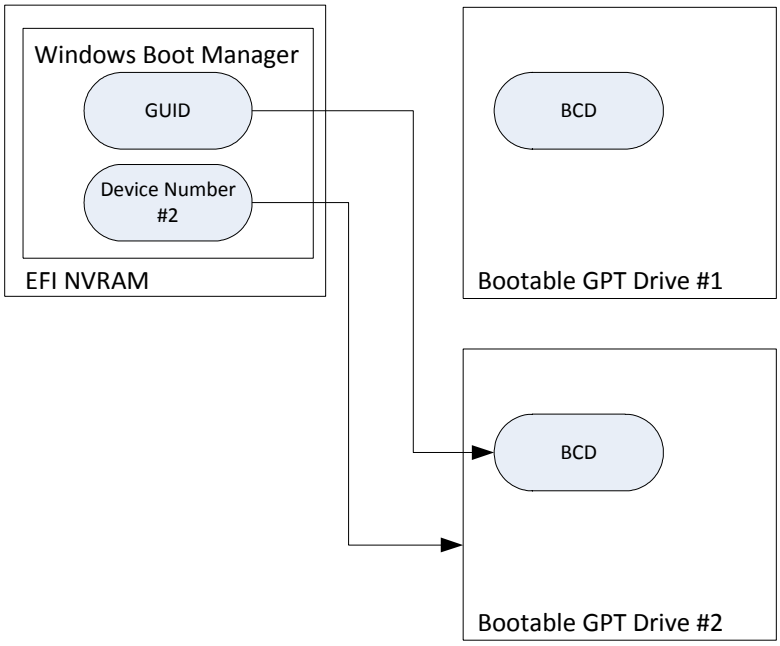
By default , there can be only one Windows Boot Manager in EFI NVRAM. In such case, dual-booting will only be possible if the boot files for all Windows versions installed in EFI mode are stored on a single EFI bootable system partition called an ESP or listed in a single BCD store. So if something went wrong with the main bootable hard disk where all the boot data is stored, then all dependent Windows versions will become unbootable.

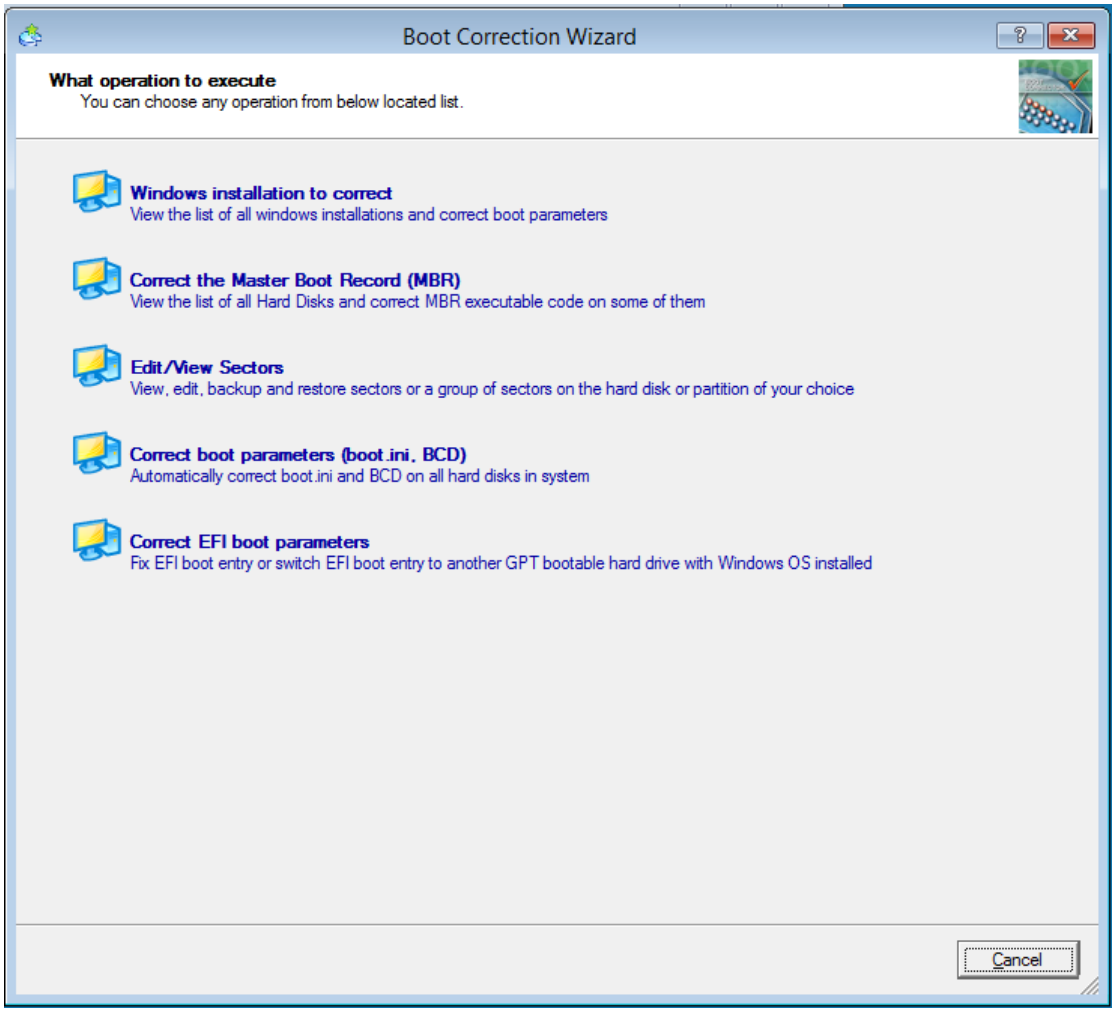


In order to switch EFI booting from one Windows disk to another, you will need to update all of the records in Windows Boot Manager.

What is the solution?

Paragon Software offers the simplest solution in their well-known Paragon Hard Disk Manager. This includes a BootCorrector wizard under 64-bit WinPE 4.0 environment to switch EFI Windows boot entry from one independent GPT bootable drive with Windows to another one. To simplify the process, this option is also included in all wizards on Paragon 64-bit WinPE 4.0 recovery media. All of these utilities will correct the records in Windows Boot Manager, making your Windows bootable again.



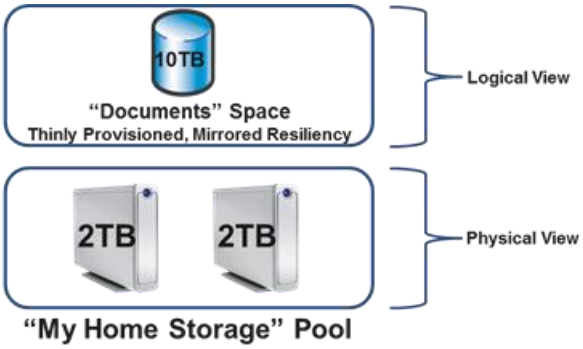


In order to handle modern GPT drives on EFI systems, you will need a new bootable environment based on the latest Windows Assessment and Deployment Kit (ADK) for Windows 8. This is a collection of tools which you can use to create a WinPE-based bootable recovery media. You can construct this media manually, but it is faster and more efficient to use the purpose-built tool which is included in all solutions developed by Paragon Software.

Working with Windows Storage Spaces

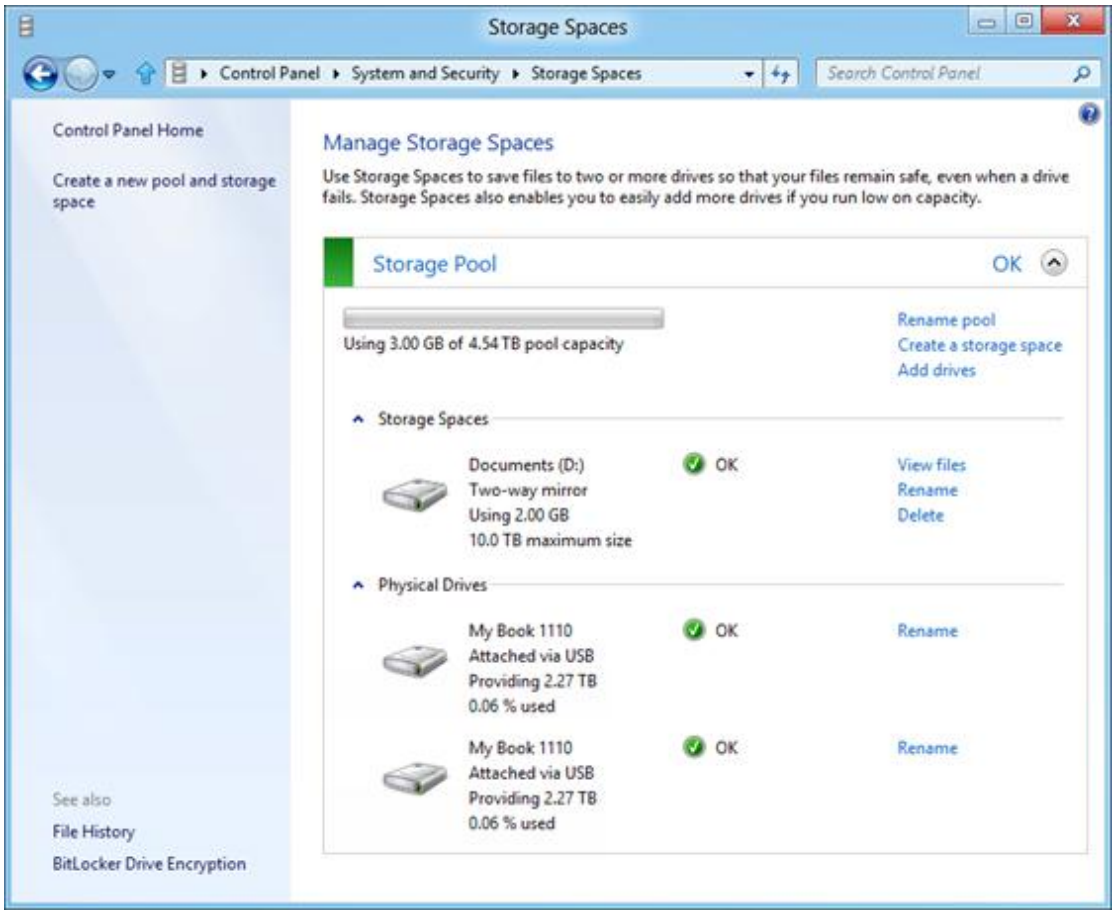
Storage Spaces are an evolution of Windows dynamic disks technology. They provide virtualization for data storage hardware and resemble RAID technology on software level. Essentially, Windows Storage Spaces can be used to combine several hard disk drives or another storage media into one or several virtual entities or pools that will be shown and act in Windows 8 and Server 2012 as convenient Windows disks. In a nutshell, Storage Spaces allow:

- Organization of physical disks into storage pools, which can be easily expanded by simply adding disks. These disks can be connected either through USB, SATA (Serial ATA), or SAS (Serial Attached SCSI). A storage pool can be composed of heterogeneous physical disks – different-sized physical disks accessible via different storage interconnects.
- Usage of virtual disks (also known as “spaces”) which, for all intents and purposes, behave just like physical disks. However, spaces also have powerful new capabilities associated with them such as thin provisioning, as well as resiliency to failures of underlying physical media.



This virtual disk can be used just like a regular physical disk – you can partition it, format it, and start copying data to it.

You can use PowerShell commands or GUI utility from Control Panel in Windows to work with the structure of Storage Spaces.



All Paragon solutions work with Storage Spaces at the same high level as with traditional physical drives.

About Paragon Software Group

Paragon Software Group is an innovative software developer focused on two dynamic growth markets. The company's comprehensive product line for the data storage market addresses the needs of data security, storage and management for PCs, servers and networks. A second portfolio of products focuses on mobile productivity applications for handheld devices. Founded in 1994, Paragon Software has offices in the USA, Germany, Japan, and Russia, delivering its solutions to consumers, small business and enterprise clients worldwide through a network of Value Added Resellers, distributors and OEMs as well as online through the company website. Paragon Software provides technology to a host of world class companies and partners including Cisco, Dell, Toshiba, NEC, Siemens, Microsoft, Motorola, Nokia, and more. For more information please visit the company website at www.paragon-software.com.