Incompatible Disk Selected

Introduction

This article explains the reasons why you might see the error message **"Incompatible Disk Selected"** when attempting a Restore or Clone operation.

⚠ • This is only an issue with when the structure of the target disk for a restore or clone differs from the source. It does not concern disks used to store images / backup files.
  • There are no disks currently available that would cause this issue when connected directly (i.e. not via USB). However, some external disk enclosures are remapping the native disk structure to enable > 2TB disks to be used with Windows XP. See here

When restoring or cloning you may see the error message box below and be prevented from continuing with the operation:

The error indicates that the target disk has a larger sector size than the source or you are using a USB disk enclosure that is changing the reported sector size of the disk. **This is not supported.**

The table below shows compatible disks for the source and target of restore and clone operations:

Source Sector Size	Target Sector Size	Compatible
512 or 512e	512 or 512e	✔
512 or 512e	4096	**No**
4096	512 or 512e	✔
4096	4096	✔

How do I check disk sector sizes?

1. **Press the 'Windows' key**, **type 'System Information'** and **press 'Enter'**
2. In the Window that opens, **expand 'Components' > 'Storage'** and **select 'Disks'**. A list of all locally attached disk will be displayed in the right Window. The **'Bytes/Sector'** field will display the **sector size.**

Note: Disks with a physical sector size of 4096 Bytes that implement 512e will show 512

Note: If your PC uses **" Intel Rapid Storage Technology"** (RST) also known as **"Intel Matrix Storage"** then you may need to update the Intel Matrix /RST driver to the latest release when moving to a disk that supports **Advanced Format 512e**. Intel RST Driver Download

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What is a disk sector?

A sector is the smallest addressable block on a disk and until recently all disks had a sector size of 512 Bytes. With the advent of larger, multi Terabyte, disks the physical sector size has increased on some disks to 4096 Bytes. These are sometimes referred to as 4K sector disks. To overcome Windows compatibility issues the majority of disks use a technology called Advanced Format 512e. This enables 4K disks to emulate 512 Byte sector size disks by providing an **emulated** sector size of 512 Bytes.

So what's the problem?

The NTFS file system contains a data structure called the Master File Table (MFT). The MFT is critical to the file system and defines all the files and directories. The MFT contains 'records' and each record is 1024 Bytes (1K) long if the disk sector size is 512 Bytes. For a 512 Bytes per sector disk this equates to **2** sectors. If the entire file system is restored or cloned to a disk with a sector size of 4096 Bytes then each MFT record (at 1K) would be a **quart er** of a sector. Since a sector is the smallest amount data that can be read or written to a disk this means that NTFS cannot directly read it's own data! 4K Disks that support Advanced Format 512e do not have this problem as these disks permit directly accessing 512 Bytes of data.

External USB enclosures...

We have identified that a number of recent external USB enclosures will **'fake'** 4096 Bytes per sector disks and cause the error above. This happens regardless of the actual sector size of the attached disk and even if the disk supports 512e.

Why do they do this?

Normally disks with 512 Bytes per sector that are larger than 2TB would need to be initialized using the GUID Partition Table (GPT) format. Note that GPT disks **are not supported** by Windows XP, however, MBR disks **are** supported by all Windows Operating Systems, including Windows XP.

If the reported sector size is **changed** to 4096 Bytes then MBR disks can be as large as 16 Terabytes and still be accessible by Windows. So, by changing the reported disk sector size to 4096 Bytes for disks attached to the enclosure this enables **all** Windows PC's from XP onwards to be able to access disks greater then 2TB. If you are selling USB enclosures then this gives you a larger potential market and is a 'no-brainer' product feature.

Isn't this good?

Well yes, if the only purpose for the USB enclosure is to provide additional storage and you do not intend to take out the disk. But this is bad if you intend to clone to a disk in the enclosure and then use the cloned disk to boot your PC. **It simply won't work.** If you remove the disk from the enclosure then it cannot be read. This is because the sector size will change and the partition structures on the disk will be unreadable.

So what do I do?

If you receive the **'Incompatible Disk Selected'** error shown above and you are using an external USB enclosure, then either try a different enclosure which doesn't change the reported disk sector size or directly attach the disk to a spare SATA port on your PC's motherboard. This will ensure that the disk manufacturer's drive geometry is reported correctly and may allow you to proceed with your clone or restore operation providing that the reported sector size is now compatible.