How-To Geek

How to Use Windows 10’s Storage Spaces to Mirror and Combine Drives

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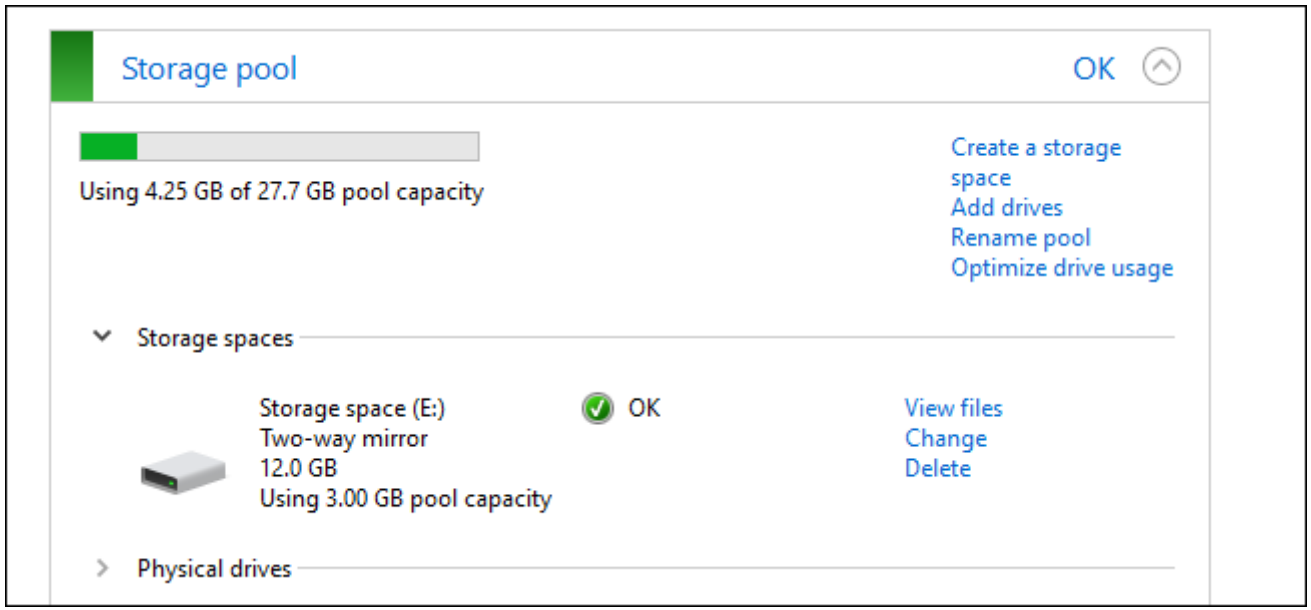

The Storage Spaces feature built into Windows allows you to combine multiple hard drives into a single virtual drive. It can mirror data across multiple drives for redundancy, or combine

multiple physical drives into a single pool of storage. Storage Spaces is similar to RAID or LVM on Linux.

This feature was added in Windows 8, and was improved in Windows 10. It's available on all editions of Windows 8 and 10, including Home editions.

What Are Storage Spaces?

To create a Storage Space, you need at least two physical drives on your PC. These can be internal drives or external drives connected via USB.

Storage Spaces allow you to create a "storage pool" of two or more physical drives, grouping them together. Once you've created a storage pool made up of two or more physical drives, you can create three types of "spaces" using that pool:

- A **simple space** is designed to give you the most storage possible, but doesn't provide any protection against drive failure. Windows will store only a single copy of your data across all the drives. If one of these drives fails, your data will be lost and corrupted. This is ideal for temporary data.
- A **mirror space** is designed to protect you from drive failure by storing multiple copies of your files. A single drive—or more than one drive, depending on how you configure things—can fail and you won't lose any data. This is ideal for protecting important data from hardware failure.
- A **parity space** is designed as a compromise. Windows will keep a single copy of your data along with parity information. You'll have more space and you'll be protected if a single drive fails. However, parity spaces are slower than simple and mirror spaces. This solution is ideal for data archival, and not data you use frequently.

If you choose to format a mirror or parity space with the Windows Resilient File System (ReFS), Windows will automatically monitor and maintain file integrity to prevent file corruption.

How to Create a Storage Space

You can create a Storage Space from the Control Panel. First, connect the drives you want to group together to your computer. Then, head to Control Panel > System and Security > Storage Spaces. You can also just search for "Storage Spaces" in your Start menu.

Click the "Create a new pool and storage space" link to get started.

Select the drives you want to add to the pool and click "Create Pool" to create a storage pool from those drives.

Warning: All data on the drives you select will be erased, so back up any important data before continuing!

After creating a pool, you'll be prompted to configure your new storage space. Type a name for the storage space and select a drive letter. The storage space will appear with this name and drive letter in Windows.

You can select either the standard Windows NTFS file system or ReFS, the new resilient file system. If you'll be using mirroring or parity to protect against data loss, we recommend choosing ReFS for its file integrity protection features.

You'll need to choose a resiliency type. Select "Simple (no resiliency)" for a large pool of storage that provides no protection from drive failure. Select "Two-way mirror" to store two copies of your data across the drives or select "Three-way mirror" to store three copies of your data across the drives. Select "Parity" to be protected from a single drive failure and have more space, but remember that a parity space is noticeably slower than the other options here.

You'll also need to choose the size of your storage space here. The interface will show you the maximum available amount of storage you have, which will vary depending on the type of space you create.

This interface allows you to create pools of storage larger than the amount of physical storage space you have available. When the physical storage fills up, you can plug in another drive and take advantage of it with no additional configuration required.

Click "Create storage space" when you're done configuring your storage space.

How to Use Storage Spaces

The storage space you created will appear as a standard drive under This PC, with the name and drive letter you configured. It appears no different from a normal, physical drive to Windows and the desktop programs you use.

You can do anything you'd do with a normal drive with the storage space. For example, you can even enable BitLocker drive encryption for it.

How to Manage Storage Spaces

After creating a storage space, you can head back to the Storage Spaces pane in the Control Panel to manage it.

To create a new storage space, click "Create a storage space". You can create as many separate storage spaces as you like. You're only limited by how many physical drives you have available.

To rename a storage pool, click "Rename pool" under that storage pool. To rename a storage space, change its drive letter, or specify a different size, click "Change" to the right of the space.

If you originally created a storage pool with Windows 8, you'll see an "Upgrade pool" link you can click to take advantage of the new features in Windows 10. The upgraded storage pool will only be compatible with Windows 10, and Windows 8 won't be able to use it anymore. After upgrading the pool, you'll be able to remove drives from pools and optimize drive usage.

To add drives to an existing storage space, click "Add drives" and choose the drives you want to add. Select the "Optimize drive usage to spread existing data across all drives" option to have Windows intelligently rearrange the data.

If you didn't select this option while adding a drive, you can click "Optimize drive usage" afterwards. The "Optimize drive usage" option is new in Windows 10. You should also run the "Optimize drive usage" option after upgrading a pool originally created on Windows 8.

To remove a physical drive from a storage pool, expand the "Physical drives" section under that storage pool and click the "Prepare for removal" link next to the drive you want to remove.

Windows will move the data from the physical drive onto the other physical drives in the storage space. The drive will then be listed as "Ready to remove" and you can click the "Remove" link to remove the drive from the pool.

You can then use the Disk Management tool to partition and format the empty drive.

You can also choose to delete a storage space or storage pool from here by clicking "Delete" to the right of the storage space.

Warning: If you delete a storage space, you'll lose all data on the storage space, so back up any important data first!

After deleting the storage space, click the"Delete pool" option to the right of the storage pool to delete the pool of drives.

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Chris Hoffman is Editor in Chief of How-To Geek. He's written about technology for nearly a decade and was a PCWorld columnist for two years. Chris has written for The New York Times, been interviewed as a technology expert on TV stations like Miami's NBC 6, and had his work covered by news outlets like the BBC. Since 2011, Chris has written over 2,000 articles that have been read more than 500 million times---and that's just here at How-To Geek. READ FULL BIO »

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