5.10.4 SSD Maintenance Facts

Implementing an SSD storage device in a desktop or notebook computer can significantly increase the system's overall performance. However, the same flash memory technology that makes SSDs so much faster than standard hard disk drives also introduces other maintenance and troubleshooting issues.

Issue	Description
Defragmentation	On an SSD storage device, fragmentation is much less of an issue than it is for standard hard disk drives. File systems such as NTFS still fragment files when writing them to the drive in order to optimize storage space. However, an SSD storage device doesn't have read-write heads, and no repositioning must occur to read heavily fragmented files. As a result, fragmented files can be read as quickly as contiguous files. When working with SSD drives, you should not defragment them as you do standard hard disk drives. This is because SSDs wear out over time. Each cell in a flash memory bank has a finite lifetime and can only be written to and erased a certain number of times before it fails. Running defragmentation utilities causes unnecessary write/erase operations to occur. Use Security and Maintenance in Control Panel to disable automatic disk defragmentation on SSD storage devices.
Mean Time Before Failure (MTBF)	Because of the way they are constructed, an SSD storage device has a lifespan called the mean time before failure, which is usually much shorter than standard hard disk drives. Each time a write/erase operation occurs, it consumes some of the finite lifetime of the flash memory chips within the SSD device. Be aware that some applications running on the system can overuse SSD storage devices. For example, audio, graphic, and especially video editing applications commonly require a very large number of write/erase operations and can cause SSD storage devices to fail prematurely. However, these applications also benefit greatly from the increased speed offered by SSD storage devices. Therefore, if you chose to use SSDs with these types of applications, you should consider configuring an automatic data backup process (such as Windows Backup and Restore or File History) to protect the data stored on the SSD drive on a traditional hard disk drive. Some system builders implement a mix of storage devices in high performance systems so that: ▪ Heavily used information is stored on a standard hard disk drive. For example, the Windows operating system and its applications may be installed on a less expensive but more durable standard hard disk drive. ▪ Only data that requires high performance is stored on SSD storage devices. ▪ Important data on the SSD is automatically backed up on the standard hard disk drive.
TRIM	One method for extending an SSD device's life is to enable TRIM functionality. TRIM configures the operating system to communicate with an SSD device and to tell it which blocks of data on the device are no longer required and can be wiped clean. This prevents the SSD device from storing unnecessary data and being overused. Later versions of Windows should automatically detect the presence of an SSD device and enable TRIM. You can verify this by opening a command window and entering **fsutil behavior query DisableDeleteNotify**. This command will return either a **0** or a **1**. A value of 0 indicates that TRIM is enabled, but a value of 1 indicates that it is not. If it is disabled, you can manually enable TRIM on an SSD drive by entering **fsutil behavior set DisableDeleteNotify 0**.