Computer Know How Series

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Storage and Performance – Thursday March 21th 2019 @ 2pm

http://www.aehost.net/morpd or http://www.morpd.com

Today's computers are measured in many ways. The speed and performance of your system is dictated by multiple hardware components. Most will think of the CPU (Central Processing Unit) or RAM (Random Access Memory) and they would be right but in todays computers storage devices are a vital part of the performance of your system. Can your storage device be slowing your machine and would an upgrade to that device help?

1) Terminology
   a. Redundant Array of Independent Disks (RAID)
   b. Storage-Area Network (SAN)
   c. Network-Attached Storage (NAS)
   d. Input/Output operations Per Second (IOPS)
   e. Mean Time Between Failures (MTBF)
   f. Mean Time to Recovery (MTTR)
   g. Response time (milli-seconds [ms] or nano-seconds [ns])
   h. Read/write speed (Mb/s)
   i. Percent utilization
   j. Bit (b lowercase), Byte (B uppercase) & Kilo (K), Mega (M), Giga (G), Tera (T), Peta (P) Exa (E), Zetta (Z), etc.
2) Storage Types
   a. Hard Disk Drive (HDD)
      i. What is an HDD? A hard disk drive (HDD) is a non-volatile computer storage device containing magnetic disks or platters rotating at high speeds.
      ii. Are all HDDs created equally? No. Different types, RPM speeds and bus transfer speeds are available.
   b. Solid State Drive (SSD)
      i. What is an SSD? A solid-state drive (SSD) is a storage device containing non-volatile flash memory, used in place of a hard disk because of its much greater speed.
      ii. Are all SSDs created equally? No. Different types, Read/Write speeds and bus speeds are available.
   c. Types and Sizes
      i. Physical – PATA (Previous Technology), SATA 1.8" (HDD or SSD), SATA 2.5" (HDD or SSD), SATA 3.5" (HDD only), & PCIe/NVMe Cards and M.2 (SSD only).
      ii. Logical – HDD 500GB, 1TB, 1.5TB, 2TB, 3TB, 4TB, 5TB, 6TB, 8TB, 10TB, 12TB & SSD 32GB, 64GB, 128GB, 256GB, 512GB, 1TB, 2TB, 4TB and larger. Seagate announced a 16TB 2.5" SSD.
3) Finding the right balance for the performance of my system.
   a. Monitoring Tools
      i. Task Manager provides basic real-time information on system performance and troubleshooting.
      ii. Resource Monitor provides detailed real-time system performance information.
   b. Maintenance Tools
      i. Check Disk will help optimize file system performance.
      ii. Defragmenter will help optimize storage performance, especially on HDDs.

4) Resources/Links
    a. Data Storage Terms You Should Know - https://www.networkcomputing.com/data-centers/data-storage-terms-you-should-know
    b. Storage Performance - https://www.techopedia.com/definition/28330/storage-performance
    c. SSD vs HDD - https://www.storagereview.com/ssd_vs_hdd
    d. SSD vs HDD: Which should I have in my PC? - https://www.windowscentral.com/ssd-vs-hdd-which-should-i-have-my-pc
    e. Solid-state drives are speedier than hard disk drives. Are they worth it? - https://www.digitaltrends.com/computing/ssd-vs-hdd
    f. SSD vs. HDD: What's the Difference? - https://www.pcmag.com/article/297758/ssd-vs-hdd-whats-the-difference
    g. How big is a Petabyte, Exabyte, Zettabyte, or a Yottabyte? - http://highscalability.com/blog/2012/9/11/how-big-is-a-petabyte-exabyte-zettabyte-or-a-yottabyte.html