

Business Computing

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A free monthly publication for small business. Over 20 years experience providing computer and network solutions.

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The Learning Center

The different types of memory: Synchronous DRAM or SDRAM became available for PCs from about 1995. Unlike earlier memory modules SDRAM had the ability to synchronize itself with the CPU. This enabled faster access times and added benefits such as burst mode and interleaving functions. DDR SDRAM was the next generation of "go faster" technology which allowed memory access on both the falling and rising edge of CPU cycles. Double data rate SDRAM or DDR2 was the next improvement. It is an evolution of DDR memory technology that delivers higher speeds with lower power consumption and heat dissipation. It is perfect match for today's mobile users with the lower power consumption and high speed.



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Why a Lack of Memory Dramatically Slows Down Your Computer System

Today, no matter how much memory we have in a computer, we never seem to have enough. Or so the experts tell us. What actually is memory and what task does it carry out? In this case we are referring to random access memory or RAM. The role of RAM is to hold short-term data while the computer carries out and completes chores. Generally speaking when the computer is completing a job and the hourglass is displayed, more RAM means less waiting time. By glancing at the taskbar at the bottom of the screen you can immediately see what programs are currently loaded into RAM. There may be several windows open and ready for input. Care needs to be taken in not overdoing the number of open windows.

People get confused with memory and hard drive storage. Hard drive storage is slow and permanent, while RAM storage is fast and temporary. When you turn off your computer, data in RAM is lost, unlike your hard drive storage. You can relate your hard drive storage to a filing cabinet and RAM to your tabletop. While working at your desk you have documents at your fingertips, while the rest is stored away in the filing cabinet. Therefore adding RAM is rather like increasing the work area of your table top. By adding to the size of your work area it saves having to dive back and forth into the filing cabinet shuffling documents.

When your computer lacks sufficient RAM data needs to be transferred back onto the hard drive. Using the hard drive in this manner is termed virtual memory. If there isn't enough room in memory the computer sets up a space for a swap file on the hard drive to simulate additional RAM.

This process referred to as memory swap, severely slows down the system. Virtual memory is like an ox cart when you compare it to racing car RAM. To put this comparison onto a time scale would mean RAM is fifty thousand times faster than virtual memory. A one second task in RAM would take fifteen hours using virtual memory. Therefore a lack of RAM in a computer can severely diminish staff productivity and make work a struggle.

So how much memory do you need in a desktop computer? By having a minimum of windows open at one time can keep your PC at maximum efficiency. Generally speaking, if the hourglass is starting to irritate and you can hear the computer working hard swapping data back and forth, your computer needs more RAM or replacing. The exact amount of memory depends on the type of system you own, the type of work you're doing, and the software applications you are running. For example, a memory hungry architect's drawing machine would need far more processing power and memory than a basic workstation that uses email and creates documents. Today with low cost hardware the upgrade path is more likely to be computer replacement rather than fitting extra memory.

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A Good Way to Check Reliability of Your Computer Hardware ...

If your computer is not performing well and you suspect hardware problems, it would be nice to accurately pinpoint the problem. Hardware diagnostic software is one way to check for faults. One Internet site that has suitable diagnostic software is www.passmark.com. The software is free if you use it for a month and it will only run for 15 minutes intervals. Pay a fee to the autho and you can have the full working version. This enables you to test your computer for several hours with no interruption. If you are only going to use the software occasionally, the free version is adequate.

Passmark's Burn-In Test is a software tool that allows all major sub-systems of a computer to be simultaneously tested for reliability and stability. Anyone who has used computers knows the importance of having a stable system. The cost of hardware

failure can be enormous. If you are lucky, your data will only become inaccessible while faulty components are replaced. By using this testing software, you may discover potential problems and prevent a major mishap.

What Burn-In Test does is thoroughly exercise the hardware in a PC in a short period. It is like you using the computer over a long period. The software should bring to the surface intermittent or hidden hardware problems. The application tests the CPU or engine of the PC, hard drive, CD Rom, sound card, video card, printer, RAM or memory and any network connections. Note that the testing process itself does not touch any existing files on your hard drive but make sure you have backed up your data before running this test.

Burn-In Test does not create any problems in your hardware; it just helps you find them in a controlled manner. The software doesn't

use any nasty programming tricks to try and make the hardware fail - like exercising to the extreme the mechanical read/write heads on the hard drive. Because the test doesn't delete any files from the disk, the occupied portion is not tested. Thus, the more free space on the disk, the larger the portion of the disk will be tested. To test your whole hard disk run Windows Scandisk or equivalent as this will check your whole drive.

If your system locks up or gets a blue screen while running the test you will need to eliminate the faulty module. You do this by running each test individually to isolate the problem. You can also boot your computer in the safe mode to see if this eliminates any faults and adds to stability. Remember the software runs on the Windows platform so this test is also vulnerable to viruses. There is an extensive Help menu to which you can refer and plenty of options to select to tailor the

The Recall or Memory Mechanism in a PC

The overall task of memory or RAM is to make data easily available for the central processing unit or CPU. As previously explained, having more memory is like having a bigger workspace. The CPU is the brain of the computer where all the actual data processing takes place. The adjacent memory space is temporary storage for unfinished business until data can be permanently parked back on the hard drive. The efficiency of RAM is measured in "access time" or how long it takes to retrieve data. The lower the access time the more desirable the random access memory.

Another type of RAM used in computers is cache memory. Having a memory cache can easily speed up a computer. Cache RAM is a small amount of high speed memory that resides close to the brain or CPU. It is designed to supply the CPU with the most frequently requested instructions. Retrieving information from cache only takes a fraction of the time it takes from the main memory. By making a detour via cache the CPU is not significantly interrupted as the diversion is lightning fast. It is like checking your refrigerator for food before driving to the supermarket to stock up. One major variation between high powered CPUs and their low cost cousins is the amount of cache RAM.

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