Desktop PC Buying Guide

Why Choose a Desktop PC?

The desktop PC in this guide refers to a completely pre-built desktop computer, which is different to a self-built or DIY (do it yourself) desktop computer system. Desktop PCs are offered by brandname manufacturers or SIs (Systems Integrators).

Building a computer is a non-choice for many individuals – it lacks appeal because it is a rather technical process and needs more than general knowledge and information about computer hardware. Pre-built computers are easier choices for those who just want a computer to use, leaving brandname desktop PCs and laptops as the only realistic choices.

Laptop computers are designed to be much more mobile than desktop PCs. However, there are many applications and scenarios that do not require much mobility, such as heavy home and office computing. For these usages, you will get more performance bang for the buck with a desktop PC. There are also applications that demand extremely high performance beyond the bounds of what a laptop computer can deliver, although this is improving all the time. This sometimes leaves the desktop PC as the only available choice.

In addition, desktop PCs allow for extensive upgrading to be performed, allowing you to make the most out of your investment.

Desktop PC Types

Desktop PCs are very different from laptops. Since most components used in brandname desktop computers are standardized, there is not really much that distinguishes products occupying the same market segment from the different manufacturers (of course, this does not include the design of the computer case). In fact, you can build an almost exact duplicate by yourself quite easily.

There are essentially just two things to consider when choosing a desktop PC (besides price, of course): configuration and appearance. Configuration (hardware and software) determines the functionality and performance of the computer; and since appearance is a subjective matter, we will simply skip that part.

To get started, your choice of configuration should depend on your actual usages and requirements. Different configurations are developed and offered by the manufacturers to meet different requirements. To choose the right desktop computer, it is important to find out what applications you are planning to run most often.

For the Home and Home Office

Cutting-edge performance is not a necessity for the majority of home users. Almost any mainstream desktop computer on offer can satisfy normal home and home office users since surfing the web, watching DVDs and word processing work do not require high computing horsepower. Of course, you can still opt for a faster computer for gaming and simple multimedia processing work, but this typically comes at higher cost.

Business Desktops & Workstations

Business desktop computers aren't tremendously different to home office PCs. Running Word, Excel and web browsers cannot be regarded as highly demanding applications, so the hardware configuration does not need to be extreme at all.

Workstations for professional users are at the opposite end of the spectrum and are all about performance. Professionals in different areas of expertise have distinguished requirements as well - for instance, an engineer/designer who runs professional 3D design programs may require a very fast processor, large amounts of memory and a high-end professional video card. If you are a workstation user, please choose a workstation that was designed for your profession.

Gaming

Gaming is a highly demanding application, especially for the video card and CPU. If you want to enjoy the latest 3D games using full special effects at high screen resolution, it may be worthwhile to consider a top-end gaming desktop PC. You can still play games with a mainstream gaming machine, but you may have to compromise your enjoyment by turning down the special effects and scaling down the resolution to ensure a smooth gaming experience.

Media Center/Home Theater PC

Playing, recording, saving and editing high quality audio and video are what a media center computer does most often. Since high quality video processing requires extremely high computing power, the performance of the processor and memory (as well as its capacity) is of great importance. Hard drive capacity is also vital to media center computers, because an hour of high definition video can occupy tens of gigabytes (GB) of hard disk space.

Specifications to pay attention to

Desktop computers are composed of many different components - both hardware and software. Having a basic understanding of some of the most important parts will help you to

make the right choice more easily. Here are the areas you should pay attention to when choosing a desktop PC:

CPU/Processor

The CPU (Central Processing Unit) is essentially the brain of the computer. It interprets and executes instructions and data contained in software programs. It is also the largest single determinant of system performance. The more generic term "processor" is often used to refer to a CPU as well.

Intel and AMD are the two most prolific CPU manufacturers in the current PC market. They provide the overwhelming majority of processors used in PCs.

There are four Intel desktop processor product lines: the very well-known *Pentium 4* is prepared for the mainstream segment, the *Celeron D* is for budget and entry-level users, the *Extreme Edition* is for power users/enthusiasts (just as the name suggests), and the latest *Pentium D* processor is a dual-core processor that intends to replace the current Pentium 4.

AMD also offers four desktop processor product series. The best-known *Athlon 64* is provided for the mainstream segment, the *Sempron (*including *Sempron 64)* are for entry-level users, the *Athlon 64 FX* are for high-end users/gamers, and the cutting edge *Athlon 64 X2* is a dual-core processor that intends to replace the current *Athlon 64* in one or two years.

Quick reference for contemporary processor series:

Profile		Intel	AMD
Desktop	**High-End/Gamer**	Pentium Extreme Edition	Athlon 64 FX
	Multitasking/Mainstream-to-Be	Pentium D	Athlon 64 X2
	Mainstream	Pentium 4	Athlon 64
	Budget/Entry Level	Celeron D	Sempron (64)
Workstation/Server		Xeon	Opteron

A processor brand/series will often include a number of models that are capable of different operating speeds. A faster operating speed usually corresponds to higher performance relative to the other models in the same series. For example, a 3GHz Pentium D 930 processor is faster than a 2.8GHz Pentium D 920; and an Athlon 64 3500+ is faster than Athlon 64 3000+. The operating speed of one processor cannot be used as a basis for comparison with a processor from another series or brand.

Memory

The memory we refer to here is the main memory in a computer system, also known as RAM (Random Access Memory). It is essentially the computer's workspace - the place where a

computer temporarily stores data and programs. More memory allows you to run more programs simultaneously, and to store a greater amount of data for faster access by your computer (mostly the processor). Therefore, memory performance is an important factor to consider as well, since faster memory allows more data to be transferred in a given amount of time.

Generally speaking, the larger the capacity of your memory modules, the more programs you will be able to run simultaneously (as long as your motherboard and operating system supports it). The capacity you need depends on your requirements - for most home users 512MB should be enough, while gamers will need at least 1GB of memory to ensure that cutting edge 3D games will run smoothly.

There are two types of memory used in today's desktop computers: DDR and DDR2. DDR2 performance potential is higher than DDR, and is slated to replace DDR. Your choice of memory type is restricted by the desktop computer you choose.

Hard Drive

The hard drive stores almost all the data required by the computer system including the operating system, application programs and user data. Hard drives provide massive storage capacities for all types of data including images, documents, movies, music, games. This means more fun for you and greater functionality for your computer.

Desktop computers typically use 3.5 inch hard drives. Most desktop hard drives spin at 7200RPM (some high-end desktop PCs utilize 10000rpm hard drives). RPM (Revolutions per Minute) refers to the speed at which a hard drive spins. Generally speaking, you can equate higher rotational speeds with better performance.

Most desktop computers are usually configured with 80-160GB hard drives, which should be sufficient for most users. Users who store more documents and video or music files may require higher capacity hard drives of 200GB or greater.

Graphics/GPU/VPU

There are two types of video/graphics cards: discrete and integrated. Many desktop PCs utilize chipsets with integrated graphics units, which are not quite as powerful as most discrete (add-on) video cards in terms of 3D rendering power in games and other 3D applications. These computers are perfect for basic business and general home usage, however, since the user does not have to invest more for a discrete video card.

Integrated video cards feature GPUs (graphics processing units) integrated directly onto the chipset and require system memory for use as the video memory. The Intel Extreme Graphics (2), Intel GMA 900/950, SiS Mirage and SiS UniChrome Pro are all integrated graphics cores.

NVIDIA and ATI, which are the largest providers of discrete graphics cores, also provide integrated graphics products.

Discrete video cards feature discrete GPU and local video memory to free up system memory. For demanding 3D games, a discrete video card is usually the better choice. ATI and NVIDIA are the major GPU manufacturers today. If you are involved in professional 3D design/creation work, a professional video card is necessary.

Optical Drive

DVD-ROM or DVD/CD-RW combo drives are very popular optical drives. If you only read data discs and watch DVD movies, a DVD-ROM drive is sufficient. A DVD/CD-RW combo drive can do all of the above and has the added ability to write/burn CD-R/RW discs (700MB max capacity). If, however, you require more data storage or wish to burn your own DVD movies, a DVD burner is recommended (single-layer DVDs provide a capacity of 4.3GB).

Operating System

The operating system or OS is essentially the software program that manages the hardware and other software resources of a computer system. A computer cannot work without an operating system.

The Windows XP operating system is the most popular choice nowadays. There are three different editions of Windows XP often used by desktop PC users: Home edition, Professional edition and Media Center edition. Each edition is optimized for a different type of usage, as their names suggest (Professional edition is essentially the Home edition plus business/professional functions).

Others

Display/Monitor
The monitor is one of the most important components of the total PC solution. Please read our *LCD monitor buying guide* for more information.

Keyboard, Mouse, Speaker and Card Reader
Some desktop PCs on Newegg come with a keyboard, mouse and even a pair of speakers. As a computer cannot be used without a keyboard and a mouse, purchasing your own becomes necessary for desktop PCs that <u>do not</u> include these two input devices. Please read our Keyboard buying guide and Mouse buying guide for more information.

In addition, if you have digital cameras or other devices using flash memory such as SD/MMC, Memory Stick (Pro/Duo/Pro Duo), CF or xD-Picture, a desktop PC with built-in card reader should be very useful - if the card reader supports the flash memory types you use.

I/O Connections

If you have many external devices that need connecting (e.g. photo printer, scanner, digital camera), make sure there are sufficient matching I/O ports such as USB and IEEE1394 (aka Firewire or i.Link) on the computer you are planning to purchase.

Our Recommendations

As described in the Desktop PC Types section above, brandname desktop PCs are developed and designed with different applications/usages in mind. The recommendations we make here follow the user segments mentioned in that section. Of course, our recommendations may not perfectly suit your requirements, so please read this entire guide to have as much information to make your choice with as possible.

For Home and Home Office Users

CPU	Pentium 4 or Athlon 64
	Celeron D or Sempron (for budget users)
Memory	512MB or 1GB
Hard Drive	100GB or more
Graphics/GPU	Integrated or discrete mainstream video card
Optical Drive	DVD-ROM or DVD/CD-RW combo
Operating System	Windows XP Home/Professional

For Business Users

Business Desktop PC

CPU	Pentium 4 or Athlon 64
	Celeron D or Sempron (for budget users)
Memory	512MB or 1GB
Hard Drive	80GB or more
Graphics/GPU	Integrated
Optical Drive	DVD-ROM or DVD/CD-RW combo
Operating System	Windows XP Professional

Graphics Workstation

CPU	Xeon or Opteron
Memory	1GB/2GB or more with ECC
Hard Drive	80GB or more
Graphics/GPU	Professional discrete video card
Optical Drive	DVD-ROM, DVD/CD-RW combo or

	DVD±R/RW burner
Operating System	Windows XP Professional

For Gamers

CPU	Athlon 64 (above 3200+) or Pentium 4 (above 3.2 GHz)
	Athlon 64 X2 or Pentium D
	Athlon 64 FX or Pentium Extreme Edition
Memory	1GB or 2GB
Hard Drive	160GB or more
Graphics/GPU	High-end discrete video card driven by NVIDIA or ATI GPU
Optical Drive	DVD/CD-RW combo or DVD±R/RW burner
Operating System	Windows XP Professional

For Media Centers/ Home Theater PCs

CPU	Pentium D or Athlon 64 X2
Memory	1GB or more
Hard Drive	200GB or more
Graphics/GPU	Integrated or discrete video card
Optical Drive	DVD±R/RW burner
Operating System	Windows XP Media Center