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PERTH WESTERN AUSTRALIA

Tel. 1300 661 624

How to buy a new computer in 2010

Introduction.

For the average non-technical user choosing specifications for a new computer can be bewildering. The new Intel micro architecture (nm) Core i-series processors offer smarter processing and greater performance compared to earlier Pentium processors, but choosing which model, version and stepping is more complex.

Retailers advertising and promotion is often selective and can be misleading. We show you how to avoid the pitfalls and know what you're buying in terms of the processing power of your new computer.

The Problem

Intel remains the market leader in processors for mainstream computing but recently things started getting complicated. Intel released its range of 45nm micro architecture processors known as Core i3, Core i5 and Core i7. The various steppings available for each processor complicate the buying decision, and this complication is being subtly exploited by retailers of computers and laptops.

A computer retailer may make a feature of the Core i5 3.2GHz processor. Sounds impressive. How does this compare to a Core i5 2.66GHz? You would be forgiven for leaning towards the 3.2GHz model; it's cheaper and at first look appears to be more powerful. The key information that is omitted in the description is whether the processor is Dual Core or Quad Core.

Core i5 CPU, 3.20 GHz	➔	Core i5 CPU, Dual Core 3.20 GHz
Core i5 CPU, 2.66 GHz	➔	Core i5 CPU, Quad Core 2.66 GHz

The Quad Core 2.66GHz processor is more powerful. It can do many things at one time without noticeable performance lags. The Quad Core was, until recently, seen as the CPU of choice for CPU intensive tasking, such as CAD, drafting, gaming, trading computers. But in the small office or home office users often have many programs open at one time, and Core i5 Quad Core is often the preferred option. Core i7 Quad Core is a leap up in cost and performance from Core i5 but prices have fallen at the mid range i7 and are now in the mainstream cost areas.

The Solution

Your choice of CPU or processing power is no longer just about whether you need lots of grunt (video editing, etc), but how efficient and smooth you want computing to be on a multitasking system. It's surprising how half a second in response times and more fluid response can make you feel better about using your computer. Performance is a key factor in simplifying computing for end users because attention is not hijacked by nagging issues relating to lags and response times.

Notice in the table below you can see some represented models and features you should also be aware of when choosing a balance between budget and performance.

- Integrated graphics. The new Intel Core processor with integrated graphics eliminates the need for a graphics card. The way graphics memory is shared is a more direct method on the CPU when compared to earlier CPU's. While the process is more efficient it is not capable of rendering games, graphs, images like a graphics card. With such a high percentage of home offices sharing PC's with family members' graphics performance may be a consideration.
- Turbo Boost technology from Intel can increase the clock speed of each core to increase performance on the chip when you need it. If Windows is asking for more performance the Turbo Boost controller will deliver it.

Core		Integrated graphics	Turbo boost
Intel i5-750 Core i5 CPU, Quad Core 2.66GHz	Lower GHz to the 650/660 but a Quad Core processor with greater processing/performance	No – purchase graphics card	yes
Intel i5- 650 Core i5 CPU, Dual Core 3.20 GHz	Around 10% cheaper than the 3.33 processor	Yes	Yes
Intel i5-660 Core i5 CPU, Dual Core 3.33 GHz	Note the GHz difference from 3.2 to 3.33 – the difference is noticeable in terms of performance	Yes	Yes
Intel i7-860 Core i7 CPU, Quad Core 2.80 GHz	Almost half the cost of the 870 processor shown below	No – purchase graphics card	Yes
Intel i7-870 Core i7 CPU, Quad Core 2.93 GHz	High performance computing – graphics, CAD, Trading computer	No – purchase graphics card	Yes
Intel i3-530 Core i3 CPU, Dual Core 2.93 GHz	Budget desktop.	Yes	No
Intel i3-540 Core i3 CPU, Dual Core 3.06 GHz	Budget desktop.	Yes	No

So, which processor is right for you?

Many home office/small offices tend to have multitasking needs, and share computers with family members, so choosing the right PC processor to meet these needs can help to future-proof your new system.

Intel Core i3 supersedes the desktop Core 2 Duo CPU's. Core i3 is your choice for basic desktop/workstation. Choosing i3 over the earlier Pentium Core 2 Duo's or the even older Dual Cores means better performance (in the case of Core 2 Duo X around 15%), but don't expect blazing performance from this processor group.

Intel Core i5 is positioned between Core i3 and Core i7 and offers a good balance of power (performance) to cost. The socket changes (from 775 to 1156) raise RAM (memory performance) from DDR2 to DDR3. This processor (choose your stepping) at the right stepping is more than capable of powering through your day.

Intel Core i7 will appeal to power users, video editors, share traders, graphics intensive work. But unlike Quad Core of the past, home users and small office's can also benefit from this processor upgrade because the price leap from Quad Core i5 to Quad Core i7 is not that great and can be incorporated into a standard desktop PC.

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