Things to know about overclocking computers

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Introduce

Many people may not know what overclocking is but at least have heard this term before.Simply put, overclocking is the process of making a computer part like a microprocessor run with specifications higher than the manufacturer's specs.Each part manufactured by companies like Intel andAMDhas specific speeds.Manufacturers have checked the capabilities of these parts and confirmed it for a specific speed.

Of course, most parts are 'underestimated' about its capabilities.Partial overclocking is simply understood to take advantage of the rest of those parts to improve computer system performance.

Why overclock the computer?

The main benefit of overclocking is that it can increase computer performance without having to spend extra costs.Most people overclock the system want to improve computer systems or improve performance with limited budget.In some cases, users can increase their system performance by 25% or higher.For example, a person buys an AMD 2500+ and through a careful overclocking of the processor, it can run with the same processing power as an AMD 3000+ but at a significant cost.

The biggest drawback of overclocking a computer is that you are canceling the warranty provided by the manufacturer because it does not run with the specifications given by the manufacturer.

Overclocked parts pressed to their limits also tend to reduce life expectancy or even worse, if done improperly, can be completely destroyed.For that reason, all overclocking instructions will have a disclaimer warning about problems after overclocking before instructing you how to overclock your computer.

1. Instructions for overclocking the CPU

Bus speed and multiplier

To better understand overclocking the CPU in a computer, it is important to know the processor processing speed.All processing speeds are based on two different factors: bus speed and multiplier.

Bus speed is the core clock rate that the processor transmits to parts such as memory and chipset.It is usually evaluated in the MHz scale relative to the number of cycles per second it runs.The problem is that the bus is frequently used for different aspects of the computer and may be lower than the user's expectations.For example, an AMD XP 3200+ processor uses a 400 MHz DDR memory, but in fact, the microprocessor uses 200MHz frontside bus (doubled pulse) to use DDR memory. 400 MHz.Similarly, the new Pentium 4 C processor has an

800MHzfront bus, but it is actually a 200 MHz quad (pumped) bus.

The multiplier is a multiple when comparing the processor speed to the bus speed.This is the actual number of processing cycles, it will run with a clock cycle of the bus speed.Therefore, a Pentium 4 2.4GHz "B" processor is calculated as follows:

133 MHz x multiplier 18 = 2394MHz or 2.4 GHz

When overclocking a processor, these are the two factors used to affect performance.

Increasing the bus speed will have the greatest impact when it increases factors such as memory speed (if memory runs simultaneously) as well as processor speed.The multiplier has an effect lower than the bus speed but the bus speed may be more difficult to adjust.

Take a look at the example below about three AMD processors:

Model CPU

Multiplication factor

Bus speed

CPU clock speed

Athlon XP 2500+

11x

166 MHz

1.83 GHz

Athlon XP 2800+

12.5x

166 MHz

2.08 GHz

Athlon XP 3000+

13x

166 MHz

2.17 GHz

Athlon XP 3200+

11x

200 MHz

2.20 GHz

Let's take a look at two examples of overclocking the XP2500 + processor to see what the rated clock rate will look when changing both bus speed and multiplier:

Model CPU

Overclocking factor

Multiplication factor

Bus speed

Pulse pulse CPU

Athlon XP 2500+

Bus increase

11x

(166 + 34) MHz

2.20 GHz

Athlon XP 2500 +

Increase multiplier

(11 + 2) x

166 MHz

2.17 GHz

In the above example, we have made changes to both overclocking elements to produce the speed of 3200+ processor or 3000+ processor.However, not all Athlon XP 2500+ produce such a result.In addition, there may be many other factors that affect achieving this speed.

Because overclocking has become a problem from some fraudulent agents, they overclocked under-rated processors and sold them as higher-priced microprocessors, manufacturers began Perform hardware lock to make overclocking become more difficult.The most common method is through clock lock (clock).Manufacturers change traces on chips to run only at a specific multiplier.Users can still overcome this barrier by modifying the processor, but it will be much more difficult.

Voltage

Each computer component is operated with a specific voltage.During overclocking, electrical signals can be reduced when passing through the circuit.If reduced to a certain level, the system may become unstable.When

overclocking the bus speed and multiplier, these signals may be affected.Avoid this by increasing the CPU core, memory orAGPbusvoltage.

While increasing the voltage, note the additional voltage applied to the processor.If too much voltage is increased, the circuits inside the parts can be destroyed.Usually this is not a problem because most motherboards limit voltage settings.Another common problem is overheating.The higher the voltage, the more heat the processor emits.

Heat

The biggest obstacle when overclocking a computer system is heat.Current high-speed computer systems have created a large amount of heat.Overclocking the computer system only adds to this phenomenon.Therefore, if anyone intends to overclock the computer should also prepare high-performance cooling solutions.

The most common way to cool a computer system is through a standard air cooling system such as heat sink and CPU fan, memory heat transfer, fan on video card (video card) and fan for computer case. .Proper air flow and good conductive metals are important when cooling air.Large copper heat sinks cool computers better than computer case fans.

In addition to air cooling, you can use liquid radiators and coolers by switching phases.These measures are more complex and costly than conventional computer cooling solutions, but they provide higher performance when heat dissipation and noise reduction.Well-built systems can allow overclockers to push hardware performance to its limits, but the cost may be more expensive than the original processor.Other disadvantages are that fluids running through the system may cause short circuits or destruction of devices.

Other components

Throughout this article we have discussed issues related to system overclocking, but there are many other factors that affect whether a computer system can be successfully overclocked.First and foremost is the motherboard and chipset, allowing users to modify the settings.Without this capability, you will not be able to change the bus speed or multiplier to increase performance.Most commercial computer systems from major manufacturers do not have this capability.This is why most people who are interested in overclocking must equip specific parts and build their own systems to be able to overclock.

In addition to the ability to change the actual settings for the CPU of the board, other components must also be able to handle when the speed increases.However, if a person wants to overclock the bus speed and keep the memory in sync to provide the best memory performance, it is advisable to buy a memory that is rated or tested at a higher speed.For example, overclocking a front bus of Athlon XP 2500+ from 166 MHz up to 200 MHz requires a system with memory rated as PC3200 or DDR400.This is why companies like Corsair and OCZ are so popular in overclockers.

The front bus speed also adjusts other interfaces in the computer system.This chipset uses a front speed bus reduction rate to run at the speed of the interface.The three main desktop interfaces are AGP (66 MHz), PCI (33 MHz) and ISA (16 MHz).When the previous bus is adjusted, these buses will also run with parameters outside the specs unless the chipset's BIOS allows scaling down.Therefore, it is important to know how adjusting the bus speed can affect stability through other components.Of course, increasing bus systems can also improve their performance, but only if components can handle speed.Most expansion cards have their tolerance limits.

Slow but sure

Overclockers are warned that they should not overclock 'aggressively'. Overclocking is a very complicated process and errors often occur. It should be slow and speed up gradually.It is best to check the system fully for a long period of time to ensure the system is stable at that speed.This process is repeated until sympathetic If the computer is not stable, then you should leave the system to the previous speed to be stable and less damaged, should not overclock to reach its limit.

Conclude

Overclocking is a method to increase the performance of standard computer components to potential speeds that exceed the manufacturer's evaluation criteria.The performance benefit that can be achieved through overclocking is very significant, however much consideration is required before performing a system overclock.It is important to know the risks involved, the steps to be taken to achieve the results and understand the results will vary for each CPU.Those who are willing to take risks can get some great performance from other systems and components at low cost.