STAR Watch

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Memory Prices Plummet— Buy Now!

Recently, some computer vendors have been offering to configure new computers with double the amount of memory for no additional cost to the customer. How is this possible? Have they lost their collective minds? Absolutely not. Due to the slowdown in computer purchases and an overproduction by memory manufacturers, there is a surplus of all types of computer memory. When supply exceeds demand, prices fall. Almost everyone agrees that the price of computer memory can't sink any lower. There is also agreement that these record low prices won't hang around for very long.

If you have been thinking about buying additional computer memory, now is the time.

Why add memory?

When a program begins execution on a computer, its instructions and data are stored in memory. If there is not enough memory to hold all of the program instructions and data, the "excess" is written to the "swap file" on the hard drive. When program instructions or data stored in the swap file are needed by the program, an area of computer memory has to be written out to disk to free up space. Then, the desired block of data or program instructions are read into the area of computer memory just freed up. This takes time.

The time required for a computer program to access program instructions and/or data residing in memory is measured in nanoseconds (1 nanosecond = 1 billionth of a second). The time required to swap instructions and data in and out of memory is measured in milliseconds (thousandths of a second). Even though both numbers are extremely small, the magnitude of difference between them is 100,000:1. If the swapping process only happens once or twice a second, computer performance does not noticeably suffer. As the number of swaps per second increase, the performance degradation increases proportionally.

Increasing the amount of memory in the computer creates more space for program instructions and data. Performance improves because program instructions and data do not have to be swapped into computer memory before it can be used by the programs running on the computer.

So how much memory should you purchase?

Previously, when prices were substantially higher, it was felt that 64mb of memory on a computer workstation was an ideal balance between the cost of memory and the performance benefit. Now that prices are less

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than 25% of what they were a year ago, the ideal memory size has risen to 256mb. If you can't afford to purchase a large amount of memory, buy whatever you can afford. Any increase in available memory will improve performance.

What kind of memory does your computer need?

If your computer is a nationally known brand, most of the memory manufacturers have information on their web sites that will tell you which kind of memory that you will need.

If your computer is not a nationally known brand, check the owners manual. It may describe the type of memory.

If all else fails, you may have to open the computer case to identify the make & model of the motherboard. Then look up the specs for the motherboard on the manufacturers web site. The specs will normally include a description of the specific type of memory needed.

How much does memory cost?

Depending on the type and amount of memory, prices vary greatly. The following prices were found in a recent search of the Internet

PC66/PC100/PC133 SDRAM This type of memory is the most commonly used in computers today. Depending on the computer vendor, PC66/100/133 is used by computers with Intel Pentium II and Pentium III processors and sometimes by computers with AMD Athlon or Duron processors.

    32mb $9.00
    64mb $10.00
    128mb $14.00
    256mb $35.00
    512mb $85.00

PC600/PC800 Rambus Memory Most Pentium 4 processors use this type of memory. There are 2 different speed ratings for this type of memory: PC600 and PC800.

    128mb $50.00
    256mb $112.00
    512mb $230.00

PC1600/PC2100 DDR Memory This type of memory is similar in appearance to PC66/100/133 SDRAM memory, but is able to store/fetch data at double the rate of SDRAM. There are 2 different speed ratings for DDR memory: PC1600 and PC2100. This type of memory is used mostly with computers that have AMD Athlon or Duron processors.

    128mb $33.00
    256mb $67.00

EDO Memory (72-pin) When the first generation of Pentium processors made their debut, this was the type of memory that was used.

    32mb $22.00
    64mb $40.00

EDO Memory (168-pin) This type of memory can be found in Pentium I, II and III file servers.

    32mb $53.00
    64mb $100.00

Where can these bargains be found?

Check any or all of the following locations on the Internet. WNYLC does not recommend or endorse any of the following vendors or pricing services, but considers them to be representative of most vendors.

    www.viking.com
    www.crucial.com
    www.dealtime.com
    www.nxgenstore.com
    www.123memory.com
    www.oempcworld.com
    www.pricegrabber.com
    www.18004memory..com
    www.computers4sure.com
    www.motherboardexpress.com

How long will these prices last?

As we stated earlier, prices have been slashed because of a surplus. When the surplus is gone, prices will rise. Whether they return to previous levels is open to debate, but they will go up. The opportunity to save a substantial amount of money exists now. Don't miss it.

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Uninterruptable Power Supplies

To most people, a UPS, or Uninterruptable Power Supply, is just a battery backup for a computer or file server in the event of a power failure (blackout) or other electrical line problems. If a blackout occurred, the computer or file server would continue to draw power from the UPS thus allowing users to save their work and shutdown their systems properly without data loss or interruption of service. But that is only one of several functions performed. Depending on its quality, a UPS will provide varying levels of protection against all of the following:

- Voltage surges and spikes - times when the voltage on the line is greater than it should be.

- Voltage sags - times when there is power on the line but it is less than it should be.

- Total power failure - times when a line goes down or a fuse blows somewhere on the grid or in the building

- Frequency differences - times when the power is oscillating at something other than 60 hertz.

- EMI/RFI or electromagnetic interference/radio frequency interference - "noise" in the electrical power that causes computers and peripherals to malfunction.

As we just stated, the level of protection is dependent on the quality of the UPS. And how does one get a quality UPS? By paying for the quality, of course. You can pay as little as $49 or more than $1000 for a single UPS. It all depends on the capabilities of the unit.

Basic Types of UPSs…

There are two basic types of UPS in modern use. The simplest and least expensive is called "Off-line" or "Standby". Building power is fed through the UPS to the devices connected to it. A small amount of power is used to operate a battery charger inside the UPS. The UPS monitors the incoming power for voltages that are above or below a specific value. If the voltage is outside of the acceptable range, the UPS stops passing the building power through to the devices connected to it and turns on its power to create power from the energy stored in the battery. When this type of UPS activates, there is a brief, but normally insignificant power loss.

The second type is called "On-line" or "Continuous". In this more expensive type of UPS, the incoming building power is immediately converted to 12 volts DC and goes to both the inverter and the battery through a common circuit. The devices connected to the UPS are constantly powered by the inverter, never by the building power. The voltage of the incoming building power is monitored. If the voltage falls outside of the acceptable range, the UPS shuts off incoming building power. As soon as this happens, power flows out of the battery to the inverter. The inverter is already in operation. There is no switchover time or power loss.

Line Conditioning

Simply because of the way they operate, on-line UPSs provide cleaner power to connected devices than standby units. The conversion of 120 volt AC building power to 12 volts DC, then back to 120 volt AC filters out most electrical line noise, frequency variations and voltage spikes.

Some of the better on-line units will even adjust for voltage surges and sags in the building power. Without using any power from the battery, they will keep the voltage supplied to the connected devices constant. If the voltage of building power varies more that +/- 20% of its expected value, then the UPS goes into battery backup mode.

Output Power

Ideally, the AC power supplied to a computer device should be 110-120 volts at exactly 60 cycles per second. The voltage of the supplied power should be in the form of a sine wave. While there is considerable heated debate about the need for the AC power output of a UPS to have a "perfect" sinusoidal waveform, there is universal agreement that there must be precise control of voltages and frequency or the power supplies on the devices connected to the UPS may eventually overheat.
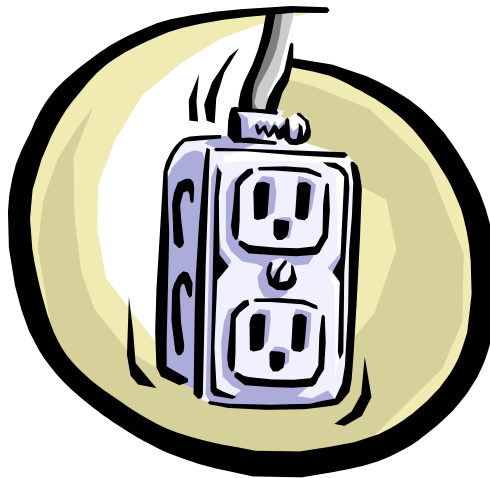
Low-cost UPSs may not be able to precisely regulate their output power. The devices connected to the UPS will tolerate short periods of operation in battery mode, but extended use could cause the computer power supply to fail.

Battery Life

At a minimum, a UPS must supply power for a long enough time to allow users to ride out a short power interruption or gracefully shut down the computers connected to it. For most typical computer workstations, one might have a UPS that was rated to keep the machine alive through a 15 minute

power loss. If you need to survive hours without power, you should probably look at a more robust power backup solution.

The technical specifications of most UPSs will tell you how long the unit will provide power to equipment connected to it. It probably won't be in the form that you were hoping for. The spec will state that the unit will provide backup power for a specific amount of time at a specific "VA" or "kVA" (kVA = 1000 * VA). The amount of time is a no-brainer, but the VA/kVA rating isn't. The VA or kVA rating specifies the maximum "load" that the UPS can handle:

- The VA rating is the maximum number of Volts * Amps it can deliver to connected equipment at any given time.

- The VA rating of the UPS must be equal to or greater than the sum of all the VA ratings of the equipment connected to the UPS. Exceeding the VA rating of the UPS will cause it to fail. It will also void the warranty on the UPS.

- The VA rating is not the same as the power drain (in Watts) of the equipment. In science class, we were told that volts * amps = watts. If this is true, doesn't VA = watts? In a word, no. What we learned in science class was true if we were dealing with direct current (DC), but computer devices use alternating current (AC). In an AC power circuit, VA is 1.4 – 1.7 times greater than the wattage for the device.

- The backup time is not proportional to the load on the UPS. If the actual

VA/kVA is half of the rated VA/kVA, the battery life will not be doubled. A large amount of power is consumed in the process of converting battery power into AC power.

Extra Bells and Whistles

Some things are worth paying extra for. While most of these items don't directly increase the level of protection, they make it easier to maintain and use:

- Power monitoring software: Even some of the least expensive UPSs have this feature. A program on the protected computer constantly monitors the status of the UPS, especially battery life. If a power outage occurs and the battery life is getting low, the power monitoring program will shut the computer down gracefully.

- Replaceable battery: Batteries in UPSs will eventually wear out. When it finally happens, can the battery be replaced or do you throw the entire unit out? Batteries can be replaced easily on better UPSs.

- Hot-swappable battery: Can the battery be removed from the UPS while it is in operation? When batteries fail, the equipment they protect does not have to be shut down to replace the battery.
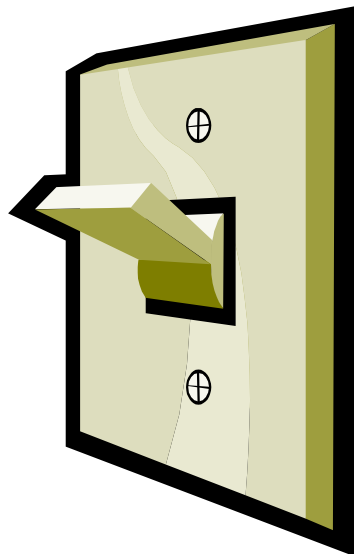
- Extra external battery connector: Can you add a second, third, fourth, … battery to the UPS in order to extend the run time when in battery backup mode? With external battery connectors, it is possible to daisy-chain additional batteries together, increasing the up time for the devices connected to the UPS.

- Manual bypass switch: If the UPS is broken or is being serviced, can you pass power through it to your equipment? The last thing you want is for a broken UPS to be the cause of extra downtime. Better UPSs can be switched in and out of bypass mode with out interrupting power to the connected devices.

What's Best For You

The amount of protection provided by a UPS varies greatly depending on the features included in it. While price is an important factor when determining which UPS to buy, it should not be the only consideration. You should consider all of the following:

1. What are the possible electrical problems that the UPS will protect against and realistically, how often do these problems occur?

2. How critical are the devices to be protected?

3. What will be the consequences if the problems occur?

4. What is the cost of the UPS to protect against those problems?

At a minimum, you should purchase a UPS that will protect against all likely problems or you are wasting your money. It may cost you a little more than you had hoped for, but you will have the protection that you need.

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For August 2001

Total Hits 449,421	Most Active Hour. . . . . .9-10 a.m.	
Total User Sessions 19,593	Accessed Using Netscape 22%	
Average Hits/Day	Accessed Using Internet	
(Monday thru Friday) . . 18,026	Explorer 73%	
Average User Sessions/	From Windows 95, 98 or	
Weekday 742	NT 91%	

Most Active Day of Week. . . . . . Wednesday

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