

Is it better to sleep or shut down your Mac?

By David Balog, Interrupt19, July 28, 2008

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Last week I had the opportunity to attend an Apple Professional Seminar. Aside from learning the nuances of many incredible new features of Leopard Server, The speaker said something intriguing. He said that for those shutting down the computers at night – “Bad Idea.” and that for energy efficiency, its better to leave a computer in sleep mode than to shut it down for the night. I’ve always held the logical thought that if something is off, its better for energy savings than something left in sleep or stand-by mode. So, I decided to research this claim and here are the results.

Beginning Arguments:

After researching this subject a bit, I began finding a few arguments people used to justify using sleep mode over shutting down. These arguments are:

1. Sleeping uses less energy to wake a computer than booting from shutdown.
2. Shutdown and Boot-up causes wear and tear on your Mac.
3. The Mac **must** run it’s maintenance scripts every night at 3am.
4. OS X is so stable and reliable that it can run forever without a reboot.

Let’s debunk these ~~arguments~~ myths because they are **all** not true.

Argument #1: Sleeping uses less energy.

This was the all powerful argument that the Apple Consultant used. It does make sense, that if it uses less energy than booting, it must be better. However, let’s look at reality:

First, for the facts on energy use, we review the following [University of Pennsylvania study](#) on the power consumption of desktops and laptops. For this article, we will concentrate on 3 machines. The Intel iMac from early 2006, The Early 2006 MacBook Pro and the Early 2008 MacBook Pro. Here are the following **facts**:

Early 2005 iMac G5 – Boot: 135 Watts, Moderate Use: 105 Watts, Sleep: 3 Watts.

Early 2006 iMac – Boot: 72 Watts, Moderate Use: 60 Watts, Sleep: 3 Watts.

Early 2006 MacBookPro – Boot: 59 Watts, Moderate Use: 26-38 Watts, Sleep: 2 Watts, Charging: 76 Watts.

Early 2008 MacBookPro – Boot: 52 Watts, Moderate Use: N/A, Sleep: 1 Watts, Charging: 41 Watts.

As you can see, the newer desktops and laptops have increased efficiency. That's a great achievement.

Now let's assume we are using our Macs in an office or school where they get around 8 hours of use in a day. We will also assume that during the day, they go into sleep mode (which is fine). That gives us 16 hours of down time. We will also take into account whether they were plugged in overnight or unplugged.

iMac G5:

Sleeping: 48 Watts.

Shutdown but plugged in: 16 Watts.

Shutdown with the power strip turned off: 0 Watts.

iMac Intel:

Sleeping: 48 Watts.

Shutdown but plugged in: 16 Watts.

Shutdown with the power strip turned off: 0 Watts.

2006 MacBook Pro:

Sleeping: 32 Watts.

Shutdown but plugged in: 16 Watts.

Shutdown with the power strip turned off: 0 Watts.

2008 MacBook Pro:

Sleeping: 16 Watts.

Shutdown but plugged in: 16 Watts.

Shutdown with the power strip turned off: 0 Watts.

Interesting to note the 2008 MacBook Pro uses the same amount of energy sleeping as it does shutdown and plugged in. However, for the laptops we need to take into consideration the amount of energy used to charge them. Its about 3 times as much energy than moderate use for the older MacBook Pro and 2 times for the

newer model. If left sleeping and unplugged overnight, we will have to assume at least a half hour of charge time during the day. Less for the newer model.

Basically, all this means is that when plugged in and sleeping, the computers use energy. The crux of the first argument is that it uses LESS energy to wake them up than it does to boot.

Debunking the Power Consumption Myth

According to our numbers, it takes 52-135 Watts to boot the Macs studied. What it doesn't account for is the time it takes. We'll use the lowest power consumption machine to illustrate this myth.

The 2008 MacBook Pro boots at 52 Watts, however the one I use goes from shutdown to ready in about 60-90 seconds. That means 60-90 seconds peaking at 52 Watts with a moderate use of 26-38 Watts (Battery charged). We will assume the same or better usage due to both increased efficiency and more powerful processing.

If it used 16 Watts to sleep and needs 15-30 minutes to recharge, it will draw 41 Watts. Now add 16 Watts for what it used while sleeping and we are at 57 Watts. (If it was sleeping over the weekend, that 16 Watts becomes 64 Watts!) Note that the 2008 MacBook Pro peaks at 52 Watts during boot which takes a total of 60-90 Seconds! This is with the most energy efficient model. The worst, the G5 uses 30 more Watts during boot than moderate use and drew 48 Watts while sleeping.

Note: These measurements were taken as the drawing of current. Meaning at boot, the MacBookPro peaked at 52 Watts during a 60-90 period in which peaked means that it wasn't constantly drawing 52 Watts. During sleep it was a constant draw of 1 Watt.

So as you can see, to summarize, if you shut down your Mac at night and unplug it from the wall (shut down the power strip) you will save 16 – 48 Watts during the week. 64-192 Watts over the weekend. During a 60-90 second boot time, the draw peaks at 12-30 Watts more than what it draws during moderate use (your work-day).

Does a 60-90 second draw of 12-30 Watts more than moderate use sound like it's using more than a 16-48 Watts of total use during sleep? No, it doesn't. If you add in the weekends, the loss becomes way more apparent.

Argument #1 is a myth, shut down the computer at night and **unplug it** to conserve the most energy.

Oh! and I almost forgot, this assumes that you will never reboot your computer, **ever**. Any negligible gains from sleeping overnight are tossed as soon as you reboot your machine.

Argument #2: Shutting down and booting up are stressful for your computer.

This argument basically states that shutdown and boot-up puts stress on components, making them more prone to an early failure.

According to Jonathan Koomey at the Lawrence Berkeley National Laboratory, who says in a [Wall Street Journal article](#), "PCs are not hurt by turning them on and off a few times a day." also in agreement is Michael Bluejay, who has over five years experience working for Apple Computer troubleshooting hardware. According to Mr Bluejay, "The useful life of a computer these days is only a few years anyway. The computer will become obsolete long before you wear it out, no matter how often you cycle it." ([Source, http://michaelbluejay.com/electricity/computers.html](http://michaelbluejay.com/electricity/computers.html))

If anything, the constant spinning of a hard drive when the computer is left on (not sleeping) causes more failure than turning it on and off daily. Yes, server drives are on all the time. However servers are in redundant RAID arrays because admins know that failure happens, and its quite common. Also the drives they put in servers are built tougher.

Constant motion also wears out fans and generates heat. LCD displays left on with a screen saver also wear out faster. Let's not even begin to discuss the issues of putting a sleeping laptop into a bumpy ride in your backpack. If the laptop opens up and it wakes while being bumped around, that's much worse than what it goes through at boot time.

Argument #2 is a myth. Shutdown and Startup will not ruin your Mac.

Argument #3: OS X and it's Maintenance Scripts.

OS X's UNIX heritage brought along a few maintenance scripts that run at 3AM until 5:30AM. Everyone thinks that these scripts must be run and they are so important that the computers have to be left sleeping for them to execute. So, in sleep mode they run.. right?

Actually, according to Apple themselves: "Mac OS X performs background maintenance tasks at certain times if the computer is not in sleep mode. If your computer is shut down or in sleep at the designated times, the maintenance does not occur." ([Source](#))

So, unless you are awake at 3AM-5:30AM and using your Mac, just kick them off manually by typing into terminal:

1. sudo sh /etc/daily
2. sudo sh /etc/weekly
3. sudo sh /etc/monthly

Argument #3 is a myth. The scripts don't even run if its sleeping.

[There's also debate whether you even need to run them at all.](#) If you want to run them, kick them off manually, or if you're a real power user, change the time that the cron-job runs to a time when you are using the Mac.

Argument #4: OS X doesn't need a reboot. Ever.

This one just isn't true. All OS's no matter how well written, need to refresh themselves every now and then. When I learned troubleshooting for an ISP, I learned that about 75% of all problems can be solved by anyone off the street. How? By rebooting the modem.

In my years of professional support for OS X, I've seen so many weird and unexplainable issues arise that a reboot solves. My theory is that its the applications themselves that screw up the OS and rebooting the machine refreshes everything. There's also been issues with OS X's Airport not reconnecting on

waking from sleep. To solve this? Reboot. Updates require reboots and so does some software installations.

Argument #4, without a doubt is a myth.

So, if you subscribed to Argument #1, which is honestly the only argument that makes any sort of sense, and thought that sleeping is better because booting the machine uses up “too much energy” don’t forget that you’re going to have to reboot that machine at least once a week. Possibly more.

Sure, you can shut down on Friday and start up on Monday (which you definitely should) but that still assumes that you’ll never reboot your Mac during the week and we all know that’s not likely.

Morale of the story:

When you go home for the night, Shut down your computer and turn off the power strip. At home, when you use the computer for even less time, shut it down when you aren’t using it anymore. Don’t forget to unplug it from the wall. Those chargers and transformers continue to draw power even when the computer is off.