What To Do When

A Power Surge Hits Your PC

It wasn't that big of a storm. You figured everything would be fine. After resetting the alarm clock and oven display, you didn't give the computer a second thought—until now. The printer is still on, the router downstairs is blinking away happily, but your PC won't boot up. You try several times, panic welling, but can't get it going. What's wrong? There are several possible answers, but most stem from the simple fact that you plugged that computer directly into the wall, bypassing the opportunity for both surge protection and uninterruptible power.

Power Protection 101

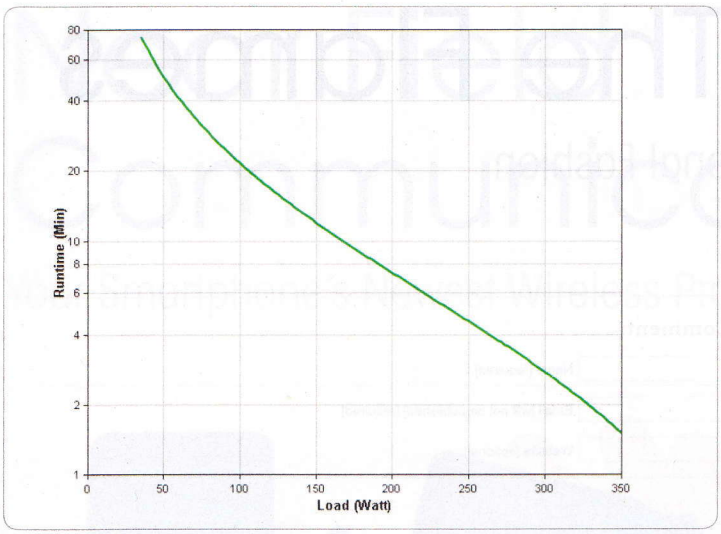
Before we start figuring out the problem and how to address it, let's get some terminology straight. Surges and spikes have very precise technical definitions. For our purposes, though, we'll include surges with the moderate to strong fluctuations that commonly afflict our electrical system. Short-term "surges" in power usually result from devices powering up and down, or from variations in power grid conditions. Spikes, on the other hand, are massive, sudden floods of power that can overwhelm the entire infrastructure (or at least a localized segment of it). Spikes are usually caused by nearby electromagnetic disturbances, including lightning strikes. The difference is important as you clarify your needs. All good surge protectors guard against small to moderate surges. Nothing will protect against a direct hit by lightning. Where your needs fall in between those extremes depends on your budget and the value of your equipment and the data on it.

A UPS (uninterruptible power supply) provides a cushion against a complete loss of power. We all know it's a bad idea to turn off a computer abruptly without allowing it to go through its proper shutdown process. A power outage, by definition, will shut everything off in an instant. If you're in the middle of something, even a basic UPS can give you a few crucial minutes for saving and shutting down. More advanced models work with specialized software and your PC to facilitate a graceful shutdown even when you aren't around.

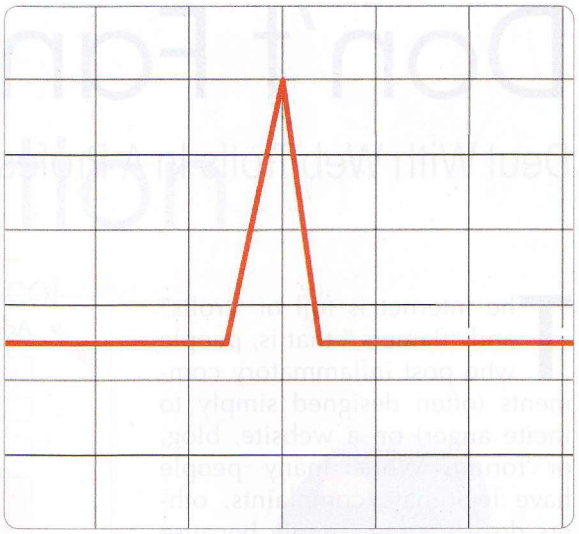
So how do you know what to look for? In surge protectors, a higher joule (unit of energy) rating and a lower clamping voltage are better. Also, a fuse or auto-disconnect provide better protection from spikes. Most UPS models also act as surge protectors, so you'll want to start with similar specs. Additionally, make sure a UPS provides enough wattage to support your system and enough time for you to bring it down.

After The Fact

Before assuming the worst about your PC, check to make sure other devices in the same room or on the same outlet are working. If your computer shows no signs of life whatsoever—nothing on-screen, no lights, no fans—then your power supply is probably ruined. With luck, the power supply blew first before the surge damaged any other components. You can replace the power supply pretty cheaply and easily, but you won't know for sure if other damage lurks beneath until afterward. If the power supply fan whirs to life (and/or case fans, too) but the machine emits an odd series of beeps, strange messages on-screen, or nothing beyond the fans, your motherboard is the most



An uninterruptible power supply can provide a few minutes of extra power in an outage, allowing time to turn off the connected systems and avoid damage from unexpected shutdown.



Surge protectors can block jumps in electrical voltage, which can help to save your PC's internal hardware.

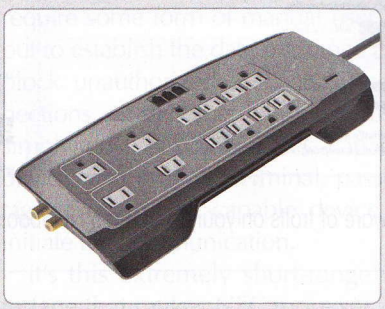
likely victim. On the other hand, if everything starts up normally for the first few seconds but then hangs when it's time for the OS to load (again, you may or may not see an error message from the BIOS [Basic Input/Output System]), the hard drive is probably fried. It's also possible that one (or all) of these devices might be damaged but not destroyed, resulting in unreliable performance or random crashes.

Recovery from this kind of situation primarily involves hoping fervently that your backups are up-to-date and then replacing damaged hardware. You did have automatic backups running regularly, stored on an external or network drive, didn't you? And you checked them periodically to make sure they were running successfully, right? If so, start by checking backups (from another machine or location) and make sure they're intact. If they are, you have a lot less to worry about: A hard drive is much easier to replace than a year's worth of proposals, reports, and emails.

As you follow the troubleshooting steps outlined above and identify affected hardware, add each component to your shopping list. If you suspect that multiple components have been damaged, you can replace them one at a time, starting with the power supply, testing in between each to determine what can stay. In a best-case scenario, you'll be able to start up and use the hard drive long enough to extract any data that wasn't already backed up. Alternatively, especially if your backups are current, it may be just as cost-effective (and quicker) to replace the entire system. That's not a pleasant pill to swallow, but it can serve as a useful reminder of the important role played by surge protectors and uninterruptible power supplies, not to mention the advisability of keeping current backups.

If your computer contains sensitive information that you wouldn't want to lose, we suggest that you at least invest in a surge protector for each system. Those concerned about damage to hard drives and other components from unexpected shutdowns should consider an uniterruptible power supply.

Changing The Guard



Even with a high-quality surge protector or UPS in place, you won't be totally immune from damage and costs associated with electrical vagaries. Surge protectors expend themselves to protect your more valuable equipment, placing themselves in front of your system and taking the brunt of the impact. This means, however, that once they've done so, they've now sustained damage and need to be replaced. After any major event, check the unit to see if it feels unusually warm or provides unreliable power. Devices with indicator lights should continue to display normally; otherwise, they should be replaced.

When it's time, give these devices a well-deserved pat on the back and then drop them off at an electronics recycling center. Don't hold on too long out of misguided thriftiness or simple denial—a worn-out surge protector or UPS is no more useful than none at all.