

Protecting Technology From Lightning Damage

George D. Bigham

A

s our own company, Bigham Technology Solutions, Inc., recently worked to recover from lightning damage,

we decided to share some tips for your business in this issue's technology column. The following was written by my husband and business partner and head geek at BTSI – I know you will find some tips useful for your own planning and technology protection. – Vicki Smith Bigham, NSSEA Ed Tech Consultant

Savvy computer users know that one of the purposes of using surge protectors and/or UPS's (Uninterruptible Power Supplies) is to protect computers and other equipment from damage caused by fluctuations in electrical power coming into their business or home.

But many computer users do not realize that television cabling, Ethernet (network) cabling and even telephone cabling can also carry damaging electrical signals. Protecting valuable equipment against damage caused by electromagnetic pulses (EMPs) requires additional precautions.

Here at BTSI, each computer is protected by a UPS. Recently a major electrical storm caused a lightning strike near our facilities. While there was no direct hit (thankfully!), an EMP was generated by the lightning strike, and it was strong enough to damage a lot of our computer equipment.

Three desktop computers each required a new Ethernet card. Two laptops had to be replaced because their Ethernet is a chipset on the main logic

board. It made more sense to replace them than to replace the main board. A physicist friend explained that the Ethernet port acts like a fuse when the transient pulse travels down the network cabling. The Ethernet gets fried and, in doing so, prevents damage to the rest of the computer.

Both routers had to be replaced, and the DSL modem also was damaged. Additional protective devices have now been installed to guard against a recurrence of this event. You should profit from what we have learned before this happens to your computer installation.

Of course if the equipment had been unplugged from the network (as well as from telephone lines and TV cable), there would have been no damage. This is always a smart precaution to take when electrical storms threaten.

Protecting Television Sets

To frame the discussion for protection of your computer equipment, let's start with looking at the same precautions needed in homes. Most homes have expensive television sets connected to either cable service or satellite dishes. This equipment may be even more costly to replace than computers found in the home and so should also be protected.

Here is an example of one device to purchase. It is an APC Premium 11



Outlet SurgeArrest Performance Surge Protector, APC Part Number PF11VNT3. It should be available at your local Fry's

or most other computer stores and can, of course, be purchased online, generally for less than \$40. It is available at Amazon.com. Search for "APC Premium Surge" in the Electronics section.

This is a very useful device, and you may need several of them. This is the end of the APC device that goes into the wall. It is a standard 3-prong male electrical plug.

The grounding prong (that's the round one) carries

3-prong male electrical plug



all the bad electricity and sends it off to ground. The point here is that if this plug is connected to a 3-for-2 adapter, which is in turn plugged into a 2-prong wall socket, then there is no path for the bad electricity to go to ground—and there will be no protection.

You may be saying "This is so obvious!", but this "work-around" has been observed many times at client locations. If there are no 3-prong (grounded) wall outlets available, an electrician needs to be brought in to modify an existing outlet or install a new grounded one.

Here is how to protect your television set using the APC device:

television connections



- Unplug the coax cable from your television and plug it into the "SAT/ CABLE IN" socket.
- Using a second coax cable of an appropriate length, plug the first end into the "TV/DSS OUT" socket.
- Then plug the remaining end into your television set.
- Don't forget to re-plug the power cord from the TV set into the APC Surge Suppressor.
- Also re-plug the power cords to the DVD player, the Stereo Receiver and all other devices.

Congratulations – your TV set is now protected from both kinds of electrical damage!

Protecting Cable Modems

If your broadband Internet connectivity is supplied by your TV cable company, then there is a cable modem installed. It will have the same type of coax cable

coming into it. Protect it following the steps above, just as you did for your TV set.

Protecting DSL Modems

If your broadband Internet connectivity is supplied by your telephone company, then there is a DSL modem installed. Unplug the telephone wire from the DSL modem and replug it into the "TELEPHONE WALL" socket on the APC device. Using an additional telephone-type cable, connect the first end to the "TELEPHONE MODEM/FAX/PHONE" socket and the remaining end into the DSL Modem.

Remember to plug the power supply for the DSL Modem into the APC device.

Protecting The Network

Locate the Ethernet cable coming out of the cable or DSL modem. Plug the other end of it into the "NETWORK WALL" socket. Using a second Ethernet cable, connect the "NETWORK COMPUTER" socket into whatever device was previously connected to the modem.

In a one-computer installation, that will be the computer. In a multiple-computer setup, it will be a router or hub that in turn connects to the computers.

Protecting Laptops When Traveling

This is the Belkin Travel Surge Protector - Model Number F9H220-TVL. Just

Belkin Travel Surge Protector



plug this or a similar device into a grounded outlet. It provides two additional electrical outlets, one on each side.

Next, plug the Ethernet cable from the wall into the "In" port and use a second Ethernet cable to connect your laptop to the "Out" port.

Be sure to plug your laptop power supply into one of the electrical outlets provided.

The Belkin Travel Surge Protector is available at Amazon.com for about \$14.00. Search on "Belkin Travel Surge" in the Electronics section.

Warranties and Registration

Both manufacturers identified in this column guarantee that their equipment will protect your hardware from electrical damage and say they will reimburse users for any equipment damaged while protected by their devices.

- A) Read and carefully follow the instructions provided with these items to be sure they are installed according to the manufacturer's specifications.
- B) Be sure to register your ownership of the devices so that you have warranty coverage.

Final Notes

These safety devices are each good for exactly one incident. Replace them immediately after each incident in which there has been damage. If a power surge causes the APC surge suppressor to trip, you can just re-set it. But if there are burned areas or the gear smells smoky or heat-damaged, then it is time to replace it.

And remember: Murphy prefers easy targets. Once your equipment is protected, lightning will never come anywhere near your installation. Murphy will send the lightning down the street or across town somewhere!

George Bigham is Vice President of Bigham Technology Solutions, Inc., a Houston-based consulting firm. He has over 30 years experience in textbook and software sales and training, technology system troubleshooting, database design and product development. You may contact George at bigham@aol.com or 281.866.9726.