

## Tech Talk Episode 6: Computer Breakdown

[Music plays]

**Singer:** Talkin' 'bout what to do when your computer gives you the blues  
Steps to take for your mistake,  
Who to call when you hit the wall  
How to fix it or should you stick it in the garbage on the way out the door

[Tech Talk intro plays]

**Susan:** Hell, and welcome to Tech Talk, from the University of Minnesota. I'm your host, Susan McKinnell. Technology is all around us, and it's a challenge just to keep up. This program is designed to give you some insight into the technology we use every day. Today we're talking about, as if you hadn't already guessed, computer breakdown. You're probably saying, "I know all about that, it's when the computer doesn't work anymore!" And you're right, that's what happens when all your preventive efforts fail. But who should you call for help? And what should you know when you make that call? And is there any trouble shooting you can do? See, there's a lot more to computer breakdown than you might have imagined. Some of the terms we'll be using today include UPS, virus definitions, and hard drive. When a computer breaks down, the causes are many. You might eliminate some of them with just a little preventive maintenance. Professor Joe Konstan comes from the U of M's Computer Science and Engineering. He's author of the book, *Word of Mouse*, as well as numerous articles on computer usage. He specializes in problems of computer usability, or human computer interaction. Which is really important when the computer breaks down! Welcome to Tech Talk, professor!

**Professor Konstan:** Thank you, it's good to be here.

**Susan:** Can you tell me what are some basic things I can do to keep my computer healthy?

**Professor Konstan:** Sure, let's break it down into two categories. There's the hardware of the computer, where the two biggest things you can do to keep your computer healthy are; one, be healthy about what goes into it. And that's primarily power. So one of the things you want to do with any computer, particularly a desktop computer, is to protect its power supply. I recommend getting an uninterruptible power source, or a UPS.

**Susan:** And we have some of those over here.

**Professor Konstan:** Yes, we have some here, and on the back you can see that any of these pretty much look the same. They have places to plug your computer into that are the protected outlets, which is if the power goes out, will keep your computer running for a few minutes. They also let you plug in your telephone line or network line to prevent lightning strikes or other things from creating surges that will go into your computer. There are also cheaper surge protectors that can do a good job protecting against a

lighting strike or a surge on the line, but they won't help your computer if the power goes out.

**Susan:** So that's what we have on the left? The surge protectors?

**Professor Konstan:** Exactly. Now the other thing which is very similar to this is to make sure that the computer shuts down properly. The main reason you want a UPS is to stop the possibility that while your computer's running, while something is writing to the disc, the power goes out and the head crashes against the disc, destroying your data and creating a big problem. On the other hand, power problems, and hardware problems in general, are fairly rare. I think the bigger challenge with computers is keeping them protected on the software side. And for that the biggest thing you can do is worry about good virus protection. I know every computer I have is running some version of a virus protection software package that will check all of the files I have, check all of the e-mail, I receive and any disc I put in, just to make sure that there isn't some program loaded on that disc or attached to that e-mail that's going to cause damage.

**Susan:** Now we've got an antivirus program on this computer right here. Why don't we take a quick look at it.

**Professor Konstan:** Sure. This is the one right here in the corner. This one happens to be Norton Antivirus. There are a couple things that are quick that you can look at. Over here on the left you have certain things you can do when you want to, like scanning a disc or scanning your whole computer. I tend to set it up so it scans my computer once a night, just to be safe to see if something happened. But the other thing you can do is set it up to see how up to date your protection is, and- Oh my! On this machine the virus definition file was last updated in September! Actually, if you don't mind, I can take the time to show people what it looks like to update it.

**Susan:** Absolutely. I think that's a great idea.

**Professor Konstan:** I'm just telling it to go into update and it's coming back and saying, "do you want to see what updates are available."

**Susan:** I know that we've set before that it's a good idea to update your viruses once a week.

**Professor Konstan:** Yeah, that's a pretty good timing, and if have a computer that's on the network all the time, then I normally would recommend that you set it to do it atomically. With a laptop computer like this one, if your traveling and your dialing up from a hotel room phone, you may not want to update it there. But make sure you update them before you leave on a trip and when you come back.

**Susan:** So it's all done already.

**Professor Konstan:** Well, it going to finish by installing the files that actually define the types of viruses it knows to look for. One of the things these programs do well is respond. When somebody writes a new virus, the companies write a new definition to help you find that virus and protect against it. And in just a second it's going to show that it's been updated recently. But those are the big things you can do to protect your computer.

**Susan:** Now, it seems to me that a lot of problems occur after software's been installed- while we're talking about software. Why is that?

**Professor Konstan:** Well, the big challenge with computer software today, people who may have learned to program ten or twenty years ago thing about a computer program. Well, that's not actually how software today is shipped. It's a whole bunch of little pieces that are out there. And your computer has installed, for a simple program like a word processor, it may have thousands of different programs that are pieces of that software. From the definition of the text fonts that show up on the screen to how that program talks to your printer. And every time you install a piece of software, it may update some of those pieces, which unfortunately may make an older program which you installed unhappy. It's sort of like if you had a kitchen with all of your appliances and everything worked really well, and you bought a new blender. And as part of buying a new blender, it said, well while we do this we're going to change all the outlets and switches to match your new blender, and now your toaster doesn't work anymore.

**Susan:** So they're sharing these files, and if one of the files change, one of the programs that's using it might not be able to work anymore.

**Professor Konstan:** Exactly. And there are two things that you can do that are very important there. One of the things is always make backups of what you have, especially before installing anything new. Backups of your data files are the one thing you really can do to prevent problems on computers. People may blame themselves if the computer burns out, but that's not their fault. Normally there's very little you can do to hurt a computer short of dropping it or taking it in the bathtub. But it is your fault if you have a computer and you put all sorts of tax returns or work or school or the office on it and don't bother to make a back up, either onto another disc or a floppy disc or CD.

**Susan:** Or any work that you're doing on a computer, even if it's not for business if it would take a really long time to recreate your files.

**Professor Konstan:** Absolutely. Some of these things are things that people invest weeks, months, even years in. But the other thing you can be careful about is trying to install software the way it's designed. Most software, on PCs and Macintoshes, includes an uninstall option. If you install something and suddenly things don't look right, you can uninstall it and see if things work again the way they should.

**Susan:** Another software issues is updates. I know that I'm always getting notices that I should update this or update that. Should I be doing this?

**Professor Konstan:** It depends a lot on what kind of computer you have, and what kind of update it is. For your programs themselves, if you find out that you've been using Microsoft Excel, the spread sheet, and a new version comes out and you'd really like to use the new version because it has a neat feature, it's pretty safe to go and update to the new version. The only time that could cause a problem is if you have a very old computer, the new version might be a little slower, because computers have gotten faster and you might feel you need to add memory or update your computer to be a faster one. But that's not that common. The other updates that show up that you should install are patches for improved security or improved performance.

**Susan:** For your operating system. Like a Windows or a Macintosh update.

**Professor Konstan:** Exactly, and some times for your programs, like your Web browser this will often come up. Now there's a different situation when it comes to the latest release on an operating system. So when your Mac or your PC comes out with the next great operating system, for instance, my laptop was running Windows 2000, and the question came, should I move it to Windows XP. For desktop computers, I find it's probably pretty safe to upgrade the operating system to the next version. It's been pretty well tested, things seem to work.

**Susan:** But you need to make sure you've got the basic minimum requirements, as you mentioned, with memory and so forth.

**Professor Konstan:** Absolutely, and I'm not sure I would keep a desktop computer through many, many upgrades because it'll get too slow. With laptops, though, things are a little bit different, especially in the PC world. Each laptop is really very carefully built to match the capabilities of the operating system it was shipped with. My experience has been that the computer never quite works the same if you take the operating system off and put another one on. Perhaps this is somewhat because I like to get new laptops every few years, but I skip one update, let it run the old version, and by the time the next one comes out, I'm thinking, "gee I could use a laptop that's a little faster, and maybe has a little bit larger screen," and I get a new laptop.

**Susan:** Great excuse for a new computer, isn't it?

**Professor Konstan:** And we always need a great excuse for a new computer.

**Susan:** That you so much for being here with us today.

**Professor Konstan:** My pleasure.

**Susan:** So that's the "before" picture of computer breakdown. But what happens when you sit down, turn on the computer, and nothing happens? Well, if you're at the University, you call the Computer Helpline.

**Bob:** Ok, I hope that helps. Alright, buh-bye.

Now, help lines are a wonderful thing. But you have to remember that the person on the other end of the line can't see, hear, or touch your computer. So you have to explain to them how your computer's not working. Now to make your call more successful and to get that quick fix, you should do a little homework before you call. Let's go through a checklist of what you should do and look for before you call the help line.

First, look for the simple things, like is it plugged in? I know it sounds ridiculous, but you'd be surprised how many times that fixes the problem. Check the cables a loose cable can cause all sorts of problems. Unplug your power, keyboard, mouse, monitor, modem, and printer cables, and plug them back in again to make sure their nice and tight.

Turn everything off. Power everything down, take a break, and come back and power everything back up. This will often clear up simple problems.

Take a step back. Try to remember exactly when the problem occurred, and what you had done just before it happened. Had you installed a new piece of software that might be causing conflicts inside the machine? Is a new piece of hardware incompatible with other hardware? Try removing the hardware or software and see if the problem still occurs.

Check the manufacturer's Web site and see if there are any downloadable patches that might fix the problem for you. These patches are very easy to download and install.

If you still have a problem after you've gone through the checklist, give the appropriate helpline a call. Make sure you tell them all the troubleshooting steps you've already gone through. Now not all problems can be solved over the phone. As good as helpline staff are, you may have to take your computer elsewhere to be repaired. And remember, if all else fails, you can do what I do! Put your computer on your head and dance around the room!

**Susan:** And there's someone at the help desk seven days a week. In fact, Leonard Miller works at the desk when he's not bust writing computer programs. But we've got Leonard here because he actually fixes computers. He was working at the University computer services even before he got his degree in computer science. He's been using computers since he was five, but he never got a chance to open them up and take them apart until he got here. Leonard, it's nice to have you with us!

**Leonard:** Thank you.

**Susan:** Now at the University we have a wonderful helpline, but what does the rest of the world do when their computer breaks down? Are there other help lines they can call?

**Leonard:** Yes. There's help lines for your Internet service provider, the software manufacturer for the product that you're using, and for the computer itself. You have Apple Computer, or you could call Dell for support, you could call your Internet service provider if you have trouble connecting.

**Susan:** But who would you call depending on the problem?

**Leonard:** It's important that you understand the problem and where the problem lies so that you can call the right helpline. If you call the wrong helpline you could waste a lot of your time waiting on hold.

**Susan:** So if I can't connect to the Internet, I shouldn't be calling Apple...

**Leonard:** Correct. Or Dell, or whoever-

**Susan:** Or whoever made my computer. I should go to my Internet service provider. Being able to localize and figure out where the problem is, is really an important step. What do you think about Bob's tips?

**Leonard:** I think he's got it right on. One thing I could expand on is, when you take a break, taking a break is not only good for the computer, but it's also good for you to sit back. If you're getting frustrated, come back an hour or two later when you're not so frustrated, and you're not as likely to make it worse.

**Susan:** And sometimes you might have a more open mind coming back to things! Now, are there any instances where you don't want to mess with things on your computer? When things aren't going right and you may want to stop entirely?

**Leonard:** The biggest thing when you don't want to play with your computer anymore is when you want to recover all your data and not lose anything more.

**Susan:** So when you've got a situation where you think you may have lost something, like a document?

**Leonard:** When you've lost a document, the most important thing to do is absolutely nothing. Turn your computer off the right way and don't touch it again. Let someone who knows what they're doing try to recover the file. Usually that would mean bringing it in to a repair shop.

**Susan:** And when you mean absolutely nothing, that means not going onto the Web to look for answers.

**Leonard:** Correct. I've had a customer who actually thought she was doing me a favor by copying zip discs worth of information on to her computer, and therefore deleting everything I had hoped to recover.

**Susan:** And the reason for this is, let's say I accidentally deleted something, and even delete it out of the trash and suddenly realize I want it back.

**Leonard:** The way the computer does this, is the hard drive is just a blank page and at the beginning there's just an index that says from point A to point B there's a file here. And when it deletes a file, it doesn't do anything between point A and point B, it just deletes the index. And then it just says this is now available for use by everybody else. So if you don't do anything, the "everybody else" can't use that space.

**Susan:** So it can't cover over what you're trying to recover. You may have noticed that we have this open computer right in front of us. Because you're so used to opening these up, I'd really love it if you'd open this up and show us a few things.

**Leonard:** Sure. Basically we just have the floppy drive here, and then a CD-ROM drive. And this is your power supply.

**Susan:** Now when we start this out, we need to say that this is not something you want to be doing at home.

**Leonard:** Correct.

**Susan:** We have a professional here!

**Leonard:** You should never do this unless you know what you're doing and how to open up a computer. In here we have PCI cards, and this is a video card. You have memory, your processor, and your hard drive.

**Susan:** Now, the hard drive, of course, is where all your information is stored.

**Leonard:** I've actually taken the time to open up this hard drive. Now when I opened up this hard drive, I've basically destroyed it for any further use.

**Susan:** So this is an old computer that we're just using?

**Leonard:** Yes, this is an old computer. Now right in here in the hard drive, we have the disc, and there's actually three discs here. I don't know if you can see it, but all your data is stored on it, much like a record player. And this little arm, which moves back and forth, is just like the needle on a record play, and reads the data in the same manner. And if you turn the computer on, you can see it spin up and you can see the arm move.

**Susan:** There we go! Let's see what happens. And there's that disc going. That's obviously why it's called a hard disc, because it's literally a disc that is hard.

**Leonard:** Yes.

**Susan:** So how fast is this going?

**Leonard:** This is spinning at fifty-four hundred RPMs. This is actually one of the slower drives. They make them up to ten thousand, fifteen thousand, even.

**Susan:** I suppose I'm dating my self here, but that's a little bit faster than a seventy RPM record player!

**Leonard:** Yes.

**Susan:** And how much information would fit on this particular hard drive?

**Leonard:** I think this particular hard drive is a two gig hard drive.

**Susan:** Ok, two gigabytes of information.

**Leonard:** So it's not a very big one, but I didn't want to destroy the latest eighty gig hard drive.

**Susan:** What are some things- should I go ahead and turn this off?

**Leonard:** Sure

**Susan:** What are some things that can hurt a hard drive? I was talking with Joe earlier, and he mentioned that it's good to have an uninterruptible power source. If the power goes out when you're in the middle of writing something onto the hard drive, what can happen?

**Leonard:** A couple of things can happen. One, if you're in the middle of writing it, whatever your writing was lost, or at least corrupted, and you have no idea how good that data is anymore. If you're luck that's all that happened to that data, that whatever you were writing is bad. If you're not so lucky, in the hard drive, that little arm spinning back and forth will cause some sort of damage on the disc, because the power was cut out unexpectedly. That usually presents itself in the form of a bad sector when you're running Scan Disc or in a disc utility.

**Susan:** Now I've had computers where I've had to pull the plug for some reason, and when it restarts it automatically does a scan.

**Leonard:** That is Scan Disc. That's Microsoft's way of trying to prevent the software problems from becoming bigger problems.

**Susan:** And the same thing happens on a Macintosh computer as well. And it should let it do that? Because it always gives me an option to turn it off.

**Leonard:** Yes, you should. It doesn't hurt any thing, and it just takes a little bit of time. It's just scanning, doing its thing.

**Susan:** So these hard drives really are kind of fragile! You need to be careful with them. Great. Now, is there anything else that people should think about when they're trying to take care of their computer?

**Leonard:** One thing that has caused a number of problems in the repair shop is dirty computers. Now when you close the machine up, I'll unplug it here, when you close the machine up, everything is really compact in here. There's a lot of cabling, and if you have lots of dust bunnies, or even smokers are worse, this all fills up with dust. Then the air can't flow and the machine gets hot. Now it probably won't overheat and fail on you immediately, but it shortens the life span of the computer, and the components inside of it.

**Susan:** Now that doesn't mean I should be opening up my computer and vacuuming it out, right? But I just should be keeping the room clean?

**Leonard:** Keep the area around it clean of dust, and like I said before, smoking. I've seen machines where the whole fan- inside the power supply here there are fans that spin- and the bearings and everything inside the fan got gummed up by the cigarette smoke.

**Susan:** Oh, that's awful!

**Leonard:** It was really gross.

**Susan:** Well, that you very much for being with us today, Leonard!

**Leonard:** No problem!

**Susan:** We got lots of great information. That's all we have time for in this session of Tech Talk. We've covered quite a lot of information concerning computer break down. Some of it we don't want you to forget, so here's some highlights-

### **For Your Files**

**Susan:** To keep your computer healthy, Professor Konstan says,

**Professor Konstan:** Be healthy about what goes into it. And that's primarily power. So one of the things you want to do with any computer, particularly a desktop computer, is to protect its power supply. I recommend getting an uninterruptible power source, or a UPS. Now the other thing which is very similar to this is to make sure that the computer shuts down properly. I think the bigger challenge with computers is keeping them protected on the software side. And for that the biggest thing you can do is worry about good virus protection.

**Susan:** Professor Konstan suggests that before you update a computer program:

**Professor Konstan:** Always make backups of what you have, especially before installing anything new. Backups of your data files are the one thing you really can do to prevent problems on computers. The other thing you can be careful about is trying to install software the way it's designed. Most software, on PCs and Macintoshes, includes an uninstall option. If you install something and suddenly things don't look right, you can uninstall it and see if things work again the way they should.

**Susan:** Leonard Miller, the technician who actually fixes computers, warned:

**Leonard:** When you've lost a document, the most important thing to do is absolutely nothing. Turn your computer off the right way and don't touch it again. Let someone who knows what they're doing try to recover the file. Usually that would mean bringing it in to a repair shop.

**Susan:** Leonard also advised that if you're on your computer when the power goes out:

**Leonard:** If you're in the middle of writing it, whatever your writing was lost, or at least corrupted, and you have no idea how good that data is anymore. If you're lucky that's all that happened to that data, that whatever you were writing is bad. If you're not so lucky, in the hard drive, that little arm spinning back and forth will cause some sort of damage on the disc, because the power was cut out unexpectedly.

**Susan:** For more information about this and future Tech Talk episodes, stop by our Web site. The address is [www.techtalk.umn.edu](http://www.techtalk.umn.edu). If you want to review this program, or missed one of our past Tech Talk episodes, we have streaming video files available for you online. And feel free to submit a question or comment on our viewer feedback form.

And until next time, I'm Susan McKinnell.

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