Notebook Computers Go Live on the Desktop

Do you still need a big desktop computer? Many corporations have switched from desktop systems to notebook computers. Generally they cost more, but they come with significant advantages.

A large corporation I'm familiar with issues notebook computers to all of its employees, even software developers. Most people have Windows computer from HP, but those who travel a lot have Microsoft Surface tablets and those who can justify the expense will be issued Macbooks.

I am not a large corporation, but I recently experienced the challenges of switching from a desktop system to a notebook. Overall, I'm happy with the choice, but there were some frustrations along the way.

The desktop computer that was being retired had several terabytes of internal storage on 4 disk drives — one solid-state boot drive and 3 standard hard drives. No notebook computer could ever be fitted with that much storage, so I purchased an Orico 4-bay external USB3 disk enclosure. The faster transfer speeds provided by USB3 (or USB-C or Thunderbolt) are what made the transition to a notebook system feasible.

Transfer speed is important because I work with photos, audio, and (occasionally) video. That's also why the desktop computer had a fast multi-core Intel i7 processor and 32GB of RAM. The notebook is powered by an Intel Xeon CPU and has 64GB of RAM. The built-in solid-state drive is relatively small — just half a terabyte — but only the operating system and applications are installed there.

Which Computer?

I selected a Lenovo Think Pad for several reasons.

First, Lenovo (successor to IBM) has a good reputation, my wife's Lenovo notebook is reliable, and my secondary computer (a Lenovo notebook) has worked well. The Think Pad series is Lenovo's high end of notebook systems; had I been looking for a computer to handle word processing, spreadsheets, email, and web browsing, there would have been no need to select components based on speed.

The built-in monitor has 4K resolution, but I planned to run it with the case closed and use the two 1920 x 1080 displays that had been connected to the desktop system. This proved to be a minor challenge because the computer kept going to sleep whenever I closed the case. I also found that the Lenovo docking station has two HDMI ports, but they can't be used at the same time. To connect two external monitors, I needed to use one DVI port and one HDMI port.

Long Boots & Sleepy Disk Drives

Initially there were some problems at startup time. The boot process consumed more than half an hour in some cases, but much of this may have been Microsoft updates running in the background.

A Windows update in late September resolved most of those issues and left we with a powerful, portable computer that works well for all the tasks that it must perform.

The only small problem remaining is that the external drives enter a type of sleep mode if they aren't used for a few minutes.

When that happens, the drives take about 30 seconds to wake up. This can be frustrating, but it's not a show stopper.

A solution exists, of course, but it's not in Power Settings where you might expect to find it. Instead, it's in the Device Manager. Even there, it might not be where you expect it. Instead of looking under Disk Drives, expand the Universal Serial Bus item and disable the setting labeled "Allow the computer to turn off this device to save power."

The USB drives will be attached only when the computer is running on AC power, so it's pointless to use a battery-centric setting.

You may need to change this setting for several devices including generic and superspeed hubs, mass storage devices, root hubs, and extensible host controllers.
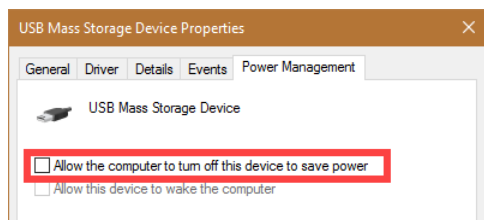
USB Everywhere

IF YOU'RE OLD ENOUGH, YOU MAY REMEMBER WHEN USB 1.1 WAS RELEASED. YOU'D PLUG A USB DEVICE IN AND CROSS YOUR FINGERS. MAYBE IT WOULD WORK AND MAYBE IT WOULDN'T.

Then came USB 2 and now USB 3. Serial and parallel ports are long gone and even USB 3 is being threatened by ever faster interfaces. But for now, we live in a USB world.
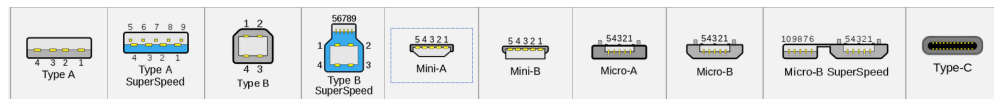
When combined, the ports on the notebook computer and the docking station for the notebook computer that replaced an enormous desktop system total 8 USB 3 ports, but I need a 10-port USB 2 hub and a 4-port USB 3 hub to run all of the attached devices.

In addition to that, I have a USB 2 switch that allows me to switch up to 4 USB devices between 2 computers. That means I can connect a keyboard and mouse to my computer or to a small notebook computer that sits behind my computer and provides access to a client's network.

USB 1.0 was rarely seen in the wild. If somebody tells you that they remember USB 1.0 they're either lying or uncommonly well connected. USB 1.1 was the first generally available release and ran at 1.5 Mbps or 12 Mbps, depending on the device. That was fast in 1996.

USB 2 was released in 2000 and increased the speed to 480 Mbps. USB 3.0 offered 5 Gbps starting in 2008 and 3.1 pushed that to 10 Gbps in 2013. These are fast enough to allow external USB hard drives to be used for processes that demand quick disk performance. Video, for example.

Thunderbolt is different and so are USB 3.1 and USB-C. Developed at roughly the same time as the USB 3.1 specification, USB Type-C was finalized in 2014 and defines a new small reversible-plug connector for USB devices. The Type-C plug connects to both hosts and devices so it replaces the silly batch of Type-A and Type-B connectors.

Some (not all) of the USB connection types currently in use are shown below.

Intel developed Thunderbolt. Thunderbolt 1 and 2 use the same connector as Mini DisplayPort (MDP), while Thunderbolt 3 uses USB Type-C. It was initially developed as "Light Peak".

Some people say that we need standards. We have standards. Lots of them. Maybe too many standards.

Notebooks or Desktops?

DESKTOP SYSTEMS USE MORE POWER, BUT ARE EASIER TO EXPAND AS NEEDED. NOTEBOOKS ARE QUIETER, USE LESS POWER, AND ARE PORTABLE. WHICH IS RIGHT FOR YOU DEPENDS ON YOUR NEEDS.

For me, the notebook system appears to be a reasonable replacement for the desktop system. I like the fact that it's smaller, quieter, and uses less power.

When I use the system outside the office, I will need to copy files from the hard drive stack to the computer's internal drive or to an external hard drive. Those are the same issues I would have needed to address with a desktop system and a separate notebook.

So if you're thinking about switching from an old, reliable desktop system to a notebook computer, expect success, but be prepared for a little rough going. Ω

Backup: Important

OOPS. MY DISK IS MISSING.

Something happened. It might have been something I did. It might have been a power fluctuation (even though everything is powered by a UPS unit). It might have been that one of the fairies dancing on the head of a pin fell off. Who knows! What I did know was that Windows suddenly told me that drive F could not be used until it was formatted.

Drive F houses music, the Lightroom Catalog, and a few other files that don't change very often. It's one partition on a drive with two logical drives.

The other logical drive was fine, so the drive was clearly not failing, but where had everything on drive F gone?

The Windows partition manager reported it as "raw", meaning that it was a section of the disk that looked like it had never been formatted. Formatting the partition would restore the drive, but delete all the data.

I had two choices: Format and restore from backup or use a partition editor such as PartEd Magic to fix the partition but not format it. The choice I selected may surprise you: I decided to format the drive and restore from backup.

Had this been a drive where changes are frequent (D, my primary data drive, or E, the website development drive), I would have reached for the bootable USB drive with PartEd Magic on it. But I have added no new music for months and only one image had been modified in Lightroom in the past few days.

Formatting took a few minutes. Restoring from a local backup that was less than a week old that I store at the office took about 2 hours. Then I restored the Lightroom Catalog from CrashPlan to make sure that the most recent image modifications had been recorded.

Why not PartEd Magic? That probably would have been faster, but I would always wonder if one or more of the files on the drive had been damaged at the same time the partition became unusable. Although the format-and-restore process took longer, I'm more confident that all of the data on the drive is exactly as it was before whatever happened happened. Ω