



MCCC News



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Peripheral Connections Explained

If you're not sure of the difference between USB-C vs. Thunderbolt 3, or between USB 3.0 vs. USB 3.2, you're not alone. But mind you, that's a small problem to have. Not so long ago, we had to also deal with a myriad of other peripheral connections types, like FireWire, eSATA, and so on.

This post will help you understand the current state of modern connection standards—namely USB and Thunderbolt—so that you can plug one device into another with confidence. There are two things to keep in mind: connection types and connection standards.

Connection type: How things fit

To connect a device (like a portable drive) to a host (like a computer), you need a cable. Like all cables, it has two ends, which are male connectors or connectors for short. One end goes into a host, and the other goes into the device itself. The hole the cable's end plugs into is a female port or port for short. The configuration of a port determines its type. Each port type has its corresponding connector.

USB-C port type is the new norm

Most modern devices use USB Type-C (or USB-C for short) port type. In this case, both ends of the connecting cable are the same: they

are USB-C connectors. It's super convenient. You don't need to figure out which end of the cable goes into the host and which is for the device. The USB-C port also features reversible plug orientation, meaning you can plug the cable in with whichever side up or down.

What's more, USB-C also works as the power connector for large devices, like a laptop—the machine won't need a dedicated power port anymore—and it can deliver power both ways. So, for example, when connecting two smartphones using a USB-C cable, you can share data and power between them.

This convenience is available to the latest USB standard and Thunderbolt 3, which also uses USB-C port type. In other words, when all of our devices support USB-C, which is the way of the future, there's no need to worry about what cable to carry anymore, since there's just one type of cable. Well, almost.

Port types: Thunderbolt 3 vs. USB-C

All Thunderbolt 3 ports work as a USB-C port, but not vice versa. As a result, you can plug a USB-C portable drive into a TB3 port, and it will work as intended. However, a TB3-only device, like the Samsung X5, will not work when plugged into a USB-C port, even though its cable fits perfectly. The reason is TB3 has more requirements. There's more to a TB3 connection than a USB-C one.

As for the connecting cable, all TB3 cables work as USB-C cables, but only high-quality USB-C cables can also work as TB3 ones. "Low quality" ones might work but at a much slower speed or are just unreliable. For this reason, a TB3 cable tends to come with the TB3 symbol, and that's the only way one can visually distinguish one from a USB-C counterpart.

Legacy USB port types

Since there are billions of existing USB devices on the market, it's essential to support them. And as a result, for the foreseeable future, chances are you'll run into older USB port types. In this case, remember that, now, the connecting cable has two different ends.

USB Type-A

The end that goes into a host is called a USB Type-A connector. This connector and the corresponding port type—the USB-A female port—remains the same in all USB standards, at least for now. However, there are two USB Type-A versions:

- USB Type-A: Used in USB 1.1 to USB 2.0 and supports speeds up to 480 Mbps.
- USB Type-A SuperSpeed: Used in USB 3.x standards—more on this below—and supports speeds up to 10Gbps. It tends to come in blue.

Again, these two types use the same port and work interchangeably (at their speed). In other words, USB

Type-A SuperSpeed is backward-compatible with USB Type-A.

USB Type-B

This type is the other end of the cable that goes into a device and where things get complicated. There are so many variations of standard USB Type-B. That's not to mention the countless proprietary Type-B designs, of which the most famous is the Apple Lighting connector that goes into an iPhone.

Each variant of Type-B connectors requires a corresponding port of its own. Physically, one variant's connector won't fit into another's port. As a result, each port type requires a distinctive cable. So, for example, if you have an iPhone and another non-Apple device, you'll have to carry at least two cables.

Following are some, out of many, Type-B standards:

- **Standard-B (or Type-B):** Used in USB 1.1 and USB 2.0 standards. It suits mostly large devices, like printers or scanners.
- **Standard-B SuperSpeed:** Available only to USB 3.x device, this port type works best for large desktop external storage devices.
- **Mini-USB (or Mini-B):** Significantly smaller than Type-B, this standard is for old portable devices, such as clamshell phone, first-gen portable drive. It's mostly obsolete now.
- **Micro-USB (or Micro-B):** Slightly smaller than Mini-USB, this port was one the go-to type for older generations of smartphones and tablets. It's also being phased out.
- **Micro-USB SuperSpeed:** The thin version of the Standard-B SuperSpeed. It's popular in the portable hard drive drives, like the WD My Passport.

Again, as you can imagine, with so many port types, finding the right cable for your device can be a pain in the rear, especially when you're in a hurry. This problem is why USB-C is such a knight in shining armor.

Legacy Thunderbolt port type

Even though much younger and more "modern," Thunderbolt has port issues of its own. Before Thunderbolt 3, there were Thunderbolt and Thunderbolt 2, which use the Mini-Display port type. That plus the fact there aren't many "legacy" Thunderbolt devices—the connection was once available exclusively to Apple's ecosystem—Thunderbolt 3 generally doesn't support Thunderbolt 2 and Thunderbolt devices. Some can work via an adapter, but in most cases, they don't work well.

The takeaway

USB Type-C is a new port type that aims to replace all other USB port types, giving users one unifying port standard or all peripheral devices.

The fact that Thunderbolt 3 also uses this port means, going forward, it will be the prominent type. So far, it's the only USB port that can work all existing USB standards (except for the ancient USB 1.x), and chances are it will also support future connection standards.

By the way, all USB-C devices can connect to a USB Type-A port via an adapter or a Type-A to Type-C cable. So going USB-C allows you to get the best of both worlds, the out-of-the-box convenience with modern equipment and the compatibility with legacy devices when need be.

Connection standards: How fast things connect

The connection standard determines how fast a connection is and what you can do with it. For example, the USB 2.0 standard allows for a connection speed of up to 480 Mbps, and you can also use it to charge a connected device. It's quite straight forward if the USB Implementers Forum could make up its mind on a simple issue that is how to call a USB revision. (Hint: Don't count on it!)

USB standards

Due to multiple name changes of the third USB generation, USB standards can be confusing. Currently, there are the following:

- **USB 3.2 Gen 2.2:** Formerly USB 3.2, and is the upcoming USB standard. Cap speed: 20Gbps.
- **USB 3.2 Gen 2:** Formerly USB 3.1 Gen 2, which was also called USB 3.1 at one point. Cap speed: 10Gbps.
- **USB 3.2 Gen 1:** Formerly USB 3.1 Gen 1, which was also called USB 3.0 at one point. Cap speed: 5Gbps
- **USB 2.0:** Older standard that's still quite popular. Cap speed: 480 Mbps.
- **USB 1.1:** An old standard that's now obsolete. Cap speed: 12 Mbps.

To recap, so far, we've had USB 1.1, then USB 2.0, then USB 3.2—(don't think about 3.0 or 3.1 and you'll be less confused)—which has three variations, including Gen 1, Gen 2, and Gen 2.2. There will be USB 4 at some point though it could also be called USB 4.x or something else entirely.

Generally, USB can also deliver power to a connected device. For this reason, most, if not all, portable drives don't require a separate power adapter; they draw juice from the host. Via special software or driver, USB can also deliver sound and vid-

eo signals but only at modest levels of qualities.

Thunderbolt standards

Relatively young, Thunderbolt has been through three revisions.

- Original Thunderbolt: This standard uses the Mini DisplayPort port type and has the cap speed of 10Gbps.
- Thunderbolt 2: It also uses Mini DisplayPort and has the cap speed of 20Gbps.
- Thunderbolt 3: Uses USB-C port type. Cap speed: 40 Gbps.

Thunderbolt can do a lot more than USB. Among other things, it can deliver ultra Hi-Def video/audio signals together with high-speed data signals, and also works as a high wattage power delivery. You can also daisy-chain up to 7 devices together without signal degradation.

By the way, currently, a Thunderbolt 3 port supports USB 3.2 Gen 2 (10 Gbps) speed. But when USB 3.2 Gen 2x2 (20 Gbps) is available, it likely will also be implemented within Thunderbolt 3. Future Thunderbolt generations will likely continue to use USB-C port type.

Conclusion

With lots of capabilities, the Thunderbolt 3 is a standard designed to replace all other wired peripheral connections, including HDMI, and, maybe, even USB. But it's expensive and a bit complicated in licensing for hardware vendors to support. For this reason, USB has been winning and will continue to prevail in a popularity contest. My guess is, at some point, Thunderbolt and USB will converge, as they should. But before then, the USB-C port type has already had enough reasons to reign Supreme.

...by Dong Ngo

<https://tinyurl.com/wqqtzlg>

Javascript: Service Worker Downsides

One of my interests with JavaScript is how knowing just a little can empower end-users. (E.g. useful one liner bookmarklets.) It was one of the JavaScript Meetup talks that informed me that service workers even exist, and what their use is. However, as an end user, I've noticed several downsides of them in Chrome.

Today I opened the Chrome browser, and noticed once again I got a desktop notification ad from a vitamin company I ordered something from once. This ad was starting to pop up every time I opened my browser despite running an ad blocker. Not only that, I consider desktop notification ads to be even more annoying. So I went into the developer tools, and unregistered that service worker, and a bunch of others from sites I almost never visit, and don't want offline content from. I used Process Hacker to note that Chrome memory usage dropped from about 2.5Gb to 1.1Gb, and with each service worker I deleted, one Chrome process thread went away. Some sites like AliExpress had a service worker for each store I'd visited in that site! After restarting the browser, that annoying ad was gone! (I also blocked JavaScript on that vitamin site, as there seems to be no other way to block a service worker in Chrome.)

<https://www.ghacks.net/2016/03/02/manage-service-workers-in-firefox-and-chrome/>

Firefox gives the end user more control over service workers.

I conclude these are getting to be like spyware, causing browser bloat leading to system bloat. Since closing a tab to a site does not stop the service worker thread, all service workers ever loaded are loaded every time you start the browser! Imagine if a hundred websites installed service workers. It might be worse than trying to load 100 tabs every time you start the browser. It reminds me of all the processes that slow down system startups so that every program you install can have its own updater.

I think sites should ask for end user approval to install a service worker, and explain the pros and cons. If a site is rarely used, the cache may not actually be of value to the end user, and as more and more sites use them browser bloat could get to be a bigger problem. (My system with 16Gb of ram has been warning me to close programs as I'm running out. Now I know one reason why! I'll have to see if this helps my Chromebook as well!) I imagine some less respectable sites could even install multiple cryptocurrency miners further bogging down popular browsers. Even worse, sites could hijack your bandwidth for a geoblocker, spam engine, botnet or vpn. The malware implications are scary! End user impact could be far worse than cookie abuse!

<https://blog.acolyer.org/2019/04/12/master-of-web-puppets-abusing-web-browsers-for-persistent-and-stealthy-computation/>

I don't really know enough about this to do a real presentation, but I think this would be an interesting discussion topic for our group. I'd be willing to tell the story I've basically outlined here, and would be interested in expert opinions. Does anyone know if one could add service worker blocking to an ad blocker? (Google didn't seem to find that

answer for me.)

...Mark Zinzow

From the Status Register of the Champaign-Urbana Computer Users Group, December 2019

Remembering The CD-32

The end of the year, not to mention the decade, is running up fast. During this concluding year—actually around the end of 2018—I began using Twitter, despite my resistance thanks to certain powerful individuals using it like a weaponized sewage pile. I discovered that, like most ‘social media’ outlets, what you get out of it and whether you enjoy it or not depends on how you decide to use it. I use it to post news and information about my work and business, along with the occasional bit of fun.

As 2019 was the 35th anniversary of the Transformers toy brand, I was tweeting out various historical Transformer tidbits over the course of the year for my followers. With this year ending, I finish up my formal Transformers coverage in favor of something else. 2020 is the 35th anniversary of the debut of the original Amiga 1000, so expect the year to be filled with historical Amiga tweets.

I also have one or two other Amiga-related ideas for the coming year. It seems I’ve been energized some-

what by the anniversary year along with the up-tick in community energy recently, both in the areas of retro stuff and newer hardware and software development. I hope it all proves interesting, at the very least.

With the holiday season, one might think back on gifts and games, and of course, the most desirable video game console of the 1990s, the Sony- I mean the Amiga CD-32. I’ve mentioned previously that it actually sold quite well in various European markets during its short life, though not enough to stop Commodore from sinking, and almost certainly not enough to stop the Playstation juggernaut had it been able to compete directly. The CD-32 had a lot of games, though many were direct copies of Amiga 1200, or even 500, games. If you were lucky, a game may have gotten some simple console enhancements, like making use of the extra buttons on the controller, a higher-quality CD soundtrack, or a fancy animated intro that wouldn’t fit on a floppy disc. A luckier few actually received extra content, such as more maps or levels. Games with sprawling worlds, like adventures or role-playing frequently fared best, and their style of play was best suited to larger storage formats like CD, and offered more content than floppy-based versions— bigger maps or voice tracks instead of text, for two examples.

The CD-32 is sought after by retro collectors, as its versions of games

were often the best one, (or at least rarely worse) if only because they usually came on a single CD instead of a small stack of corruptible floppies. It was also expandable, with either a MPEG full-motion video add-on, or an expansion (a classic one like the SX1, or the recent TerribleFire boards) to add the missing bits to make it a full computer. If there was one thing I wish the CD-32 offered in its stock configuration, it would be an RGB video output like all regular Amigas, but as it was intended to be a TV-based game console, S-video wasn’t a terrible trade-off, and there remains the expansion option. I’ll be bringing my CD-32 to this month’s holiday meeting, for fun, and to show off a method of connecting an Amiga to an HD television via component inputs, thanks to the RetroTINK RGB2COMP transcoder. It has definite pluses and minuses, which I’ll be happy to discuss at the meeting. Hopefully your holiday will be merry and bright, and the coming year will be worth the wait, for your Amiga systems and you as well.

...Eric Schwartz

From the AmiTech Gazette,
December 2019

Amiga Movie Magic

Check out this video. Thanks to Johnny Kitchens for providing the link.

<https://www.youtube.com/watch?v=qrMpyxBzwBA&t=6s>

January Calendar

January 11 — MCCC Meeting
2:00 PM — Burses Public Library
248 SW Johnson Ave., Burses

January 11 — Board of Director’s Meeting
Approximately 4:00 PM — Location TBD

February 1 — Newsletter Deadline — 8:00 AM

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