USB 2.0 vs 3.0 | Difference between USB 2.0 and USB 3.0

USB 2.0 and 3.0 are the two specifications of USB (**Universal Serial Bus**) that are used for connecting peripheral devices to the computers. Nowadays, most computers and other electronic devices are using USB 3.0 instead of 2.0 due to various advanced features of USB 3.0. In this topic, we will see the differences between USB 2.0 and 3.0 and what are new advanced features are there in 3.0, which are not in 2.0. Before starting, let's understand what USB and its specifications are.



What is USB?

[USB](https://www.javatpoint.com/usb-full-form) or **Universal Serial Bus** is a **connecting interface standard that enables the computer or other electronic devices to connect and communicate with other peripheral devices** such as *Keyboard, MIC, Mouse, flash drive,* etc.

The [USB](https://www.javatpoint.com/usb-flash-drive) connectors can also be used as the power transmitting cables such as to charge the mobile phone or tablets and these connectors are replacing the other traditional types of charger cables.

The first USB standard was released in the year **1996**, and today there are four versions of USB specifications, which are **USB 1.x, USB 2.x, USB 3.x, and USB 4.**

USB 2.0

USB 2.0 is USB standard and is also known as the **high-speed USB**. It was released in **April** **2000**. Almost all the devices with USB compatibilities support USB 2.0.

The devices that use USB 2.0 can transfer the data at a maximum speed of **480Mbps**, which is faster than the USB 1.1 standard and slower than the USB 3.0 standard.

The USB 2.0 standard provides support for the **USB Mini-A, USB Mini-B,** and **USB Mini AB connectors.**

USB 3.0

USB 3.0 is another USB standard, which was released in the **year 2008**. It is known as the ***Superspeed USB.*** Most of the new electronic devices and computers support this USB standard to enable faster communication between the devices.

Devices that support & use USB 3.0 can transmit the data at a maximum speed of **5Gbps**. It provides much faster data transfer compared to the USB 2.0 standard. The USB 3.0 has two updated versions, which are **USB 3.1 and USB 3.2.**

There are various types of USB 3.0 connectors, which allow connecting two devices together. In 3.0 standard, **USB Type A, Type B, Micro-A, and Micro-B,** are the supported connectors.

The USB 3.0 standards can be distinguished by their ***blue-colored inserts and also has a 3.0 logo on them.***

Main 5 factors to differentiate the USB2.0 and USB3.0

There are five major factors by which we can differentiate the USB 2.0 and USB 3.0, which are given below:

1. Physical Appearance

* In both USB 2.0 and USB 3.0, there are some physical differences, due to which anyone can easily identify both of the standards. The USB2.0 connectors are of white & black colored inside, whereas USB3.0 is usually of blue colored inside.
* The other physical difference is the number of connection wires. The USB 2.0 contains **four connector wires**, which support half-duplex communication. On the other hand, the 3.0 standard contains a total **of 9 wires.**
* The *five extra wires in USB 3.0 allow the two*-*ways or full-duplex communication and also increases the bandwidth.*

2. Speed

* The data transfer speed between both standards is one of the major differences. The data transmission speed of USB 3.0 is extremely faster than USB 2.0, which makes it more suitable for today's devices to enable high-speed data transfer.
* The transfer rate of USB 2.0 is a maximum of **480 Mbps(Megabytes per second)**. This rate is very slow for the data transfer, but it is sufficient to connect peripheral devices such as Keyboard, mouse, headset, etc.
* The data transfer rate of 3.0 standard is much higher(approx. 10 times) than 2.0 and can transfer the data at the maximum rate of
* However, it's the theoretical number of speed and practically it depends on specific drives. Such as the USB drive's speed depends on the speed of their flash memory.

3. Price

* The price is also the big factor to differentiate between both the standards. *The products of USB 2.0 standards are less expensive than the products of USB 3.0 standards.*
* USB 3.0 standard devices are much suitable if there is a requirement for high-speed data transfer, but for general use, the 2.0 standard products are also good.

Note: We can use USB 3.0 drives with a 2.0 port; it will work fine but will work at the speed of 2.0 only.

4. Power Management

* The power management of USB 3.0 standard is much efficient compared to the 2.0 standard.
* USB 3.0 provides efficient power management with increased power delivery. It provides power usage upto 900mA, whereas the USB 2.0 standard provides power usages upto 500 mA, and hence increases the total power delivery from 2.5 W to 4.5 W.
* It means the USB 3.0 devices can be charged faster. It also contains more power as per the requirement and conserves that power when the device is at an idle state.

5. Compatibility

The USB 3.0 provides backward compatibility, which means, if it is connected to the 2.0 port, then the drive works fine, but with the speed of 2.0 standard. And if it is connected to the 3.0 port, then the speed will be higher.

Comparison chart between the USB 2.0 and USB 3.0

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| --- | --- |
| **USB 2.0** | **USB 3.0** |
| The transmission rate of USB 2.0 devices is maximum of 480Mbps. | The transmission rate of USB 3.0 devices is 5Gbps. |
| It allows half-duplex or one-way transmission only. | It allows full-duplex or two-way communication. |
| It contains a total of 4 number of connector wires. | It contains a total of 9 connector wires. |
| The price for a product with a USB 2.0 standard is very less compared to 3.0. | The product with the USB 3.0 standard is costly compared to 3.0. |
| The white & black blocks occur in USB 2.0. | The blue-colored blocks occur in USB 3.0. |
| The cable length of USB 2.0 can be upto 5 meters. | The cable length of USB 3.0 can be upto 3 meters. |
| It can provide maximum power output upto 500mA. | It can provide better power efficiency and can provide power usage upto 900mA. |

Conclusion

In the above sections, we have discussed the differences between the USB 2.0 standards and 3.0. So, now it is easy to make a selection between both the standards. As compared to 2.0, 3.0 is much efficient in various aspects such as transfer speed and power management, but it is much costly. So, if there is a requirement for high-speed data transfer and power management, we can choose USB 3.0 standard devices. But if we have a limited budget and for general use, we can choose the 2.0 standard.