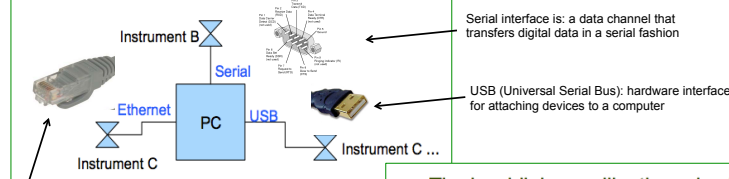


How to Integrate Scientific Instruments to Computers

In today's research world, scientists use a lot of instruments to "see", to "touch", to "feel", and to "listen to" the unknown objects, so that they can discover the hidden natural principles. Our planes are filled with many instruments all collecting data that needs to be integrated.

How is the measurement data in an instrument collected? Let's look at the hard-link first.



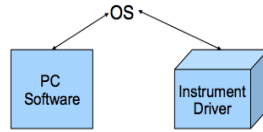
Serial interface is: a data channel that transfers digital data in a serial fashion

USB (Universal Serial Bus): hardware interface for attaching devices to a computer

Ethernet: The global standard for physically connecting computers and devices together in a network.

The hard-links are like the veins in a human's body that connect the organs together, while soft-links are blood that brings the organs alive.

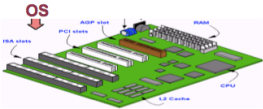
Driver and PC Software



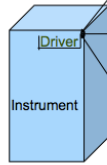
OS is a software providing interfaces between the hardware board and the programs in PC.

OS is initial, complicated, and the most important to a PC.

OS examples: Linux, window, MacOS, IOS, etc.



The **driver** is a small software program in an instrument.



It provides the interface for the instrument to "talk" to the outside world. It is like a translator between the instrument and the programs.

It usually has very simple functionality, such as "open", "read", "write", and "close".



In general, software in a PC varies a lot: it can be large or small, simple or complicated.

Scientific instrument software collects the data from the instrument through the driver.

Therefore, integrating instruments to PCs requires Ethernet, USB, Serial, or a wireless link, driver, and software to make the data flow!

