Network Interface Cards

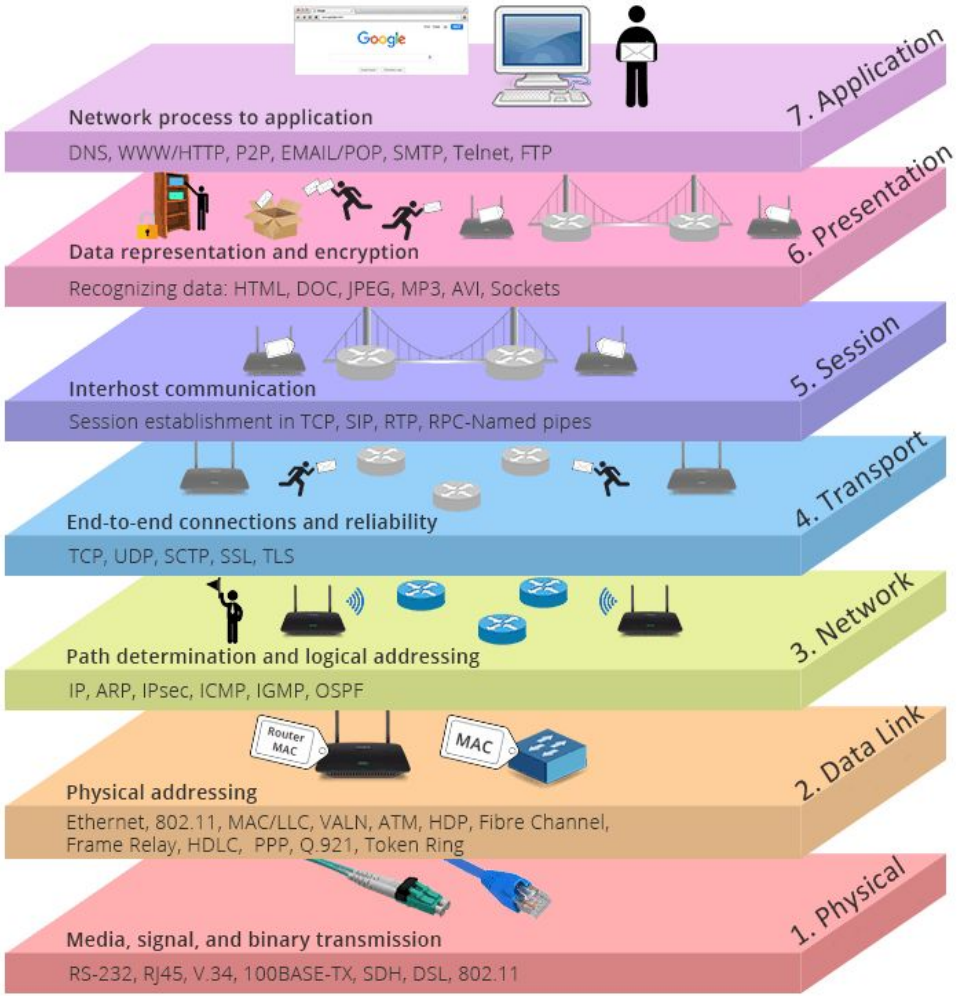
Roman Bodrykh

NIC

Stands for "Network Interface Card" and is pronounced "nick." A NIC is a component that provides networking capabilities for a computer. It may enable a wired connection (such as Ethernet) or a wireless connection (such as Wi-Fi) to a local area network.

Purpose of the NIC

The NIC allows computers to communicate over a computer network, either by using cables or wirelessly. The NIC is both a physical layer and data link layer device, as it provides physical access to a networking medium and, for IEEE 802 and similar networks, provides a low-level addressing system through the use of MAC addresses that are uniquely assigned to network interfaces.



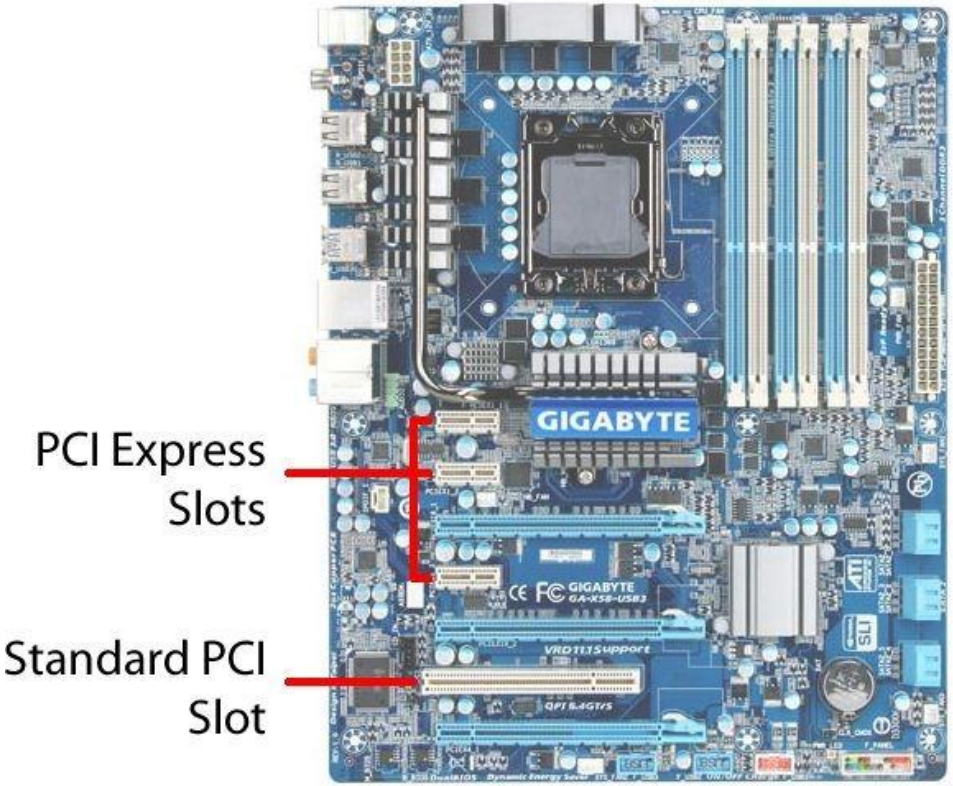
Types of Network Interface Card by Configuration

- ★ Jumper configurable network interface cards
  - Jumper configurable network interface cards are efficient and easy to use for older equipment. They have physical jumpers.
- ★ Software configurable network interface cards
  - Software configurable NIC must be manually configured when installed, but contain a proprietary software program that allows the operator to configure the NIC via a menu, or choose the auto configuration mode that determines what configuration is most suitable.
- ★ Plug-and-play configurable network interface cards
  - Most NICs today use the PnP technology as it does not have to be manually configured.

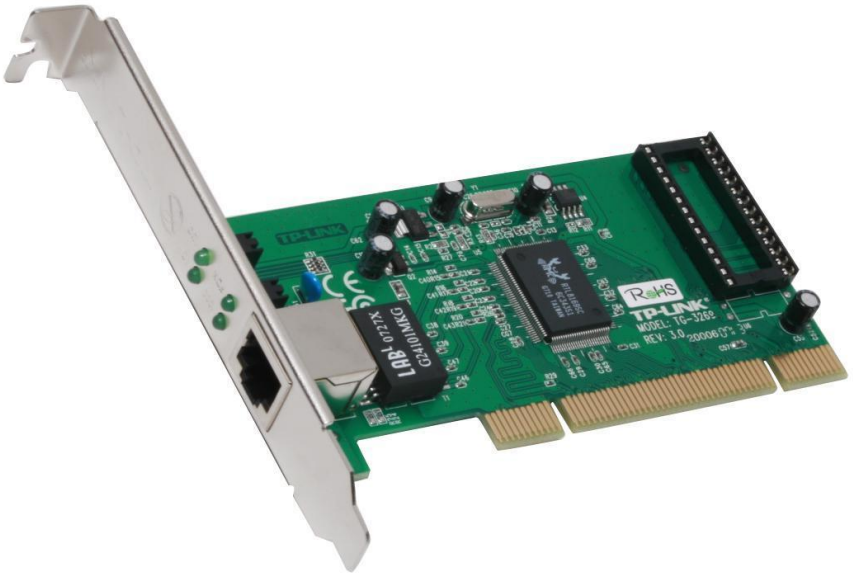
Short History

NICs were commonly included in desktop computers in the 1990s and early 2000s. In the 1980s and early 1990s, many computers did not include networking capabilities, so a NIC could be added as an expansion card. Most NICs were installed in a PCI slot on the motherboard.

PCI and PCI-Express Slots



PCI Network Card



PCI Express Network Card

- ★ PCIe is much faster compared to PCI.
- ★ PCIe uses a serial interface while PCI uses a parallel interface.
- ★ PCIe speed is classified into lanes, each capable of delivering up to 1GB/s data transfer.
- ★ PCI slots are standardized while PCIe slots vary depending on the number of lanes the slot is intended for.
- ★ Despite PCIe superiority, many manufacturers still use the PCI standard for their devices.

Wireless Networking

As wireless networking became more popular, wireless NICs also grew in popularity. Instead of an Ethernet port, wireless NICs are designed for Wi-Fi connections and often have an antenna to provide better wireless reception for the computer. Older wireless cards have PCI connections while most modern wireless NICs connect to a PCI Express slot.

Integrated Networking

Many computers and wireless devices now include an integrated networking component called a network adapter. This may be an Ethernet controller and port attached to the edge of a motherboard or a small wireless networking chip located on the motherboard.

Integrated Networking

Network Through Other Ports

A network adapter may also be a small peripheral that connects to a USB port or PCMCIA card.

Thank you for your attention!

References

1. https://techterms.com/definition/nic
2. https://en.wikipedia.org/wiki/Network_interface_controller
3. http://www.differencebetween.net/technology/difference-between-pci-and-pci-express/
4. https://en.wikipedia.org/wiki/PC_Card
5. https://www.cozlink.com/pice-a272-2387-2388/article-73444.html