**Name**: **Date**:: / /2020
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# Experiment No::8

**Aim** :: **Case study in buses like ISA,PCI and USB**.

## Theory::

### ISA (Industy Standard Architecture mean)

An Industry Standard Architecture bus (ISA bus) is a computer bus that allows additional expansion cards to be connected to a computer's motherboard. It is a standard bus architecture for IBM compatibles. Introduced in 1981, the ISA bus was designed to support the Intel 8088 microprocessor for IBM's first-generation PC.

In the late 1990s the faster peripheral component interconnect (PCI). Soon afterwards, use of the ISA bus began to diminish, and most IBM motherboards were designed with PCI slots. Although there are still a few motherboards being made with ISA slots, these are generally referred to as the legacy bus motherboards.

The ISA bus provides direct memory access using multiple expansion cards on a memory channel allowing separate interrupt request transactions for each card. Depending on the version, the ISA bus can support a network card, additional serial ports, a video card and other processors and architectures, including:

- IBM PC with Intel 8088 microprocessor
- IBM AT with Intel 80286 processor (1984)
- Extended Industry Standard Architecture (1988)

The ISA bus first included synchronicity with the CPU clock. It was later upgraded to high-level buffering, which interfaced the chipsets with the CPU. Likewise, the ISA bus used bus mastering, which directly accessed just the first 16 MB of main memory.

**Fig::ISA BUS**

## PCI （ Peripheral Component Interconnect ）Bus

A Peripheral Component Interconnect Bus (PCI bus) connects the CPU and expansion boards such as modem cards, network cards and sound cards. These expansion boards are normally plugged into expansion slots on the motherboard.

This term is also known as conventional PCI or simply PCI.

PCI requirements include:

•Bus timing

•Physical size (determined by the wiring and spacing of the circuit board)

•Electrical features

•Protocols

During system startup the operating system searches for all PCI buses to attain information about the resources needed for each device. The OS communicates with each device and assigns system resources, including memory, interrupt requests and allotted input/output (I/O) space.

**Fig-PCI-Peripheral Component Interconnect Bus**

## USB- （ Universal Serial BUS ）

A Universal Serial Bus (USB) is a common interface that enables communication between devices and a host controller such as a personal computer (PC). It connects peripheral devices such as digital cameras, mice, keyboards, printers, scanners, media

devices, external hard drives and flash drives. Because of its wide variety of uses, including support for electrical power, the USB has replaced a wide range of interfaces like the parallel and serial port.

There have been three major USB standards,

**USB 3.1:** Called Superspeed+, USB 3.1 compliant devices are able to transfer data at 10 Gbps (10,240 Mbps).

**USB 3.0:** Called SuperSpeed USB, USB 3.0 compliant hardware can reach a maximum transmission rate of 5 Gbps (5,120 Mbps).

**USB 2.0:** Called High-Speed USB, USB 2.0 compliant devices can reach a maximum transmission rate of 480 Mbps.

**USB 1.1**: Called Full Speed USB, USB 1.1 devices can reach a maximum transmission rate of 12 Mbps.

Most USB devices and cables today adhere to USB 2.0, and a growing number to USB 3.0.

## USB Connectors

A number of different USB connectors exist, all of which we describe below.

**USB Type A**: Officially called USB Standard-A, these plugs and receptacles are rectangular in shape and are the most commonly seen USB connectors. USB 1.1 Type A, USB 2.0 Type A and USB 3.0 Type A plugs and receptacles are physically compatible.

**USB Type B**: Officially called USB Standard-B, these plugs and receptacles are square shaped with an extra notch on top, most noticeable on USB 3.0 Type B connectors. USB 1.1 Type B and USB 2.0 Type B plugs are physically compatible with USB 3.0 Type B receptacles but USB 3.0 Type B plugs are not compatible with USB 2.0 Type B or USB 1.1 Type B receptacles.

**USB Type C:** Often referred to simply as USB-C, these plugs and receptacles are rectangular in shape with four rounded corners. Only USB 3.1 Type C plugs and receptacles (and thus cables) exist but adapters for backward compatibility with USB 3.0 and 2.0 connectors are available.

Fig-USB-Universal Serial BUS

CONLUSION :