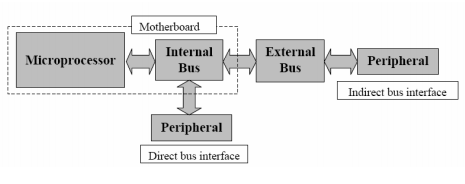
**CASE STUDY ON PCI BUS**

**INTRODUCTION**

A computer bus is used to transfer data from one location or device on the motherboard to the Central Processing Unit where all calculations take place.

Based on the functions of the bus, they may be classified as address, data or control buses. Address Bus transfers information about where the data should go. Data Bus transfers actual data. Control Bus is responsible for carrying the various control signals.

Today, all computers utilize two types of buses, an internal or local bus and external bus. An internal bus enables a communication between internal components such as a computer video card and memory (ISA, EISA, PCI, AGP, etc.) and an external bus is capable of communicating with external components such as a SCSI bus, GPIB, etc.



Peripheral Component Interconnect is a standard that describes how to connect the peripheral components of a system together in a structured and controlled way. It was developed as a 32-bit computer bus, but off-late can also be used as 64-bit buses. It is the most commonly used buses and the most accepted standards. It can be populated with adapters requiring fast accesses to each other and/or system memory and that can be accessed by the processor at speeds approaching that of the processor’s full native bus speed. It is used for the expansion of computer systems by the expansion of bus add-in cards. It acts as an interconnect mechanism between peripheral controller components and processors. It provides direct access to system memory for connected devices with the help of a bridge.

**PCI FEATURES**

PCI is a Multi-master Bus. PCI has three bus agents: Initiator (Master), Target (Slave) and Agent. Initiator owns the bus and initiates data transfer meant to the target. Agent is any initiator or target in the PCI Bus facilitating communication.

PCI has three access types: one for configuration access, one for I/O access and one for memory access.

The major features of the PCI bus can be stated as under:

1. Processor Independence:

Components designed for the PCI bus are PCI specific and not processor-specific. Thus it separates device design from that of processor design

1. Support for 80 PCI functions per PCI Bus
2. Support for up to 256 PCI Buses
3. Low Power Consumption
4. Bursts can be performed on all read and write transfers
5. Access Time as fast as 60ns
6. Concurrent bus operation:

Concurrency with processor bus, PCI bus and the expansion bus fully supported

1. Integrity checks on all the transactions performed
2. Supports three address spaces: Memory, I/O and configuration
3. Auto-configuration:

Supports automatic device detection and configuration

1. Software Transparency:

Utilizes same command set and status definition when communicating with PCI device

1. Add in cards are also supported for expansions

**ADVANTAGES**

1. PCI devices can have direct access to memory without involving the CPU. Thus, they increase the computer utilization manifold
2. The use of bridges allows the simultaneous handling of a large number of devices
3. The support of auto configuration saves the CPU’s time spent on detecting devices
4. It is processor independent and thus, can be used with any processor
5. A single PCI bus can handle up to five devices

**DISADVANTAGES**

1. Only as many devices as there are slots in the PC’s motherboard can be connected