

Batch: A2 Roll No.: 16010122041

Experiment / assignment / tutorial No: 1

Grade: AA / AB / BB / BC / CC / CD / DD

Signature of the Staff In-charge with date

TITLE: Study of PCI and SCSI.

AIM: To Study and learn PCI and SCSI

Expected OUTCOME of Experiment : (Mention CO/CO's attained here)

Books/ Journals/ Websites referred:

1. <https://www.techopedia.com/definition/8815/peripheral-component-interconnect-bus-pci-bus>
2. <https://www.techopedia.com/definition/331/small-computer-system-interface-scsi>
3. http://www.csun.edu/~edaasic/roosta/BUS_Structures.pdf
4. W.Stallings William "Computer Organization and Architecture: Designing for Performance", Pearson Prentice Hall Publication, 7th Edition. C.

Pre Lab/ Prior Concepts:

Microcomputer buses which communicate with a peripheral devices or a memory location through communication lines called buses.

The major parts of microcomputers are central processing unit (CPU), memory, and input and output unit. To connect these parts together through three sets of parallel lines, called buses. These three buses are Address bus, data bus, and Control bus.

Address Bus:

The address bus consists of 16, 20, 24, or more parallel signal lines, through which the CPU sends out the address of the memory location. This memory location is used for to written to or read from. The number of memory location is depends on 2 to the power N address lines. Example, a CPU with 16 address lines can address 2¹⁶ or 65,536 memory locations. When the CPU reads data from or writes data to a port. The port address is also sent out on the

address bus. This is unidirectional. This means that the CPU can send data to a memory location or I/O ports.

Data Bus:

The data bus consists of 8, 16, 32 or more parallel signal lines. The data bus lines are bidirectional. This means that the CPU can read data from memory or from a I/O port as well as send data to a memory location or to a I/O port. In a system, many output devices are connected to the data bus, but only one device at a time will be enabled to the output.

Control Bus:

The control bus consists of 4-10 parallel signal lines. The CPU sends out signals on the control bus to enable the outputs of addressed memory devices or port devices. Typically control bus signals are memory read, memory write, I/O read and I/O write. To read a data from a memory location, the CPU sends out the address of the desired data on the address bus and then sends out a memory read signal on the control bus. The memory read signal enables the addressed memory device to output the data onto the data bus where it is read by the CPU.

PCI Bus

PCI stands for Peripheral Component Interconnect. It could be a standard information transport that was common in computers from 1993 to 2007 or so. It was for a long time the standard transport for extension cards in computers, like sound cards, network cards, etc. It was a parallel transport, that, in its most common shape, had a clock speed of 66 MHz, and can either be 32 or 64 bits wide. It has since been replaced by PCI Express, which could be a serial transport as contradicted to PCI. A PCI port, or, more precisely, PCI opening, is essentially the connector that's utilized to put through the card to the transport. When purge, it basically sits there and does nothing.

Types of PCI :

These are various types of PCI:

- PCI 32 bits have a transport speed of 33 MHz and work at 132 MBps.
- PCI 64 bits have a transport speed of 33 MHz and work at 264 MBps.
- PCI 64 bits have a transport speed of 66 MHz and work at 512 MBps.
- PCI 64 bits have a transport speed of 66 MHz and work at 1 GBps.

Function of PCI :

PCI slots are utilized to install sound cards, Ethernet and remote cards and presently strong state drives utilizing NVMe innovation to supply SSD drive speeds that are numerous times speedier than SATA SSD speeds. PCI openings too permit discrete design cards to be included to a computer as well.

PCI openings (and their variations) permit you to include expansion cards to a motherboard. The extension cards increment the machines capabilities past what the motherboard may create alone, such as: upgraded illustrations, extended sound, expanded USB and difficult drive controller, and extra arrange interface options, to title a couple of.

Advantage of PCI :

- You'll interface a greatest of five components to the PCI and you'll be able moreover supplant each of them by settled gadgets on the motherboard.
- You have different PCI buses on the same computer.
- The PCI transport will improve the speed of the exchanges from 33MHz to 133 MHz with a transfer rate of 1 gigabyte per second.
- The PCI can handle gadgets employing a greatest of 5 volts and the pins utilized can exchange more that one flag through one stick.

Disadvantage of PCI :

- PCI Graphics Card cannot get to system memory.
- PCI does not support pipeline.

SCSI bus:

The basic interface for connecting peripheral devices to a PC is a small computer system interface. Based on the specification, it can typically respond up to 16 external devices using a single route, along with a host adapter. Small Computer System Interface is used to boost performance, deliver fast data transfer delivery and provide wider expansion for machines like CD-ROM drivers, scanners, DVD drives and CD writers. Small Computer System Interface is most commonly used for RAID, servers, highly efficient desktop computers, and storage area networks. The Small Computer System Interface has control, which is responsible for transmitting data across the Small Computer System Interface bus and the computers. It can be fixed on a motherboard, or one client adapter is installed through an extension on the computer's motherboard. The controller also incorporates a simple SCSI input/output system, which is a small chip that provides access and control equipment with the necessary software.

The SCSI ID is his number. Using serial storage architecture initiators, new serial SCSI IDs such as serial attached SCSI use an automatic process which assigns a 7-bit number.

Post Lab Descriptive Questions

Q1 . Differentiate between PCI and SCSI Bus

PCI	SCSI
Peripheral Component Interconnect (PCI), as its name implies is a standard that describes how to connect the peripheral components of a system together in a structured and controlled way.	SCSI is standard electronic interfaces that allow personal computers to communicate with peripheral hardware such as disk drives, tape drives etc.
PCI bus was created by Intel in 1993. PCI bus can transfer 32 or 64 bits at one time. PCI bus can run at 33 Mhz.	It is a high performance bus which is used for fast disks, scanners, and for devices which require high bandwidth. It has a data rate of 160 MB/s.
Typical bandwidth is 80 m/s	Typical bandwidth is 1.5 to 40 m/s
Bus type is Backplane	Bus type is I/O

Q2. List two applications each of PCI and SCSI Bus

Applications for PCI are:

- Designed for multiprocessor system and high performing peripheral. This includes audio, video system, network adapters, graphics and accelerator board, data storage collectors
- Because each PCI design is unique, programmable logic devices provide an ideal solution for PCI design
- PCI has replaced ISA as the bus of choice in new desktop and industrial PCs. With the PCI bus, high-performance, low-cost, and convenient PCI based image processing and data acquisition solutions are at hand.

Applications for SCSI are:

- SCSI is a multi-task interface with bus arbitration function. Multiple peripherals hung on one SCSI bus can work simultaneously
- SCSI devices have equal possession of the bus.
- SCSI interface can transmit data synchronously and asynchronously. The synchronous transmission rate reaches 10MB/s, and the asynchronously transmission rate reaches 1.5MB/s.

Date: _____

Signature of faculty in-charge