

Batch: A1 Roll No.: 16010120015

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:

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. 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.

SCSI bus:

A small computer systems interface (SCSI) is a standard interface for connecting peripheral devices to a PC. Depending on the standard, generally it can connect up to 16 peripheral devices using a single bus including one host adapter. SCSI is used to increase performance, deliver faster data transfer transmission and provide larger expansion for devices such as CD-ROM drives, scanners, DVD drives and CD writers. It is either embedded on the motherboard or a host adapter is inserted into an expansion slot on the motherboard. The controller also contains SCSI basic input/output system, which is a small chip providing the required software to access and control devices. Each device on a parallel SCSI bus must be assigned a number between 0 and 7 on a narrow bus or 0 and 15 on a wider bus. This number is called an SCSI ID. Newer serial SCSI IDs such as serialattached SCSI (SAS) use an automatic process assigning a 7-bit number with the use of serial storage architecture initiators.

Post Lab Descriptive Questions**Q1 . Differentiate between PCI and SCSI Bus**

A) PCI is used as interface with the processor. It has 64 bit addressing, linear burst mode data transfer and large bandwidth.

B) SCSI is a set of standards for physical connecting and transferring data between computers and peripheral hardware such as disk drives and tape drives etc.. Upto 8 to 16 devices can be attached on a single SCSI bus.

Q2. List two applications each of PCI and SCSI Bus

A) PCI bus: PCI slots are utilized to install sound cards, ethernet and remote cards and presently in SSDs utilizing NVMe innovation to supply SSD drive speeds that are numerous times speedier than SATA SSD speeds.

B) SCSI bus:

i)The application of this bus is to interconnect with optical drives, scanners, printers and other targets to a wide range of terminals, computers, and other hosts

ii)SCSI is useful in network servers, where several hard drives can be easily set up as a RAID configuration. If one drive fails, it can be removed and a

new one inserted, without loss of data, while the system is still operational.
This feature of RAID hardware is called hot-swapping.

Date: __15/08/21__

Signature of faculty in-charge