**OS:** is a program that manages a computer’s hardware.

Also provides basis for application programs and acts as an intermediary

The computer user and the computer hardware.

**OS:** is the one program running at all times on the computer called kernel .

Only one interrupt is generated per

block, to tell the device driver that the operation has completed, rather than

the one interrupt per byte generated for low-speed devices.While the device

controller is performing these operations, the CPU is available to accomplish

other work.

\*User View MainFrame WorkStation EmbeddedSystems

we have seen, resource allocation is especially important where many

users access the same mainframe or minicomputer.

**control program:** manages the execution of user programs

to prevent errors and improper use of the computer, It is especially concerned

with the operation and control of I/O devices.

There are two types of a program

1-System program which are associated with the operating system but are not necessarily part of the kernel .

2-application programs, which include all programs not associated with the operation of the system.

Middleware:a set of software frameworks that provide additional services to application developers

1.2 Computer Organization :-

What happened when the CPU gets interrupted,it stops what it is doing and immediately

Transfers execution to a fixed location .The fixed Location usually contains

The starting address where the service routine for the interrupt is located

The interrupt service routine executes; on completion, the CPU resumes the

interrupted computation

Many old designs simply stored the interrupt address in a

fixed location or in a location indexed by the device number. More recent

architectures store the return address on the system stack. If the interrupt

routine needs to modify the processor state

1.2.3 I/O Structure:-

The controller starts the transfer of data from

the device to its local buffer. Once the transfer of data is complete, the device

controller informs the device driver via an interrupt that it has finished its

operation. The device driver then returns control to the operating system,

possibly returning the data or a pointer to the data if the operation was a read.

For other operations, the device driver returns status information.

The device controller is responsible for moving the data between

the peripheral devices that it controls and its local buffer storage

**direct memory access (DMA)** is used. After setting

up buffers, pointers, and counters for the I/O device, the device controller

transfers an entire block of data directly to or from its own buffer storage to

memory, with no intervention by the CPU. Only one interrupt is generated per

block, to tell the device driver that the operation has completed, rather than

the one interrupt per byte generated for low-speed devices.While the device

controller is performing these operations, the CPU is available to accomplish

other work.

Some high-

1.3.2 Multiprocessor Systems

Multiprocessor systems have three main advantages:

**1- Increased throughput**. By increasing the number of processors,we expect

to get more work done in less time.

**2- Economy of scale**. Multiprocessor systems can cost less than equivalent

multiple single-processor systems

**3- Increased reliability**. If functions can be distributed properly among

several processors, then the failure of one processor will not halt the

system, only slow it down

**asymmetric multiprocessing**, in which each processor is assigned

a specific task.A***boss*** processor controls the system;

The most common systems use **symmetric multiprocessing (SMP)**, in

which each processor performs all tasks within the operating system. SMP

means that all processors are peers;

Notice

that each processor has its own set of registers, as well as a private—or local

—cache. However, all processors share physical memory. An example of an