

# PART 2

SUBMITTED BY: DR. SANGEETA ARORA  
(DEPT. OF COMPUTER SCIENCE AND IT)

# PART-2

- Parallel processing
- Parallelism in uniprocessor
- Basic uniprocessor system

# PARALLEL PROCESSING

- Parallel processing is an integral part of everyday life. The concept is so inbuilt in our existence that we benefit from it without realizing.
- When faced with a tough problem, we involve others to solve it more easily.
- This co-operation of more than one worker to facilitate the solution of a particular problem may be termed as parallel processing.
- The goal of parallel processing is thus to solve a given problem more rapidly, or to enable the solution of a problem that would otherwise be impracticable by a single worker.

# LEVELS OF PARALLEL PROCESSING

- Data processing
- Information processing
- Knowledge processing
- Intelligence processing

# DATA PROCESSING

- The data space is the largest including numeric numbers in various formats, character symbols and multidimensional measures.
- Data objects are considered mutually unrelated in the space.
- Huge amount of data are being generated daily in all walks of life, specially among the scientific, business and government sectors.

# INFORMATION PROCESSING

- An information item is a collection of data objects that are related by some syntactic structure or relation.

# KNOWLEDGE PROCESSING

- Knowledge consist of information item plus some semantic meanings.
- Thus knowledge items from a subspace of the information space.
- Intelligence is derived from a collection of knowledge items.

# INTELLIGENCE PROCESSING

- Intelligence is derived from a collection of knowledge items.
- The intelligent Space is represented by the innermost and higher triangle in the venn diagram.



# PARALLELISM IN UNIPROCESSOR SYSTEM

Most general purpose uniprocessor systems have the same basic structure. It is assumed that reader have had at least one basic course in the past on conventional computer organisation.

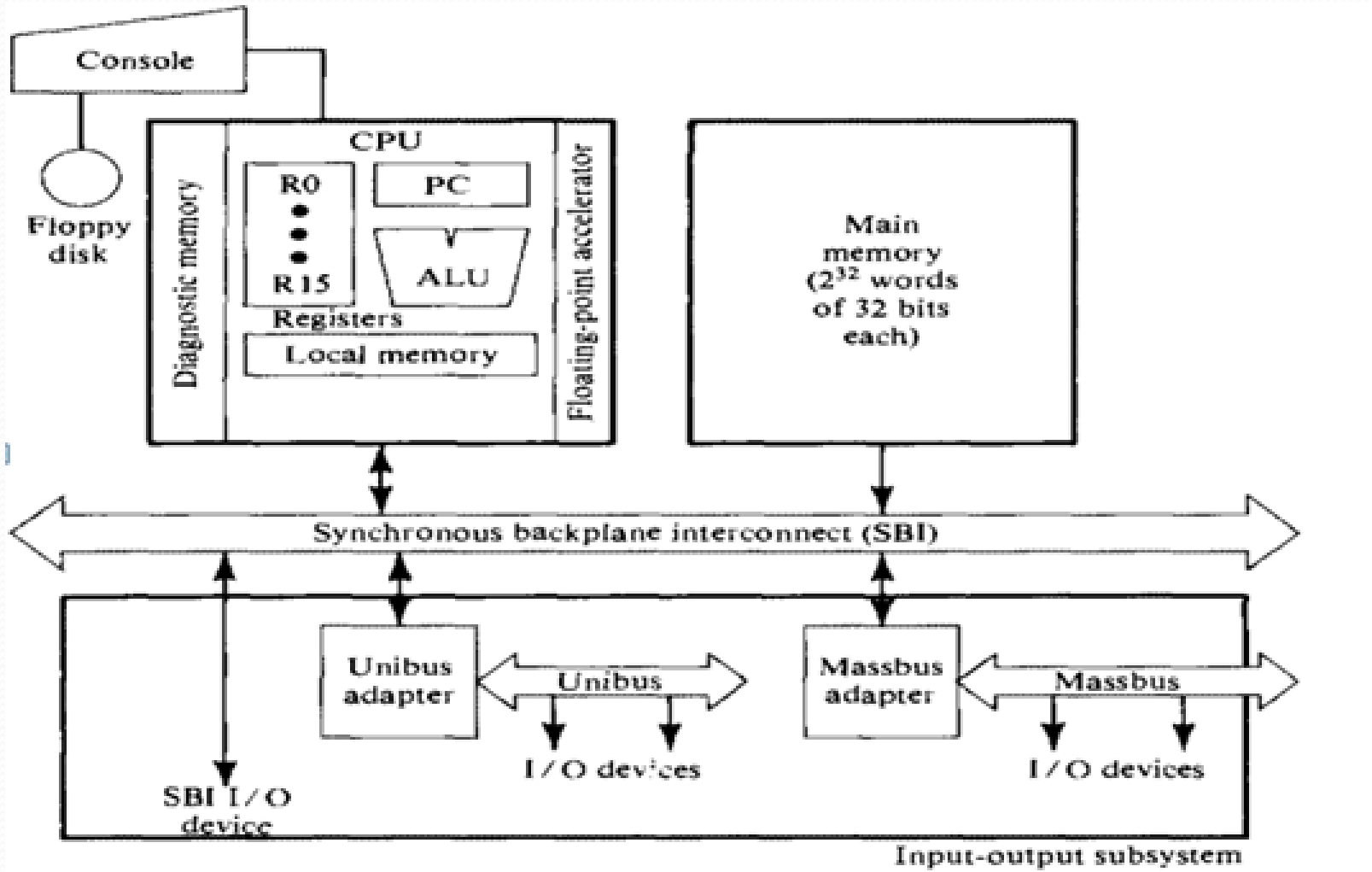
parallel processing mechanism and method to balance subsystem bandwidth will then be described for a typical uniprocessor system.

- It is possible to achieve parallelism with a uniprocessor system.
  - Some examples are the instruction pipeline, arithmetic pipeline, I/O processor.
- Note that a system that performs different operations on the same instruction is not considered parallel.
- Only if the system processes two different instructions simultaneously can it be considered parallel.

# BASIC UNIPROCESSOR SYSTEM

- Uniprocessor computer consist of three major components.
- Central processing unit
- Main memory
- Input/output subsystem
- The architecture of two commercially available uniprocessor computers are given below to show the possible interconnection of structure among the three subsystem.

# BASIC UNIPROCESSOR SYSTEM



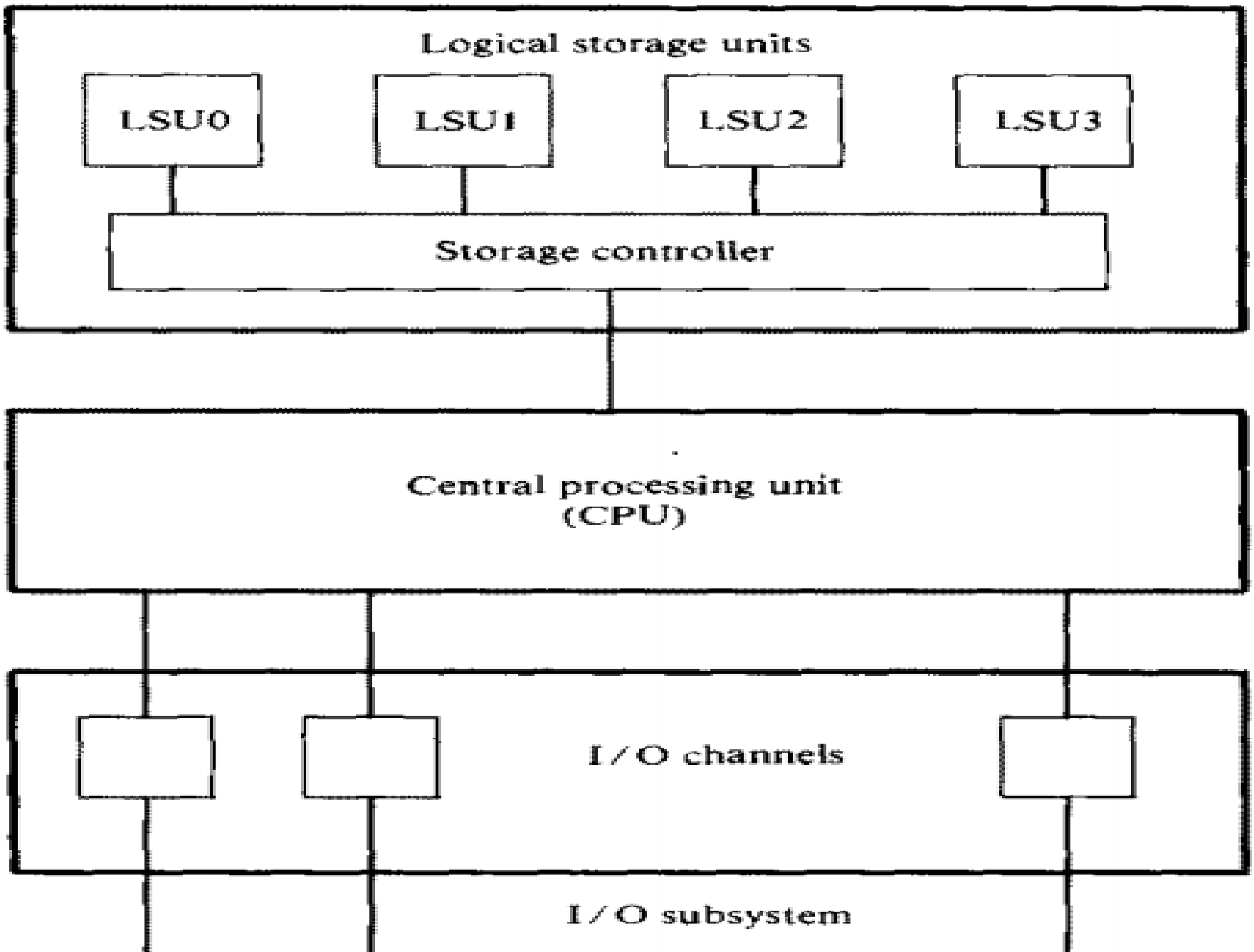
# COMPONENT OF VAX-11/780 SUPER MINICOMPUTER

- The CPU contains the master controller of the VAX system.
- There are sixteen 32 bit general purpose registers ,one of which serves as the program counter(PC).
- There is also a special CPU status register containing information about the current state of the processor and of the program being executed.

# MAIN MEMORY

- The CPU, main memory and the I/O subsystems are all connected to a common bus, the synchronous backplane interconnect(SBI).
- Through this bus all I/O device can communicate to each other.
- I/O devices can be connected directly to the SBI through the unibus and its controller or through a massbus and its controller.

# Main memory



# REFERENCE

- Advanced Computer Architecture: Parallelism, Scalability, Programmability by kai hwang.





**THANK**

**YOU**