LECTURE 1

EET 2211

4TH SEMESTER – CSE & CSIT

CHAPTER 1, LECTURE 1

CHAPTER 1 – BASIC CONCEPTS AND COMPUTER EVOLUTION

TOPICS TO BE COVERED

- Organization and Architecture
- Structure and Function
- A brief history of Computers
- The evolution of Intel x86Architecture
- Embedded Systems
- ARM Architecture
- Cloud Computing

ORGANIZATION AND ARCHITECTURE

COMPUTER ARCHITECTURE	COMPUTER ORGANIZATION
It refers to those attributes of a system visible to a programmer.	It refers to the operational units and their interconnections that realize the architectural specifications.
Architectural attributes have a direct impact on the logical execution of the program.	Organizational attributes include those hardware details transparent to the programmer.
e.g. Instruction set, the number of bits used to represent different data types, I/O mechanisms and memory addressing techniques.	e.g. control signals, interfaces between the computer and peripherals and memory technology used.
It is an architectural design issue whether a computer will have multiply instruction .	It is an organizational issue whether that instruction will be implemented by a special multiply unit or by a mechanism that makes use of repeated addition units.
A particular architecture generally lasts for many years.	The organization generally changes with the changing technology.

STRUCTURE AND FUNCTION

- STRUCTURE defines the way in which the components are interrelated.
- FUNCTION defines the operation of each individual component as part of the structure.
- There are basically two types of computer structures:

1. single-processor computer
2. Multi-core computer

- There are four basic functions of a computer:

1. Data processing
2. Data storage
3. Data movement
4. Control

SINGLE PROCESSOR COMPUTER

- There are four main structural components

1. CPU
2. Main memory
3. I/O
4. System interconnections

Contd.

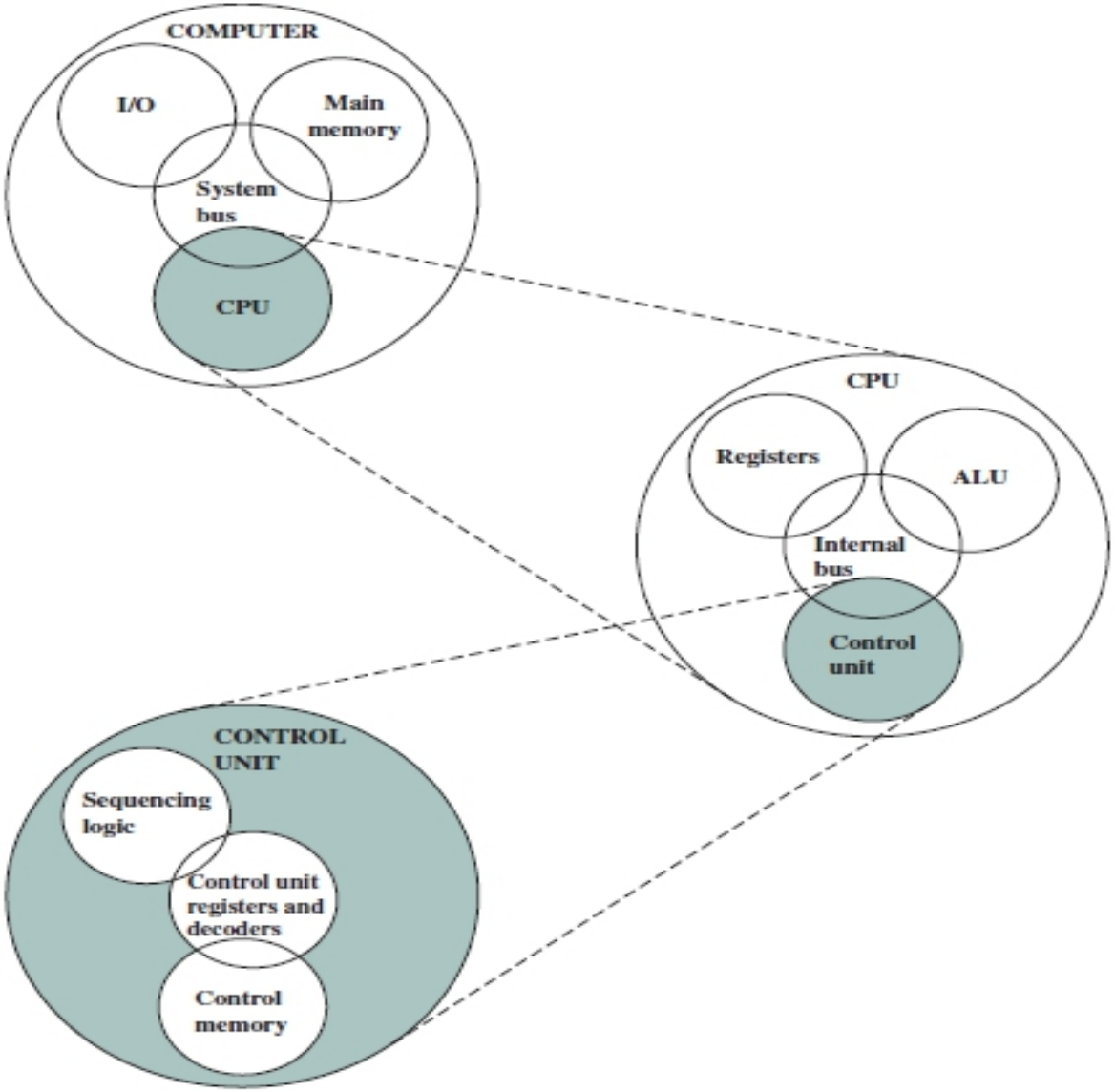

Fig. The computer: Top-Level Structure [Source: Computer Organization and Architecture by William Stallings]

MULTICORE COMPUTER STRUCTURE

- The computers with multiple processors present on a single chip is called a multicore computer and each processing unit consisting of a control unit, ALU, registers and cache is called a core.
- An important feature of this is the use of multiple layers of memory called cache memory between the processor and the main memory.

Contd.

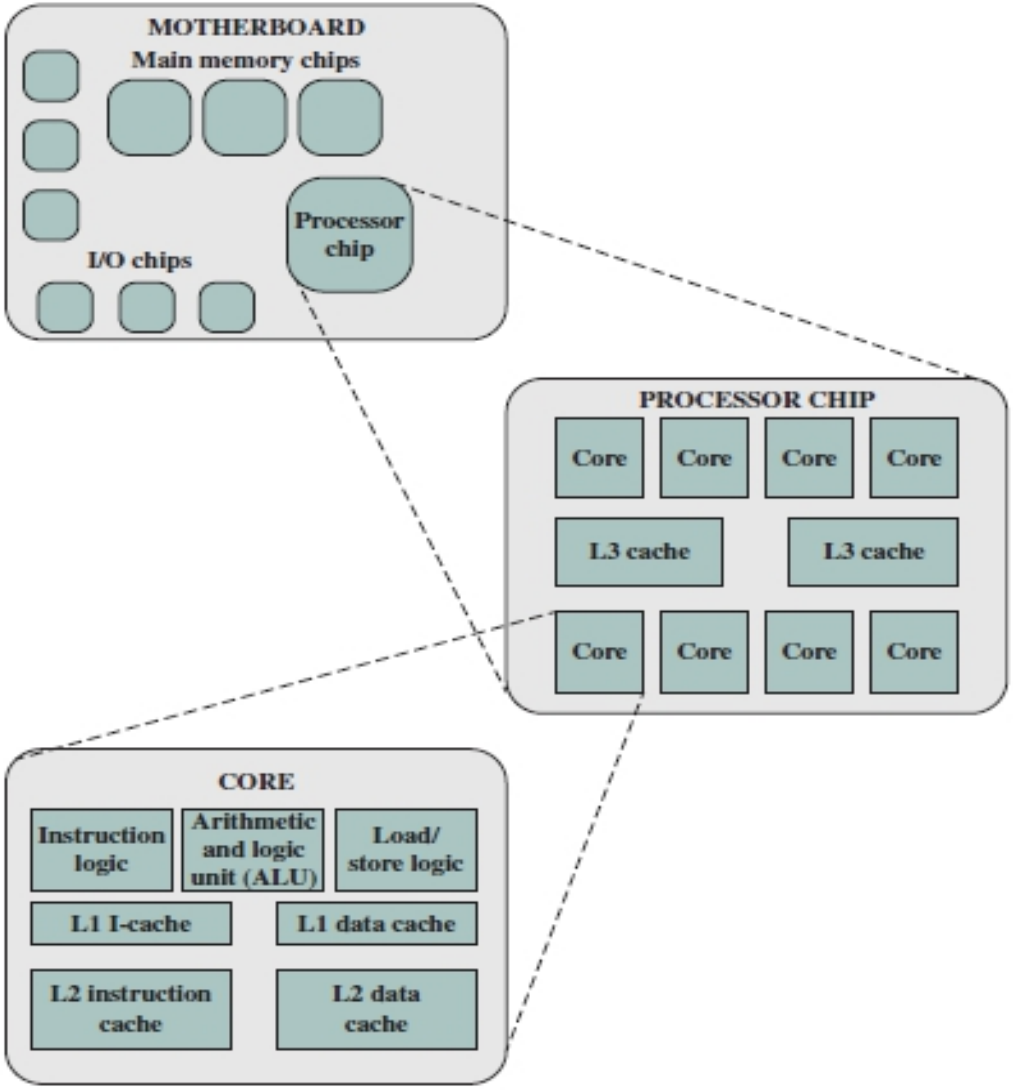

Fig.: Simplified view of Major Elements of a Multicore computer [Source: Computer Organization and Architecture by William Stallings]

Contd.

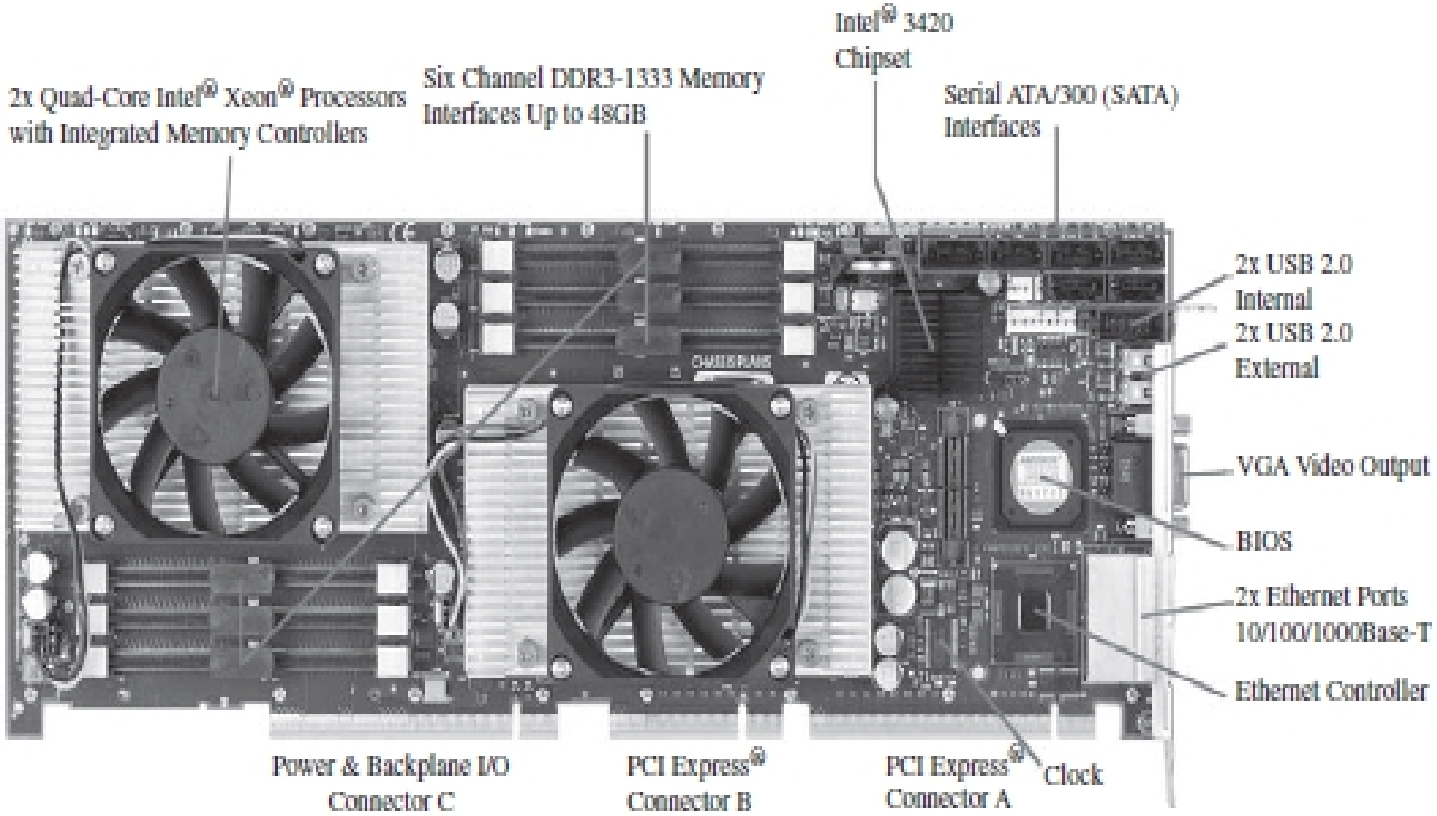

Fig.: Motherboard with Two Intel Quad-Core Xeon Processors [Source: Computer Organization and Architecture by William Stallings]