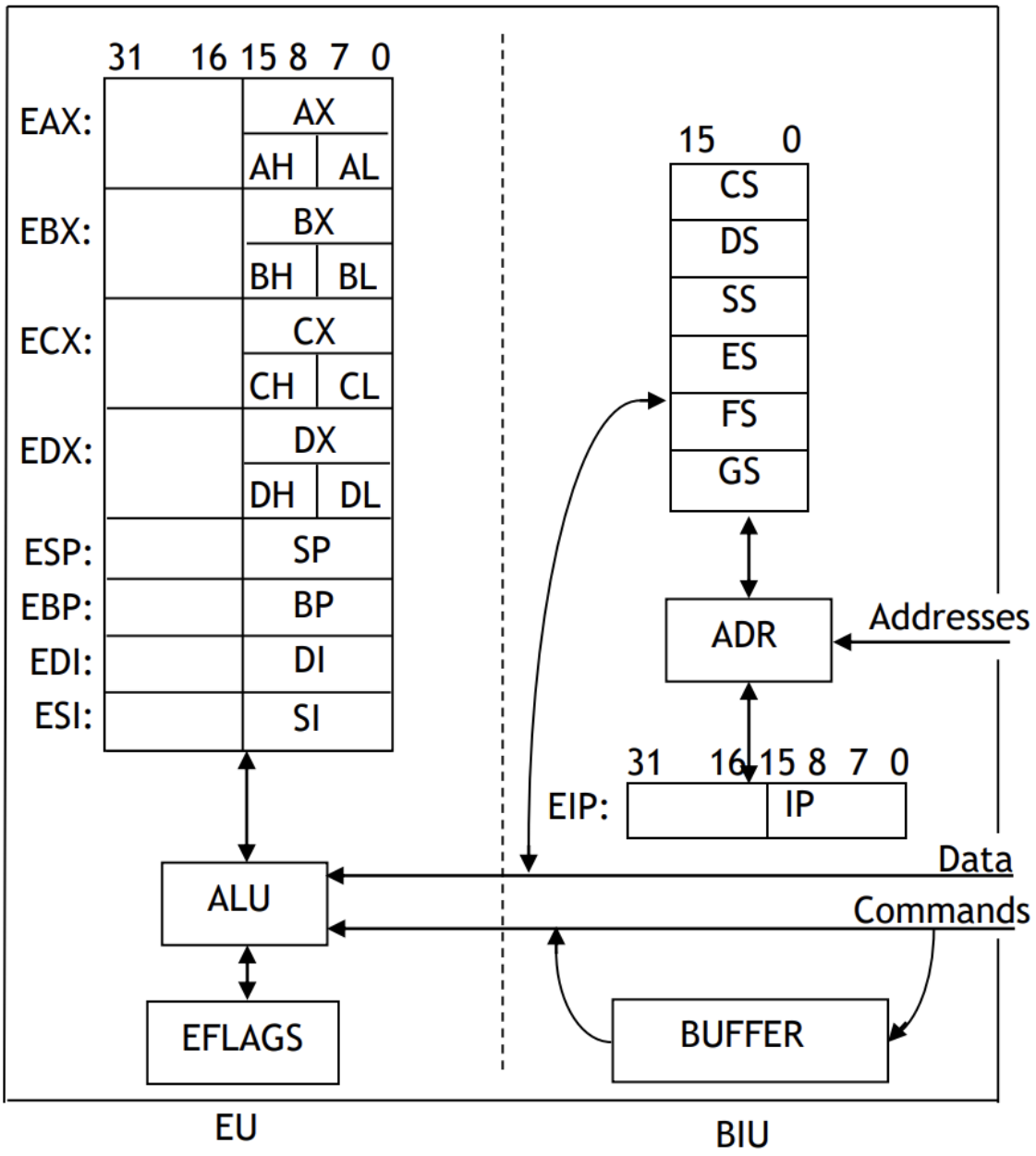
ASC Lecture 1 → intro: EU, BIU, ALU

Notes | lecture notes 1

the BIT is basic unit of representing the information

the BYTE (8 = 2^3 bits) the smallest ADDRESSABLE (accessible) unit of information // NOT the smallest usable unit of information

on 16bits you can only access 1MB, on 32bits 4GB



the bits in registers are indexed from 0 to 31, right to left, because it represents the power of 2 for that bit

the registers are storage capacities of very small size (8 → AL/AH, 16 → AX, 32 → EAX, 64 bits) but very fast in terms of access speed, used for temporary store of operands with which a processor works

operands → data, command codes, addresses

datatype → structure that has to be given + associated operations (e.g. data.method(2,3))

- the registers are **not** RAM, they are 1000x faster than RAM or HDD

EU → executive unit

BIU → bus interface unit

EU and **BIU** work in parallel → while EU runs the current command, BIU prepares the next one

- It is responsible for grabbing from memory the operands
- it needs addresses to work

ALU → arithmetic and logic unit

- base 2 is a **representation** mechanism, together with base 16 while base 10 is an **interpretation** mechanism

> 💡 the datatype on x86 microprocessors is **the size of representation** (e.g. 1 byte, 2 bytes, 4 bytes, 8 bytes)

- It can do arithmetic and logic operations
- It can also apply the instruction code and activate a circuit where, just like a washing machine, utilises an already fixed program
- What kind of operations?
  - The native architecture does not work with real numbers, only integer numbers
  - The task to use real numbers is done by mathematical co-processor
  - It works with:
    - Addition
    - Substraction
    - Multiplication
    - Divition

Q: Why do PCs use 0 and 1

- we can block/let through electricity

Q: What is a bit?

- The bit is a basic unit of representing information inside a computer
- It can have a value of 0 or 1

Q: The region where you declare data is separate because

- What you write in a high level programming language is sent to a data segment
- All the continuous lines of code go to a code set
- The data segment IS NOT EXECUTABLE, IT IS “DEAD”

Q: What is a data type?

- A meaning of trying to interpret and give info about something

- From a constructive and logical point of view, a data type is a couple of structure + associated operations