

# **16.317: Microprocessor Systems Design I**

Fall 2012

Lecture 3: Key Questions

September 10, 2012

1. Describe the basic characteristics of processor registers.
2. Describe the basic characteristics of processor memory.

3. What does it mean for data to be aligned? What is the impact of mis-aligned data?

4. What is “little endian” data?

5. **Example:** Given the figure shown below (Fig. 2.5b), write the full data word in hexadecimal. Is this word aligned?

Address	Memory (binary)
0200E <sub>16</sub>	0010 1100
0200D <sub>16</sub>	1001 0110

(b)

6. **Example:** Given the double word in this figure (Figure 2.7a), write the full double-word in hexadecimal. Is this double word aligned?

Address	Memory (binary)	Memory (hexadecimal)
02105 <sub>16</sub>	0000 0001	01
02104 <sub>16</sub>	0010 0011	23
02103 <sub>16</sub>	1010 1011	AB
02102 <sub>16</sub>	1100 1101	CD
02101 <sub>16</sub>	XXXX XXXX	XX
02100 <sub>16</sub>	XXXX XXXX	XX

(a)

7. Describe the general characteristics of the 80386DX

8. Briefly describe the registers of the 80386DX.

9. What are the three general types of locations where operands can be stored and the addressing modes associated with those locations?

10. Explain what an effective address is and how one is generally calculated.

11. Describe each of the general classes of memory addressing modes.

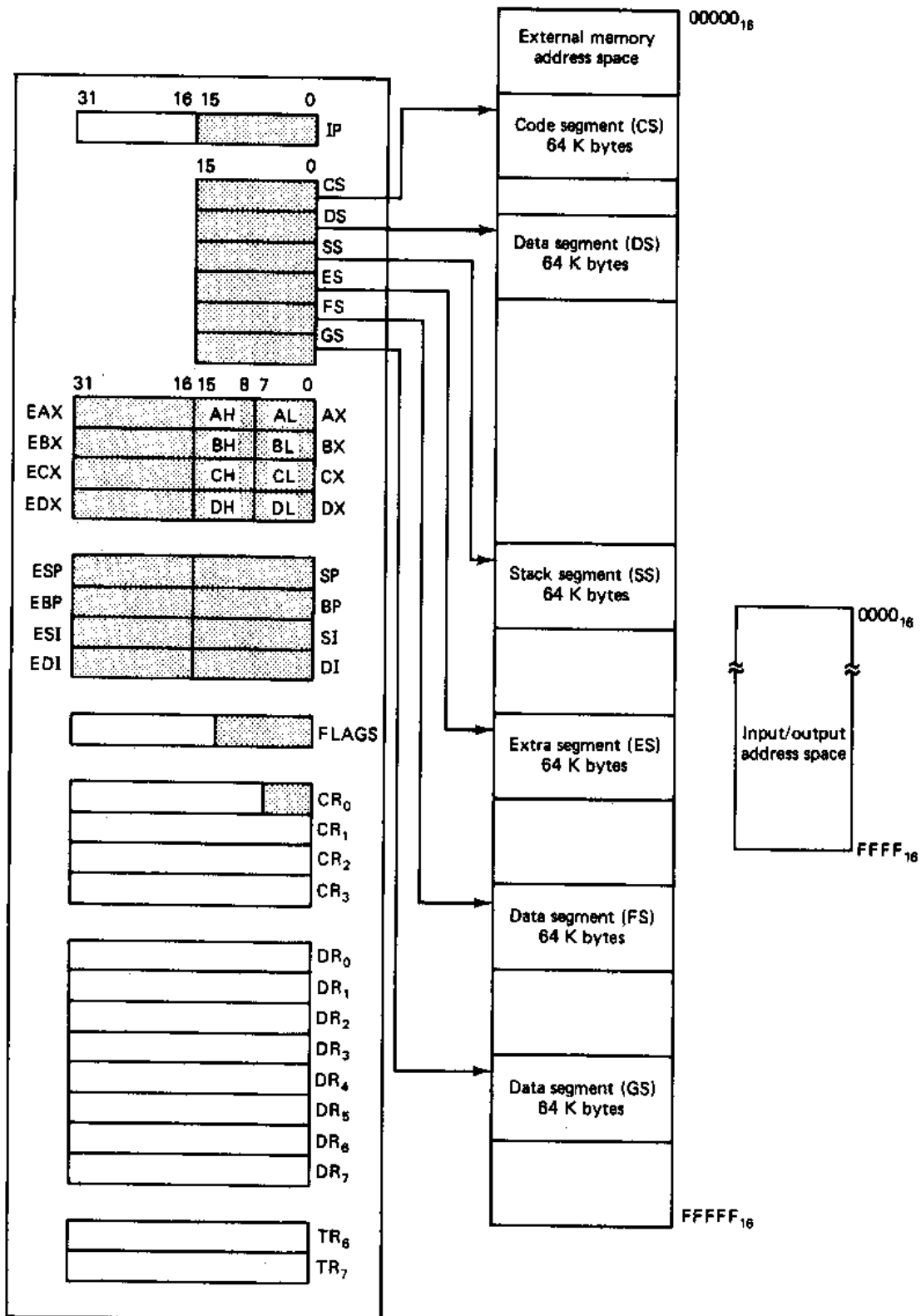


Fig. 2.2: Real-mode software model of the 80386DX microprocessor