

Class Presentation

Topic

Multitasking concept and Flag Register in 80286

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Multitasking Concept in 80286

- It is a special features of 80286.
- 80286 is an advanced version of 8086 designed for multitasking and multiple user environment.
- Multitasking is based on modes of operation of it i.e.

Protected Virtual mode

- It supports multitasking and multiple user environment using virtual memory.
- It offers 24 bit memory address along with 1gb of virtual memory.

Virtual Memory

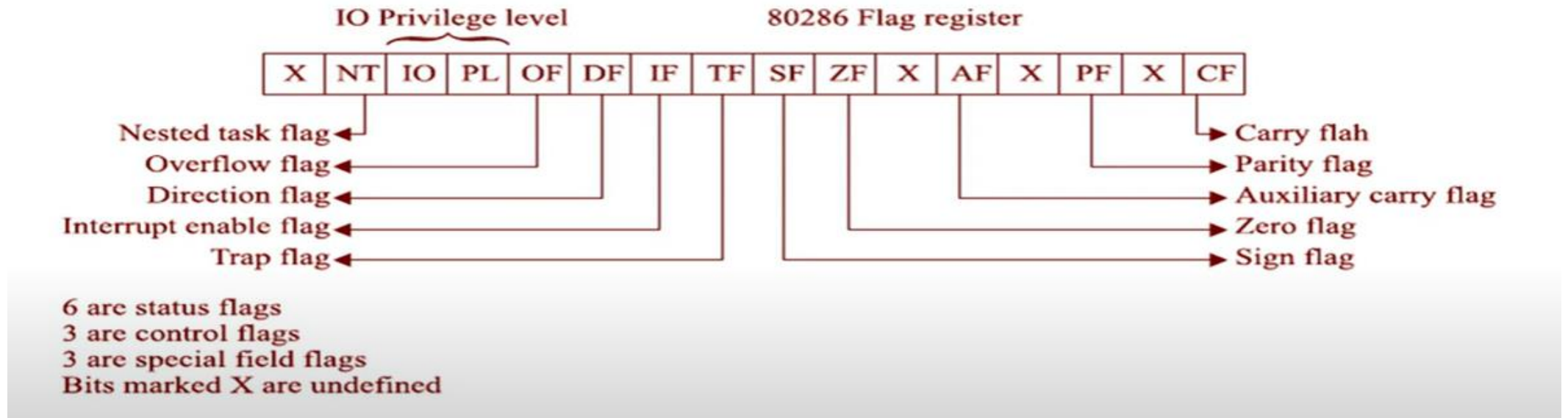
- Part of HDD which can be utilized for storing large instruction inside the system.
- It could handle multitasking.
- It allows 1gb addressable space via segmentation,etc.

Flag Register of 80286

- Flag register of 80286 is a modified version of 8086's flag to accomodate various status and control operations involved in 80286 due to multitasking and multiple user environment.
- It consists of two words (Upper and Lower word)

Lower Word

- Similar to 8086 with some additional flags.



CF Carry Flag (bit D0)

- Set on high-order bit carry or borrow; cleared otherwise

PF Parity Flag (bit D2)

- Set if low-order 8 bits of result contain an even number of 1 bit; cleared otherwise.

AF (bit D4)

- Set on carry from or borrow to the lower order four bits of AL; cleared otherwise.

ZF Zero Flag (bit D6)

- Set if result is zero; cleared otherwise

SF Sign Flag (bit D7)

- Set equal to high-order bit of result (0 if positive, 1 if negative).

TF Single Step Flag (bit D8)

- Once set, a single-step interrupt occurs after the next instruction executes. TF is cleared by the single step interrupt.

IF Interrupt–enable Flag (bit D9)

- When set, maskable interrupts will cause the CPU to transfer control to an interrupt vector specified location.

DF Direction Flag (bit D10)

- Causes string instructions to auto-decrement the appropriate index registers when set. Clearing DF causes auto increment.

OF Overflow Flag (bit D11)

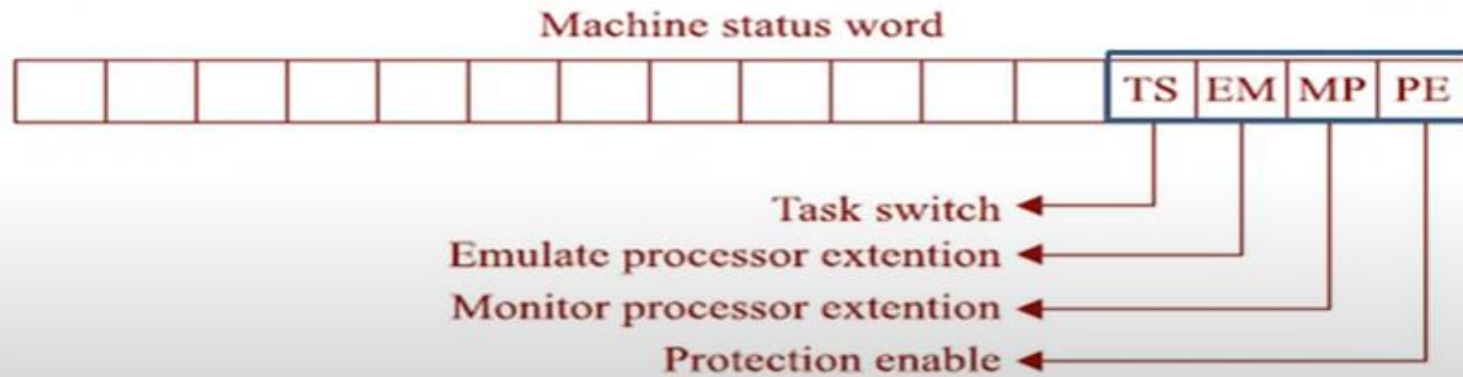
- Set if result is a too-large positive number or a too-small negative number (excluding sign-bit) to fit in destination operand: cleared otherwise.

Special Flag

- The bits 12 and 13 indicate the I/O privilege level and 14 indicates the nested task.
- The special field flags are only relevant in protected mode.
- Real mode should treat these bits as don't care, making no assumption about their status.
- The I/O privilege level is a two bit value, specifies one of the four different privilege level necessary to perform I/O operations.
- These two bit generally contain 00 in real mode.
- The NT flag controls the operation of an interrupt return (IRET) instruction and is normally 0 for real mode.

Upper Word

Upper word of flag is called as Machine Status Word(MSW).



PE (bit D16)

- Protection enable flag places the 80286 in protected mode, when PE is set. This can only be cleared by resetting the CPU.

MP (bit D₁₇)

- When MP is set, the monitor processor extension flag allows WAIT instruction to generate a processor extension not present in the exception, i.e., exception number 7.

EM (bit D₁₈)

- If EM is set, the emulate processor extension nag causes a processor extension absent exception and permits the emulation of processor extension by CPU.

TS (bit D_{19})

- When TS set, this flag indicates the next instruction using extension will generate exception 7, permitting the CPU to test whether the current processor extension is for the current task.

Thank You !

