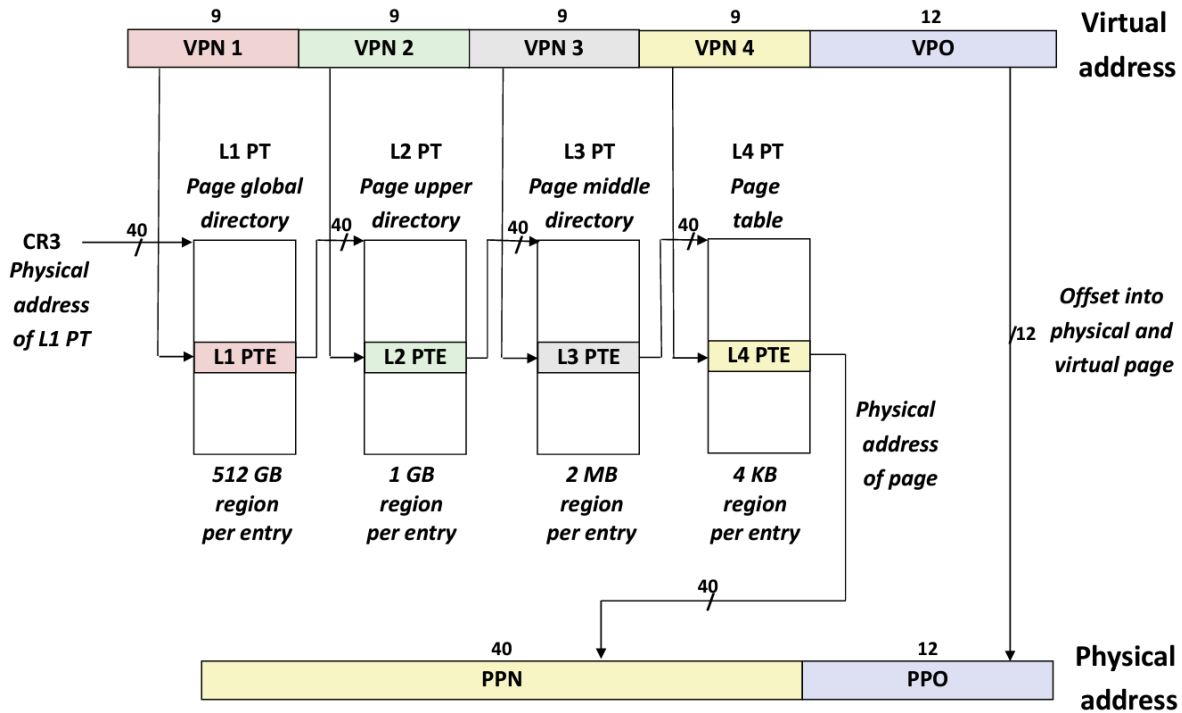I. Virtual Memory and MACROS

Core i7 Page Table Translation

Bryant and O'Hallaron, Computer Systems: A Programmer's Perspective, Third Edition

Macro	Meaning
PAGESIZE	Size of a memory page. Equals 4096 (or, equivalently, `1 << 12`).
PAGENUMBER(addr)	Page number for the page containing `addr`. Expands to an expression analogous to `addr` / PAGESIZE.
PAGEADDRESS(pn)	The initial address (zeroth byte) in page number `pn`. Expands to an expression analogous to `pn` * PAGESIZE.
PAGEINDEX(addr, level)	The index in the `level`th page table for `addr`. `level` must be between 0 and 3; 0 returns the level-1 page table index (address bits 39–47), 1 returns the level-2 index (bits 30–38), 2 returns the level-3 index (bits 21–29), and 3 returns the level-4 index (bits 12–20).
PTE_ADDR(pe)	The physical address contained in page table entry `pe`. Obtained by masking off the flag bits (setting the low-order 12 bits to zero).

II.   Constants

Constant	Meaning
KERNEL_START_ADDR	Start of kernel code.
KERNEL_STACK_TOP	Top of kernel stack. The kernel stack is one page long.
console	Address of CGA console memory.
PROC_START_ADDR	Start of application code. Applications should not be able to access memory below this address, except for the single page at console.
MEMSIZE_PHYSICAL	Size of physical memory in bytes. WeensyOS does not support physical addresses ≥ this value. Defined as `0x200000` (2MB).
MEMSIZE_VIRTUAL	Size of virtual memory. WeensyOS does not support virtual addresses ≥ this value. Defined as `0x300000` (3MB).