Paging Data Structures

Pages are fixed size (e.g. 4K) so a virtual address has two parts:

- **virtual page number** : most significant bits
- and the **page offset** : least significant 12 bits ($\log_2 4k$)

The page table is a collection of **page table entry (PTE)** that maps

- a **virtual page number (VPN)**
  i.e the index in the page table
- to **physical page numbers (PPN)** a.k.a frame number
- and includes bits for protection, validity, etc ...

Page Table Entries (PTEs)

- The **Modify bit** says whether or not the page has been written (set when the write to a page occurs)
- The **Reference bit** says whether the page has been accessed (set when a read or write to a page occurs)
- The **Valid bit** says whether or not the PTE can be used (checked each time the virtual address is used)
- The **Protection bits** say what operations (read, write, execute) are allowed on page
- The **Physical page number (PPN)** determines the physical page