Paging and Large Address Spaces

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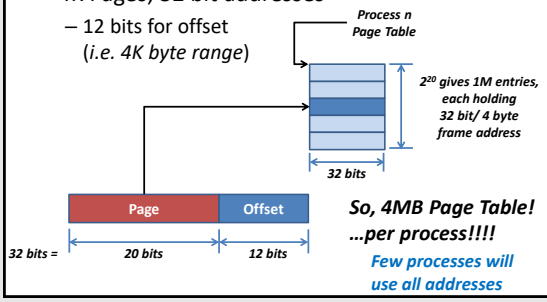
Problem: *Page Table size*

- 4K Pages, 32 bit addresses
  - 12 bits for offset (*i.e. 4K byte range*)

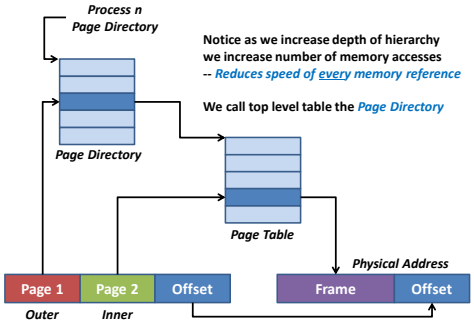


So, 4MB Page Table!
…per process!!!!

Few processes will use all addresses

2

Hierarchical/ Multi-level Paging



Notice as we increase depth of hierarchy we increase number of memory accesses
-- *Reduces speed of every memory reference*

We call top level table the *Page Directory*

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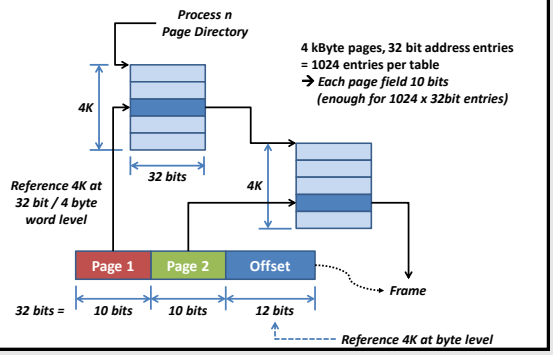
Hierarchical/ Multi-level Paging II



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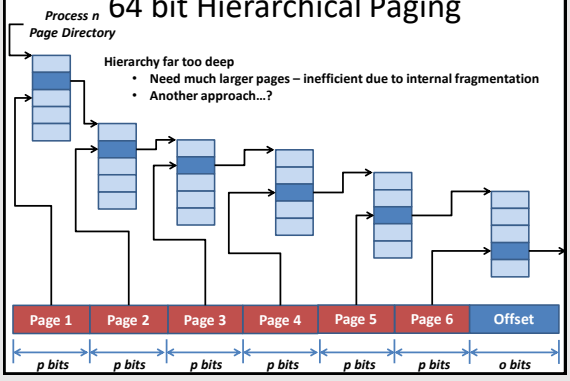
64 bit Hierarchical Paging



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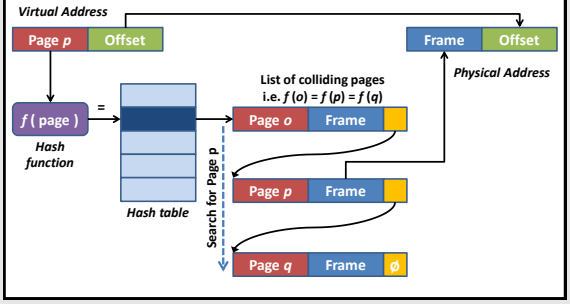
Hashed Page Tables



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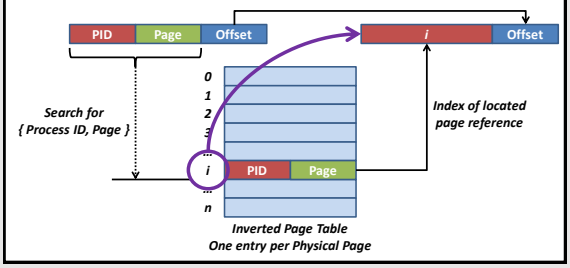
Inverted Page Tables

- Page table has one entry for each frame
  - One table used for ALL processes



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