Number of pages = process size/ page size

Page Table Size = Number of Pages x Page Table Entry Size

Consider a single level paging scheme. The virtual address space is 4 MB and page size is 4 KB. What is the maximum page table entry size possible such that the entire page table fits well in one page?

Number of pages = process size/ page size
4 mb/4 kb = 2^10 pages

Page Table Size = Number of Pages x Page Table Entry Size

Page Table Size <= Page Size

2^10 x N <= 4 KB

1. Consider a single-level paging scheme where the virtual address space is 8 MB and the page size is 4 KB. What is the maximum page-table-entry (PTE) size (in bytes) such that the entire page table occupies exactly one page in physical memory?

Number of pages = Virtual address space / Page size
= 8 MB / 4 KB
= (2^23) / (2^12)

= 2^11

= 2048 pages

Page Table Size = Number of pages × Page Table Entry Size (N)

2048 × N <= 4096 bytes

N <= 4096 / 2048 = 2 bytes

Maximum page table entry size = 2 bytes

2. Two processes, C and D, share a common library that occupies 20 pages in physical memory. The system has 512 MB of physical RAM, and the page size is 16 KB. Calculate the

percentage of physical memory saved by sharing this library between the two processes instead of loading it separately into each process's address space.

Library size = 20×16 KB = 320 KB
= 2×320 KB = 640 KB
= 320 KB
= 640 KB - 320 KB = 320 KB
= (320 KB / (512 × 1024 KB)) × 100
= (320 / 524288) × 100 = 0.061%

Percentage of physical memory saved = 0.061%