

1. code sharing or read-only data sharing is transparent to the processes concerned. It allows the system to economise on the use of physical memory by avoiding multiple copies. segmentation hardware (or paging hardware with segmentation) is needed with write protection on the shared code or data.

sharing of writeable data areas allows processes to co-operate efficiently. They may wish to share only a portion of their address space. Fine grained segmentation hardware (many segments per process) would support this. If only paging hardware is available the OS may allow the processes to declare shareable regions of their data spaces and set up the shared pages accordingly.

3. Advantages of Thread

1. Responsiveness: If process is divided into multiple threads. if one thread completes its execution then its output can be immediately returned
2. Faster context switch: context switch time b/w threads is lower compared to process context switch. process context switching requires more overhead from the CPU.
3. Resource sharing: Resources like data and files can be shared among all threads within a process.
4. Communication: Communication b/w multiple threads is easier, as the threads share common address space.

(ii) Page Table

Page Table is a data structure used by the virtual memory system to store the mapping b/w logical address and physical addresses.

Logical Address are generated by the CPU for the pages of the processes therefore they are generally used by the processes.

Physical addresses are the actual frame address of the memory. They are generally used by the hardware or more specifically by RAM subsystems.

page 0	Frame no
page 1	Frame no
page 2	Frame no
page 3	Frame no
page 4	Frame no

	Frame no	offset
physical Address	M-P	P

	Frame no	offset
logical Address	I-P	P

page $\frac{I-P}{2-1}$	Frame no
page $\frac{I-P}{2}$	Frame no

The CPU always accesses the process through their logical addresses, however the main memory recognizes physical addresses only.