Memory

Virtual Memory

So a page table is a list of pages a process has accessed and the relevant virtual-physical mapping. We have already seen every page also has some permissions attached:

- *read*: the process can read from this page
- *write*: the process can write to this page
- *execute*: the process can execute code on this page

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Further, permissions are useful when we have shared memory, too

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Or enable it if we want shared memory. Thus the TLB solves two big problems: memory protection and memory sharing

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The kernel bypasses the TLB lookup and sees physical addresses, but can map back and forth for each process

Shared Memory

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Many programs need to do mundane stuff like read or writing to files, formatted printing, drawing on the screen and so on

So *libraries* of such code are provided that the programmer can use and not have to reimplement it all themselves

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If 10 processes are in memory, each of them using the library `read` function, does that mean there are 10 copies of the code for `read` scattered about in memory?

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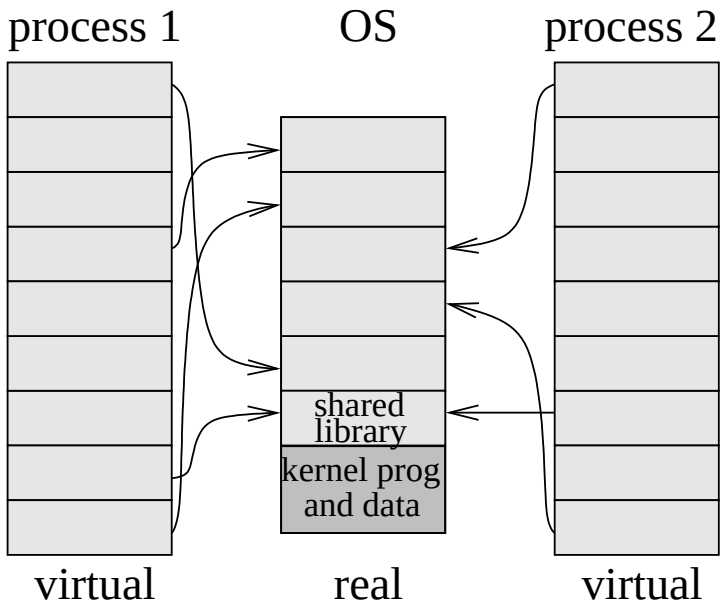
But now the use of virtual memory can let us *share* code between processes

Memory

Virtual Memory



Shared Libraries

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But there is another trick...