

COW Wrap-up & Swappin' Pages

COW Wrap-Up:

Explain a race condition that could happen if the following steps were not atomic.

- Check the ref count
- Copy the page
- Decrement the ref count

What do `vspaceinvalidate` and `vspaceinstall` do?

Why do you not need to call `vspaceinstall` in `sbrk` (with non-negative arguments) and dynamic stack growth?

Given the semantics of `vspaceinstall` and `vspaceinvalidate`, what would be better function names for them?

COW Wrap-up & Swappin' Pages

Swappin' Pages:

What is the swap region of the file system and why is it necessary?

How can we keep track of where pages exist on disk?

How can the system react if physically memory is out of free pages and the swap region of disk is full?

How should a `struct vpage_info` change when a page has been swapped out?

During a page fault, how do we distinguish between a page that is on disk and a page that has never been allocated?