

Capítulo 1

Task 12: Two-Level Paging

1.1 Task Description

Implement two-level paging using 4KB pages. This involves setting up a hierarchical page table structure where the root table points to a child node, enabling finer-grained memory management.

1.2 Planned Implementation

1. **Initialize the Root Page Table:** Declare the root page table and align it to 4096 bytes using the `__attribute__((aligned(4096)))` directive.
2. **Create a Child Node:** Allocate a new page-aligned table to serve as the child node. Initialize the child node with all entries set to zero.
3. **Update the Root Table:** Modify the root table to point to the child node for a specific entry (e.g., `raiz[2]`).
4. **Create a Pointer:** Define a pointer (`ptr3`) that points to a virtual address 4MB beyond the range of the first-level table.
5. **Test Access:** Attempt to read the content of `ptr3` and observe the behavior.
6. **Document Results:** Record the observed behavior and compare it with the expected outcome.

1.3 Expected Outcome

- The system should attempt to access the second-level page table for the address pointed to by `ptr3`.
- Since the child node is initialized to zero, the access should result in a page fault.

1.4 Implementation Details

(To be filled after implementation.)

1.5 Challenges

(To be filled after implementation.)

1.6 Final Outcome

(To be filled after implementation.)