CSCE 351
Operating System Kernels

RAM Disks

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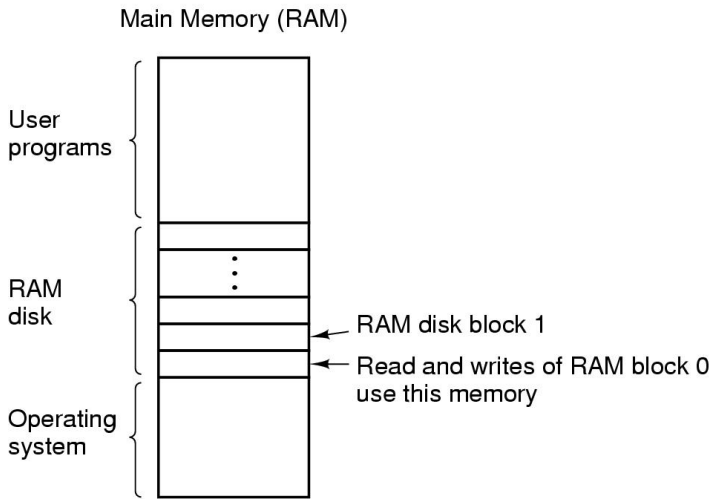
RAM Disk Purpose

- Allows a portion of memory to be accessed as though it were an ordinary disk
- On computers with no hard disks (e.g., floppy only or network-based computers),
  - » The root file system can be loaded into a RAM disk
  - » /tmp can be located in a RAM disk for temporary local storage of files.
  - » MS-DOS and Windows do not support the prior two uses. Why?
- Also useful during installation of an OS

RAM Disk Concept



RAM Disks in MINIX

- MINIX "RAM disk driver is actually four closely related drivers in one. Each message to it specifies a minor device as follows:"
  - 0:/dev/ram
  - 1:/dev/mem
  - 2:/dev/kmem
  - 3:/dev/null
- Each of these devices is a special RAM file.
- Code for handling each file/device is (nearly) identical
  - Only ram-origin and ram_limit changes
- Main loop for the RAM disk driver (**`mem_task`**) is in **`driver.c`**
- Device-specific support is in **`memory.c`**

Special RAM files

- 0:/dev/ram
  - » Default size is the size of the root file system image
    - ❖ The root file system can then copied to the ram disk
    - ❖ An optional boot parameter can specify any size
- 1:/dev/mem is used to read/write physical memory starting at address 0 (the location of the real-mode interrupt vectors).
  - » Used to change interrupt vectors
  - » Use with CAUTION!
- 2:/dev/kmem is used read/write kernel memory
  - » Byte 0 of /dev/kmem is byte 0 of the kernel's data memory
  - » Overlaps with /dev/mem, skipping interrupt vectors and kernel code.
- 3:/dev/null accepts data and discards it