RadixVM

Scalable address spaces for multithreaded applications

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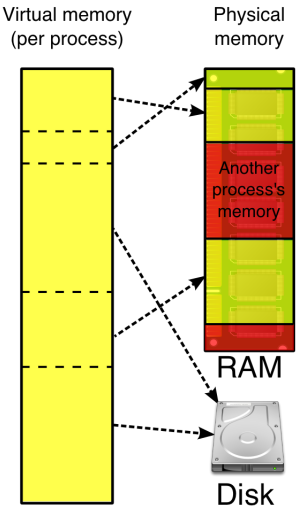
Abstract

RadixVM is a virtual memory (VM) design that attempts to increase multithreaded scalability by:

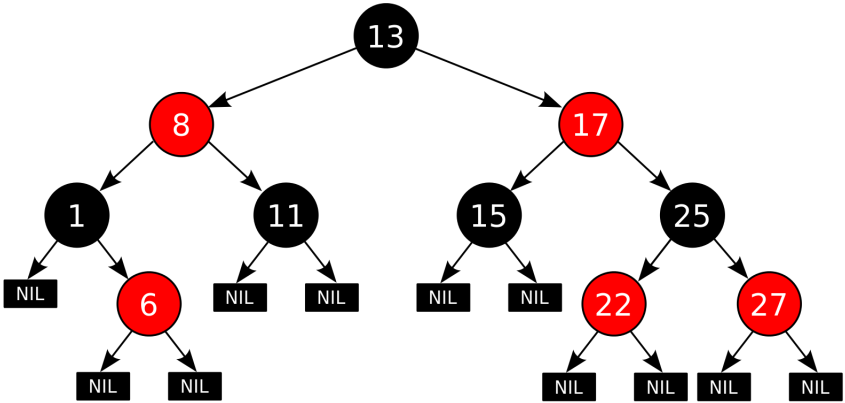
- Storing VM information in a radix tree
- Counting references to memory addresses
- Reducing inter-core virtual address invalidation (remote TLB shootdown)

Background: Virtual Memory



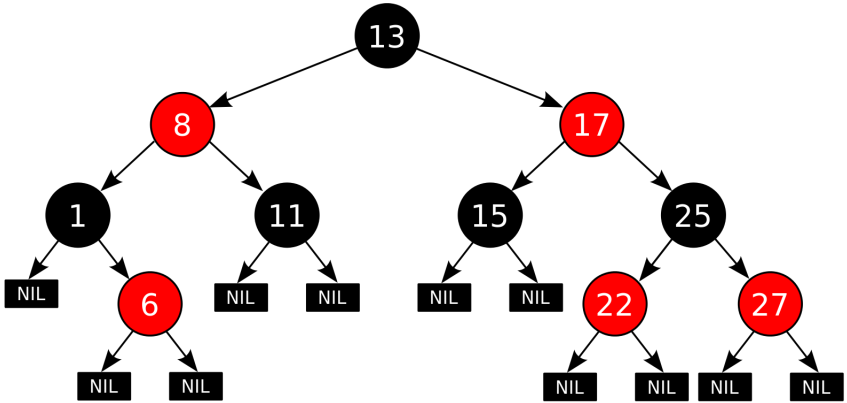
- Maps a contiguous virtual address space to physical memory and disk

Background: Linux Virtual Memory



- Red-black tree
- Allows the kernel to search for memory area covering a virtual address

Background: Linux Virtual Memory



- Red-black tree
- Allows the kernel to search for memory area covering a virtual address
- Problem: A single lock per address space!

References

- Linux VM info from:
  `http://duartes.org/gustavo/blog/post/how-the-kernel-manages-your-memory/`

Attribution

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