Sigríður Birna Matthíasdóttir, Stefán Hermundsson

1   Assignment 3a

Preemptive Scheduling: The VM hypervisor could interrupt the execution of OS1 and immediately switch to running OS2. This is known as preemptive scheduling and allows for efficient use of CPU resources by ensuring that all operating systems receive a fair share of CPU time.

One option would be preemptive scheduling. The resources are allocated to execute the process for a certain period, but then the process is taken away in the middle and placed in the queue. So the hypervisor could interrupt OS1.
Time-sharing: The VM hypervisor could allow OS1 to continue running for its full 20ms time slot, but reduce the amount of CPU time allocated to OS1 in the next time slot to make up for the time that OS2 was blocked.

2. In a virtual machine scenario, the different virtual machines are really completely separated from each other: OS1 running on VM1 can neither access the main memory nor the files1 of OS2 running on VM2. – Describe one possible solution that allows you nevertheless to exchange data between different virtual machines.

It is possible to share a file-system volume and then it is possible to share files. It is possible to define a network of virtual machines and enable each machine to send information over the virtual communication network. The network is modeled after physical communication networks but is implemented in software.

2   Assignment 4

When we turn on the computer the CPU starts execution at a fixed memory location, where the computer hardware has a ROM/EPROM that contains machine code instructions (firmware). The firmware contains a bootstrap program that has just enough functionality to locate the kernel on a mass storage device, loading it into memory and starting it. The routine then calls the kernel and the kernel boot begins. Initialization functions are called to set up interrupts, perform further memory configuration, and load the initial RAM disk. In the end, a call is made to kernel_thread to start the init function, which is the first user-space process. After

that the scheduler can take control to provide multitasking. When we can log in we
know that the OS has started operating.

https://developer.ibm.com/articles/l-linuxboot/

https://ecomputernotes.com/fundamental/disk-operating-system/preemptive-
schedulingAdvantages_of_Preemptive_Scheduling