

Advanced Operating Systems -

Assignment #1- Fall 2018

Group Members

Name	Roll Number
Aslam	11L-2233

Executive Summary

You have to create a report on how KVM does the task of CPU scheduling. You are reminded that KVM is a type 1 hypervisor and it is loaded with a Linux kernel as a loadable module. That means, the kernel working along with KVM also completes the tasks of a normal kernel. This means that the kernel has to distinguish among the processes inside the host operating system and VM processes. In this light your report must answer following questions

Question 1 :

How are interrupts handle in a kernel which has KVM module loaded and activated. Describe both scenarios

1. When the interrupt occurs and the target process is in host OS
2. When the interrupt occurs and the target process is inside a virtual machine

Answer 1 :

Write your answer here, extensively use diagrams for illustration.

Question 2 :

How KVM presents a CPU to a virtual machine. How it uses the VTx technology. What are properties of a VCPU offered by KVM

Answer 2 :

Write your answer here, extensively use diagrams for illustration.

Question 3 :

How a process switch works, which is commonly termed as context switch. Describe both scenarios

1. When a process switch occurs in the host operating system. This is simple, the text book contains the details
2. The challenging part is to explain how a process switch works when KVM is loaded. First address the topic for process switch in the host operating system
3. Address the issue of process switch inside a virtual machine.

Answer 3 :

Write your answer here, extensively use diagrams for illustration.

Question 4 :

How CPU scheduling works in KVM enabled kernel. For ease take the example of Round Robin Algorithm and describe its functions properly. You have to go at greatest length of details. For example, you must describing how a specific register is used for quantum definition, and what registers and CPU commands are used to schedule a timer interrupt. You must describe these things and other relevant details for both scenarios.

1. How CPU scheduling (RR algorithm) works for the processes in the host operating system
2. How CPU scheduling (RR algorithm) works for the processes inside virtual machine
3. What happens if host virtual machine has different scheduling algorithm than the virtual machine

Answer 4 :

Write your answer here, extensively use diagrams for illustration.