

Virtual Machines: Concepts and Applications

Homework Assignment 1

1. If we use process virtual machine for each application we have the option of running other applications natively on the underlying machine simultaneously. This is not possible in case of system VM.
2. The company has two options:
 - To use intrinsic compatible virtualization implemented in hardware, as Intel does currently to translate the x86 instructions (CISC) to RISC-like instructions (called micro-op) in the decode stage.
 - To use a software solution as a virtualization layer to emulate the old ISA on the new ISA.
3. We will prefer to use the VM if:
 - The program we want to run is malicious (or buggy) and we want to *isolate* its behavior.
 - If we want to *dynamically* optimize the program (do you remember the smartphone example, we discussed in class?).
4. Profiling means gathering *runtime* information about a program. It helps in virtualization in the following aspects:
 - Decide which translated blocks to keep in code cache instead of re-interpreting them.
 - Decide what type of optimizations are needed for the running program