Process Abstraction

- Instruction Set
- Registers
- Physical Memory
- MMU
- I/O Devices

- Virtual Memory

- System Calls

Operating System

Hardware
Process Abstraction

- Instruction Set
- Registers
- Physical Memory
- MMU
- I/O Devices

Virtual Memory
System Calls

Process Abstraction

Hardware

Operating System
Process Abstraction

- Instruction Set
- Registers
- Physical Memory
- MMU
- I/O Devices

Virtual Memory

System Calls

Operating System

Hardware

Virtual Machine

Process
Virtualizing Virtual Memory

Guest Virtual AS

Guest MMU (Virtual)

Guest Page Maps

Virtual Machine

Guest “Physical” AS

Guest MMU

Machine MMU

Machine Page Maps

Host “Machine” AS

Hardware