Kernel based Virtual Machines
A short introduction

Lukas Wanke
Ba.Sc. Information Technology
contact: lwanke@stud.fra-uas.de

Frankfurt University of Applied Sciences
Faculty of Computer Science

Virtualization

- Virtualization is a form of hardware abstraction with the aim of sharing resources.
- Components sharing an underlying hardware resource may be isolated/independent from each other.
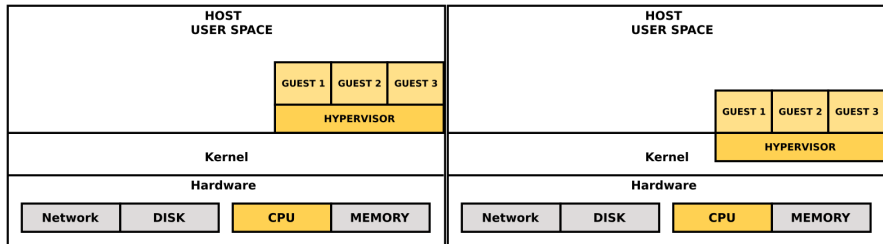- CPU Core Virtualization: *INTEL VT-x, AMD-V*

Hypervisor

- The Hypervisor is an abstraction layer between the real hardware components and any form of operating system on higher levels.

- It forms an virtual environment which can be modified and used as a basis for virtual machines regardless of the real underlying hardware components.

Concept of Host & Guest System
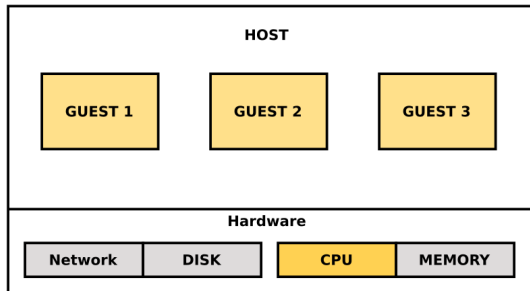
A host system
may contain several
independent guests.

Kernel & User Space

Kernel Based Virtualization

- Infrastructure for virtualization implemented in the Linux Kernel
- Since Kernel 2.6.20 (now at 4.9)
- Under OpenSource Software Licenses

Kernel Modules:
kvm.ko - KVM Core module
kvm-intel.ko - Intel VT-x specific module
kvm-amd.ko - AMD-V specific module
Location: *lib/modules/4.8.0-1-amd64/kernel/arch/x86/kvm/*

Example & Demonstration:

Host:
CPU: *Intel Core i5(64bit Dual Core CPU at maximum of 2 x 2.4GHz)*
KVM Support: *Intel VT-x*
Operating System: *Debian Linux with Kernel 4.8*

Guest(1): *Android 7.1 with Kernel 3.10*
Guest(2): *Debian Linux with Kernel 3.16*

Lukas Wanke | Kernel based Virtual Machines | A short introduction