

Open Source Virtualization

Enterprise Virtualization On A Dime

What Is Virtualization?

- * Abstraction Of Computer Resources
- * Terminology
 - * Host
 - * Guest

A Brief History Of Virtualization

- * IBM CP/CMS, VM/CMS, zVM
- * VMware
- * Xen
- * Microsoft

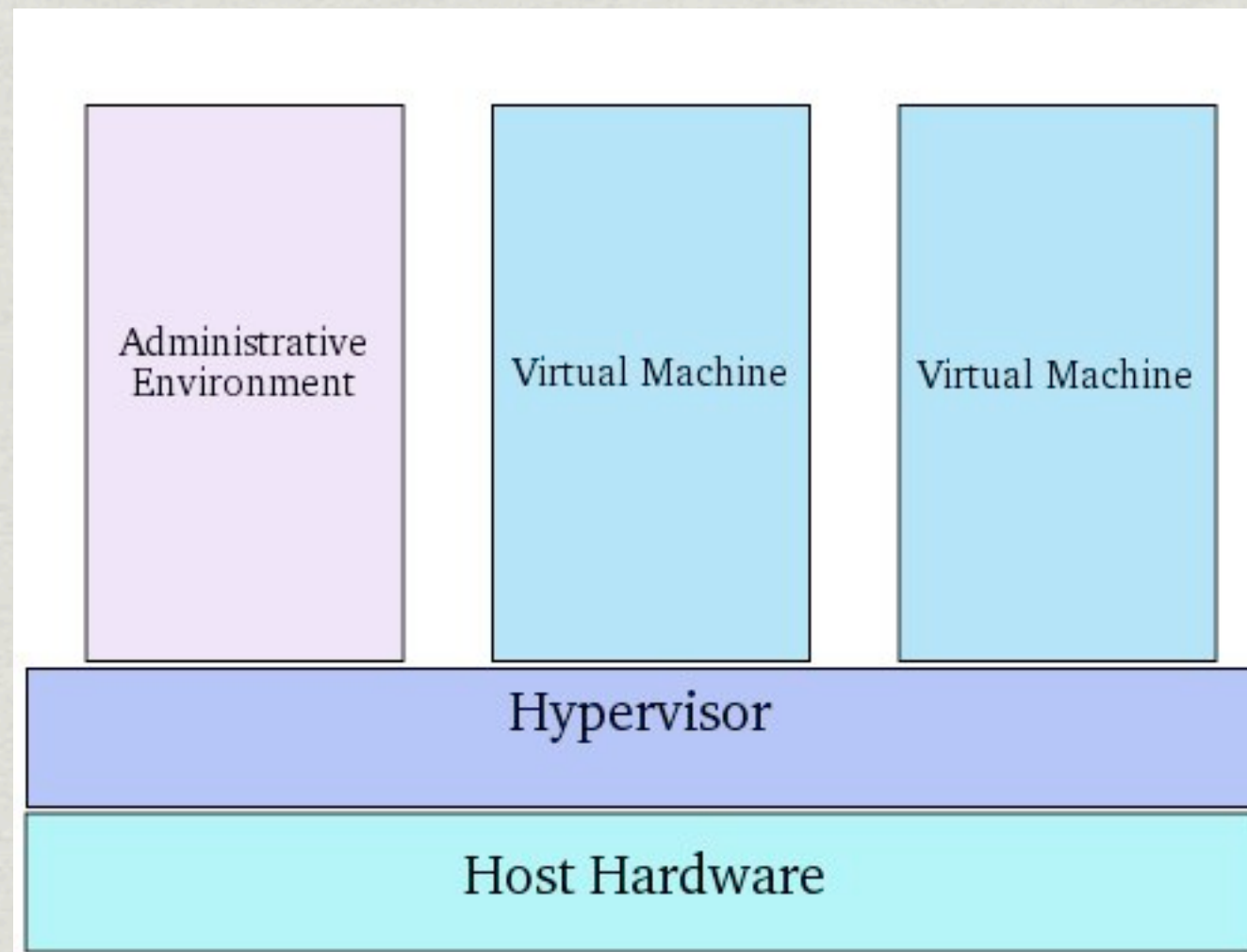
Virtualization Technologies

- * Full Virtualization
 - * Hardware Assists
 - * AMD-V (Pacifica)
 - * Intel-VT (x, i, c, d)
- * Para-Virtualization
 - * Hybrid
- * Kernel Level Virtualization
- * Shared Kernel Partitioning

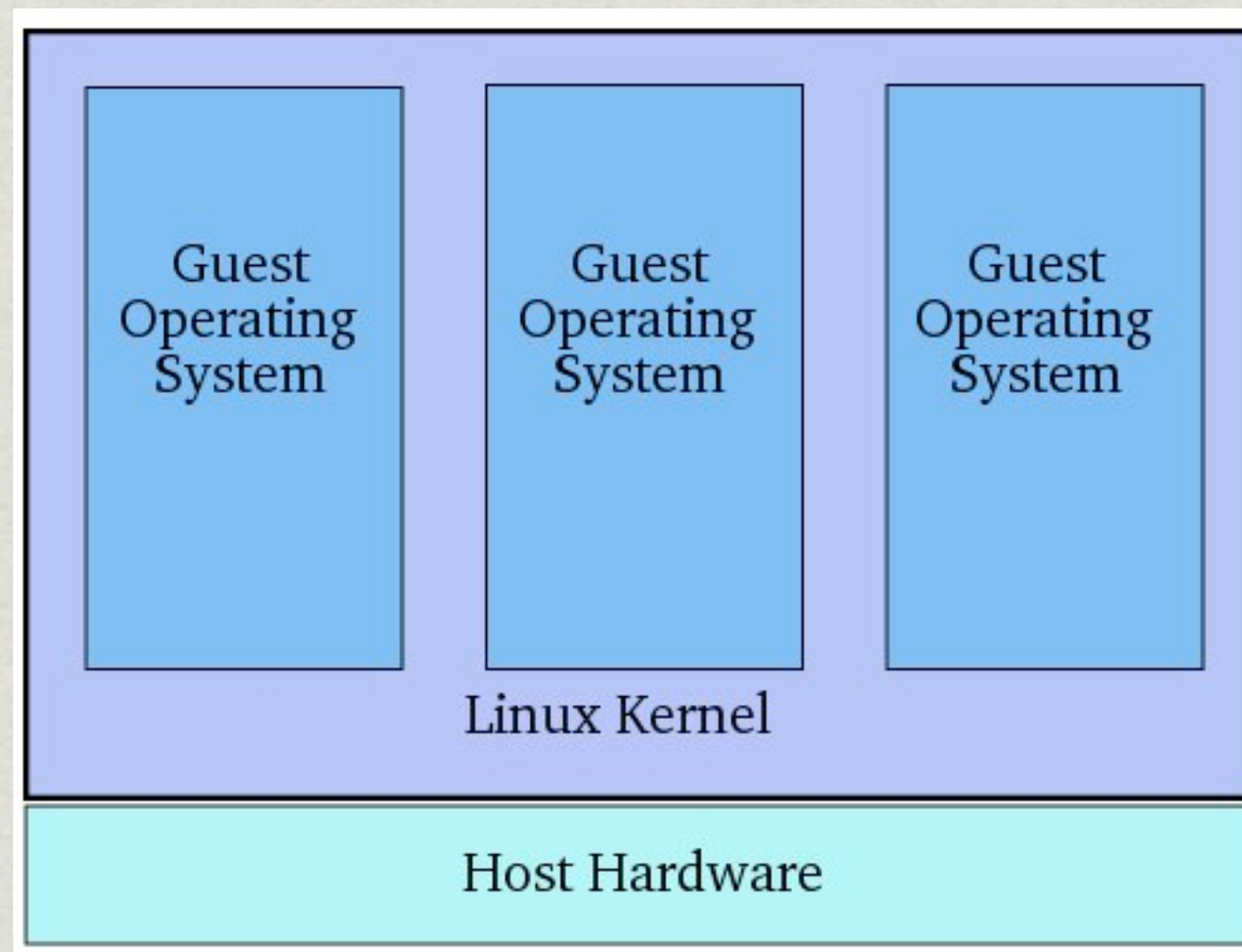
How Virtualization Works

- * Hypervisor/VMM
- * Guests
- * Live Migration

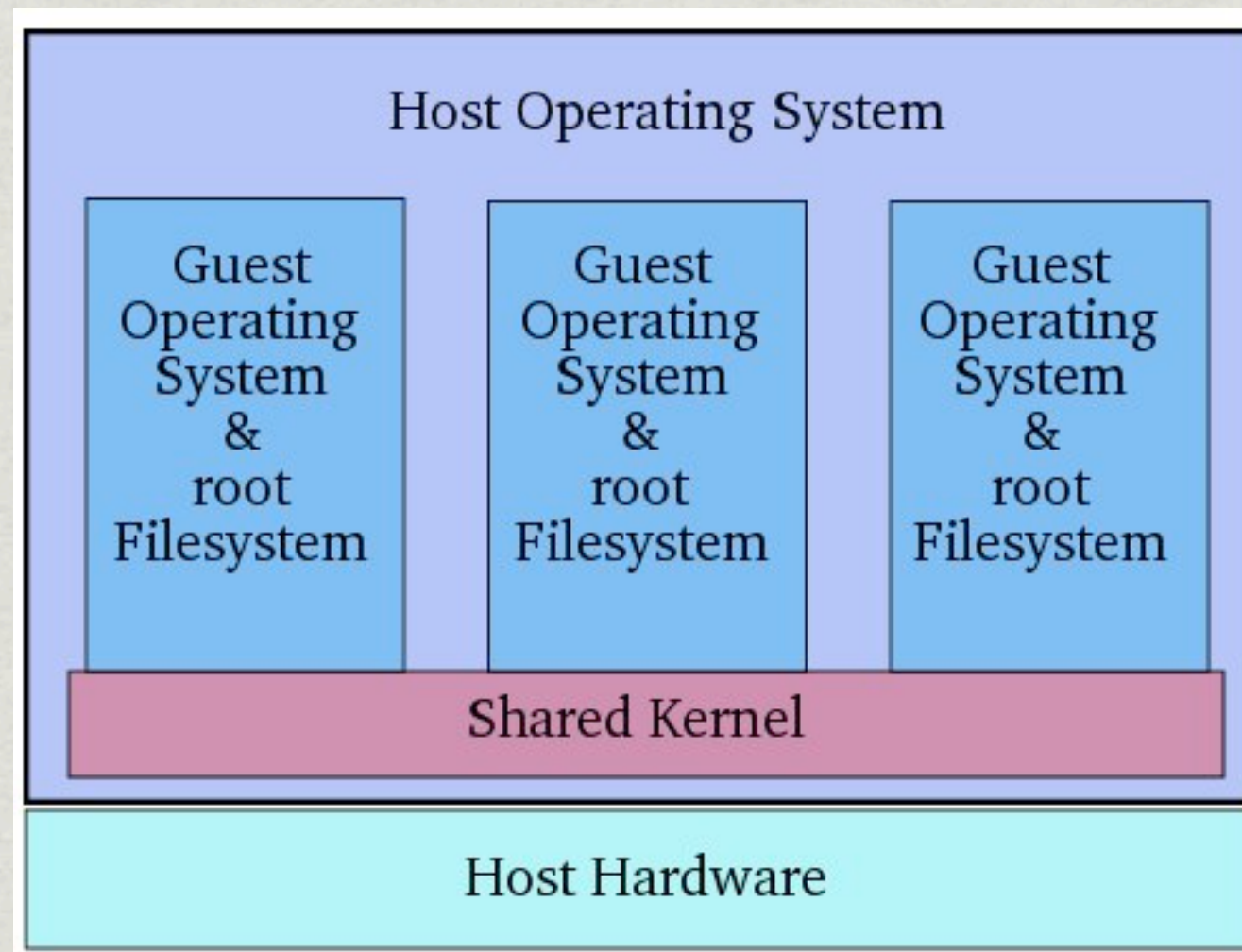
Hypervisor Virtualization



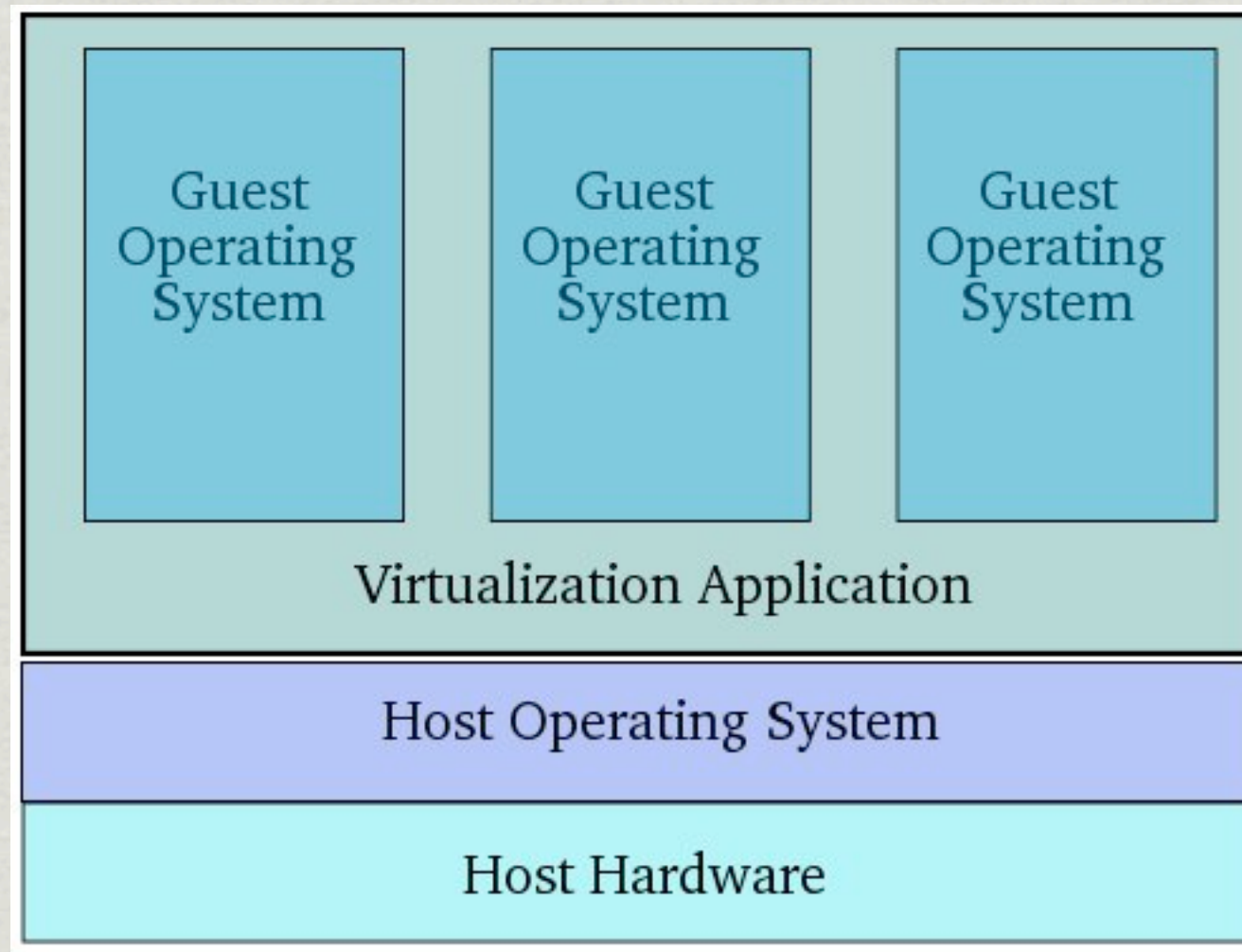
Kernel Level Virtualization



Shared Kernel Virtualization



Application Level Virtualization



Why Virtualize?

- * Fully Utilize Today's Hardware
- * Simplify Administration/Management
- * Speed Up Deployment
- * Product Testing
- * Granular Separation Of Functionality
- * Security Sandbox
- * Clusters without Clustering
- * Reduce Data Center Footprint

Performance and Limitations

- * Near Native Performance With Paravirtualization
- * Full Virtualization Is 0%-10% Penalty
- * Build With Virtualization In Mind
- * Must Balance Workloads
- * High IO and High Throughput Are Bad
- * All Eggs In One Basket
- * Guests Can Impact Other Guests

Enterprise Systems

- ✱ Hardware Vendors Partnering with Software Vendors
- ✱ Virtualization Services
 - ✱ Assessment
 - ✱ Migrations
 - ✱ Management

VMware

- * VMware ESX
- * VMware 3i
- * VMware Server
- * VMware Workstation
- * VMware Fusion

Xen Based

- * RedHat
- * Novell
- * Oracle
- * Citrix
- * Virtual Iron
- * Sun

Microsoft

- * Windows Server 2008
 - * Hyper-V
 - * 64 bit only
 - * Requires Hardware Assist
 - * Architecture Very Similar To Xen

Containers

- * Solaris Zones and Containers
- * Virtuozzo

Open Source Systems

- ✱ Management Tools Are Still Rudimentary
 - ✱ virsh
 - ✱ oVirt

Xen

- * Red Hat 5, SuSE 10, Debian, Ubuntu
- * Hypervisor Based Solution
- * Para and Full Virtualization Supported
- * Supports Live Migration
- * Guest Support
 - * Windows, Linux, UNIX, 32 and 64 bit, SMP.

KVM

- * RedHat/Centos 6, Ubuntu 8.10
- * Kernel Based Virtual Machine - Kernel 2.6.20 -
- * Full Virtualization Only
- * Requires Hardware Virtualization Support
- * Supports Live Migration
- * oVirt Management Tool
- * Guest Support
 - * Windows, Linux, UNIX, 32 and 64 bit, SMP.

Containers

- ✱ Available In Some Form On Most Current Distributions
- ✱ OpenVZ, Linux VServer
- ✱ Best Suited To Things Like Web Farms

VMware

- * Technically NOT Open Source
- * Free Products
 - * VMware Player
 - * VMware Server
 - * VMware ESX 3i

Building Your Own Virtual Infrastructure

- * Ubuntu
- * Debian Etch
- * Centos 5
- * Citrix XenServer Express
- * VMware Server
- * VMware ESX 3i

Demo

- ✱ Xen on Debian Etch
- ✱ Xen Tools - <http://www.xen-tools.org>

Questions?

✱ BoF - YubiCo YubiKey