

# SBCC Computer Science Club

Virtualization Workshop

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## Workshop Overview

Hypervisors: Hyper-V, VirtualBox, Proxmox, VMWare vSphere (Workstation)

Hyper-V is a virtualization solution provided in select versions of Windows by Microsoft.

VirtualBox is a free virtualization solution which provides features like snapshots which are normally only available in paid software.

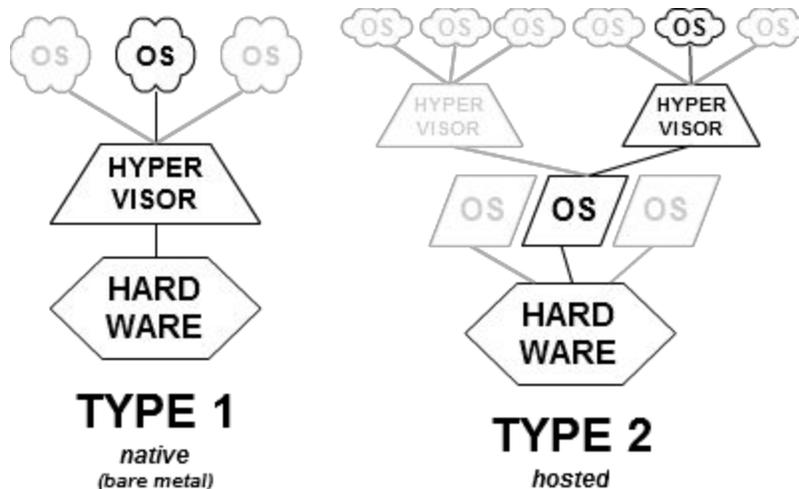
Proxmox is a Type I hypervisor (bare metal) which supports two types of virtualization (KVM, OpenVZ->LXC)

VMWare vSphere is used on campus. vSphere can be downloaded for free but virtual machine management solutions come at a premium.

## What is Virtualization?

In computing, virtualization refers to the act of creating a virtual (rather than actual) version of something, including virtual computer hardware platforms, operating systems, storage devices, and computer network resources.

<https://en.wikipedia.org/wiki/Virtualization>



<https://upload.wikimedia.org/wikipedia/commons/e/e1/Hyperviseur.png>

<https://en.wikipedia.org/wiki/Hyper-V>

[https://docs.fedoraproject.org/en-US/Fedora/13/html/Virtualization\\_Guide/sect-Virtualization-Troubleshooting-Enabling\\_Intel\\_VT\\_and\\_AMD\\_V\\_virtualization\\_hardware\\_extensions\\_in\\_BIOS.html](https://docs.fedoraproject.org/en-US/Fedora/13/html/Virtualization_Guide/sect-Virtualization-Troubleshooting-Enabling_Intel_VT_and_AMD_V_virtualization_hardware_extensions_in_BIOS.html)

### **Hardware Acceleration is Important**

Many modern CPUs have special instruction sets which enable faster virtualization. Intel's technology is called VT-x, formerly known as Vanderpool Technology. AMD's virtualization technology is called AMD-V. Here are some links on enabling it on your personal computers.

[https://access.redhat.com/documentation/en-US/Red\\_Hat\\_Enterprise\\_Linux/6/html/Virtualization\\_Administration\\_Guide/sect-Virtualization-Troubleshooting-Enabling\\_Intel\\_VT\\_and\\_AMD\\_V\\_virtualization\\_hardware\\_extensions\\_in\\_BIOS.html](https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/6/html/Virtualization_Administration_Guide/sect-Virtualization-Troubleshooting-Enabling_Intel_VT_and_AMD_V_virtualization_hardware_extensions_in_BIOS.html)

<http://www.howtogeek.com/213795/how-to-enable-intel-vt-x-in-your-computers-bios-or-uefi-firmware/>

[http://www.pcworld.com/article/220644/10\\_Cool\\_Things\\_Virtualization\\_Lets\\_You\\_Do.html](http://www.pcworld.com/article/220644/10_Cool_Things_Virtualization_Lets_You_Do.html)

Quick overview (lifted from links above):

Power on the machine and **open the BIOS**

Open the **Processor submenu** The processor settings menu may be hidden in the Chipset, Advanced CPU Configuration or Northbridge.

**Enable Intel Virtualization Technology (also known as Intel VT) or AMD-V** depending on the brand of the processor. The virtualization extensions may be labeled Virtualization Extensions, Vanderpool or various other names depending on the OEM and system BIOS.

Enable Intel VTd or AMD IOMMU, if the options are available. Intel VTd and AMD IOMMU are used for PCI passthrough.

Select **Save & Exit**.

Interesting observation from a forum page:

I had run into the very same problem and after spending like 2hrs I finally solved this. I am on a 32bit sys and my Bios does not have this Vizualization Technology option.

The problem happened to be VirtualBox related, I did this:

VirtualBox > System > Processor > change the number of processors from 2 to 1

<http://askubuntu.com/questions/118006/amd-v-is-not-enable-in-virtualbox-in-amd-apu>

### **Definition - What does AMD Virtualization (AMD-V) mean?**

AMD virtualization (AMD-V) is a virtualization technology developed by Advanced Micro Devices.

AMD-V technology takes some of the tasks that virtual machine managers perform through software emulation and simplifies those tasks through enhancements in the processor's instruction set.

<https://www.techopedia.com/definition/4786/amd-virtualization-amd-v>

**How to check if your hardware supports virtualization** -> `/proc/cpuinfo` -> `vmx` or `svm`  
look out for -> `dmesg | less` -> `kvm: no hardware support` or `kvm: disabled by bios`  
then -> `modprobe kvm_intel` or `modprobe kvm_amd`

<http://virt-tools.org/learning/check-hardware-virt/>

### **Additional Links**

<http://virtualization.softwareinsider.com//37/Proxmox-VE>

<https://cecilstechblog.wordpress.com/2013/10/22/proxmox-type-1-hypervisor/>

<https://major.io/2014/06/22/performance-benchmarks-kvm-vs-xen/>

<http://proxmox.com/en/news/press-releases/proxmox-ve-4-0-released>

### **<https://en.wikipedia.org/wiki/VirtualBox>**

-> Talk about Guest Additions!, Seamless Mode

**Proxmox** - now version 4!

Replaces OpenVZ technology with LXC

[https://en.wikipedia.org/wiki/Proxmox\\_Virtual\\_Environment](https://en.wikipedia.org/wiki/Proxmox_Virtual_Environment)

<https://en.wikipedia.org/wiki/LXC>

-- See also -> [https://en.wikipedia.org/wiki/Parallels\\_\(company\)](https://en.wikipedia.org/wiki/Parallels_(company))

<https://en.wikipedia.org/wiki/QEMU>

<https://en.wikipedia.org/wiki/DOSBox>

### **Mac OS X**

[https://en.wikipedia.org/wiki/VMware\\_Fusion](https://en.wikipedia.org/wiki/VMware_Fusion)

### **Also noteworthy --**

[https://en.wikipedia.org/wiki/Windows\\_Virtual\\_PC](https://en.wikipedia.org/wiki/Windows_Virtual_PC) (Windows 7 [except starter], doesn't support Linux)

[https://en.wikipedia.org/wiki/Docker\\_\(software\)](https://en.wikipedia.org/wiki/Docker_(software))