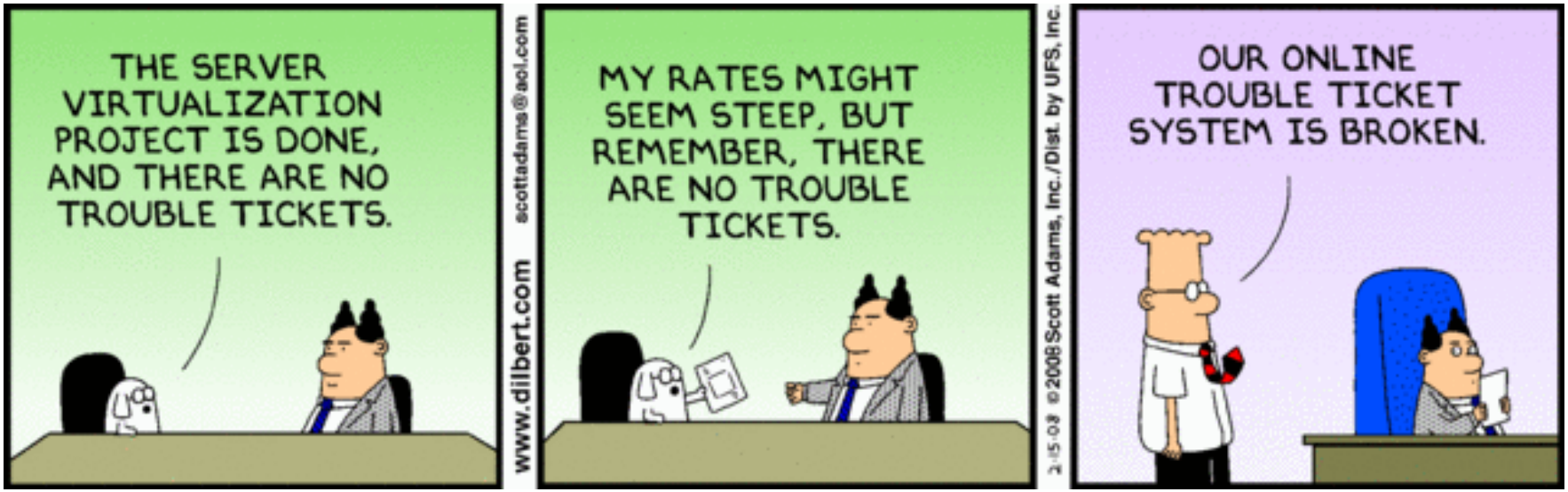
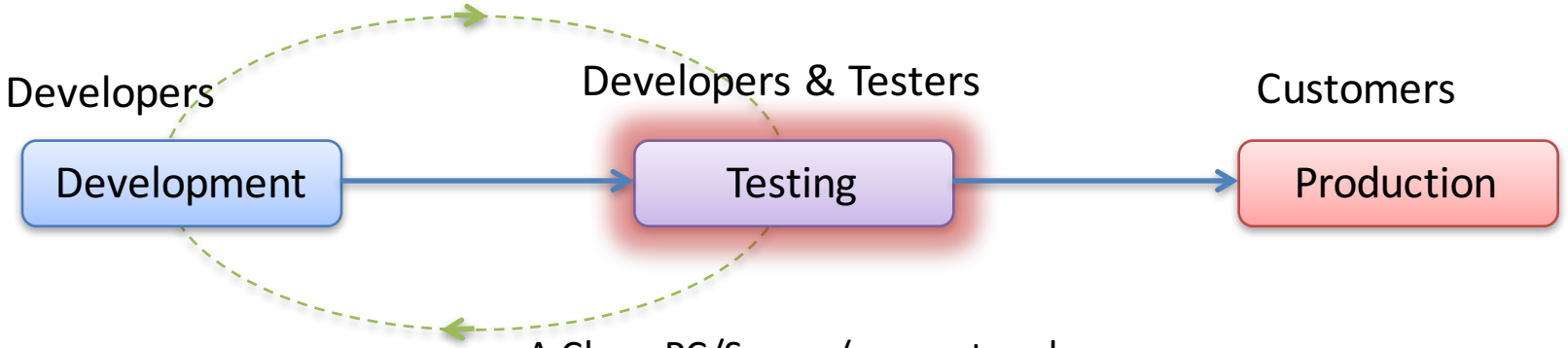
Virtualization



Hans-Petter Halvorsen, M.Sc.



Typically the Developers Personal Computer with Database, Web Server and Programming Software

A Clean PC/Server (or a network with PCs and Servers) where you install and test your Software. Today we typically set-up a **Virtual** Test Environment

The Customers environment where you unstall the final software (Servers and Clients)

Programming environments such as Visual Studio, etc. should not be installed in this environment. You need to create .exe files etc. in order to make your software run.

What is Virtualization?

- Virtualization, in computing, refers the act of creating a virtual (rather than actual) version of something, including but not limited to a virtual computer hardware platform, operating system (OS), storage device, or computer network resources.
- Hardware virtualization or platform virtualization refers to the creation of a virtual machine that acts like a real computer with an operating system.
- In hardware virtualization, the **host machine** is the actual machine on which the virtualization takes place, and the **guest machine** is the virtual machine.

[Wikipedia]

Virtualization

VM = Virtual Machines

Guests

Windows, Linux, ...

VM VM VM

Virtualization Software

Host

Operation System

Hardware (Computer)

Windows, Linux, ...

VM VM VM

Hypervisor

A Hypervisor can run directly on the computer without a Host OS

Virtualization Software

A lot of Virtualization Software exists. Here are some examples:

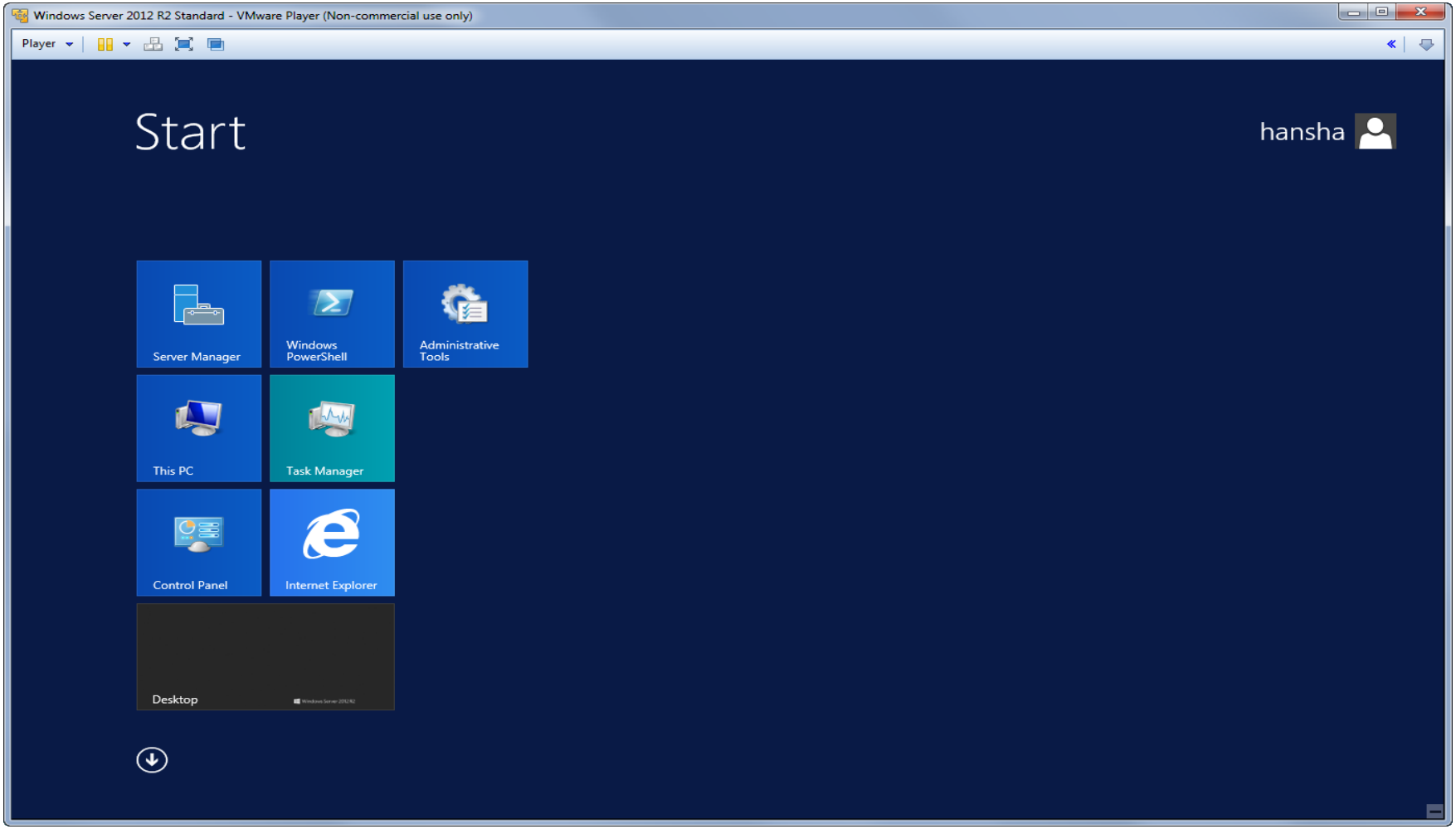
- VMware Workstation Player
- VMware Workstation
- VMware vSphere
- VMware Fusion (Mac)
- Parallels Desktop (Mac)
- Microsoft Hyper-V
- VirtualBox
- etc.

VMware Workstation Player

VMware Workstation Player is for personal use on your own PC. VMware Workstation Player is free of charge for personal non commercial use.

VMware is a company that has been specializing within virtualization software.
http://www.vmware.com

VMware Workstation Player



Above we see Windows Server 2012 R2 running within the VMware Player.

VMware Workstation

Microsoft Hyper-V

Hyper-V is the virtualization solution from Microsoft.

We have 3 different alternatives:

- Windows Server with Hyper-V
- Hyper-V Server
- Windows 8 Client Hyper-V

Windows Server with Hyper-V

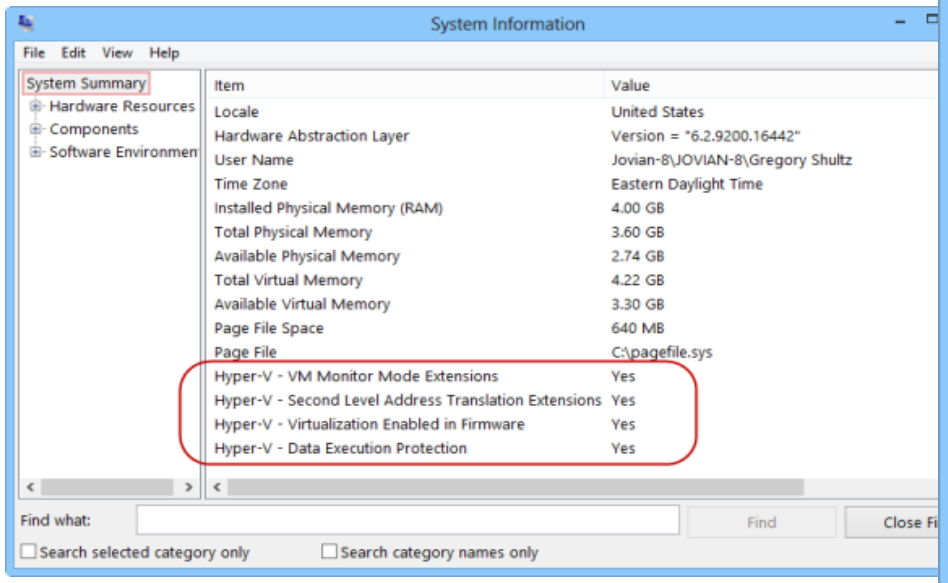
- Here you need “Windows Server XXXX” as the host operating system.
- Windows Server Standard edition gives the purchaser the rights to run 2 virtual instances of Windows Server
- The Datacenter Edition has unlimited virtualization rights.

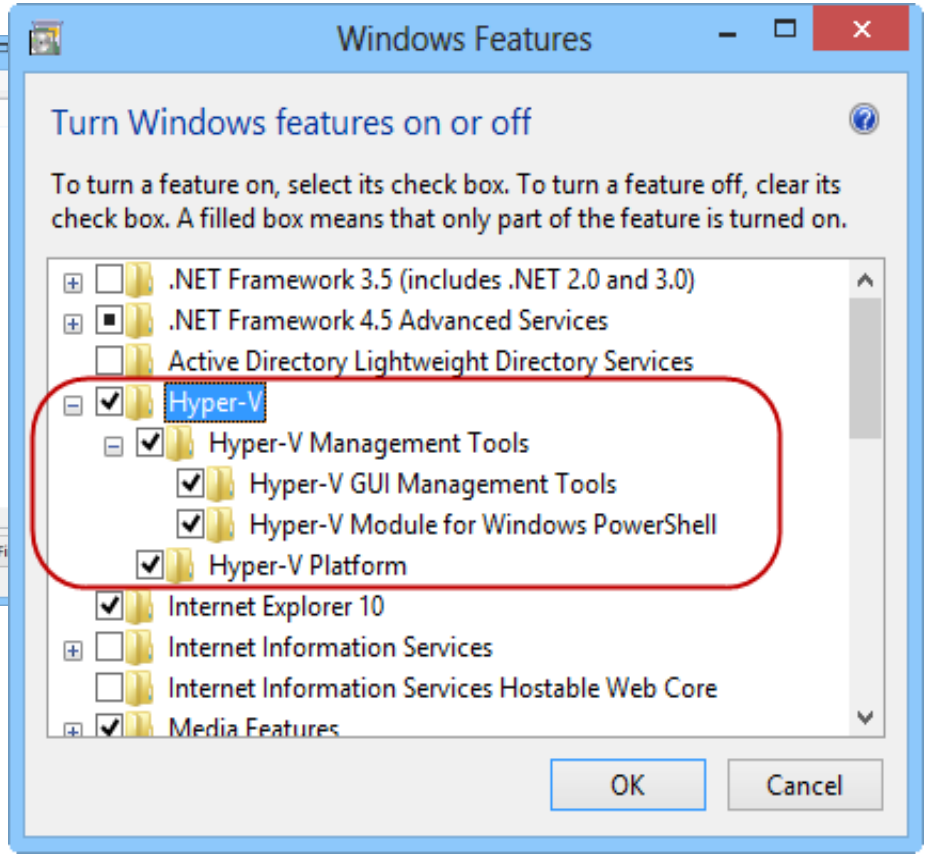
Hyper-V Server

- Hyper-V Server is a separate standalone product that is a free download. Hyper-V Server is a Hypervisor-based, meaning you don’t need to install it on top of an existing Windows Server.
- Hyper-V Server only installs the Core Server features needed to run virtualization, you cannot other Roles like Active Directory, etc and you don’t have a graphical interface.
- The normal way is to is use Windows 8/10 and the Hyper-V Manager to manage the VMs remotely (create new VM, edit VMs, etc.).

Windows 8/10 Client Hyper-V

In Windows 8/10 you can install the “Client Hyper-V” feature meaning you can run VMs inside Windows 8/10.

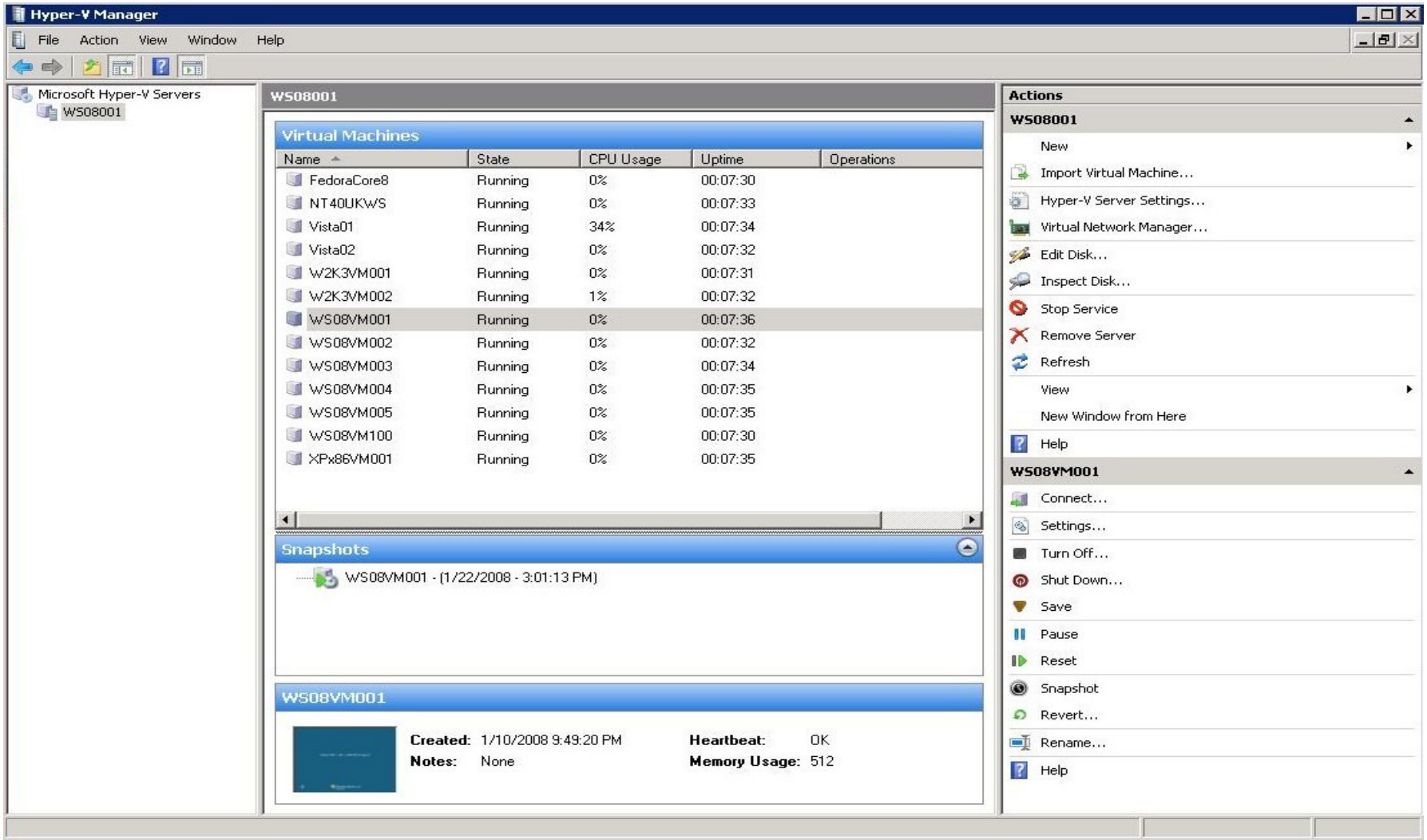




All these settings need need to be Yes. In general, if either the “Virtualization Enabled in Firmware” or the “VM Monitor Mode Extensions” are set to No, you can enable those features in the firmware. However, if the “Second Level Address Translation Extensions” or the “Data Execution Protection” settings are set to No, then you will not be able to use Windows Client Hyper-V.

Hyper-V Manager

Use the Hyper-V Manager to create and maintain the VMs



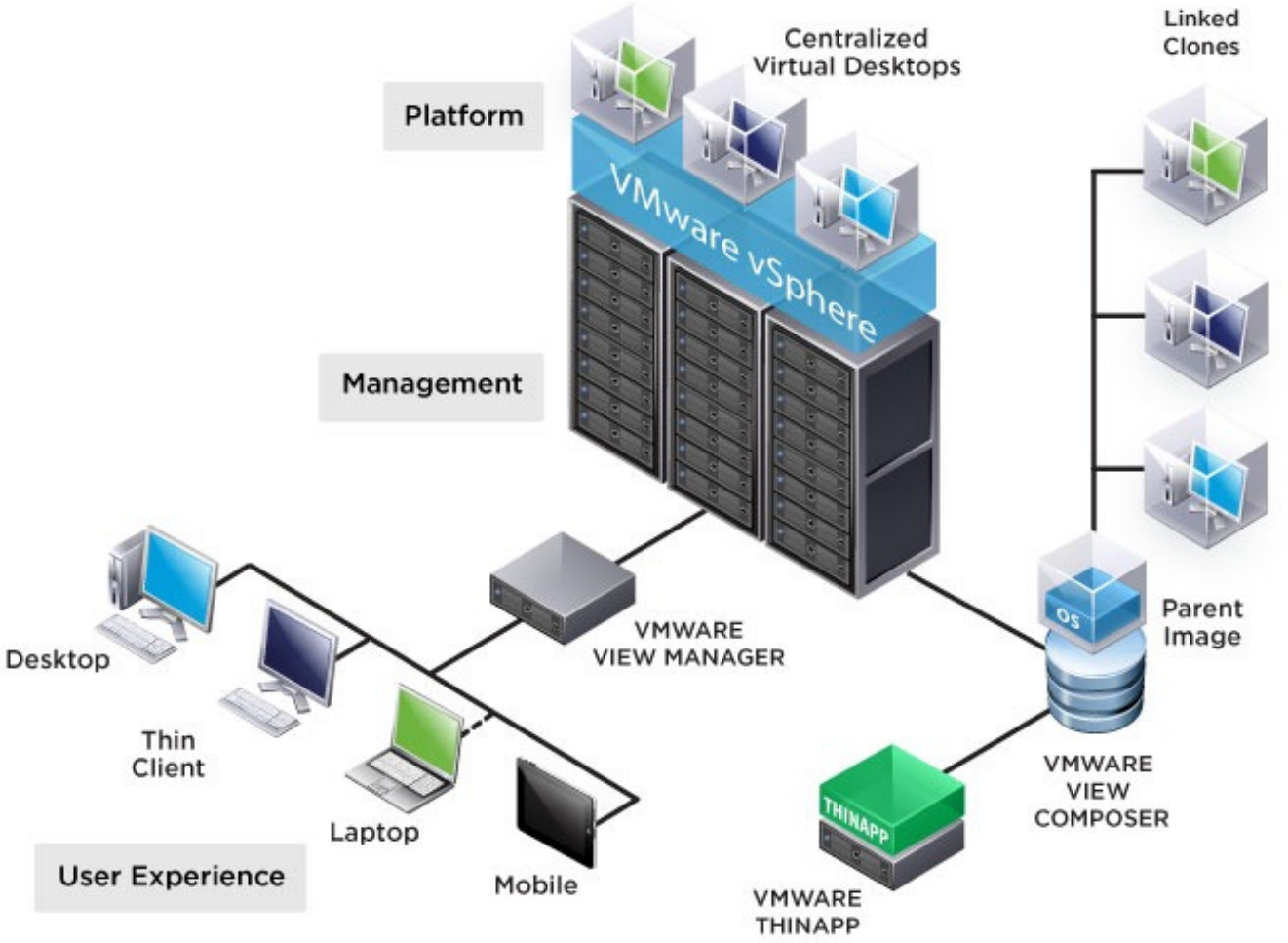
Mac and OS X

If you have a Mac and want to run Windows or other OS you have different optiens here as well.

- BootCamp
  - BootCamp is built into the Mac OS X. It is actually not a virtualization technique, but rather a method to run Windows on a Mac computer
- VMware Fusion
- Parallels Desktop
- VirtualBox

VMware vSphere

Enterprise Virtualization Solution from VMware



VirtualBox

- VirtualBox is orginally created by Sun Microsystems, but is now maintained by Oracle.
- VirtualBox is freely available as Open Source Software.
- VirtualBox is available for Windows, Mac OS X and Linux/UNIX.
- Web site: https://www.virtualbox.org

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