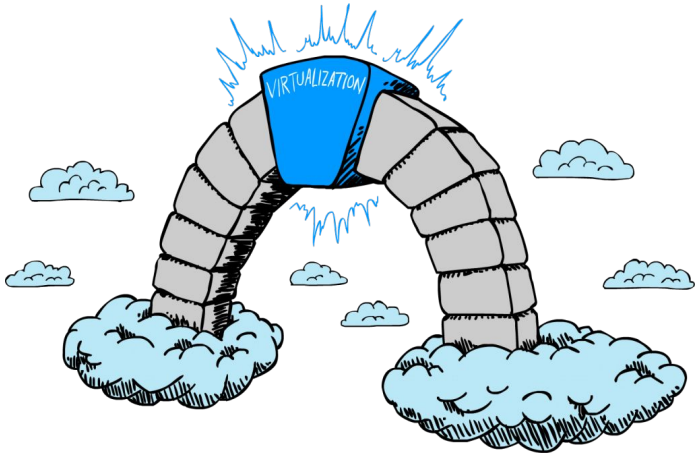
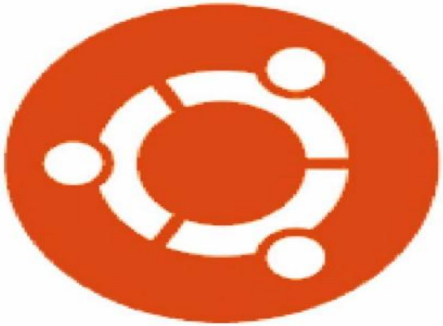
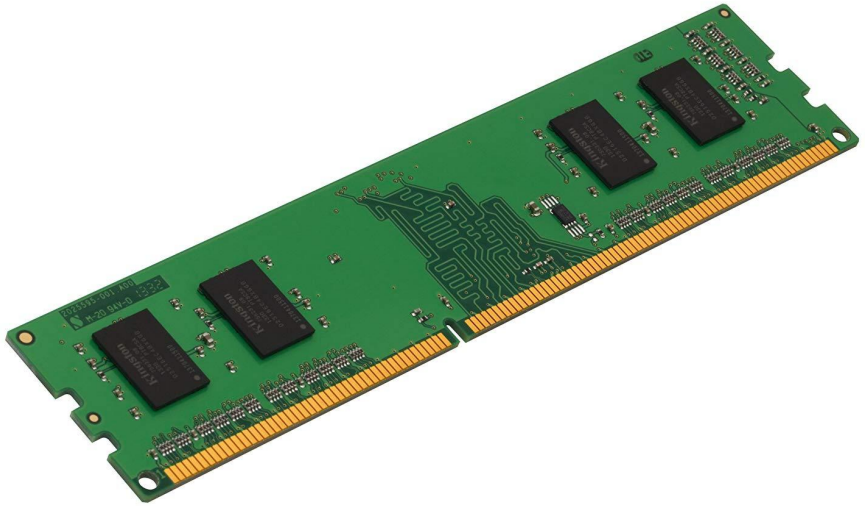
Virtualization.
“A dream within a dream”

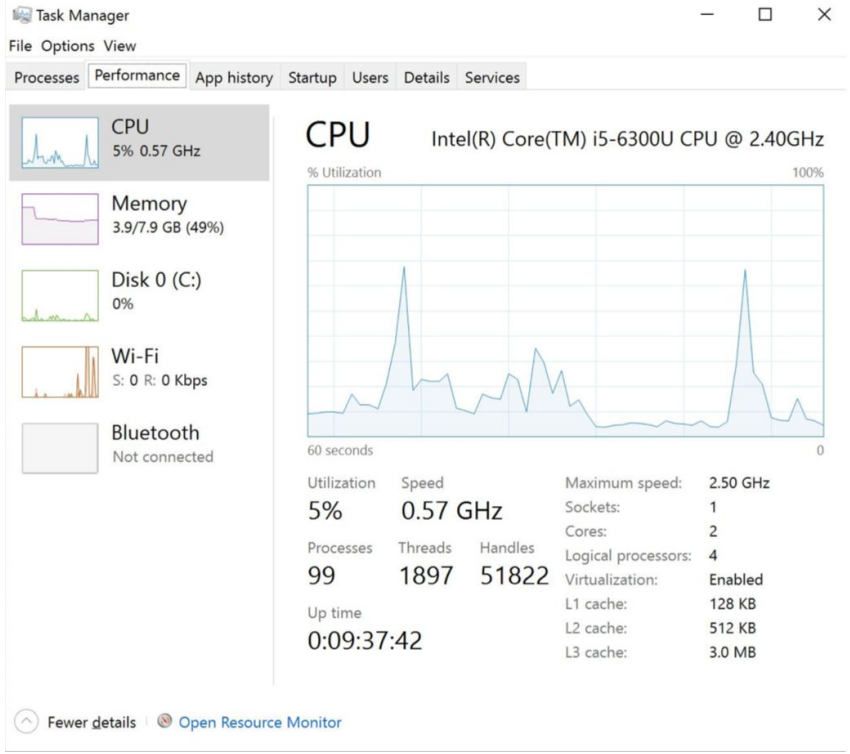


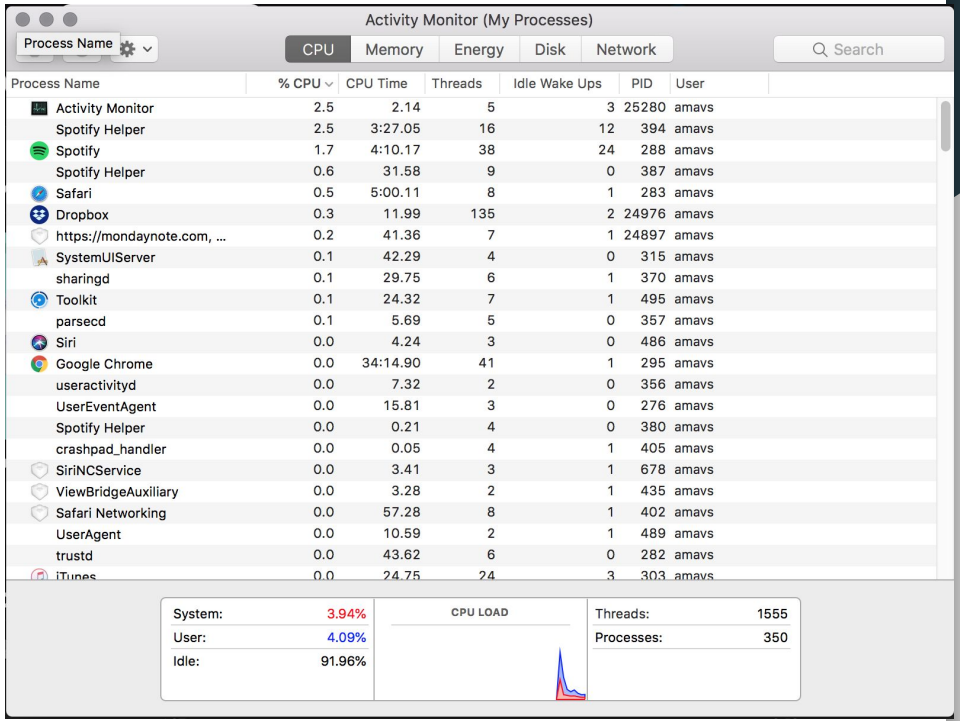

iOS

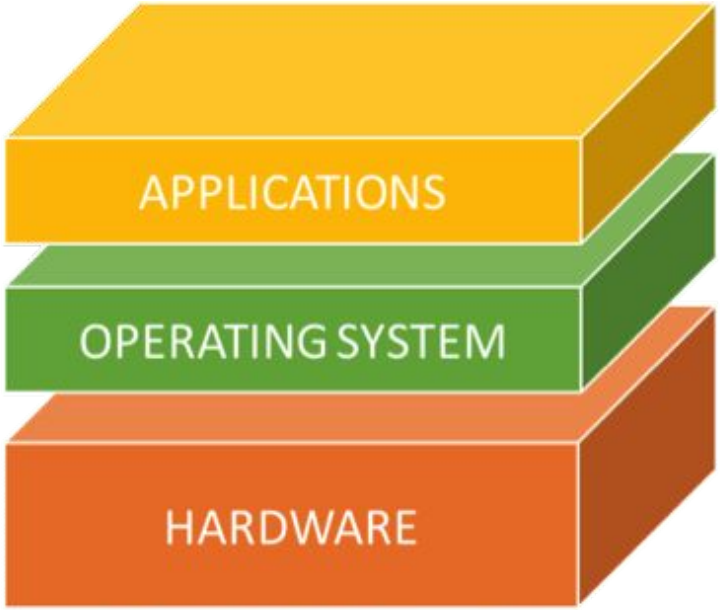



intel
9th Gen
Intel® Core™ i9

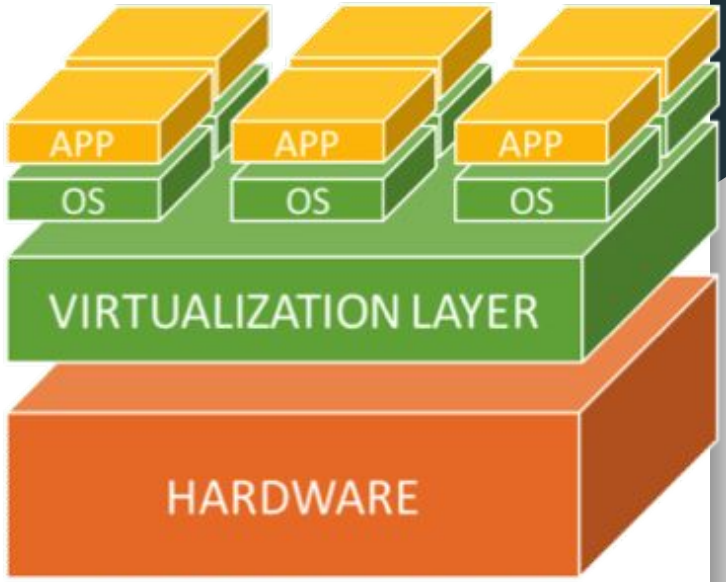



Task Manager
File Options View
Processes Performance App history Startup Users Details Services
CPU
5% 0.57 GHz
Memory
3.9/7.9 GB (49%)
Disk 0 (C:)
0%
Wi-Fi
S: 0 R: 0 Kbps
Bluetooth
Not connected
CPU
Intel(R) Core(TM) i5-6300U CPU @ 2.40GHz
% Utilization
100%
60 seconds
0
Utilization
5%
Speed
0.57 GHz
Processes
99
Threads
1897
Handles
51822
Up time
0:09:37:42
Maximum speed: 2.50 GHz
Sockets: 1
Cores: 2
Logical processors: 4
Virtualization: Enabled
L1 cache: 128 KB
L2 cache: 512 KB
L3 cache: 3.0 MB
Fewer details
Open Resource Monitor

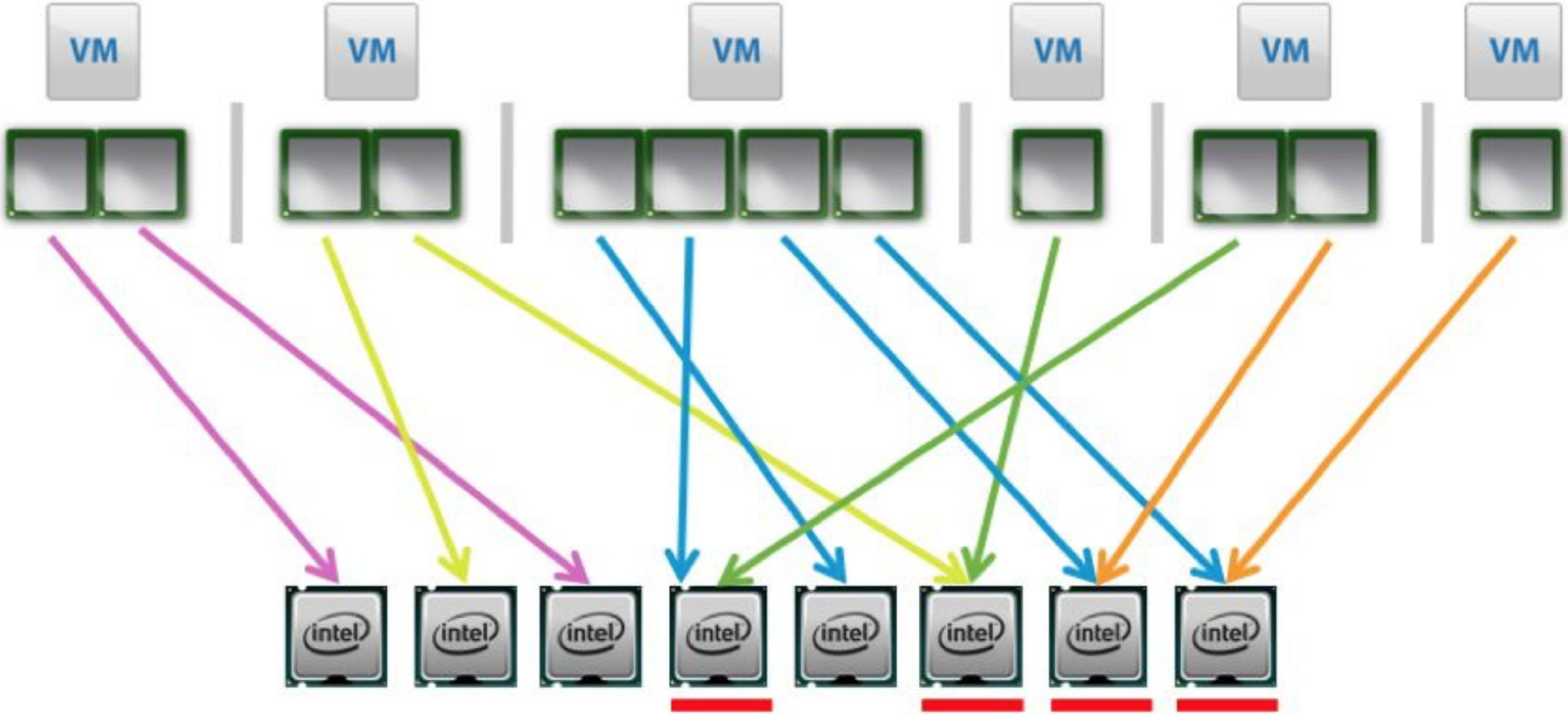

Activity Monitor (My Processes)
Process Name
CPU
Memory
Energy
Disk
Network
Search
Process Name % CPU CPU Time Threads Idle Wake Ups PID User
Activity Monitor 2.5 2.14 5 3 25280 amavs
Spotify Helper 2.5 3:27.05 16 12 394 amavs
Spotify 1.7 4:10.17 38 24 288 amavs
Spotify Helper 0.6 31.58 9 0 387 amavs
Safari 0.5 5:00.11 8 1 283 amavs
Dropbox 0.3 11.99 135 2 24976 amavs
https://mondaynote.com, ... 0.2 41.36 7 1 24897 amavs
SystemUIServer 0.1 42.29 4 0 315 amavs
sharingd 0.1 29.75 6 1 370 amavs
Toolkit 0.1 24.32 7 1 495 amavs
parsecd 0.1 5.69 5 0 357 amavs
Siri 0.0 4.24 3 0 486 amavs
Google Chrome 0.0 34:14.90 41 1 295 amavs
useractivityd 0.0 7.32 2 0 356 amavs
UserEventAgent 0.0 15.81 3 0 276 amavs
Spotify Helper 0.0 0.21 4 0 380 amavs
crashpad_handler 0.0 0.05 4 1 405 amavs
SiriNCService 0.0 3.41 3 1 678 amavs
ViewBridgeAuxiliary 0.0 3.28 2 1 435 amavs
Safari Networking 0.0 57.28 8 1 402 amavs
UserAgent 0.0 10.59 2 1 489 amavs
trustd 0.0 43.62 6 0 282 amavs
iTunes 0.0 24.75 24 3 303 amavs
System: 3.94%
User: 4.09%
Idle: 91.96%
CPU LOAD
Threads: 1555
Processes: 350



TRADITIONAL ARCHITECTURE



VIRTUAL ARCHITECTURE


VM
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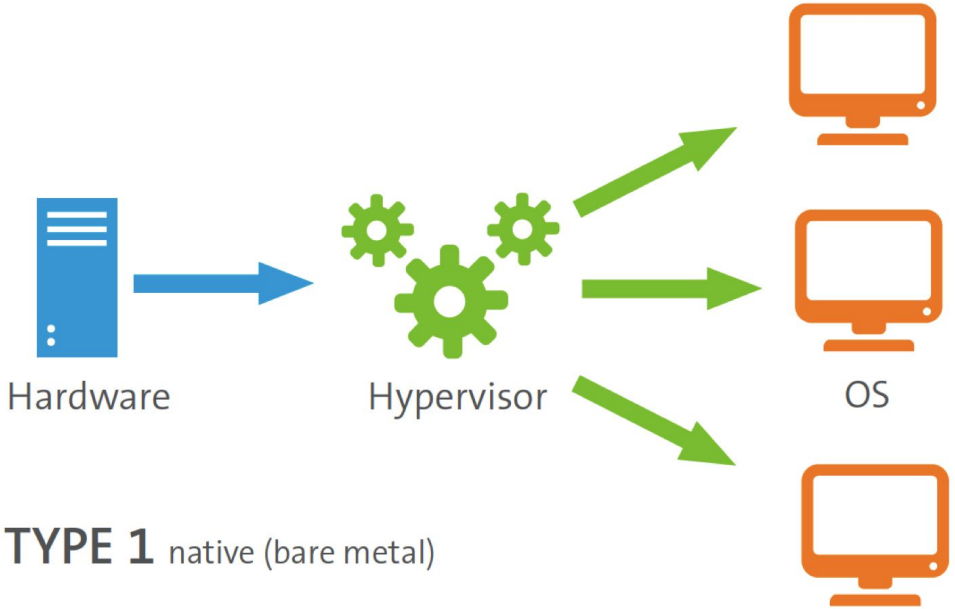
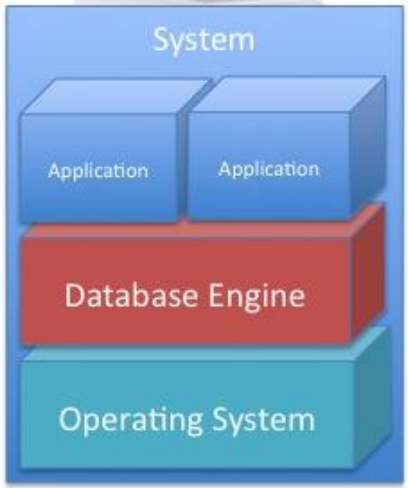
Type 1 Virtualization

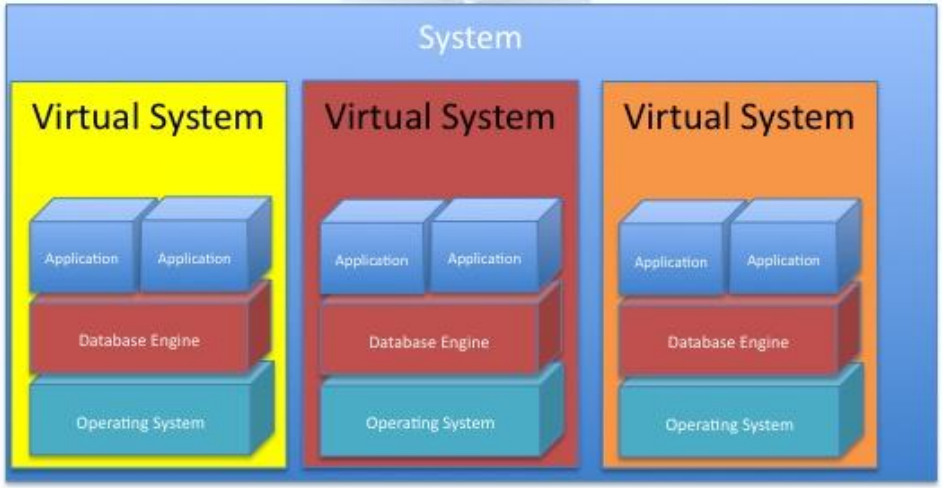
- Hypervisor run on bare metal.
- Dedicated virtualization machine.
- Higher performance.
- Typical for servers.



Operating System and Applications on a Physical System



Virtual Systems Running under a Type 1 Hypervisor



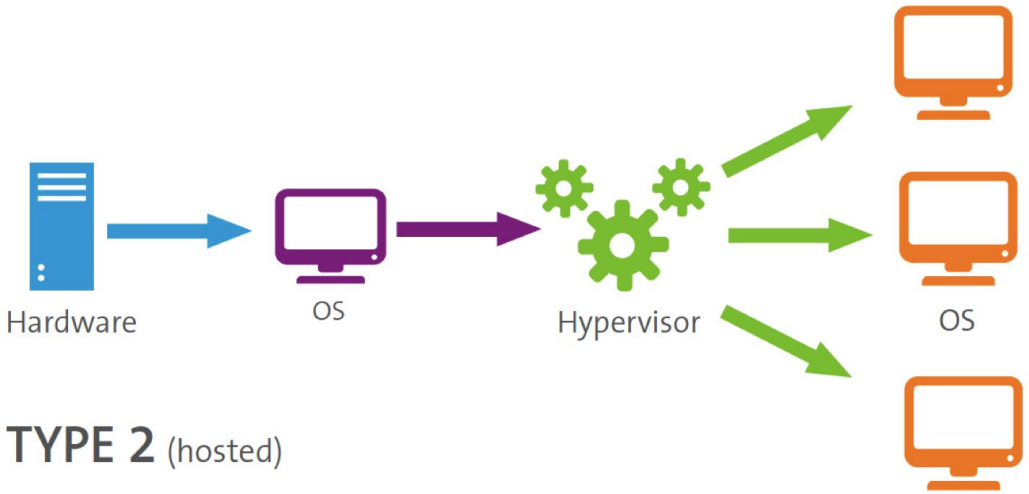

vmware®
ESXi

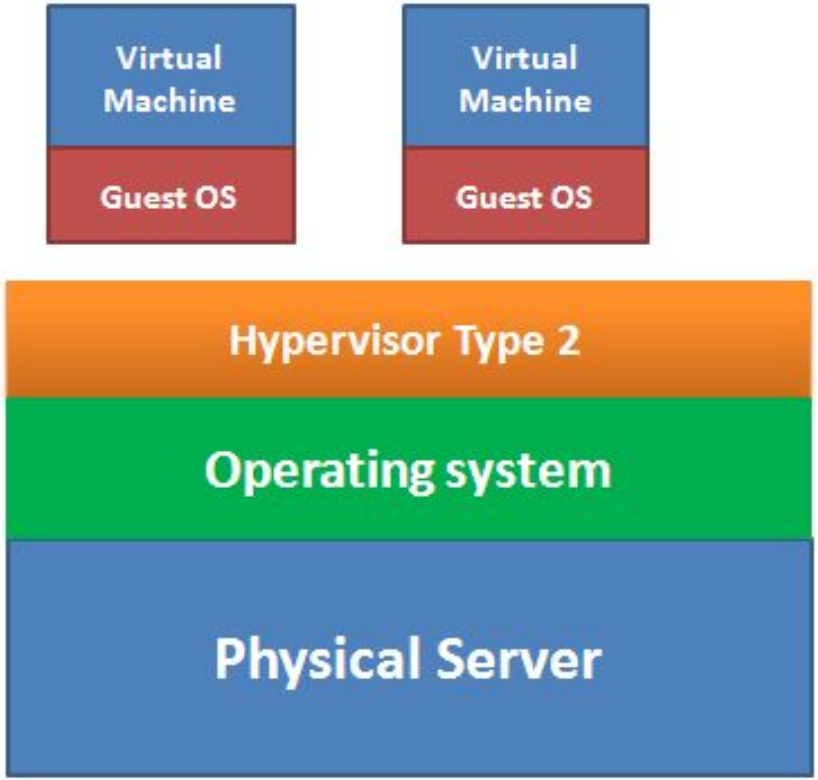

Microsoft
Hyper-V


Xen™

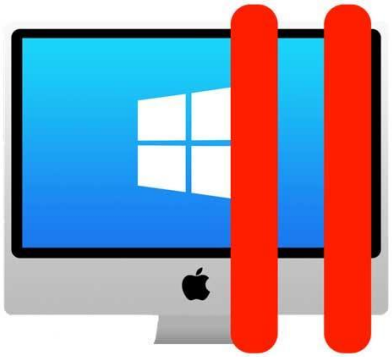
Type 2 Virtualization

- Hypervisor sits on top of the Operating System.
- Can run on Laptop/Desktop
- Typical for home virtualization.
- Better compatibility with hardware.
- Increased overhead affects performance.




Virtual Machine
Guest OS
Virtual Machine
Guest OS
Hypervisor Type 2
Operating system
Physical Server

vmware®



KVM

What are the benefits of Virtualization?

Security	Separates application from interfering with each other.
Testing	Open unknown, potentially malicious files.
Learning	Try out new programs without having to worry.
Optimization	Use what you have more efficiently

Important Terms

Virtual Machine(VM): A software computer that, like a physical computer, runs an operating system and applications. Comprised of a set of specification and configuration files and is backed by the physical resources of a host.

Hypervisor: A hypervisor is an OS that separates a computer's operating system and applications from the underlying physical hardware.

Host System: OS installed on physical hardware

Guest System: Virtualized OS on top of **Host System**

IaaS: A form of virtualization that provides virtualized computing resources over the internet.

aws

Microsoft Azure

ORACLE®
Cloud Infrastructure

- Server:
  cdr-vcenter1.cse.buffalo.edu
- Username: ad\UBIT
- Password: UBIT Password