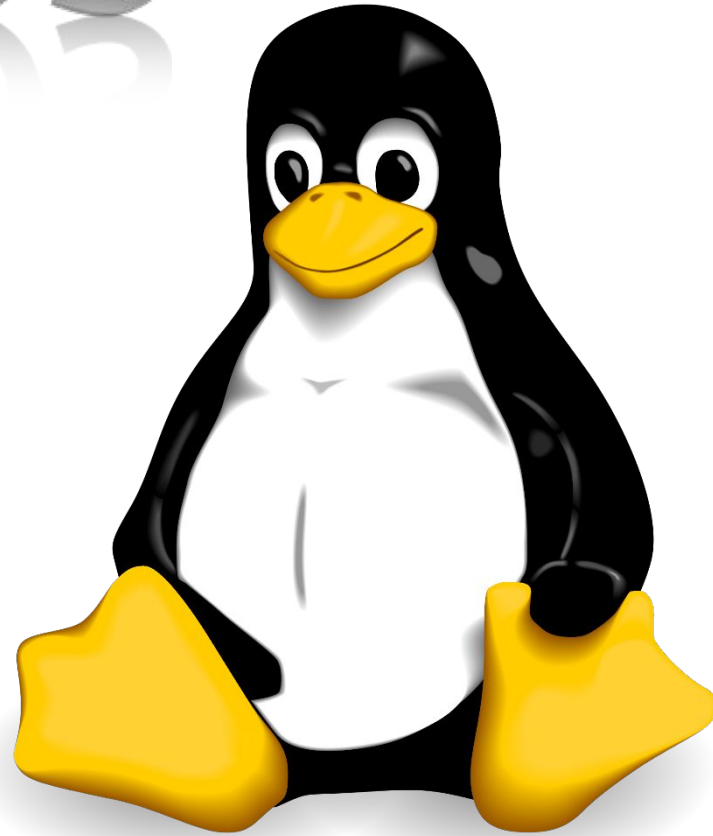
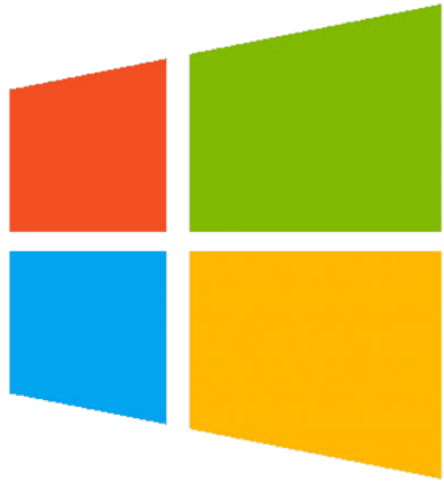




Virtualization

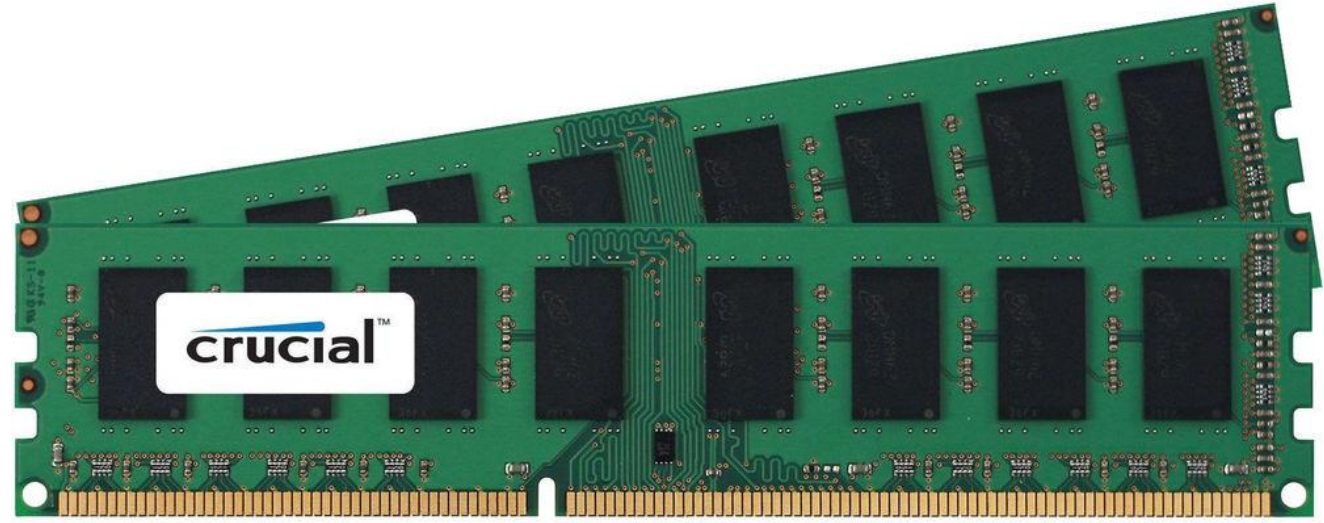
Its Magic

ios



Operating systems





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	Speed	Maximum speed:	2.50 GHz
5%	0.57 GHz	Sockets:	1
		Cores:	2
Processes	Threads	Logical processors:	4
99	1897	Handles	51822
		Virtualization:	Enabled
Up time		L1 cache:	128 KB
0:09:37:42		L2 cache:	512 KB
		L3 cache:	3.0 MB

Fewer details | Open Resource Monitor

Activity Monitor (My Processes)

CPU Memory Energy Disk Network

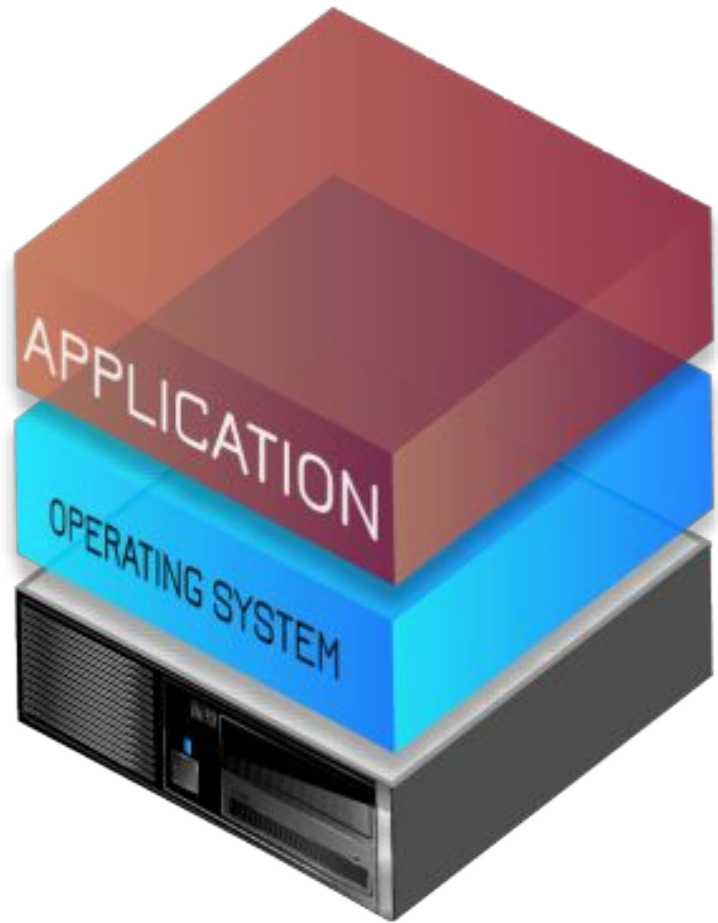
Q Search

Process Name	% CPU	CPU Time	Threads	Idle Wake Ups	PID	User
iTunes	2.9	9.75	49	4	630	John
Finder	1.9	0.83	16	0	242	John
Activity Monitor	1.3	11.20	6	1	577	John
tccd	0.6	0.73	6	0	256	John
cfprefsd	0.2	0.93	11	0	218	John
iPhoto	0.2	2.40	22	3	616	John
SystemUIServer	0.1	1.18	7	0	241	John
distnoted	0.1	1.29	11	1	216	John
com.apple.appkit.xpc.open...	0.1	1.26	5	0	623	John
Dock	0.1	2.67	5	0	239	John
quicklookd	0.0	0.34	9	0	632	John
Mail	0.0	1.90	7	0	592	John
UserEventAgent	0.0	0.54	3	0	214	John
https://itunes.apple.com	0.0	3.20	21	0	639	John
loginwindow	0.0	0.82	4	0	67	John
FaceTime	0.0	1.14	8	1	610	John
cloudd	0.0	3.27	7	0	296	John
Photo Booth	0.0	6.11	70	0	615	John
callservicesd	0.0	0.95	4	0	286	John
sharingd	0.0	0.34	5	0	255	John
identityservicesd	0.0	3.10	5	0	261	John

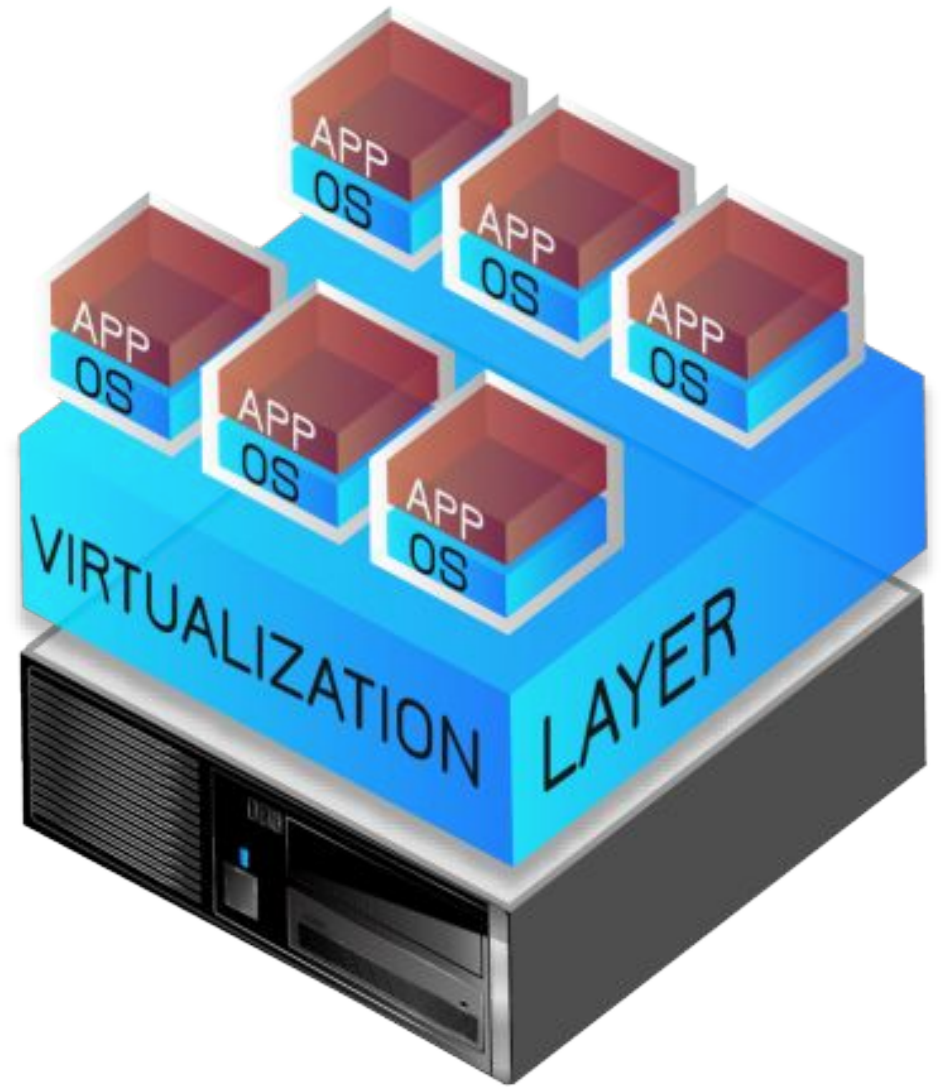
System:	1.02%
User:	2.86%
Idle:	96.12%

CPU LOAD

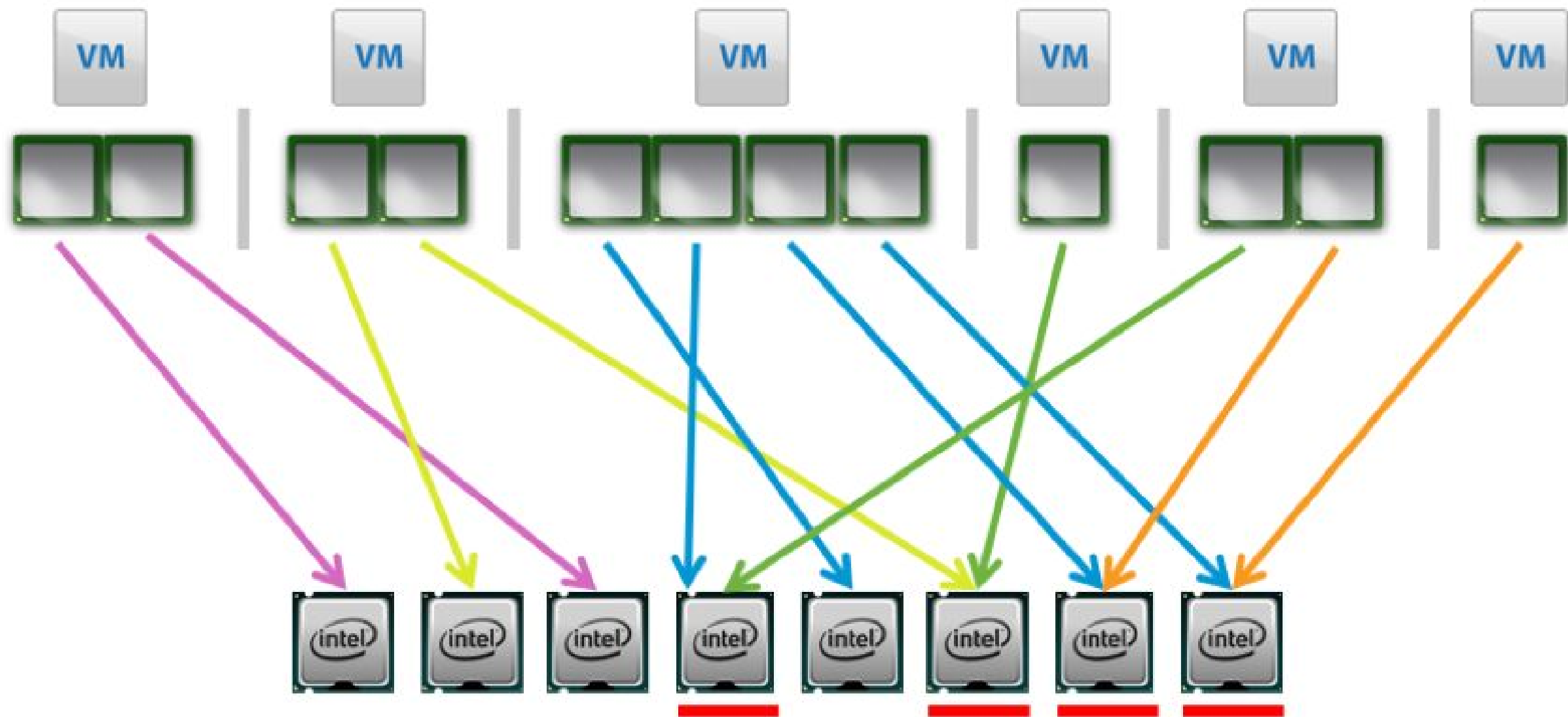
Threads:	1125
Processes:	233

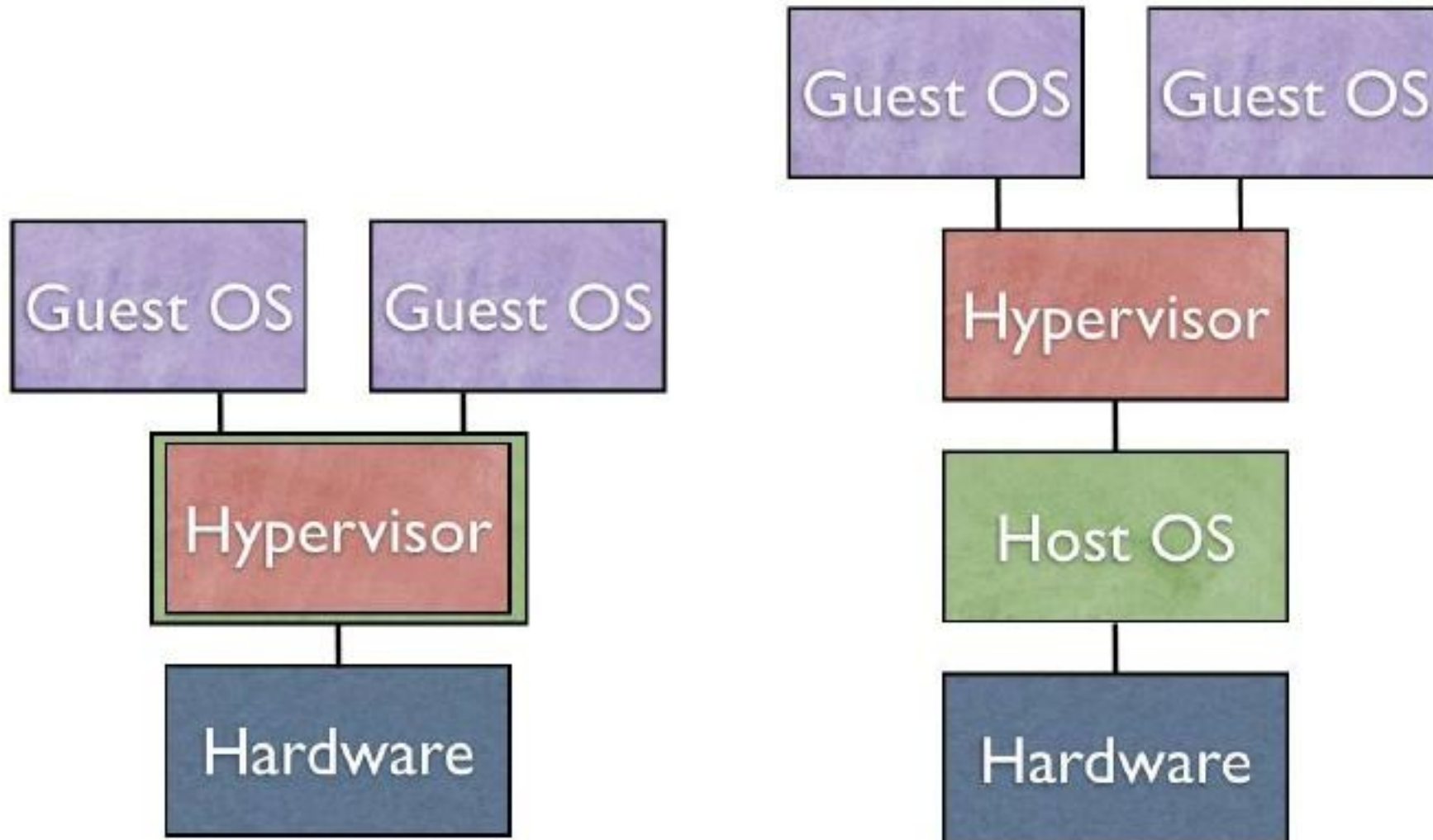


Traditional Architecture



Virtual Architecture

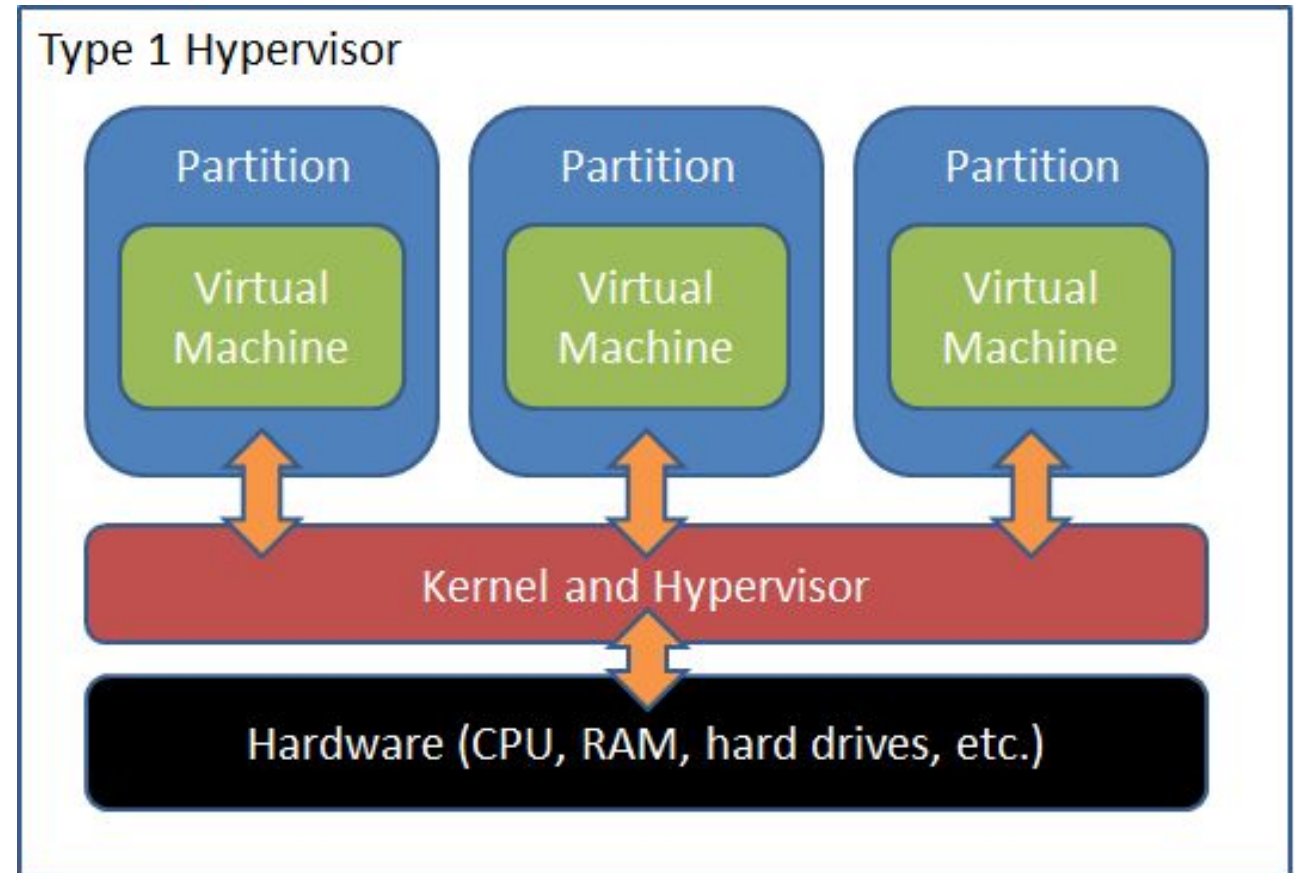


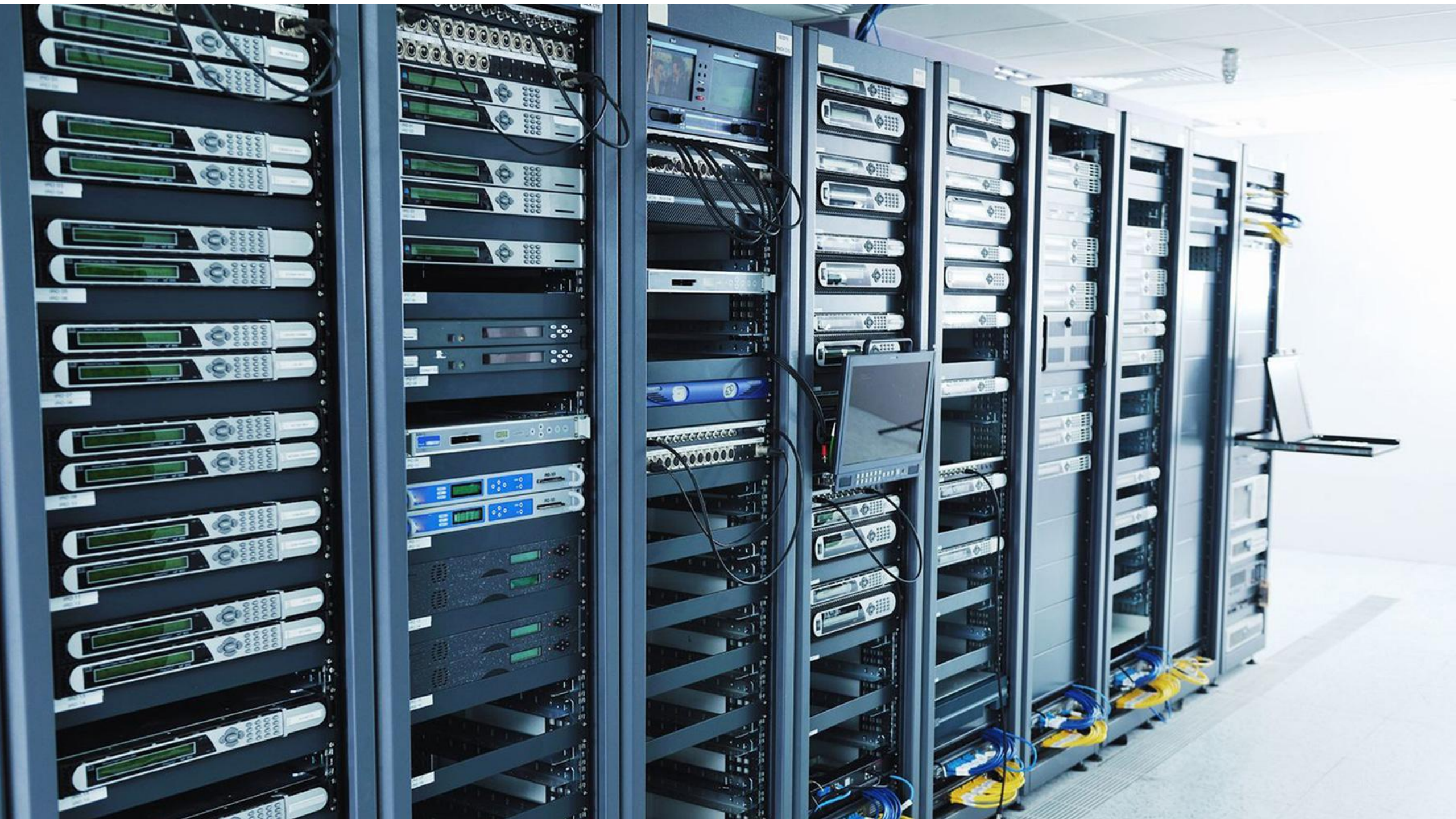


Type 1 (Hardware Level) Type 2 (OS Level)

Type 1 Virtualization (Bare Metal)

- Hypervisor runs on bare metal
- Typical for servers
- Dedicated virtualization machine



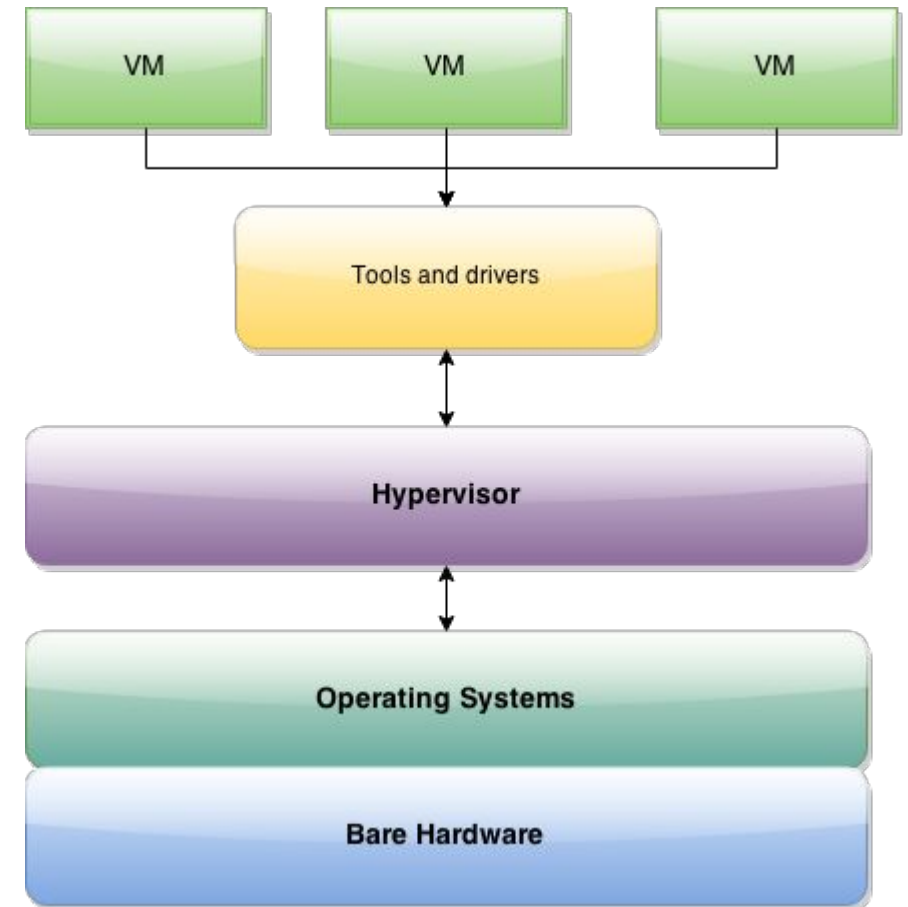




Microsoft
Hyper-V

Type 2 Virtualization (Hosted)

- Hypervisor runs on top of OS
- Typical for home virtualization
- Can run on desktop/laptop



Macintosh HD
Macintosh HD 2
Disk
VMware Fusion

PLACES
Desktop
iWork
Applications
Documents

SEARCH FOR
Today
Yesterday
Past Week
All Images
All Documents

Adobe Stock Photos CS3
Dashboard
Flip4Mac
iCal
Photo
Photo Booth
Spaces
Time Machine

Applescript
Dictionary
Font Book
iChat
iSync
Preview
SpyderExpress 2.2
Toast & Titanium
Toast &

Automator
DVD Player
Front Row
GarageBand
Chess
Exploit
Guitar
Backup
Firefox

1 of 60 selected, \$17,770

Boot Camp partition

Start Up Take Snapshot Revert to Snapshot Settings Unity Full Screen

3 days left for activation
To activate Windows now, click here

To direct input to this virtual machine, click inside the window.

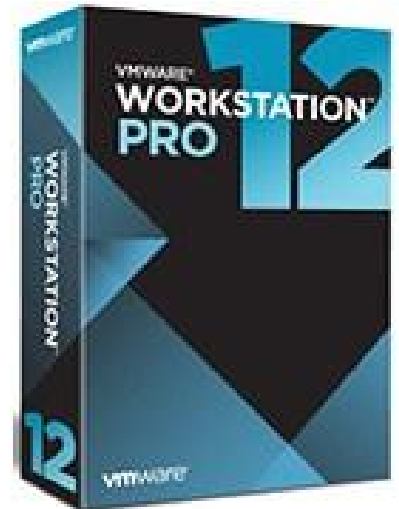


VirtualBox



Microsoft
Hyper-V

 **Parallels®**



vmware®

Benefits of Virtualization?

- Security: Separate applications from interfering with each other
 - Testing: Open unknown, potentially malicious files
- Learning: Try out new programs without having to worry
 - Resource optimization: Use what you have more efficiently
 - Many more!

Key Terms

- **Virtual Machine (VM):** virtualized computer
- **Hypervisor:** dedicated OS with purpose of allocating physical resources to VM's
- **Host System:** OS installed on physical hardware
- **Guest System:** Virtualized OS on top of **Host System**
- **IaaS:** Form of virtualization where virtual resources are accessed over the internet





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

VMware vSphere Client

vmware

VMware vSphere™
Client

All vSphere features introduced in vSphere 5.5 and beyond are available only through the vSphere Web Client. The traditional vSphere Client will continue to operate, supporting the same feature set as vSphere 5.0.

To directly manage a single host, enter the IP address or host name.
To manage multiple hosts, enter the IP address or name of a vCenter Server.

vCenter Server: cdr.vcenter1.cse.buffalo.edu

User name:

Password:

Use Windows session credentials

Login Close