USING VIRTUAL MACHINES

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SUMMARY

Using a "virtual machine program" such as the free "VMware Player" running inside your real "Windows.." or "Linux" computer, you can create "virtual machines" that act like separate computers for running "guest operating systems".

TOPICS

- "Virtual Machine" Concept
- Selecting a "Virtual Machine Program"
- Benefits of Using "Virtual Machines"
- Components of a "Virtual Machine"
- Implementing "Virtual Machines"

"VIRTUAL MACHINE" CONCEPT

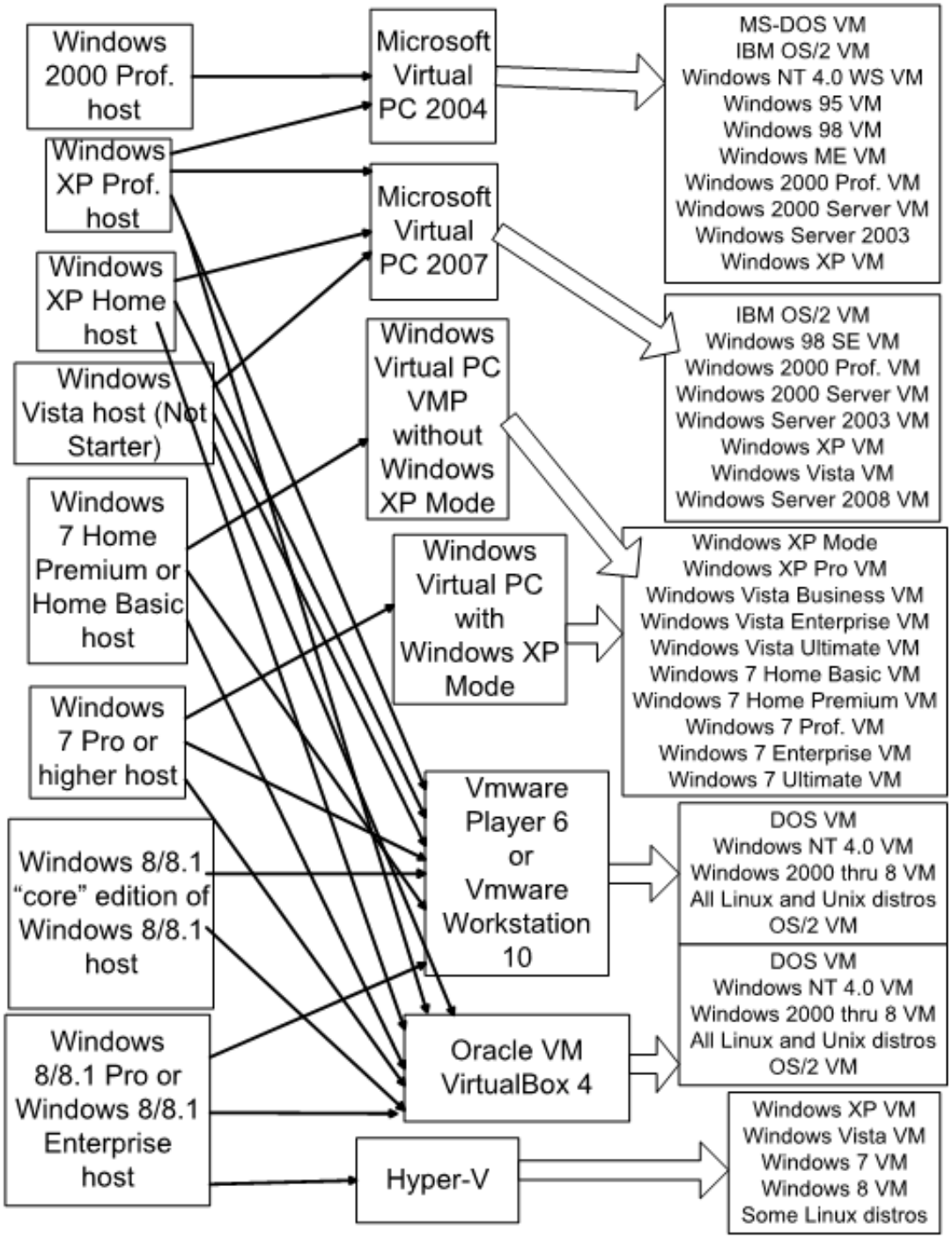
- A "virtual machine" is a single window inside your existing computer that acts like an entire separate computer.

SELECTING A "VIRTUAL MACHINE PROGRAM"

- Your selection of a "virtual machine program" is constrained by the specific host hardware and host operating system requirements of the various "virtual machine programs":

SELECTING A "VIRTUAL MACHINE PROGRAM"

- The following selection diagrams do not include running virtual machines inside of a "Windows 10.." computer:


Windows 2000 Prof. host
Windows XP Prof. host
Windows XP Home host
Windows Vista host (Not Starter)
Windows 7 Home Premium or Home Basic host
Windows 7 Pro or higher host
Windows 8/8.1 "core" edition of Windows 8/8.1 host
Windows 8/8.1 Pro or Windows 8/8.1 Enterprise host
Microsoft Virtual PC 2004
Microsoft Virtual PC 2007
Windows Virtual PC VMP without Windows XP Mode
Windows Virtual PC with Windows XP Mode
Vmware Player 6 or Vmware Workstation 10
Oracle VM VirtualBox 4
Hyper-V
MS-DOS VM
IBM OS/2 VM
Windows NT 4.0 WS VM
Windows 95 VM
Windows 98 VM
Windows ME VM
Windows 2000 Prof. VM
Windows 2000 Server VM
Windows Server 2003
Windows XP VM
IBM OS/2 VM
Windows 98 SE VM
Windows 2000 Prof. VM
Windows 2000 Server VM
Windows Server 2003 VM
Windows XP VM
Windows Vista VM
Windows Server 2008 VM
Windows XP Mode
Windows XP Pro VM
Windows Vista Business VM
Windows Vista Enterprise VM
Windows Vista Ultimate VM
Windows 7 Home Basic VM
Windows 7 Home Premium VM
Windows 7 Prof. VM
Windows 7 Enterprise VM
Windows 7 Ultimate VM
DOS VM
Windows NT 4.0 VM
Windows 2000 thru 8 VM
All Linux and Unix distros
OS/2 VM
DOS VM
Windows NT 4.0 VM
Windows 2000 thru 8 VM
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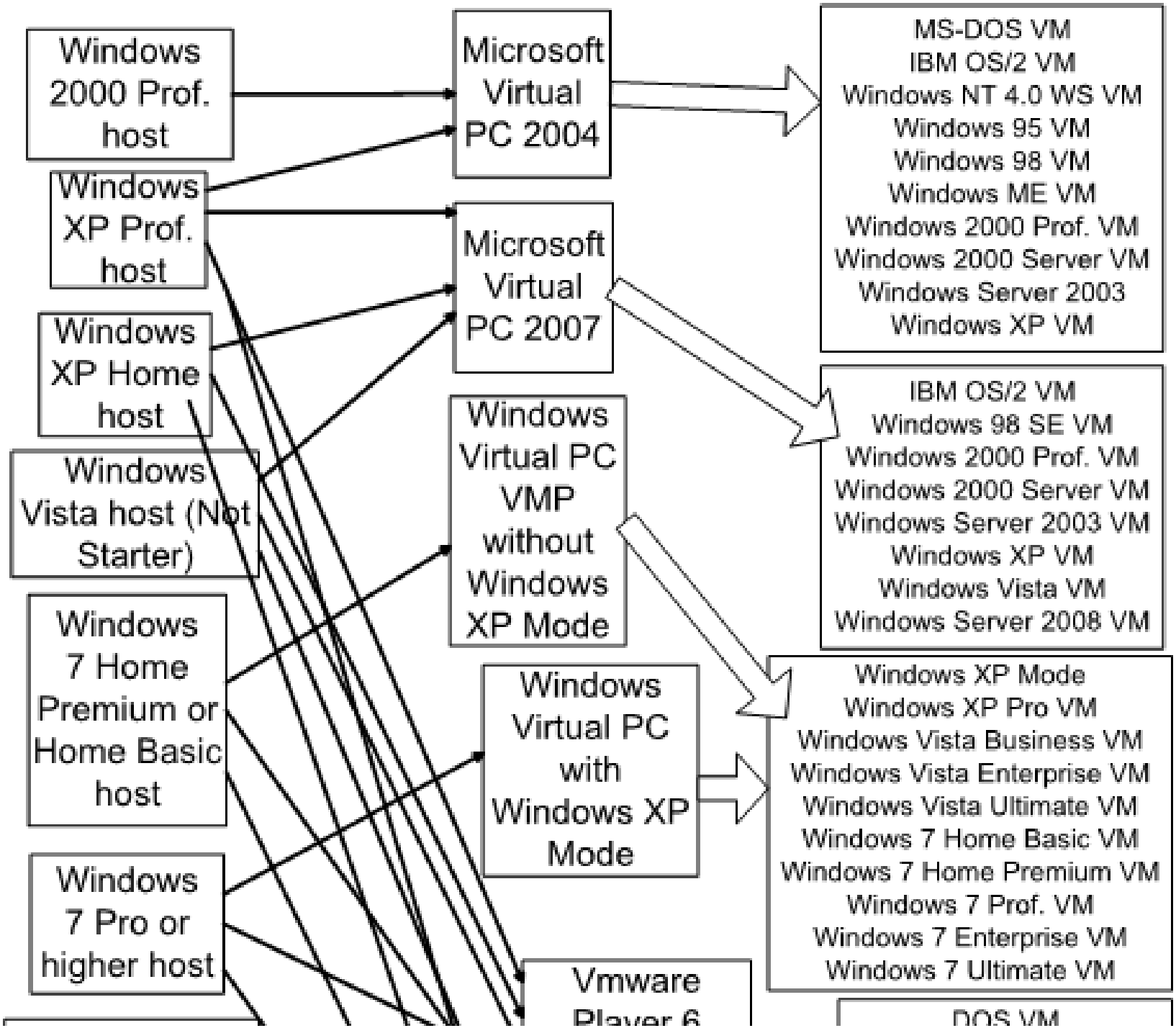
OS/2 VM
Windows XP VM
Windows Vista VM
Windows 7 VM
Windows 8 VM
Some Linux distros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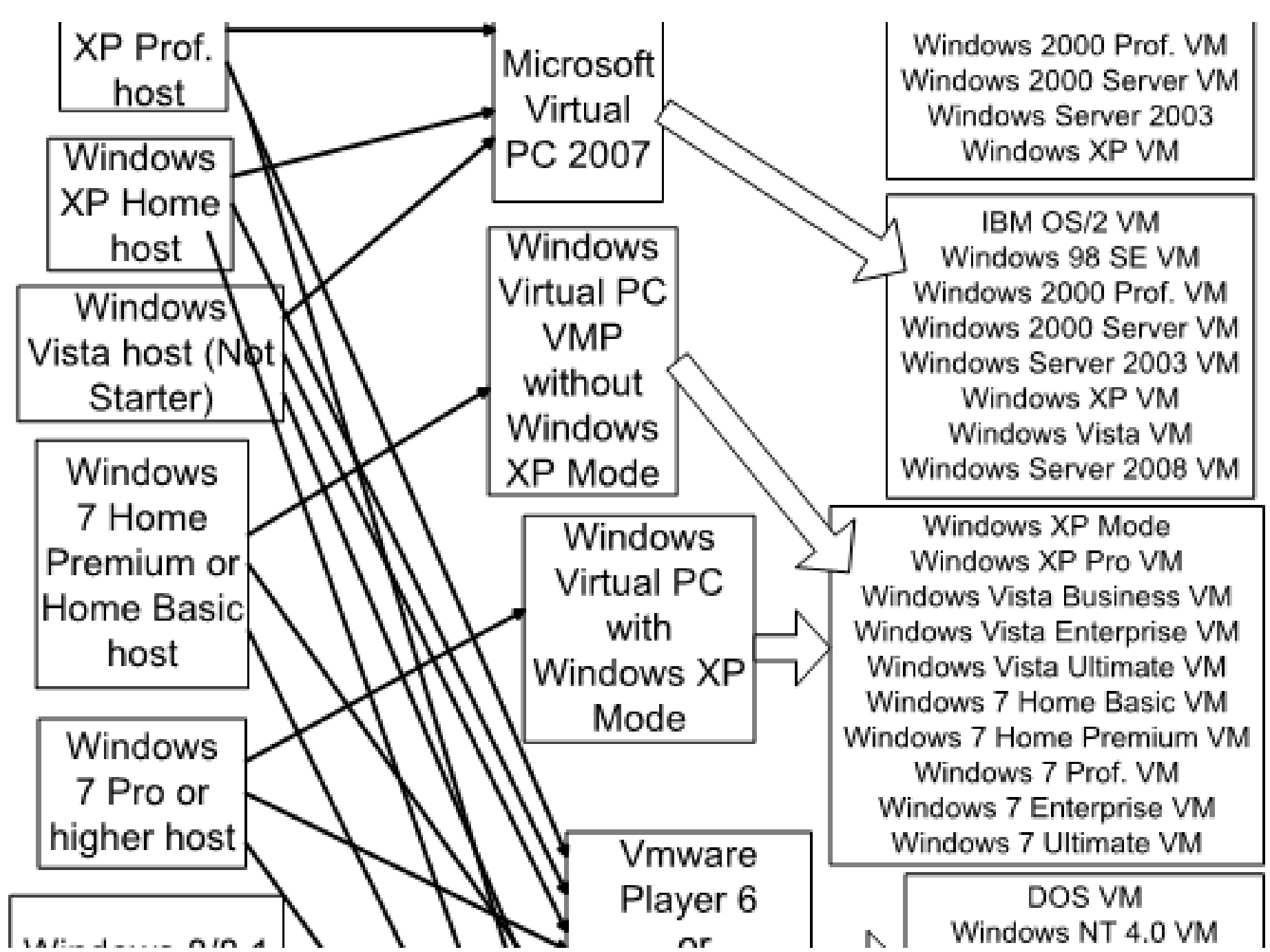
Windows 2000 Prof. VM
Windows 2000 Server VM
Windows Server 2003 VM
Windows XP VM
Windows Vista VM
Windows Server 2008 VM
Windows XP Mode
Windows XP Pro VM
Windows Vista Business VM
Windows Vista Enterprise VM
Windows Vista Ultimate VM
Windows 7 Home Basic VM
Windows 7 Home Premium VM
Windows 7 Prof. VM
Windows 7 Enterprise VM
Windows 7 Ultimate VM
DOS VM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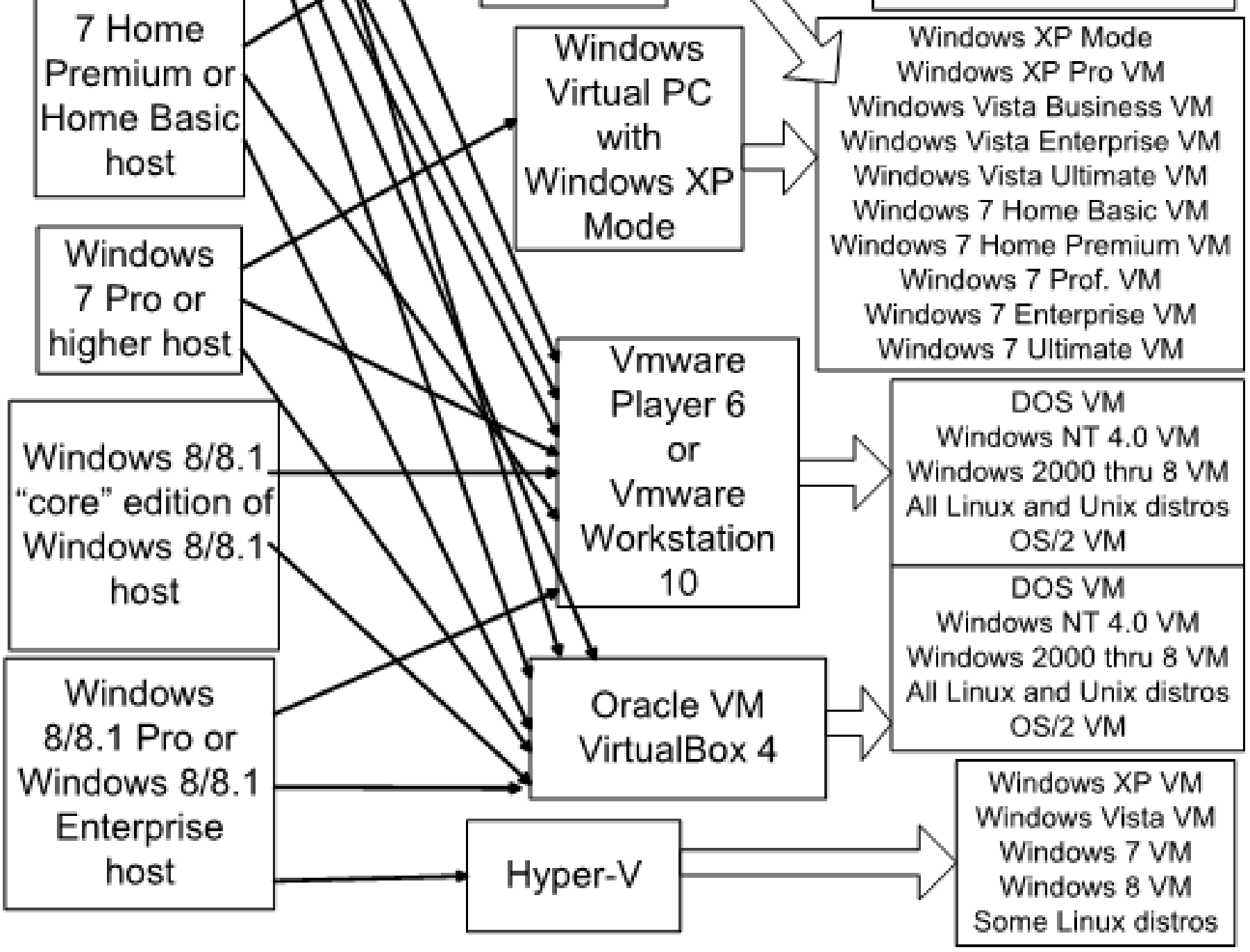
Windows 7 Home Premium VM
Windows 7 Prof. VM
Windows 7 Enterprise VM
Windows 7 Ultimate VM
DOS VM
Windows NT 4.0 VM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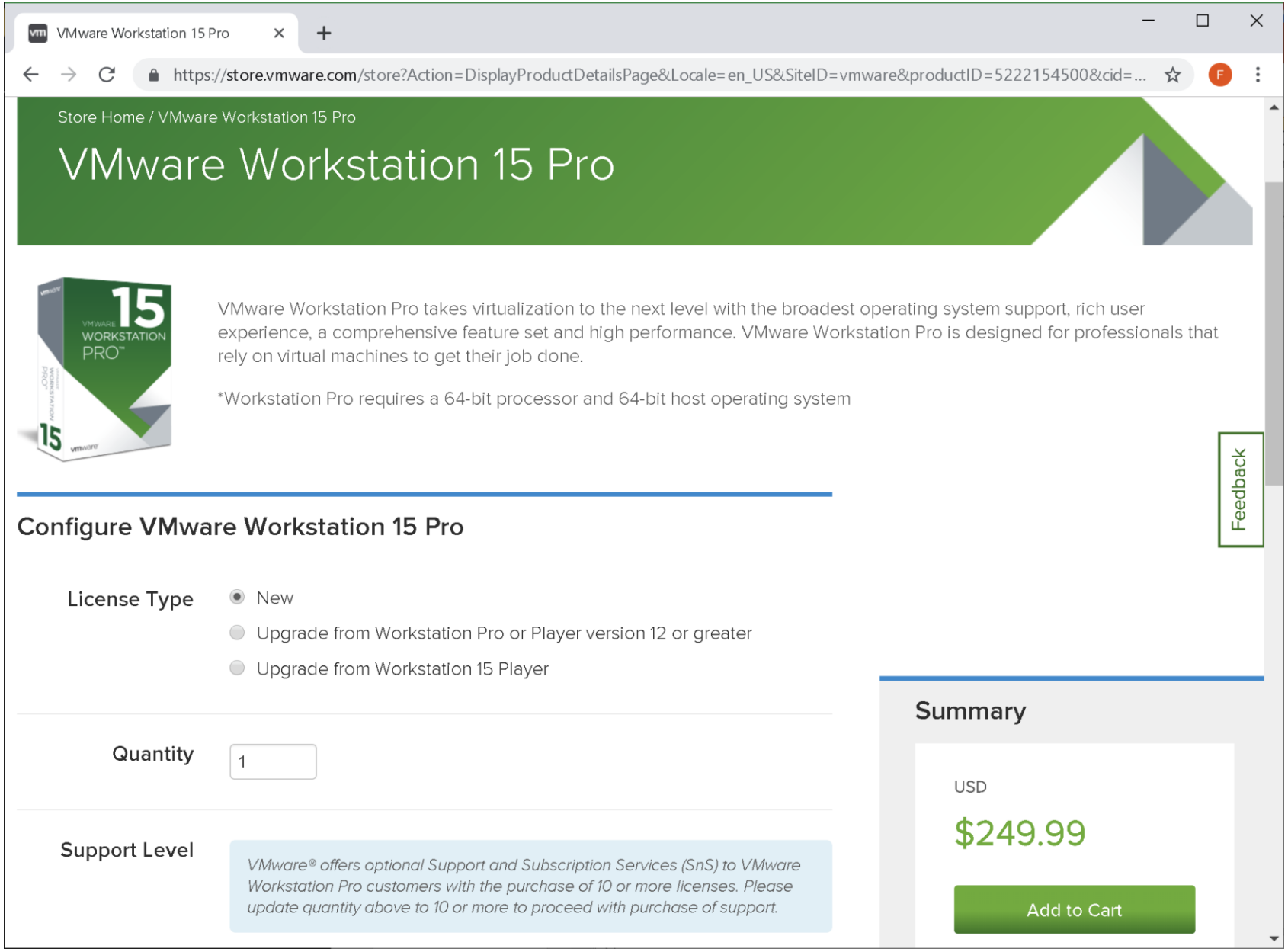
Windows 2000 thru 8 VM
All Linux and Unix distros
OS/2 VM
DOS VM
Windows NT 4.0 VM
Windows 2000 thru 8 VM
All Linux and Unix distros
OS/2 VM
Windows XP VM
Windows Vista VM
Windows 7 VM
Windows 8 VM
Some Linux distros

SELECTING A "VIRTUAL MACHINE PROGRAM" (continued)

- "Virtual Machine Program" for a real "Windows.." host computer:
  - "VMware Workstation Player"
  - "VMware Workstation"
  - "Oracle VM VirtualBox"
  - "Hyper-V"

SELECTING A "VIRTUAL MACHINE PROGRAM" (continued)

- Cost:
  - "VMware Workstation Player" (free for private use)
  - "VMware Workstation" (not free)
  - "Oracle VM VirtualBox" (free for private use)
  - "Hyper-V" (bundled with Windows 10 Pro" and "Windows 8.1 Pro")


VMware Workstation 15 Pro
https://store.vmware.com/store?Action=DisplayProductDetailsPage&Locale=en_US&SiteID=vmware&productID=5222154500&cid=...
Store Home / VMware Workstation 15 Pro
VMware Workstation 15 Pro
VMware Workstation Pro takes virtualization to the next level with the broadest operating system support, rich user experience, a comprehensive feature set and high performance. VMware Workstation Pro is designed for professionals that rely on virtual machines to get their job done.
*Workstation Pro requires a 64-bit processor and 64-bit host operating system
Feedback
Configure VMware Workstation 15 Pro
License Type
New
Upgrade from Workstation Pro or Player version 12 or greater
Upgrade from Workstation 15 Player
Quantity
1
Support Level
VMware® offers optional Support and Subscription Services (SnS) to VMware Workstation Pro customers with the purchase of 10 or more licenses. Please update quantity above to 10 or more to proceed with purchase of support.
Summary
USD
$249.99
Add to Cart

SELECTING A "VIRTUAL MACHINE PROGRAM" (continued)

- Cost (continued):
  With a few text edits of the *.vmx file inside a virtual machine, the user of "VMware Workstation Player" can get most of the benefits of the not-free "VMware Workstation" without paying for the not-free "VMware Workstation".

SELECTING A "VIRTUAL MACHINE PROGRAM" (continued)

- Playback & Microphone Audio:
  - "VMware Workstation Player" (yes)
  - "VMware Workstation" (yes)
  - "Oracle VM VirtualBox" (yes)
  - "Hyper-V" (none except "pass through" audio support for Windows 8.1 and Windows 10 guest OSs)

SELECTING A "VIRTUAL MACHINE PROGRAM" (continued)

- Virtual USB ports for connecting to real USB devices:
  - "VMware Workstation Player" (great reliable USB support)
  - "VMware Workstation" (great reliable USB support)
  - "Oracle VM VirtualBox" (poor USB support)
  - "Hyper-V" (almost no USB support)

SELECTING A "VIRTUAL MACHINE PROGRAM" (continued)

- Minimum Windows.. host operating system:
  - "VMware Workstation Player" (Windows 7, 8.1, or 10..)
  - "VMware Workstation" (Windows 7, 8.1 or 10)
  - "Oracle VM VirtualBox" (Windows 7, 8.1, or 10)
  - "Hyper-V" (Windows 8.1 Pro.. or Windows 10 Pro..--not "..Core..")

SELECTING A "VIRTUAL MACHINE PROGRAM" (continued)

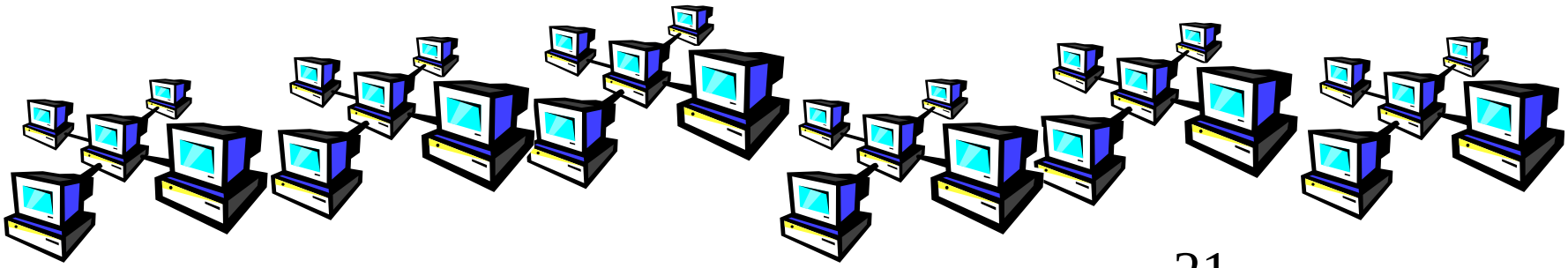
- Minimum Windows.. host operating system (continued):
  Most "Windows 10.." computers are running the "Windows 10 Home" edition (= "Core" edition of "Windows 10..) so most "Windows 10.." computers require a not-free upgrade to "Windows 10 Pro" before the "bundled" "Hyper-V" "virtual machine program" is available.

SELECTING A "VIRTUAL MACHINE PROGRAM" (continued)

- Ease of cloning, backing up, or moving a virtual machine:
  - "VMware Workstation Player" (Easy: copy the folder that contains the VM)
  - "VMware Workstation" (Easy: copy the folder that contains the VM)
  - "Oracle VM VirtualBox" (Hard: export and then import)
  - "Hyper-V" (Hard: export and then import")

BENEFITS OF USING "VIRTUAL MACHINES"

–When you use "virtual machines" in free "virtual machine programs", it is like getting a pile of computers to use for free with all of them residing inside your existing physical "host" computer.



BENEFITS OF USING "VIRTUAL MACHINES" (continued)

- You can use "virtual machines" to reduce the number of physical computers that you operate and this can help you to avoid buying additional computers:

BENEFITS OF USING "VIRTUAL MACHINES" (continued)

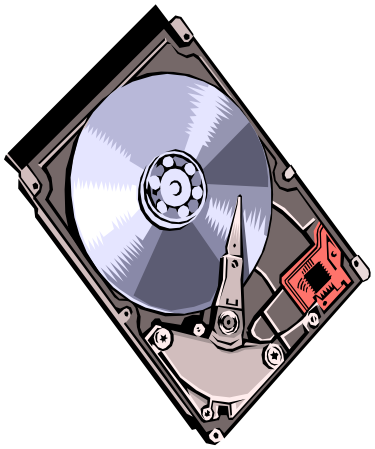
- Thin Provisioning of hard drives: Virtual machines can help you to avoid buying more hard drives because, by default, they are set up to "fool" their guest operating systems into "seeing" more hard drive space than is actually physically available:

BENEFITS OF USING "VIRTUAL MACHINES" (continued)

- In a virtual machine system, each guest operating system can be "shown" a much larger amount of hard drive space than is actually utilized by it, but the actual usage of physical hard drive space is just the "used" space--not the "free space“ that the virtual machines “see”.

BENEFITS OF USING "VIRTUAL MACHINES" (continued)

–You can use a virtual machine to attempt to repair failed hard drives.



- See

  http://aztcs.org/meeting_notes/winhardsig/harddrives/repairing/030-HDsoftrepairs.pdf

BENEFITS OF USING "VIRTUAL MACHINES" (continued)

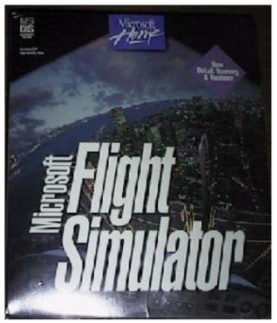
- You can easily run software that normally conflicts with each other or slows each other down (such as multiple versions of “Microsoft Office”) in separate virtual machines so that they do not "see" each other.

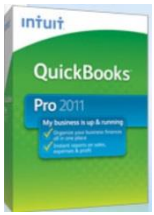
BENEFITS OF USING "VIRTUAL MACHINES" (continued)

- You can test beta software such as the prolific "Mozilla Firefox" betas without causing permanent problems with the production version of the same software, since many betas inactivate or remove the existing production version of the same program.

BENEFITS OF USING "VIRTUAL MACHINES" (continued)

- With virtual machines, you no longer need to keep older computers around in order to run those beloved MS-DOS games or to run prior year versions of income tax software or old versions of financial software such as "Quicken“, "QuickBooks“ or “Turbotax”.





BENEFITS OF USING "VIRTUAL MACHINES" (continued)

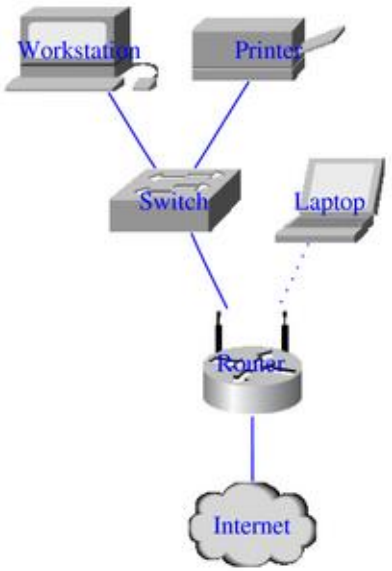
- You can clone existing "virtual machines" in a fraction of the time that it takes to set up, “reload”, or “re-image” real, physical computers.

BENEFITS OF USING "VIRTUAL MACHINES" (continued)

- If you use a cloned "virtual machine" for accessing the Web and it catches a virus/malware/trojan, you can delete the cloned "virtual machine" and create a fresh new virtual machine in tens of minutes.

BENEFITS OF USING "VIRTUAL MACHINES" (continued)

- All virtual machine programs provide you with "virtual networks":
  - –You can practice and demonstrate setting up shared files, folders, and printers without using real computers and without using real network equipment.



COMPONENTS OF A "VIRTUAL MACHINE"

- A "virtual machine" has
  - ✓ a virtual "processor"
  - ✓ some virtual "RAM"

COMPONENTS OF A "VIRTUAL MACHINE" (continued)

- ✓ a virtual "BIOS" or a virtual "UEFI"

"BIOS" =
"BASIC INPUT/OUTPUT SYSTEM"

"UEFI =
"Unified Extensible Firmware Interface"

COMPONENTS OF A "VIRTUAL MACHINE" (continued)

- ✓ a virtual "desktop"
- ✓ one or more the virtual "hard drives"
- ✓ some virtual "RAM"
- ✓ a virtual "keyboard" and
- ✓ a virtual "mouse"

IMPLEMENTING "VIRTUAL MACHINES"

- ✓ Big Step 0:
  Learn about "virtual machines"
  (This document!)
- ✓ Big Step 100:
  Install a "virtual machine"
  program
- ✓ Big Step 200:
  Create a new "virtual machine"

IMPLEMENTING "VIRTUAL MACHINES" (continued)

- ✓ Big Step 300:
  Install a guest operating system into the new "virtual machine"
- ✓ Big Step 400:
  Start up the guest operating system and install drivers provided by the "virtual machine program"

IMPLEMENTING "VIRTUAL MACHINES" (continued)

- ✓ Big Step 500:
  Install third-party application software programs into the virtual machine

IMPLEMENTING "VIRTUAL MACHINES" (continued)

- ✓ Big Step 600:
  Use the Web browser(s) and third-party apps inside the virtual machine as if it were a real physical computer

START OFF WITH YOUR EXISTING WINDOWS 10 OR 7 COMPUTER:

Real computer (="host computer") runs Windows 10 or 7

BIG STEP 100: INSTALL A "VIRTUAL MACHINE PROGRAM":

(USE ONLY THE FREE "VIRTUAL MACHINE PROGRAMS" UNLESS YOU CAN JUSTIFY THE EXPENSE OF PAYING FOR ONE)

Real computer (="host computer") runs Windows 10 or 7

Install the free "VMware Workstation Player" program

= "virtual machine program"

BIG STEP 200: CREATE A NEW "VIRTUAL MACHINE" USING THE "VIRTUAL MACHINE PROGRAM

= "CREATE VIRTUAL HARDWARE"
= A FOLDER FULL OF FILES

Real computer (="host computer") runs Windows 10 or 7

"VMware Workstation Player"

= "virtual machine program"

Create a new "virtual machine"

BIG STEP 300: INSTALL A "GUEST OPERATING SYSTEM" INTO THE "VIRTUAL MACHINE"

Real computer (="host computer") runs Windows 10 or 7

"VMware Workstation Player"

= "virtual machine program"

Install "Windows XP"
as a
"guest operating system"
inside the "virtual machine"

BIG STEP 400: INSTALL THE VIRTUAL MACHINE PROGRAM'S DRIVERS INTO THE "VIRTUAL MACHINE"

= THE "VIRTUAL MACHINE PROGRAM" PROVIDES (GUEST) OPERATING SYSTEM-SPECIFIC DRIVERS TO MAKE THE VIRTUAL MACHINE WORK BETTER

= INSTALL "VMWARE TOOLS" INTO THE "GUEST OPERATING SYSTEM"

Real computer (="host computer")
runs Windows 10 or 7

"VMware Workstation Player"
= "virtual machine program"

"Virtual machine"
runs "Windows XP"
as a "guest operating system"

Install "VMware Tools"

BIG STEP 500: INSTALL THIRD-PARTY APPLICATION PROGRAMS INTO THE "VIRTUAL MACHINE"

Real computer (="host computer")
runs Windows 10 or 7

"VMware Workstation Player"
= "virtual machine program"

"Virtual machine"
runs "Windows XP"
as a "guest operating system"

Install third-party application programs into the virtual machine

BIG STEP 600: USE THE WEB BROWSER(S) AND THIRD-PARTY APPS INSIDE THE VIRTUAL MACHINE AS IF IT WERE A REAL, PHYSICAL COMPUTER

Real computer (="host computer")
runs Windows 10 or 7

"VMware Workstation Player"
= "virtual machine program"

"Virtual machine"

runs "Windows XP"
as a "guest operating system"

Use the Web browser(s) and apps inside the virtual machine as if it were a real physical computer

YOU CAN RUN AN "XP MODE" VM INSIDE A "WINDOWS 7 PRO" HOST COMPUTER TO TAKE GET A FREE, LEGAL COPY OF "WINDOWS XP"

Real computer (="host computer") runs "Windows 7 Pro"

"Windows Virtual PC" virtual machine program runs inside "Windows 7 Pro" as a free, bundled program that you can download from Microsoft.com

"XP Mode" runs as a "guest operating system" in a virtual machine

HOWEVER, YOU CANNOT MOVE OR INSTALL "XP MODE" INSIDE ANOTHER "VIRTUAL MACHINE PROGRAM":

"XP MODE" HAS TO RESIDE INSIDE COPY OF THE "WINDOWS VIRTUAL PC" "VIRTUAL MACHINE PROGRAM" INSIDE A LEGAL, ACTIVATED COPY OF "WINDOWS 7 PRO"