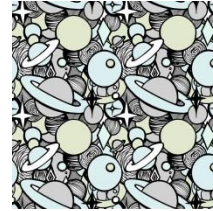


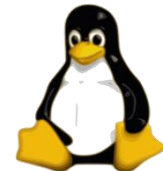
USING VIRTUAL MACHINES TO SAVE REAL MONEY, SPACE, AND TIME



Mac version



Windows version



1 Linux version

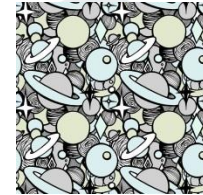
SUMMARY

For any "Linux" desktop computer that has at least two Gigabytes of RAM, you can install free "virtual machine programs" that allow you to create "virtual machine" computers, in order to save money, space, and time.

OBJECTIVES

1. Save real money \$

2. Save real space



3. Save real time



STRATEGIES FOR OBJECTIVE 1 TO SAVE MONEY \$

- 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:



STRATEGIES FOR OBJECTIVE 1 TO SAVE MONEY \$

- When you get that hot new beta of "Windows 8" or "Ubuntu Linux 12.xx (soon!)", you can resist the urge to get a new computer, if you know that you can create a "virtual machine" computer inside your existing computer in a matter of minutes to install the beta software.

STRATEGIES FOR OBJECTIVE 1 TO SAVE MONEY (continued)

- 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:

STRATEGIES FOR OBJECTIVE 1 TO SAVE MONEY (continued)

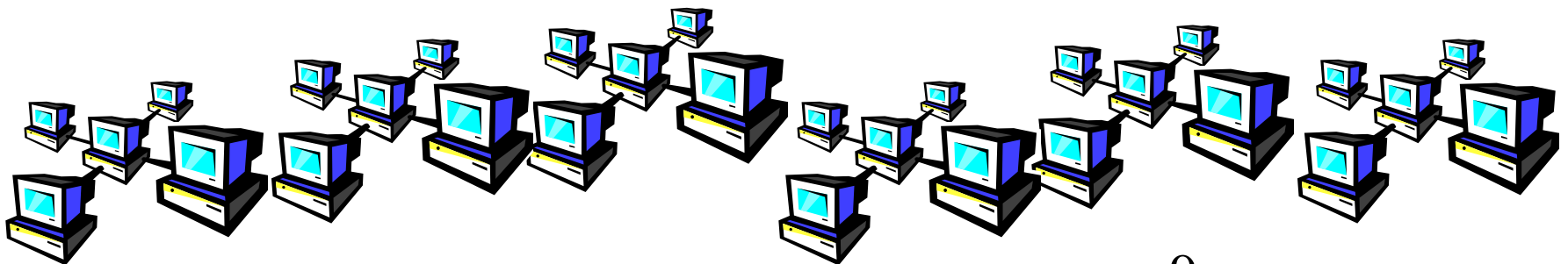
- In a virtual machine system, each guest operating system can be "shown" a much larger amount of hard drive space than is actually utilized by it, but the actual usage of physical hard drive space is just the "used" space--not the "free space" that the virtual machines "see".

STRATEGIES FOR OBJECTIVE 1 TO SAVE MONEY (continued)

- You can use “virtual machines” to perform activities that you would otherwise have to do with real computers:

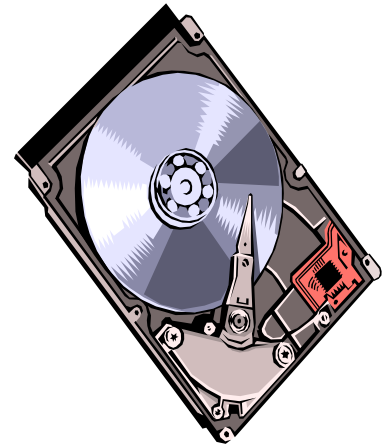
STRATEGIES FOR OBJECTIVE 1 TO SAVE MONEY (continued) \$

- 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.



STRATEGIES FOR OBJECTIVE 1 TO SAVE MONEY (continued) \$

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



- See

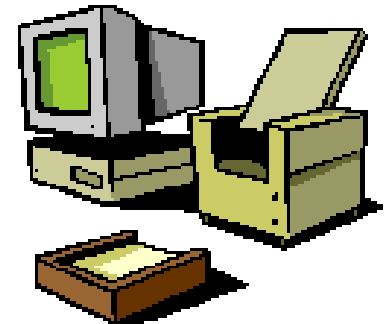
http://aztcs.org/meeting_notes/winhardsig/harddrives/repairing/hard_drive_soft_repairs.htm

STRATEGIES FOR OBJECTIVE 1 TO SAVE MONEY (continued) \$

–You can use a virtual machine to manage real print server devices.

- See

http://aztcs.org/meeting_notes/winhardsig/virtualmachines/printservers/printservers.pdf



STRATEGIES FOR OBJECTIVE 1 TO SAVE MONEY (continued)

- You can run printer management software that you get from the printer manufacturers in a virtual machine, only when you need the printer management software, so that it does not bog down your "host" computer.

STRATEGIES FOR OBJECTIVE 1 TO SAVE MONEY (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.

STRATEGIES FOR OBJECTIVE 1 TO SAVE MONEY (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.

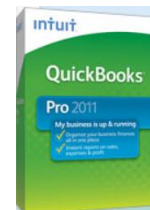
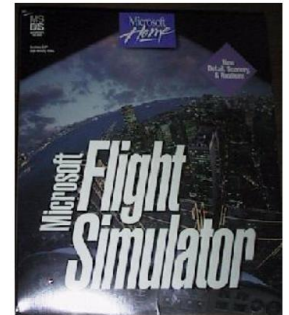
STRATEGIES FOR OBJECTIVE 2 TO SAVE SPACE

- When you run virtual machine programs, you can use fewer real computers because you can create “virtual machines” instead of keeping old computers around or buying additional new computers.

STRATEGIES FOR OBJECTIVE 2 TO SAVE SPACE (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".



STRATEGIES FOR OBJECTIVE 3 TO SAVE TIME

- 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.

STRATEGIES FOR OBJECTIVE 3 TO SAVE TIME (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 one in tens of minutes.

ADDITIONAL BENEFITS OF VIRTUAL MACHINES (continued)

- You can provide them with a “Desktop user” account in your “host” computer and make their user account inside the virtual machine an “Administrator” account.

Administrator

Can change anything on the system, including installing and upgrading software.

Desktop user

Can perform common tasks. Can't install software or change settings affecting all users.

IMPLEMENTATION

- PROJECT 1:
Choose "Virtual Machine Programs"
- PROJECT 2:
Install "Virtual Machine Program(s)"
- PROJECT 3:
Create Virtual Machines
- PROJECT 4:
Do "Physical to Virtual"("P2V")
- PROJECT 5:
(Learn to) Use Virtual Machines

PROJECT 1 DETAILS

(CHOOSE "VIRTUAL MACHINE PROGRAMS")

- A “host computer” is the real, physical computer where you install one or more “virtual machine programs”.

PROJECT 1 DETAILS (continued)

(CHOOSE "VIRTUAL MACHINE PROGRAMS")

- You can download and install one or both of the following free “virtual machine programs” into a “Linux” host computer:
 - "VMware Player"
 - "Oracle VM VirtualBox"

PROJECT 1 DETAILS (continued): (CHOOSE "VIRTUAL MACHINE PROGRAMS")

- These above-mentioned "virtual machine programs" allow you to run various operating system "guests" such as various distros of "Linux" and various versions of "Windows" as "virtual machines".
 - The terms "guest operating system" and "virtual machines" are synonymous.

PROJECT 1 DETAILS (continued) (CHOOSE "VIRTUAL MACHINE PROGRAMS")

- There are no conflicts from **installing** both of the free "virtual machine programs" into the same "Linux" host computer. You can even **run** both of the "virtual machine programs" in the same "Linux" computer at the same time, if you have enough RAM.

PROJECT 1 DETAILS (continued) (CHOOSE "VIRTUAL MACHINE PROGRAMS")

- Some special considerations for “VMware Player”:
 - It is much easier and faster to clone a virtual machine in “VMware Player”, compared to “Oracle VM VirtualBox”.

PROJECT 1 DETAILS (continued) (CHOOSE "VIRTUAL MACHINE PROGRAMS")

- Some special considerations for “VMware Player” (continued):
 - To clone a virtual machine in “VMware Player”, you just use a file manager such as “Nautilus” or “PCFileMan” to copy the entire virtual machine folder, , including the .VMDK virtual hard drive that is inside this virtual machine folder.

PROJECT 1 DETAILS (continued) (CHOOSE "VIRTUAL MACHINE PROGRAMS")

- Some special considerations for “VMware Player” (continued):
 - To clone a virtual machine in “Oracle VM VirtualBox”, you have to use the `vboxmanage` command-line command to copy the `.VDI` virtual hard drive file. Then you have to start the virtual machine installation process and attach the new virtual hard drive file to the new virtual machine.

PROJECT 1 DETAILS (continued)

(CHOOSE "VIRTUAL MACHINE PROGRAMS")

- Some special considerations for "Oracle VM VirtualBox":
 - Unlike "VMware Player", "Oracle VM Virtualbox" does not support all of the "Aero" features such as "Aero Peek at Desktop", "Aero Preview a Window", "Aero Snap", and "Aero Shake" in a virtual machine that is running "Windows 7".

PROJECT 1 DETAILS (continued) (CHOOSE "VIRTUAL MACHINE PROGRAMS")

- Some special considerations for “Oracle VM VirtualBox” (continued)
 - In addition to it’s own .VDI virtual hard drive format, “Oracle VM VirtualBox” can use .VMDK virtual hard drives that were created by “VMware Player” and .VHD virtual hard drives that were created by “Windows Virtual PC”.

PROJECT 1 DETAILS (continued) (CHOOSE "VIRTUAL MACHINE PROGRAMS")

- Some special considerations for "Oracle VM VirtualBox" (continued)
 - The degree to which "Oracle VM Virtual" virtual machine can use a .VMDK or a .VHD depends on the specific operating system that is being installed into the virtual machine. Sometimes you can boot up from the .VMDK or .VHD file and sometimes you can only use the .VMDK or .VHD file as a data drive.

PROJECT 1 DETAILS (continued) (CHOOSE "VIRTUAL MACHINE PROGRAMS")

- Some special considerations for “Oracle VM VirtualBox”(continued)
 - “Oracle VM VirtualBox” provides you with more options for the virtual hard drive controller that is used to connect to the virtual hard drive of a virtual machine.

PROJECT 1 DETAILS (continued) (CHOOSE "VIRTUAL MACHINE PROGRAMS")

- Some special considerations for “Oracle VM VirtualBox”(continued)
 - “Oracle VM VirtualBox” provides you with a choice between virtual IDE, SCSI, SATA and SAS controllers for each virtual hard drive.
 - “VMware Player” only provides virtual machines with IDE and SATA virtual hard drive controllers.

PROJECT 1 DETAILS (continued) (CHOOSE "VIRTUAL MACHINE PROGRAMS")

- Some special considerations for “Oracle VM VirtualBox” (continued)
 - In “Oracle VM VirtualBox”, if your host computer has a 64-bit CPU chip with Intel VT-# support or AMD-V support, even if you are running a 32-bit host operating system, you can create virtual machines with 64-bit operating systems.

PROJECT 1 DETAILS (continued) (CHOOSE "VIRTUAL MACHINE PROGRAMS")

- Some special considerations for “Oracle VM VirtualBox” (continued)
 - “Oracle VM VirtualBox” starts up virtual machines faster than “VMware Player”.

PROJECT 1 DETAILS (continued) (CHOOSE "VIRTUAL MACHINE PROGRAMS")

- However, after a virtual machine is started and it's guest operating system load's it's "desktop", there is very little difference between the virtual machines of the two free "virtual machine programs", with "VMware Player" a little bit faster than "Oracle VM VirtualBox.

PROJECT 1 DETAILS (continued) (CHOOSE "VIRTUAL MACHINE PROGRAMS")

- More differences between “VMware Player” and “Oracle VM VirtualBox” can be found at http://aztcs.org/meeting_notes/linux_sig/virtualmachines/comparison--linux.pdf

PROJECT 2 DETAILS

(INSTALL "VIRTUAL MACHINE PROGRAMS")

- For instructions on how to install “VMware Player” into a “Linux” host, see

http://aztcs.org/meeting_notes/linuxsig/virtualmachines/vmware/VMwarePlayerLinux.pdf

PROJECT 2 DETAILS (continued) (INSTALL "VIRTUAL MACHINE PROGRAMS")

- For instructions on how to install “Oracle VM VirtualBox” into a “Linux” host, see

http://www.aztcs.org/meeting_notes/linuxsig/virtualmachines/virtualbox/VirtualBoxLinux.pdf

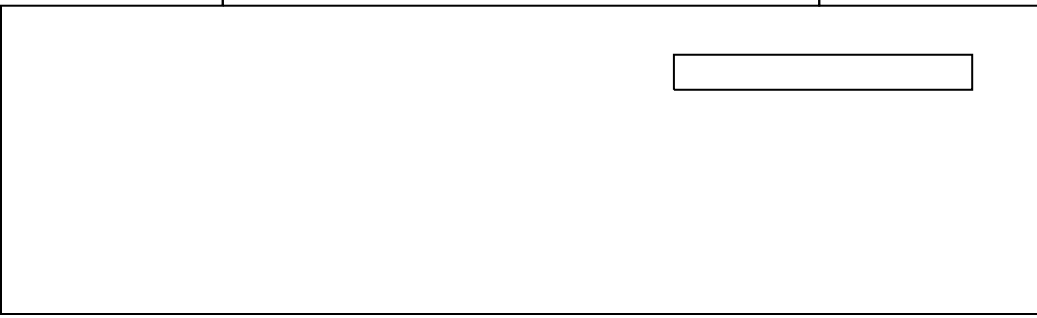
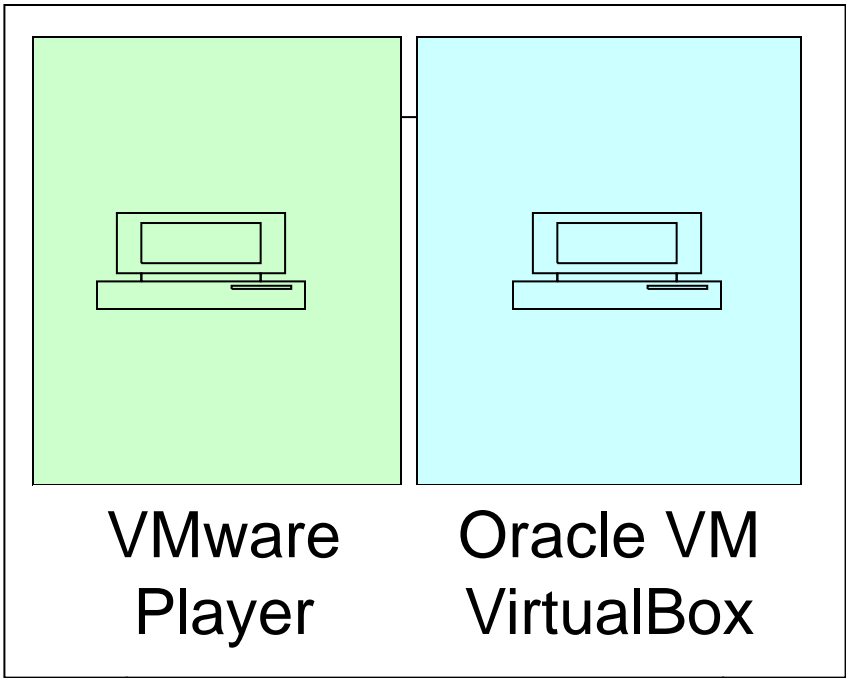
PROJECT 3 DETAILS

(CREATE VIRTUAL MACHINES)

- Method 1:
Use the installation media provided by the maker of the operating system.
- Method 2:
Clone an existing virtual machine so that it runs in the same “virtual machine program”.
- Method 3:
Clone an existing virtual machine so that it runs in a different “virtual machine program” (= “V2V”)

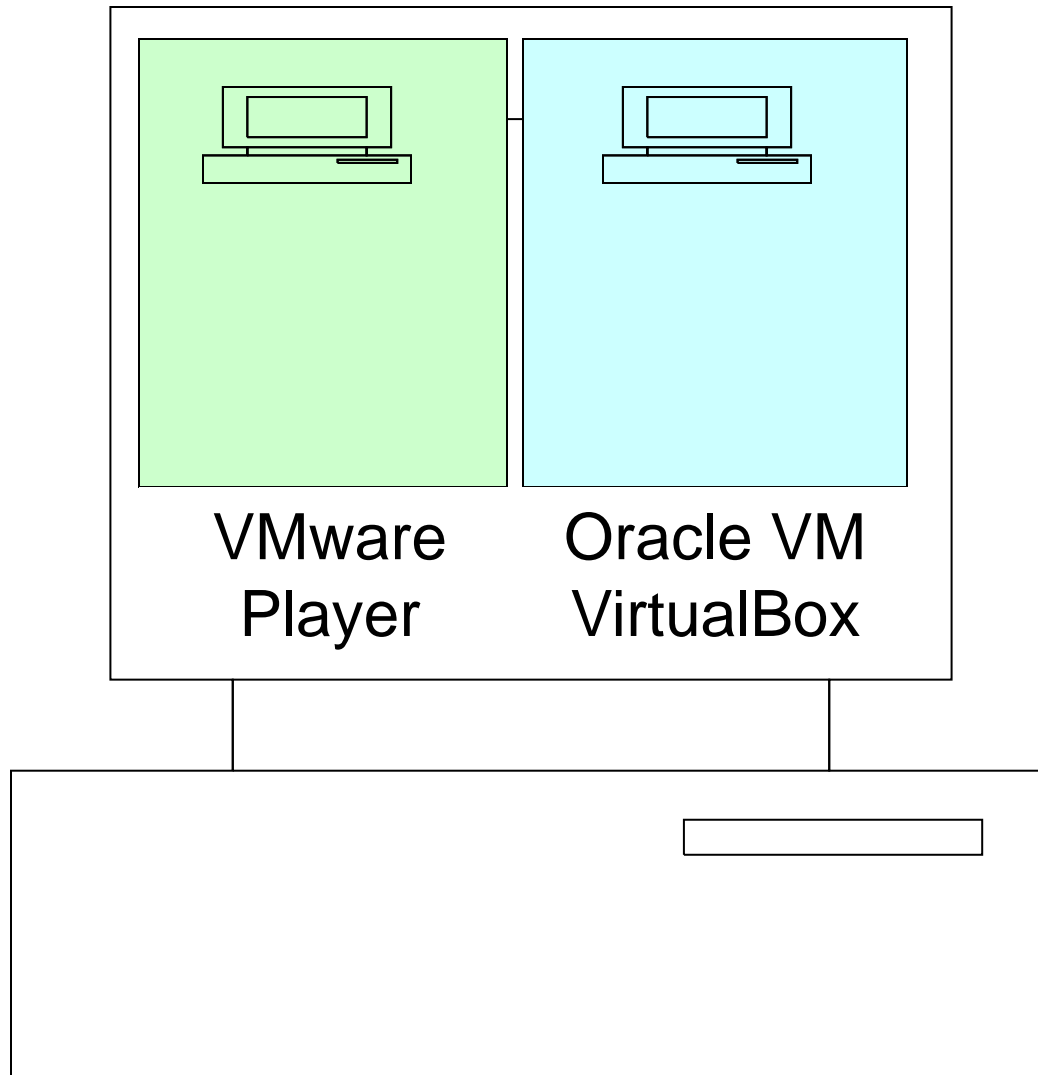
PROJECT 3 (CREATE VIRTUAL MACHINES)

Method 1: Use Installation Media (or an .ISO file)



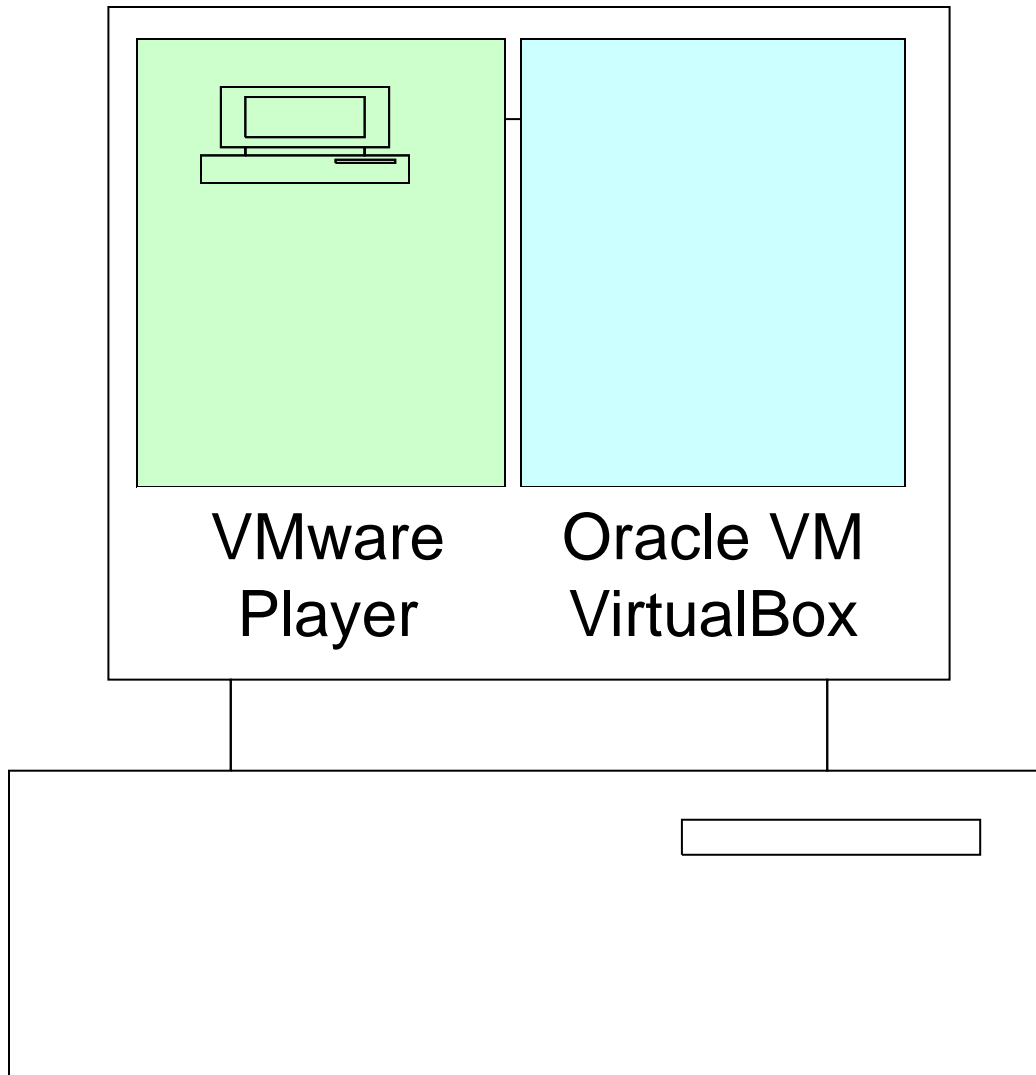
PROJECT 3 (CREATE VIRTUAL MACHINES)

Method 2: Clone an Existing Virtual Machine So That it
Runs in the Same “Virtual Machine Program”



PROJECT 3 (CREATE VIRTUAL MACHINES)

Method 3: Clone a Virtual Machine So That It Runs on a Different “Virtual Machine Program” (V2V)



PROJECT 3 DETAILS

(CREATE VIRTUAL MACHINES)

- Method 1: Use Installation Media

For advice on using installation media to create a virtual machine in

“VMware Player”, see

www.vmware.com/pdf/VMwarePlayer

[Manual10.pdf](#) and

<http://www.howtogeek.com/howto/110>

[60/create-an-xp-mode-for-windows7-](#)

[home-versions-and-vista](#)

PROJECT 3 DETAILS

(CREATE VIRTUAL MACHINES)

- Method 1: Use Installation Media (continued)

For advice on using installation media to create a virtual machine in “Oracle VM VirtualBox”, see

<http://www.virtualbox.org/manual/ch03.html#guestsupport> and

<http://www.virtualbox.org/manual/ch01.html#gui-createvm> and

<https://help.ubuntu.com/community/VirtualBox/FirstVM>

PROJECT 3 DETAILS

(CREATE VIRTUAL MACHINES)

- Method 2:

Clone an existing virtual machine (so that the cloned virtual machine runs on the same “virtual machine program”)

PROJECT 3 DETAILS

(CREATE VIRTUAL MACHINES)

Method 2: Clone Virtual Machines (continued)



– To clone a virtual machine in “VMware Player”, see

<http://lastkth->

en.blogspot.com/2008/04/virtualbox-clone-virtual-machine-ubuntu.html

and

http://aztcs.org/meeting_notes/linuxsig/virtualmachines/vmware/Cloning_VM_in_VMwarePlayerLinux.pdf

PROJECT 3 DETAILS

(CREATE VIRTUAL MACHINES)

Method 2: Clone Virtual Machines  (continued)

- To clone a virtual machine in “Oracle VM VirtualBox”, see <http://srackham.wordpress.com/cloning-and-copying-virtualbox-virtual-machines/> and <http://www.mdl4.com/2010/05/how-to-copy-clone-a-virtualbox-vdi-in-ubuntu/>

PROJECT 3 DETAILS

(CREATE VIRTUAL MACHINES)

- Method 3:

Convert an existing virtual machine so that it runs on a different “Virtual Machine Program” (= “V2V” which stands for “Virtual to Virtual”)

PROJECT 3 DETAILS

(CREATE VIRTUAL MACHINES)

- Method 3 Details (continued):

Using the free “Paragon Go Virtual” program to convert a “VMware Player” virtual machine to a “Windows Virtual PC” virtual machine (V2V):

[http://aztcs.org/meeting_notes/winhardsi
g/virtualmachines/v2v/PGV-v2v-convert-
VMware-to-VHD.pdf](http://aztcs.org/meeting_notes/winhardsi
g/virtualmachines/v2v/PGV-v2v-convert-
VMware-to-VHD.pdf)

PROJECT 3 DETAILS

(CREATE VIRTUAL MACHINES)

- Method 3 Details (continued):
Using the free “VMware vCenter Converter Standalone” program to convert a “Oracle VM VirtualBox” virtual machine to a “VMware Player” virtual machine (V2V):

http://aztcs.org/meeting_notes/winhardsig/virtualmachines/v2v/VVCS-v2v-convert-VirtualBox-to-VMware.pdf

PROJECT 3 DETAILS

(CREATE VIRTUAL MACHINES)

- Method 3 Details (continued):
Using the free “Qemu” program to convert a “VMware Player” virtual machine to an “Oracle VM VirtualBox” virtual machine (V2V)s:

<http://www.ubuntugeek.com/howto-convert-vmware-image-to-virtualbox-image.html>

PROJECT 3 DETAILS

(CREATE VIRTUAL MACHINES)

- “ADD-ON” SOFTWARE TO INSTALL INTO EACH VIRTUAL MACHINE:
AFTER YOU CREATE A VIRTUAL MACHINE USING ANY OF THE 3 METHODS, YOU SHOULD START THE VIRTUAL MACHINE AND INSTALL “ADD-ON” SOFTWARE THAT IS PROVIDED BY THE MAKER OF THE “VIRTUAL MACHINE PROGRAM.

PROJECT 3 DETAILS

(CREATE VIRTUAL MACHINES)

- Add on “VMware Tools” to make “VMware Player” virtual machines work better:

<https://help.ubuntu.com/community/VMware/Tools>

and

<http://www.vmware.com/download/packages.html>

and

<http://www.hackernotcracker.com/2007-02/obtaining-vmware-tools-for-vmware-player-through-extraction.html>

PROJECT 3 DETAILS

(CREATE VIRTUAL MACHINES)

- Add on “VMware Tools” to make “VMware Player” virtual machines work better (continued):

See

http://www.ehow.com/how_6809913_install-tools-vmware-player.html

and

<http://www.sysprobs.com/install-vmware-tools-manually-ubuntu-11-04-vmware-shared-folders>

PROJECT 3 DETAILS

(CREATE VIRTUAL MACHINES)

- Add on “Guest Additions” software to make “Oracle VM VirtualBox” virtual machines work better

See

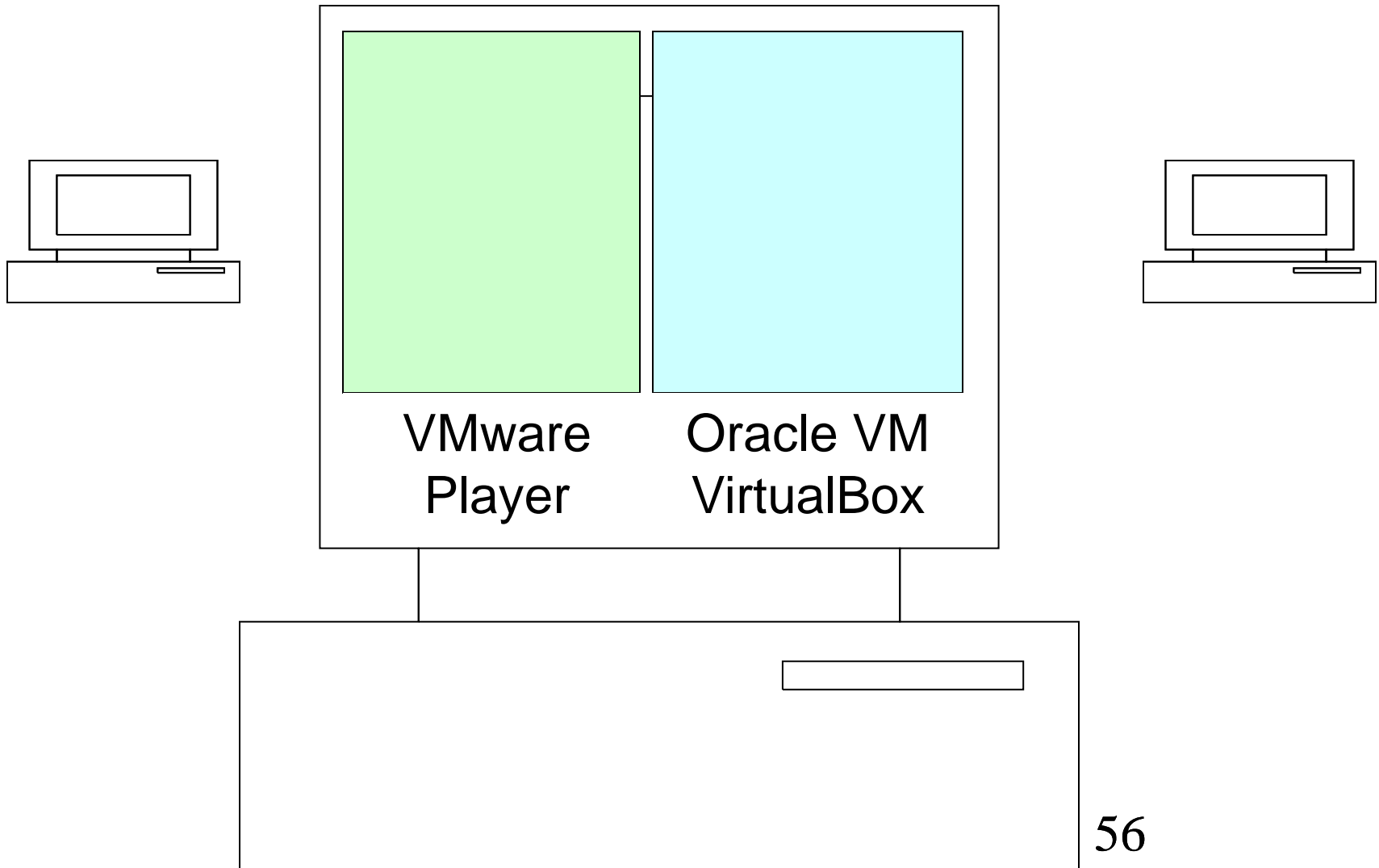
<http://www.virtualbox.org/manual/ch04.html>

and

<http://helpdeskgeek.com/linux-tips/install-virtualbox-guest-additions-in-ubuntu/>

PROJECT 4 (P2V="PHYSICAL TO VIRTUAL")

Convert a Real Computer So That It Runs as a Virtual Machine in a "Virtual Machine Program"



PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- To convert a real, physical computer into a "virtual machine" (P2V) that can be "played" in any "Linux" computer that has a copy of "VMware Player" or "Oracle VM VirtualBox", you can use "VMware vCenter Converter Standalone" or the "Paragon Go Virtual" software utility.

PROJECT 4 DETAILS (continued) (DO "PHYSICAL TO VIRTUAL")

- “Physical to Virtual” (P2V) By the Free “Paragon Go Virtual” Program
 - After installing it into a real “Windows 2000”, “Windows XP”, “Windows Vista”, or “Windows 7” computer, you can use it to perform a “Physical to Virtual”.

PROJECT 4 DETAILS (continued) (DO "PHYSICAL TO VIRTUAL")

- The free "Paragon Go Virtual" software application can create virtual machines for "VMware Player", "Oracle VM VirtualBox", "Windows Virtual PC", and "Microsoft Virtual PC 2007".

PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- "PHYSICAL-TO-VIRTUAL" (P2V) BY THE FREE "PARAGON GO VIRTUAL" PROGRAM

– You can get a free copy of "Paragon Go Virtual" at <http://www.paragon-software.com/home/go-virtual/>

– The users manual for "Paragon Go Virtual" is located at http://www.paragon-software.com/docs/GoVirtual_manual_eng.pdf

PROJECT 4 DETAILS (continued) (DO "PHYSICAL TO VIRTUAL")

- “PHYSICAL TO VIRTUAL” (P2V) BY THE FREE “PARAGON GO VIRTUAL” PROGRAM

– Installation screenshots for “Paragon Go Virtual” are available at:

http://aztcs.org/meeting_notes/winhard_sig/virtualmachines/p2v/PGV-install-into-Windows.pdf

PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- “PHYSICAL TO VIRTUAL” (P2V) BY THE FREE “PARAGON GO VIRTUAL” PROGRAM
 - Using “Paragon Go Virtual” to create a “VMware Player” virtual machine from a real “Windows” computer:
http://aztcs.org/meeting_notes/winhard_sig/virtualmachines/p2v/PGV-p2v-VMwrePlayer.pdf

PROJECT 4 DETAILS (continued) (DO "PHYSICAL TO VIRTUAL")

- “PHYSICAL TO VIRTUAL” (P2V) BY THE FREE “PARAGON GO VIRTUAL” PROGRAM
 - Using “Paragon Go Virtual” to create a “Oracle VM VirtualBox” virtual machine from a real “Windows” computer:
http://aztcs.org/meeting_notes/winhard_sig/virtualmachines/p2v/PGV-p2v-VirtualBox.pdf

PROJECT 4 DETAILS (continued) (DO "PHYSICAL TO VIRTUAL")

- “PHYSICAL TO VIRTUAL” (P2V) BY THE FREE “PARAGON GO VIRTUAL” PROGRAM

– See

http://www.informationweek.com/news/smb/hardware_software/showArticle.jhtml?articleID=226200112

or

– <http://www.intowindows.com/paragon-go-virtual-free-powerful-migration-tool-for-windows/>

PROJECT 4 DETAILS (continued) (DO "PHYSICAL TO VIRTUAL")

– See

http://www.informationweek.com/news/smb/hardware_software/showArticle.jhtml?articleID=226200112

– See

<http://dottech.org/freeware-reviews/16940>

PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- When you run “Paragon Go Virtual”, you get a selection screen where you decide whether to create one of the following:
 - a .VMDK hard drive file for “VMware Player” or
 - a .VMDK hard drive file for “Oracle VM VirtualBox”

PROJECT 4 DETAILS (continued) (DO "PHYSICAL TO VIRTUAL")

- When you run “Paragon Go Virtual” you get a selection screen (continued)

Please select a virtual software vendor:

- VMware Workstation / VMware Fusion
- Microsoft Virtual PC
- Oracle VirtualBox



Several of the selected volumes are not supported by all virtualization software vendors for their size exceed the maximum capacity for virtual disks.

PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- “Physical to Virtual” (P2V) By the Free “VMware vCenter Converter Standalone” Program
 - You can get a free copy of this program at <http://www.vmware.com/products/converter/>

PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- “Physical to Virtual” (P2V) By the Free “VMware vCenter Converter Standalone” Program
 - After installing it into Windows 2000, Windows XP, Windows Vista, or some distros of Linux, you can use it to perform a “Physical to Virtual” to create a virtual machine for “VMware Player”.

PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- “Physical to Virtual” (P2V) By the Free “VMware vCenter Converter Standalone” Program (continued)
 - For instructions on using “VMware vCenter Converter Standalone” to convert a real “Windows 7” computer into a virtual machine, see <http://www.tumfatig.net/20100727/p2v-from-se7en-to-virtualbox/>

PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- “Physical to Virtual” (P2V) By the Free “VMware vCenter Converter Standalone” Program (continued)

–Advice on doing a P2V for a Linux computer can be found at <http://enterpriseadmins.org/blog/virtualization/linux-p2v-with-vmware-converter-stand-alone/>

PROJECT 4 DETAILS (continued) (DO "PHYSICAL TO VIRTUAL")

- “Physical to Virtual” (P2V) By the Free “VMware vCenter Converter Standalone” Program
 - You can get a free copy of this program at <http://www.vmware.com/products/converter/>

PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- “Physical to Virtual” (P2V) By the Free “VMware vCenter Converter Standalone” Program (continued)
 - After installing it into Windows 2000, Windows XP, Windows Vista, or some distros of Linux, you can use it to perform a “Physical to Virtual” to create a virtual machine for “VMware Player”.

PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

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PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- “Physical to Virtual” (P2V) By the Free “VMware vCenter Converter Standalone” Program (continued)
 - Advice on doing a P2V for a Linux computer can be found at <http://enterpriseadmins.org/blog/virtualization/linux-p2v-with-vmware-converter-stand-alone/>

PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- “Physical to Virtual” (P2V) By the Free “VMware vCenter Converter Standalone” Program (continued)
 - For instructions on using “VMware vCenter Converter Standalone” to use a real “Windows 7” computer to create a virtual machine for “VMware Player”, see <http://www.tumfatig.net/20100727/p2v-from-se7en-to-virtualbox/>

PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- “Physical to Virtual” (P2V) By the Free “VMware vCenter Converter Standalone” Program (continued)
 - The steps for using “VMware vCenter Converter” to create a virtual machine from a real computer are almost exactly the same as the (V2V) steps for converting a “Oracle VM VirtualBox” virtual machine to a “VMware Player” virtual machine.

PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- “Physical to Virtual” (P2V) By Microsoft’s Free “Disk2VHD” Program
 - The “Disk2VHD” program can be downloaded from <http://technet.microsoft.com/en-us/sysinternals/ee656415>

PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- “Physical to Virtual” (P2V) By the Microsoft’s Free “Disk2VHD” Program

– You can install it into any physical computer that has Windows XP Service Pack 2 and higher, Windows Vista, or Windows 7 computer and use it to create a .VHD virtual hard drive file that can be used to create a virtual machine in “Windows Virtual PC”, “Microsoft Virtual PC 2007”, or “Oracle VM VirtualBox”.

PROJECT 4 DETAILS (continued) (DO "PHYSICAL TO VIRTUAL")

- “Physical to Virtual” (P2V) By Microsoft’s Free “Disk2VHD” Program (continued)
 - If you use the free “Disk2VHD” program to create a .VHD file from a 64-bit version of Windows, you will be unable to use the .VHD file in “Windows Virtual PC” or “Microsoft Virtual PC 2007, since these two “virtual machine programs” only allow 32-bit “Windows” as guest operating systems.

PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- “Physical to Virtual” (P2V) By Microsoft’s Free “Disk2VHD” Program (continued)
 - However, with some tweaking, you can use the any .VHD file (that is created by “Disk2VHD”) to create a virtual machine in “Oracle VM VirtualBox”, even if the .VHD file was created from a source computer that was running a 64-bit version of “Windows”.

PROJECT 4 DETAILS (continued)

- “Physical to Virtual” (P2V) By Microsoft’s Free “Disk2VHD” Program (continued)
 - When any.VHD file is used to create a virtual machine in “Oracle VM VirtualBox”, you have to connect it to a virtual IDE hard drive controller (instead of the virtual SCSI hard drive controller that is provided by default by “Oracle VM VirtualBox”). See <http://www.sysprobs.com/virtualbox-p2v-disk2vhd-errors-fix>

PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- “Physical to Virtual” (P2V) By Microsoft’s Free “Disk2VHD” Program (continued)
 - For detailed instructions for using “Disk2VHD” to use a “Windows XP” computer to create a virtual machine that runs in “Windows Virtual PC”, see <http://www.techrepublic.com/photos/convert-xp-into-a-windows-7-virtual-machine-with-disk2vhd/466302>

PROJECT 4 DETAILS (continued)

(DO "PHYSICAL TO VIRTUAL")

- “Physical to Virtual” (P2V) By Microsoft’s Free “Disk2VHD” Program (continued)
 - The steps for using “Disk2VHD” to create a virtual machine from a real computer are almost exactly the same as the (V2V) steps for using a “Oracle VM VirtualBox” virtual machine to create a “Windows Virtual PC” or “Microsoft Virtual PC 2007” virtual machine.

PROJECT 5 DETAILS

USE VIRTUAL MACHINES

- Virtual Hardware
 - With the exception of the emulated processor, the emulated, virtual hardware of any virtual machine in a “virtual machine program” will not be the same as the real hardware of the host computer.

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual Hardware (continued)
 - Instead, the virtual hardware is a standardized virtual computer that consists of a set of standardized hardware that the "virtual machine program" creates for each virtual machine.

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual Hardware (continued)
 - This makes virtual machines easy to transfer from one computer to another as long as we run them in the same “virtual machine program.

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual Hardware (continued)
 - Each "virtual machine program" creates a different set of default "virtual hardware" for the virtual machines that you create with it
 - See http://en.wikipedia.org/wiki/Comparison_of_platform_virtual_machines

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual Hardware (continued)
 - For a description of the virtual hardware for a virtual machine in “VMware Player”, see

http://www.dpunkt.de/leseproben/1686/Kapitel_2.pdf (for a very detailed virtual hardware description)

and

<http://communities.vmware.com/message/481419> (for a description of “full virtualization”)

and

<http://en.wikipedia.org/wiki/VMware>

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual Hardware (continued)
 - For a description of the virtual hardware for a virtual machine in “Oracle VM VirtualBox”, see the “Hardware Device Emulation” section in http://en.wikipedia.org/wiki/VirtualBox#Hardware_device_emulation

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual CPUs
 - “Oracle VM VirtualBox” provides each virtual machine with a virtual processor that is the same as the actual processor of the physical host computer. Each virtual machine can be provided with as many CPUs for each virtual machine as you have in the real, physical processor of the host computer.

PROJECT 5 DETAILS (continued)

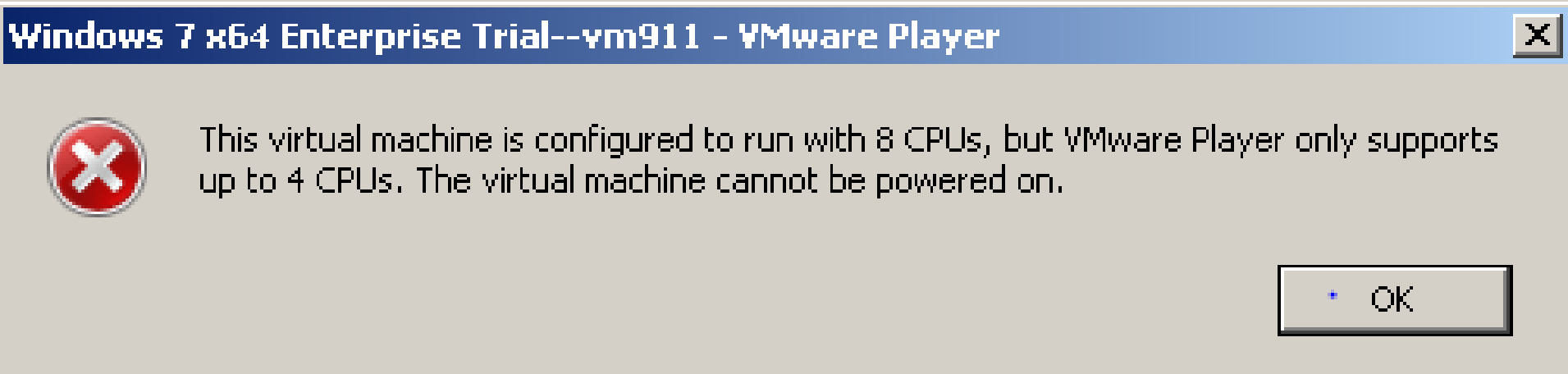
USE VIRTUAL MACHINES

- Virtual CPUs (continued)
 - “VMware Player” provides each virtual machine with a virtual processor that is the same as the actual processor of the physical host computer, up to a maximum of 4 CPUs for a virtual machine, regardless of how many CPUs that the processor of the physical host computer actually has.

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual CPUs (continued)



PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual motherboards
 - “Oracle VM VirtualBox” provides each virtual machine with a virtual no-name motherboard.
 - “VMware Player provides each virtual machine with a virtual “Intel 440BX” motherboard

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual BIOS
 - For “VMware Player” virtual machines, you can configure the virtual “PhoenixBIOS” settings by pressing the F2 key during the “Power On Self Test” of the bootup of the virtual machine

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual BIOS (continued)
 - For “Oracle VM VirtualBox” virtual machines, you can configure the settings of the virtual “innotek GmbH” BIOS by a combination of two methods:
 - Using the “vboxmanage” command at the command line of the host computer
 - Clicking on the “Settings” button of the “Oracle VM VirtualBox Manager” window

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Allocated RAM
 - For “Oracle VM VirtualBox, you can set the amount of RAM for a virtual machine up to the total physical amount of RAM in the host computer. There is no hard limit to the amount of RAM that you can assign to a virtual machine.

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Allocated RAM (continued)
 - For “VMware Player”, you can set the amount of RAM for a virtual machine up to the total physical amount of RAM in the host computer with a hard upper limit of 32GB for systems with 64-bit host operating system and 8GB for systems with 32-bit host operating system.

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- An extensive comparison between various “virtual machine programs” can be found at http://en.wikipedia.org/wiki/Comparison_of_platform_virtual_machines

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual hard drives
 - When you create a virtual machine, you also create a "virtual hard drive" for it.
 - Each of the two free "virtual machine programs" creates virtual hard drives in a different file format.

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual hard drives (continued)
 - A virtual hard drive file or file set in “VMware Player” have a file extension of .VMDK

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual hard drives (continued)
 - A virtual hard drive file in “Oracle VM VirtualBox” will have a file extension of .VDI when the virtual machine is created from installation media in “Oracle VM VirtualBox”.

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual hard drives (continued)
 - “Oracle VM VirtualBox” virtual machines can also use the .VMDK virtual hard drives that have been created by “VMware” and the .VHD virtual hard drives that have been created by “Windows Virtual PC” and “Microsoft Virtual PC 2007” but you usually cannot boot an “Oracle VM VirtualBox” virtual machine from these “foreign” virtual hard drives.

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual hard drive controllers
 - The type of virtual hard drive that a “guest operating system” “sees” depends on which type of virtual hard drive controller that you connect to the virtual hard drive.

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual hard drive controllers
(continued)

For a “Oracle VM VirtualBox”
virtual machine:

.vdi virtual hard drive file

+ virtual SATA controller

= guest operating system sees a
SATA hard drive

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Virtual hard drive controllers
(continued)

For a “Oracle VM VirtualBox”
virtual machine:

.vdi virtual hard drive file

+ virtual IDE controller

= guest operating system sees an
IDE hard drive

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Mouse cursor control rule #1:
When you first click inside a window of a virtual machine, you might be just activating the mouse for that window. Then you usually have to click again to make something happen inside the virtual machine window.

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Mouse cursor control rule #2:
For each virtual machine window,
your mouse cursor will either be in
"integration mode" or in
"captured"/"in jail" mode.

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Mouse cursor control rule #2
(continued):

To get your mouse cursor "out of jail" in "Oracle VM VirtualBox" or "VMware Player", look for a keyboard sequence at the bottom of a virtual machine's window.

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Keyboard control:

The keyboard of your computer will only work inside a virtual machine's window if you have the mouse cursor inside the virtual machine window AND maybe if you have already clicked at least once inside the virtual machine window.

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Window ownership by which virtual machine??

To determine if a Window belongs to a specific virtual machine, move the Window from side to side and watch the borders of the window.

In “Windows 7” do not shake the Window too fast, or all the other Windows might minimize (“Aero Shake”).

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- "Virtual Networks" are provided by all virtual machine programs.
- Each of the two free "virtual machine programs" provides various "virtual networks" for the "virtual network adapters" of a "virtual machine" to attach to.

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- All "virtual machine" programs provide you with "virtual networks" (continued)
 - For information on the "virtual networks" that are provided by "VMware Player", see http://aztcs.org/meeting_notes/linux_sig/virtualmachines/vmware/Virtual_Networks_in_VMware--Linux.pdf

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- All "virtual machine" programs provide you with "virtual networks" (continued):
 - For information on the “virtual networks” that are provided by “Oracle VM VirtualBox”, see http://aztcs.org/meeting_notes/linuxsig/virtualmachines/virtualbox/Virtual_Networks_in_VirtualBox--Linux.pdf

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Using virtual machines for secure Web browsing, see

<http://www.suite101.com/content/use-virtualization-to-improve-desktop-security-a73715>

and

<http://www.mobileandsecure.co.uk/articles/safe-surfing-virtual-pc.html>

and

<http://superuser.com/questions/48939/virtual-machine-and-virus>

and

http://www.trustware.com/index.php?mact=News,cntnt01,detail,0&cntnt01articleid=85&cntnt01origid=15&cntnt01detailtemplate=press_detail_with_image&cntnt01returnid=56

PROJECT 5 DETAILS (continued)

USE VIRTUAL MACHINES

- Using “VMware..” virtual machines for malware analysis

– See

<http://zeltser.com/vmware-malware-analysis/>

APPENDIX 1 : USE AND MENTION OF VIRTUAL MACHINES BY COMPUTER USER GROUPS

- See the hyperlinks to Web sites and newsletters of various user groups at http://aztcs.org/meeting_notes/winhardsig/virtualmachines/UserGroupUse.pdf

APPENDIX 2

VIRTUALIZATION “BIG PICTURE”

- Real fax machine → Virtual fax
 - Fax modem and fax software instead of a fax machine

See

<http://efax-gtk.sourceforge.net/>

and

[https://help.ubuntu.com/community/
DialupAndFax](https://help.ubuntu.com/community/DialupAndFax)

APPENDIX 2 (continued)

VIRTUALIZATION “BIG PICTURE”

- Real Television Set → Virtual TV
 - Open-source “Kaffeine” program
 - See http://aztcs.org/meeting_notes/linuxsig/kaffeine/kaffeine.htm
 - USB tuner “sticks”
 - See http://www.hauppauge.com/site/products/data_hvr950q.html

APPENDIX 2 (continued)

VIRTUALIZATION “BIG PICTURE”

- Real physical computer
→ Virtual machines

See

<http://www.windowsitpro.com/article/virtualization2/marketwatch-virtualization-from-the-desktop-to-the-datacenter-129722/3>

APPENDIX 2 (continued)

VIRTUALIZATION “BIG PICTURE”

- Real Local Area Network (LAN)
 - Virtual networks
 - from “virtual machine programs”

APPENDIX 2 (continued)

VIRTUALIZATION “BIG PICTURE”

- Real Local Area Network (LAN)
 - Virtual networks
 - from “virtual machine programs”

APPENDIX 2 (continued)

VIRTUALIZATION “BIG PICTURE”

- Hardware DVD/CD Drive
→ “Mount” an .ISO file

See

<http://pkill-9.com/mounting-an-iso9660-iso-file-in-linux-ubuntudebian/>

APPENDIX 3

LEGAL ISSUES

OF USING VIRTUAL MACHINES

- If you are recommending, planning, or installing virtual machine software for your business, school, or other non-profit organization, please read the End User License Agreements for all virtual machine programs and guest operating system software, to determine what is legal.

APPENDIX 3 (continued) LEGAL ISSUES OF USING VIRTUAL MACHINES

–See

http://aztcs.org/meeting_notes/win_hardsig/virtualmachines/legal.pdf

APPENDIX 4

TROUBLESHOOTING VIRTUAL MACHINES

- In “Oracle VM VirtualBox”, if a virtual machine is not in the list of virtual machines, use the right mouse button to click on the *.vbox file of the virtual machine, click on “Open with..”, and click on “Oracle VM VirtualBox Manager”.

APPENDIX 4 (continued)

TROUBLESHOOTING VIRTUAL MACHINES

- In “VMware Player”, if a virtual machine is not in the list of virtual machines, use the right mouse button to click on the *.vmx file of the virtual machine, click on “Open with..”, and click on “VMware Player”.

APPENDIX 4 (continued)

TROUBLESHOOTING VIRTUAL MACHINES

- In “VMware Player”, if a virtual machine will not start, delete all .LCK folders in the virtual machine and this often will repair it. See

<http://thebackroomtech.com/2009/04/02/fix-for-vmware-error-could-not-open-virtual-machine-this-virtual-machine-appears-to-be-in-use/>

APPENDIX 4 (continued)

TROUBLESHOOTING VIRTUAL MACHINES

- When part of a virtual machine program fails, you can usually get it to repair itself by running it's installation process and selecting "Repair".

See

http://aztcs.org/meeting_notes/winhardsig/virtualmachines/virtualbox/VirtualBox--repairing.pdf

APPENDIX 5

SECURITY VULNERABILITIES

- There are no known security vulnerabilities for virtual machine programs that are hosted by the Linux operating systems.

APPENDIX 6

FULL VIRTUALIZATION, PARAVIRTUALIZATION, AND EMULATION

- See

<http://www.virtualbox.org/wiki/Virtualization>

and

<http://shortrecipes.blogspot.com/2009/03/xen-performance-of-full-virtualization.html>

and

http://en.wikipedia.org/wiki/Virtual_machine#Emulation_of_the_underlying_raw_hardware_.28native_execution.29

APPENDIX 6 (continued) FULL VIRTUALIZATION, PARAVIRTUALIZATION, AND EMULATION

and

<http://www.invincea.com/blog/2010/10/hwvirtvapp/>

and

http://en.wikipedia.org/wiki/Virtual_machine

and

<http://en.wikipedia.org/wiki/Sandboxie>

APPENDIX 7

NESTING VIRTUAL MACHINES

- The “nesting” of virtual machines is a technique that is useful in special situations
- Nesting causes a significant slow-down for the inner virtual machines of the nested configuration

APPENDIX 7 (continued)

NESTING VIRTUAL MACHINES

- The convenience of the nested configuration often compensates for the slowness of the inner virtual machines.
- Nesting often results in unreliable mouse cursor tracking for the inner virtual machines of the nested configuration.

APPENDIX 7 (continued)

NESTING VIRTUAL MACHINES

- Nesting is not for everyday use.
- Never hibernate a virtual machine that is nested inside another virtual machine. Doing so will bring the outer virtual machine to a crawl.

APPENDIX 7 (continued)

NESTING VIRTUAL MACHINES

- Advice for nesting a “VMware Player” virtual machine inside a “VMware Player” virtual machine can be found at <http://communities.vmware.com/docs/DOC-8970>

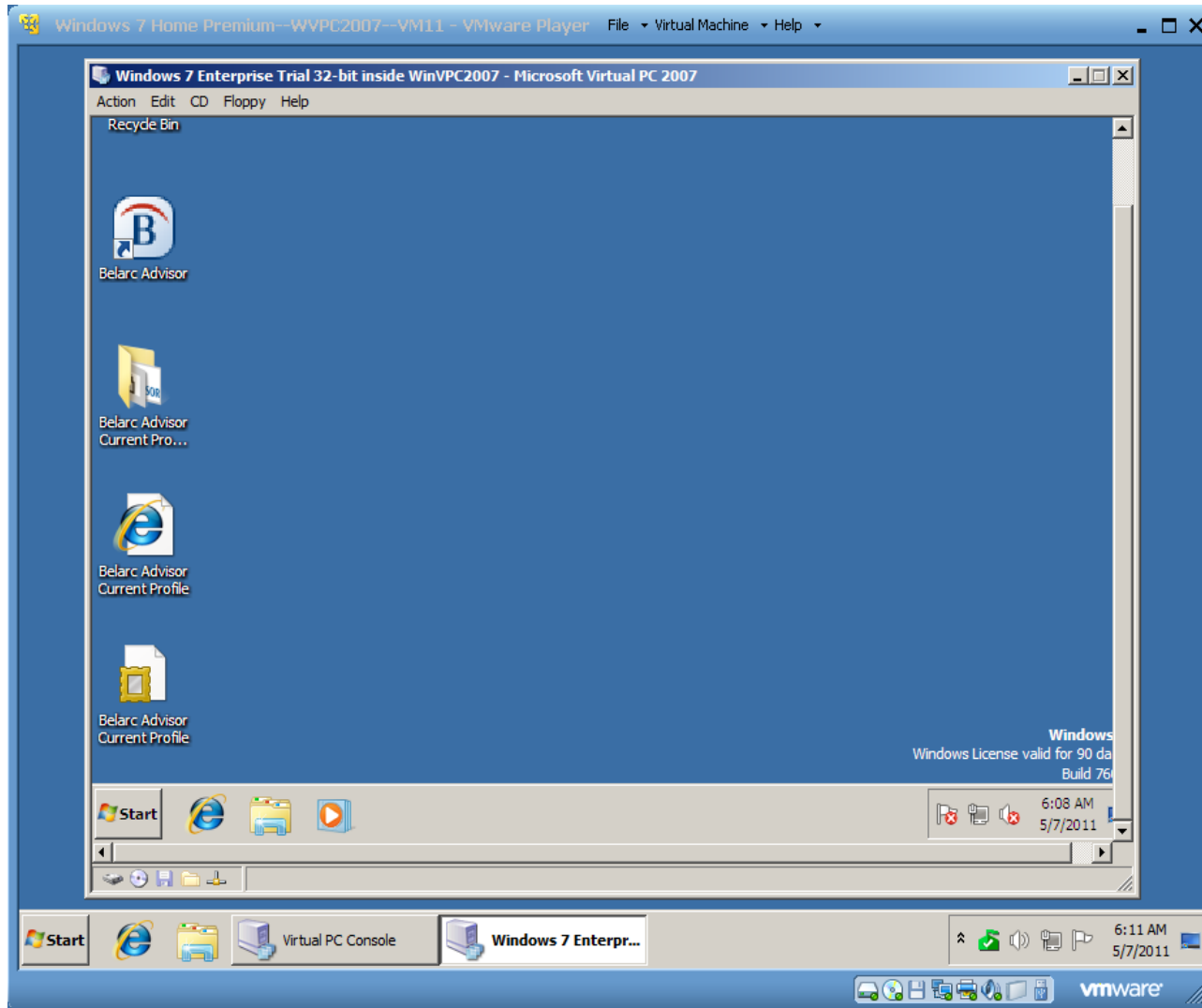
APPENDIX 7 (continued)

NESTING VIRTUAL MACHINES

- An example of nesting:
 - A “Windows 7 Enterprise Trial 32-bit” virtual machine running in “Microsoft Virtual PC 2007” which is running inside a “Windows XP Pro” virtual machine which is running inside the “VMware Player” program which is hosted in a “Windows 7” computer:

APPENDIX 7 (continued)

NESTING VIRTUAL MACHINES



APPENDIX 8

FREE SOFTWARE TRIALS FROM MICROSOFT

- “Windows 7 Enterprise Trial” at <http://technet.microsoft.com/en-us/evalcenter/cc442495.aspx?ITPID=wtcpgs>

downloads as an .ISO DVD image file that can be installed into any real computer or virtual machine program.

APPENDIX 8 (continued)

FREE SOFTWARE TRIALS FROM MICROSOFT

- Our general instructions for downloading and installing “Windows 7 Enterprise Trial” are located at http://aztcs.org/meeting_notes/win_hardsig/win7eval/win7eval.pdf

APPENDIX 8 (continued)

FREE SOFTWARE TRIALS FROM MICROSOFT

- Our specialized instructions for installing “Windows 7 Enterprise Trial” into a “VMware Player” virtual machine are located at http://aztcs.org/meeting_notes/winhardsig/win7intovmware/win7intovmware.pdf

APPENDIX 8 (continued)

FREE SOFTWARE TRIALS FROM MICROSOFT

- Our specialized instructions for installing “Windows 7 Enterprise Trial” into a “Oracle VM Virtualbox” virtual machine are located at http://aztcs.org/meeting_notes/winhardsig/win7intovirtualbox/win7intovirtualbox.pdf

APPENDIX 8 (continued)

FREE SOFTWARE TRIALS FROM MICROSOFT

- “Microsoft Office 2010” trial at <http://office.microsoft.com/> downloads as an .ISO DVD file that can be installed into any real computer or virtual machine program.

APPENDIX 8 (continued)

FREE SOFTWARE TRIALS FROM MICROSOFT

- “Internet Explorer Application Compability VHD Images” at <http://www.microsoft.com/downloads/en/details.aspx?FamilyID=21eabb90-958f-4b64-b5f1-73d0a413c8ef>

that can be used to create virtual machines in “Windows Virtual PC”, “Microsoft Virtual PC 2007”, or “Oracle VM VirtualBox”.

APPENDIX 8 (continued)

FREE SOFTWARE TRIALS FROM MICROSOFT

- When any.VHD file is used to create a virtual machine in “Oracle VM VirtualBox”, you have to connect it to a virtual IDE hard drive controller (instead of the virtual SCSI hard drive controller that is provided by default by “Oracle VM VirtualBox”). See <http://www.sysprobs.com/virtualbox-p2v-disk2vhd-errors-fix>

APPENDIX 9

SPEEDING UP A “WINDOWS” COMPUTER

- If you run any version of “Windows” in a host computer or in a virtual machine, you can speed up “Windows” by following our detailed directions.

APPENDIX 9 (continued)

SPEEDING UP A “WINDOWS” COMPUTER

- To speed up a “Windows 7” computer, follow our instructions at http://aztcs.org/meeting_notes/winhardsig/speedupWindows/windows7speedup/windows7speedup.html

APPENDIX 9 (continued)

SPEEDING UP A “WINDOWS” COMPUTER

- To speed up a “Windows Vista” computer, follow our instructions at http://aztcs.org/meeting_notes/winhardsig/speedupWindows//vistaspeedup/vistaspeedup.html

APPENDIX 9 (continued)

SPEEDING UP A “WINDOWS” COMPUTER

- To speed up a “Windows XP” computer, follow our instructions at http://aztcs.org/meeting_notes/winhardsig/speedupWindows/xp_speedup.html

APPENDIX 10

COMPARISONS BETWEEN “VMWARE PLAYER” AND “ORACLE VM VIRTUALBOX”

- http://aztcs.org/meeting_notes/linuxsig/virtualmachines/comparison--linux.htm
- <https://www.pcmech.com/article/vmware-player-vs-virtualbox-which-is-right-for-you/>

APPENDIX 11

WORKAROUND FOR LACK OF FIREWIRE SUPPORT BY VIRTUAL MACHINES

- None of the free virtual machine programs have support for firewire devices. The workaround is to use the “Shared Folders” virtual network to attach a virtual machine to a host-connected firewire device. See http://aztcs.org/meeting_notes/winhardsi/virtualmachines/FirewireDevices/FirewireDevices.pdf

APPENDIX 12

.VHD COMPLEXITIES

- When you use “Windows..” installation media to create a new “virtual machine” in “Windows Virtual PC” or “Microsoft Virtual PC 2007”, you will create a new .VHD virtual hard disk file.

APPENDIX 12 (continued)

.VHD COMPLEXITIES

- A .VHD file that has been created by “Windows Virtual PC” or “Microsoft Virtual PC 2007” when you create a virtual machine using installation media or that has been created by “Windows XP Mode” cannot be used to create a virtual machine in “Oracle VM VirtualBox”.

APPENDIX 12 (continued)

.VHD COMPLEXITIES

- A .VHD file that has been created by running the “Disk2VHD” program (to convert a real computer (P2V) or virtual machine (V2V)) can be used to create a virtual machine in “Windows Virtual PC”, “Microsoft Virtual PC 2007”, or “Oracle VM VirtualBox” BUT WITH TWO EXCEPTIONS:

APPENDIX 12 (continued)

.VHD COMPLEXITIES

- A .VHD file that you download from Microsoft as a time-limited software trial can be used to create a virtual machine in “Windows Virtual PC”, “Microsoft Virtual PC 2007”, or “Oracle VM VirtualBox” BUT WITH TWO EXCEPTIONS:

APPENDIX 12 (continued)

.VHD COMPLEXITIES

– Exception 1:

You cannot run a 64-bit operating system in “Windows Virtual PC” or “Microsoft Virtual PC 2007”. This means that a .VHD virtual hard disk file that was created by “Disk2VHD” from a 64-bit version of “Windows” can only be installed into “Oracle VM VirtualBox” or a server version of Windows!

APPENDIX 12 (continued)

.VHD COMPLEXITIES

– Exception 2:

When any .VHD file is used to create a virtual machine in “Oracle VM VirtualBox”, you have to connect it to a virtual IDE hard drive controller (instead of the virtual SCSI hard drive controller that is provided by default by “Oracle VM VirtualBox”).

See

<http://www.sysprobs.com/virtualbox-p2v-disk2vhd-errors-fix>

APPENDIX 100

STARTING A VIRTUAL MACHINE WITH A BATCH FILE

- To start a “Oracle VM VirtualBox” virtual machine from the command line or with a batch file or shell script, see

<http://blarts.wordpress.com/2007/12/03/how-to-launch-a-virtualbox-virtual-machine-from-a-shortcut/>

and

<http://combatwombat.7doves.com/2008/11/23/how-to-auto-start-virtual-machine-on-lin>

APPENDIX 100 (continued)

STARTING A VIRTUAL MACHINE WITH A BATCH FILE

- To start a “Oracle VM VirtualBox” virtual machine from the command line or with a batch file or shell script (continued)

<http://www.virtualbox.org/manual/ch08.html#vboxmanage-startvmndows-Virtual-PC/1249399819/1>

and

<http://forums.virtualbox.org/viewtopic.php?f=1&t=30245>

APPENDIX 100 (continued)

STARTING A VIRTUAL MACHINE WITH A BATCH FILE

- To start a “Oracle VM VirtualBox” virtual machine from the command line or with a batch file or shell script (continued):

<http://ubuntuforums.org/showthread.php?t=697348>

or

<http://www.webupd8.org/2009/07/create-shortcut-to-launch-virtual.html>

APPENDIX 100 (continued)

STARTING A VIRTUAL MACHINE WITH A BATCH FILE

To start a “Oracle VM VirtualBox” virtual machine from the command line or with a batch file or Powershell script (continued)

or

<http://scottlinux.com/2011/04/15/quick-intro-to-vboxmanage/>

APPENDIX 100 (continued)

STARTING A VIRTUAL MACHINE WITH A BATCH FILE

- You cannot start a virtual machine with a batch file or shell script in “VMware Player”. This feature is available when you upgrade to the not-free “VMware Workstation”.

APPENDIX 101

MAKING A VIRTUAL MACHINE START UP AUTOMATICALLY WHEN A “LINUX” HOST COMPUTER IS POWERED ON

- See <http://ubuntuforums.org/showthread.php?t=939183>
and http://www.glump.net/howto/virtualbox_as_a_service
and

APPENDIX 101

MAKING A VIRTUAL MACHINE START UP
AUTOMATICALLY WHEN A “LINUX” HOST
COMPUTER IS POWERED ON

<http://www.linuxquestions.org/questions/linux-server-73/virtualboxs-virtual-machine-start-on-boot-626120/>

and

<http://www.pclinuxos.com/forum/index.php?topic=63040.0>

APPENDIX 102

MERGEIDE

- To convert a real, physical “Windows XP” computer into a “virtual machine” (P2V) that can be “played” in any Linux computer that has “Oracle VM VirtualBox” installed in it, you can use the “MergeIDE” command line utility.

See

http://www.virtualbox.org/wiki/Migrate_Windows

and

<http://www.kleinfelter.com/node/135>

APPENDIX 103

PHYSICAL TO VIRTUAL (P2V) FOR A LINUX COMPUTER

- http://conshell.net/wiki/index.php/Linux_P2V
- <http://communities.vmware.com/thread/150431>