



Virtual Machine - Solution to run Multiple Operating System

Dr. Anwar Pasha Abdul Gafoor Deshmukh*
College of Computers and Information Technology,
University of Tabuk, Tabuk
Kingdom of Saudi Arabia
mdanwardmk@yahoo.com

Dr. Riyazuddin Qureshi
Community College, Jazan University,
Jazan, Kingdom of Saudi Arabia
riaz_quraysh21@yahoo.com

Abstract: The present study deals with the Development of Multiple Operating Systems on the same Computer. This means that one can keep more than two operating Systems on the same Computer (e. g. if one has latest version of Microsoft windows vista it is possible to have older version of Microsoft Windows XP on the same Computer) and simultaneously can carry on the development of multiple application software with different versions by installing Virtual PC 2007. In the IT world Virtualization refers to the use of virtualization software that allows the physical hardware of a single PC to run multiple Operating Systems simultaneously in Virtual Machines. The virtualization software simulates enough hardware to create an environment that allows an unmodified guest operating system (the one running inside a Virtual machine) to be in isolation on a host operating system (the one running physical computer system). This setup is very useful particularly, in a given scenario where most of the educational institutions simultaneously offer different courses and different levels of a course syllabus, with limited resources at its disposal. If we need to teach advanced version of operating systems like “Microsoft Windows Vista”, along with application software “Microsoft Office 2010” and “Microsoft Internet Explorer 7” and at the same time, older version of Operating System like, “Microsoft Windows XP”, along with application software, “Microsoft Office 2003” and “Microsoft Internet Explorer 6” as another subject for a different class in the same Computer lab. This can be done by installing different operating system on different partitions of the disk but such a setup requires rebooting the computer every time the user intends to shift from one operating system to another. This problem can very-well be solved by Virtual Machine. User can load two Operating systems like, Microsoft windows Vista and Microsoft Windows XP and then can install Microsoft office 2010 on the first Virtual Machine and Microsoft office 2003 on the second. Just like all application software click the icon of virtual machine operating system on desktop of windows 7 or select from start button to switch over to the other operating system as well as Application software. The study deals with how to create, copy, and configure virtual machines. Microsoft Virtual PC 2007 to run multiple operating systems at the same time on the same physical computer.

Keywords: Virtual Machine; Virtual PC 2007, Multiple Operating Systems, Hypervisor, virtual machine monitor

I. INTRODUCTION

Although every day we witness advancement in technology and the fact is that we strive hard to stay abreast of the changing trends but financial and infrastructural constraints persists and proves to be a major barrier in offering quality. Educational institutions play a major role in shaping the society as well as are feeders of human resources to industries and are not an exception in case of financial or infrastructural aspect. Adjustments and compromises to camouflage its weaknesses directly affect quality of education which in long run is very harmful for the society at large and industry in particular. In the IT world Virtualization refers to the use of virtualization software that allows the physical hardware of a single PC to run multiple Operating Systems simultaneously in Virtual Machines. The virtualization software simulates enough hardware to create an environment that allows an unmodified guest operating system (the one running inside a Virtual machine) to be in isolation on a host operating system (the one running physical computer system) [3]

Although offering various courses on one premise is optimum utilization of resources but at the same time is the best source of minting money. Running these courses efficiently is simply not a policy matter but a technical issue too. Switching over to the advanced versions of computers, operating systems, application software, etc. requires huge funds and simultaneously retaining the older versions for the beginner students’ is a difficult task. Negligent attitude or an ‘easy-

going’ approach for beginner students’ has become a common practice in education industry. Any adjustment made to cope up with the situation which refrains the beginner students’ from having in-depth knowledge of a particular paper badly affects the quality of education.

The main purpose of Virtual machine is to run multiple operating systems on same computer. Virtual Machine can be considered a generalization of Virtual memory. In section 2, we explain about the scope, Features and limitations and Hardware requirements. In section 3, is about the software layer that is used for virtual machine which is called as virtual machine monitor or Hypervisor. In section 4, we are describing about Installation of Virtual machine 2007, how to manage multiple virtual machines as a virtual machine consists of multiple files and Creating Virtual Machines. To manage multiple virtual machines effectively, you need to understand how these files interact. Section 5, describes conclusion

II. SCOPE

Educational institutions strive to offer the best and optimum but often most of them face financial and infrastructural constraints. Competitiveness demands to be staying abreast of the changing trends and thus every one of these swiftly switches over to the advanced versions of operating systems and application software. But for students’ opting applied sciences, arts and humanities, linguistics, business administration, etc. as major need learn basics of

computers. When it comes to teaching a paper like "Introduction to Computer Skills and Application" the syllabus which, most of the educational institutes offer demands to teach older version of Operating System, "Microsoft Windows XP" and Application Software, "Microsoft Office 2003". But preferably computer labs are equipped with advanced versions of operating systems like, 'Microsoft Windows Vista' and application software like, 'Microsoft Office 2010'. Although switching to a different operating system and application software can be done by installing these operating systems on different partitions of the disk but such a setup requires rebooting the computer system every time the user intends to shift from one operating system to another. This very well results into loss of time and could also be a reason for loss of tempo. Installing Virtual PC 2007 is the best solution to run Multiple Operating Systems on the same Computer. Such setup doesn't need to reboot the system. Just like all other application software click on the icon of virtual machine operating system from desktop or select from start menu to run our choice of Operating System as well as Application software.

A. Features of virtual pc 2007

- Virtual PC provides a simple wizard to set up different operating system by just a few clicks.
- Access your Windows 7 Folders: My Documents, Pictures, Desktop, Music, and Video, from inside the virtual Windows environment, such as Windows XP.
- Users can access USB devices attached to the host directly from virtual Windows XP.
- Users can access printers and scanners, flash memory/sticks and external hard disks, digital cameras, and more.
- Cut and paste between your Windows 7 host and any virtual machine.
- Publish and launch applications installed on virtual Windows XP directly from the Windows 7 desktop,

B. Limitations

Making virtual machine has certain limitations, it is less efficient than a real machine when it accesses the hardware directly and has unstable speed of execution, which highly depends on the workload imposed on the system by Virtual machines. [3]

C. Hardware requirements

- 400 MHz Pentium-compatible processor (1.0 GHz or faster recommended) [3]
- Approximately 35 MB of disk space [3]

III. HYPERVISOR

The System Virtual machine allows the sharing of the physical machine resources between different virtual machines, each running its own operating systems. The software layer that is used for virtual machine is called as virtual machine monitor or Hypervisor. [5]

A. Classification of Hypervisor

The Virtual machine monitor or Hypervisor can be classified into two categories.

Type 1(Native Virtual machine): The Type 1 hypervisors run directly on the host hardware of computer to control the hardware and to monitor guest operating system of same computer. A guest operating system runs on another level above the hypervisors.

Type 2 (Hosted Virtual machine): The Type 2 hypervisors run within a conventional operating system environment with the hypervisor layer as a distinct second software level. A guest operating system runs at the third level above the hardware.

IV. INSTALLATION OF VIRTUAL MACHINE 2007

A virtual machine consists of multiple files. To manage multiple virtual machines effectively, we need to understand how these files interact. The table below includes a description of the three types of files that form a virtual machine

Table 1: Description of files

Sr. no	Name of File	Description of files	Remark
1	.lnk	Shortcut file for a registered virtual machine	Points to the virtual machine's configuration (.vnc) file
2	.vnc	Virtual machine configuration text file (XML format)	Contains virtual machine configuration information, including the name of the virtual machine's .vhd file
3	.vhd	Virtual hard disk file	Represents the hard disk and its data on the virtual machine

When we install a virtual machine with Virtual PC 2007, the application creates a shortcut file in the \Documents and Settings\<username>\Application Data\Microsoft\Virtual PC\Virtual Machines folder. This folder path is different for each user. The shortcut points to the virtual machine's configuration (.vnc) file.[4]

The name of a virtual machine in the Virtual PC Console is the same as the name of that machine's .vnc file. The .vnc file contains the virtual machine's configuration settings, such as the amount of RAM, the number of network adapters, and the full path of the virtual hard disk (.vhd) file. The .vhd file represents the hard disk and its data on the virtual machine. By copying these files and making a few changes, one can create new virtual machines very quickly.[4]

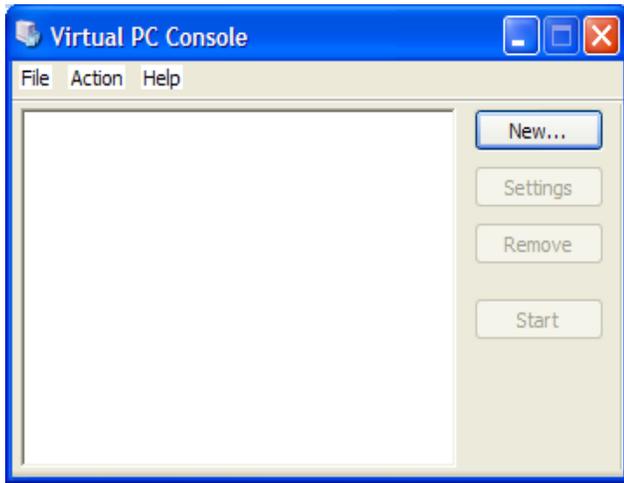


Figure 1: Virtual PC Console

A. Creating Virtual Machines

To create virtual machine is to launch the Virtual PC Console, shown in Figure 1

- Click on New Virtual Machine Wizard as shown in Figure 1

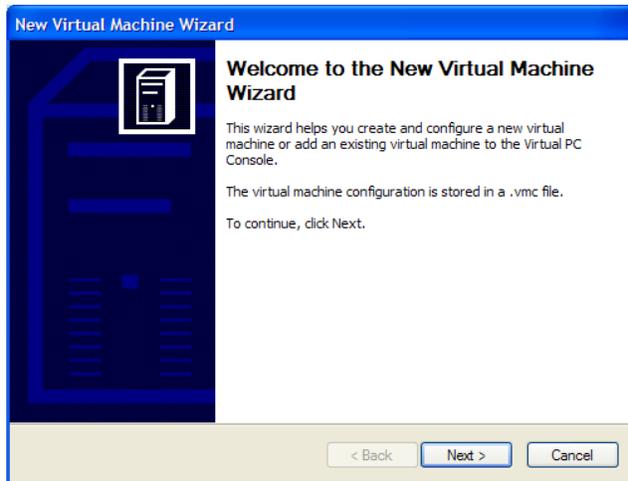


Figure 2: Welcome to the New Virtual Machine

- Click on 'Next' button of Figure 2, provides three options 1) "Create a Virtual machine" will have the settings of virtual hard disk, option 2) "Use default settings to create a virtual machine" .vmc file with default settings, without the settings of virtual hard disk option 3) "Add an existing virtual machine" we can add Virtual PC Console from existing .vmc files as shown in figure

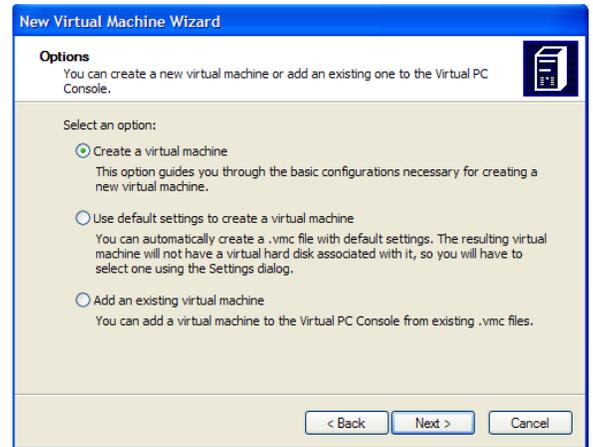


Figure 3: Options

- Select 'Create a virtual machine' from Figure 3 to let the wizard guide you through the basic configuration of the new virtual machine.

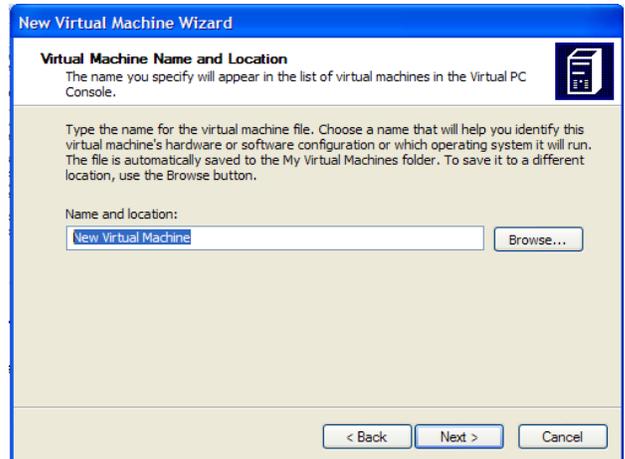


Figure 4: Virtual Machine Name and Location

- On the Virtual Machine Name and Location page that is Figure 4, type name for the .vmc file, (C:\Documents and Settings\Administrator\My Documents\My Virtual Machines\WindowXP\WindowXP.vmc) and click on Next.

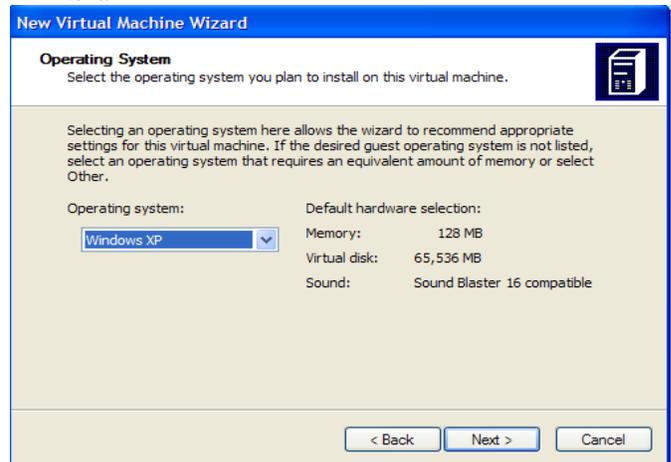


Figure 5: Operating System

- Select the operating system from Figure 5 to make virtual machine (Select Windows Xp from list) then click on Next

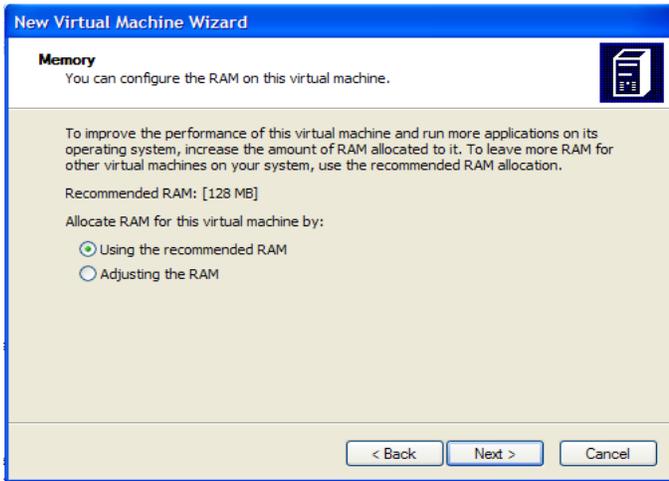


Figure 6: Memory

- Allocate the RAM for Virtual machine by selecting option “Using the recommended RAM” from Figure 6 then click on Next

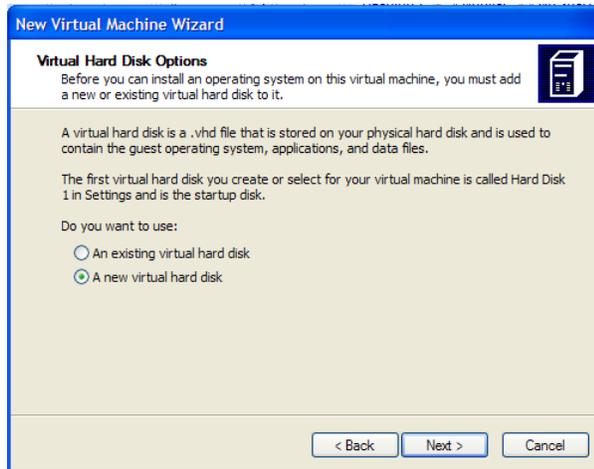


Figure 7: Virtual Hard Disk Options

- Create .vhd file from here this step provides two options “An existing Virtual hard disk” and A new virtual hard disk, choose option 2 from Figure 7 then click Next

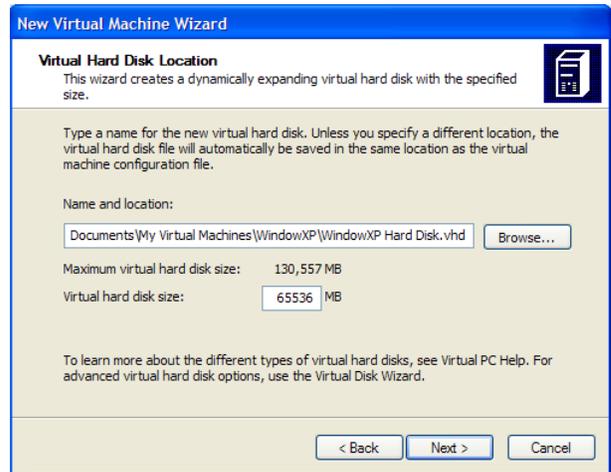


Figure 8: Visual Hard Disk Location

- The virtual hard disk file .vhd (Example C:\Documents and Settings\Administrator\My Documents\My Virtual Machines\WindowXP\WindowXP Hard Disk.vhd) automatically be saved in the same location at .vmc file() with specified size then click ‘Next’ on Figure 8

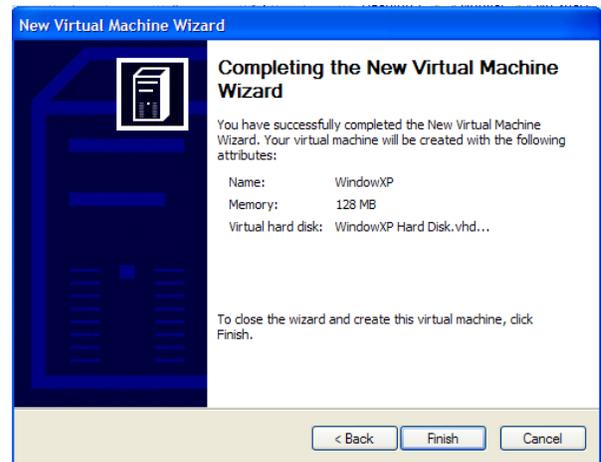


Figure 9: Completing the New Virtual Machine Wizard

- Click on Finish to complete creation of virtual machine for Microsoft Windows XP on Figure 9
- Similarly, we can create virtual machine for Microsoft Windows 7 by once again clicking on the New on virtual PC Console

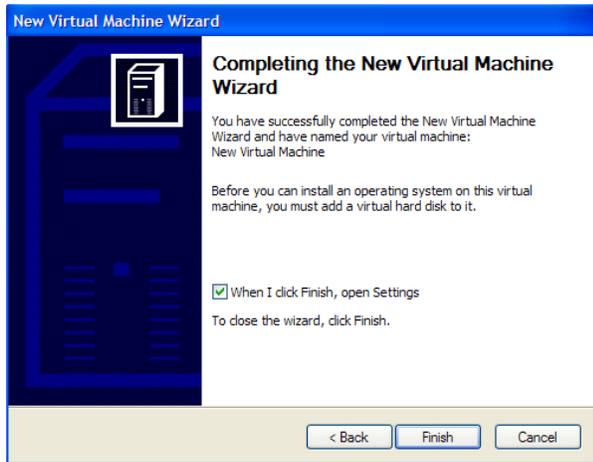


Figure 10: Completing the New Virtual Machine Wizard with check box

- Click on Next, to Figure 10, Select option 2 “Use default settings to create a virtual machine”, Click again on Next, Write the name Windows 7 at name and Location box then click on Finish with select the Open Setting dialog box shown by Figure 11

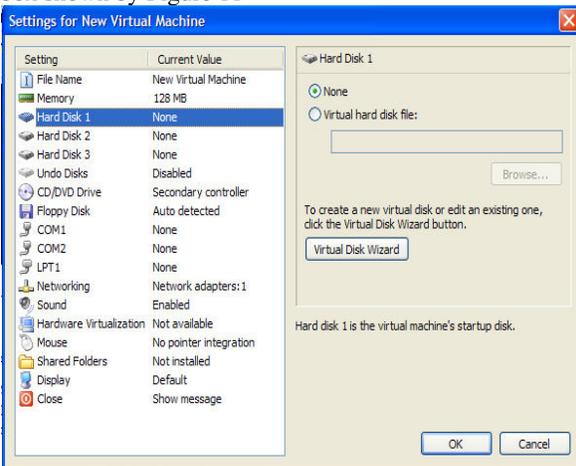


Figure 11: Settings for New Virtual Machine

- In the Settings dialog box, in the Hard Disk 1 area, select Virtual hard disk file, and then click Browse.
- In the Select Virtual Hard Disk dialog box, select the new .vhd file, and then click Open.
- Click OK to close the Settings dialog box

After the virtual machine is created and the virtual hard disk is associated, user can use the virtual machine in Virtual PC. The very first thing user need to do with the new virtual machine is start the virtual machine and install the operating system. Open the Virtual machine Console, shown in Figure 12, select any one either Windows 7 or WindowXp and Click on Start

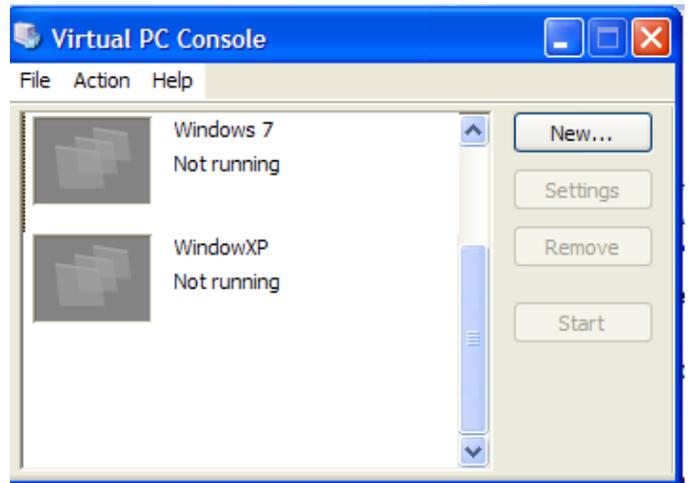


Figure 12: Settings for New Virtual Machine

Insert the CD of Windows XP to install simultaneously select windows 7 then start and install. After successful installation of both the operating system, user can easily use all these from desktop just by clicking on the icon of that particular operating system.

V. CONCLUSION

The Virtual Machines are developed under the present work has been successfully installed, created, implemented and thoroughly tested. We used this Virtual Machines in all computer labs in the students we found it to be very effective. The virtual machines based on the study of various classes were planned, designed and developed using techniques and tools described earlier. Virtual PC provides a highly configurable environment for application development. User can use Virtual PC to create both single-machine and networked virtual environments in which developers can safely try out operating system and application changes. Such a setup do not requires additional infrastructure and easily caters to the needs of beginners as well as advanced learners on one premise.

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