Picis Virtual PC Guide 

The latest version of this guide can be found on the PLS intranet:

http://bubble/pls/Information/VirtualPC.html

Contents

1 Introduction

Ever wanted to be able to run a different version of CS on your pc without uninstalling the first?

Need to reinstall CS regularly?

Ever spent a long time setting up an exact configuration or clinical situation in CS in order to observe some particular functionality (or to observe a bug)?

Ever wanted to show a client a great new feature in 10 seconds instead of waiting three minutes as CS starts up, you log on, choose patient etc

Ever wished your training attendees could compare functionality with that of the previous product version?

Want to listen to your mp3s and surf the web while rebooting your workstation? :-)

Ever felt like typing “Format C:” in the command line when you’re having a really bad day?

If you answered “yes” to any of the above questions, then Virtual PC is for you!

From the Help file...

> “Virtual PC (VPC) lets you create one or more virtual machines, each running its own operating system, on a single physical computer. The virtual machine emulates a standard x86-based computer, including all the basic hardware components except the processor. By using emulated hardware and the processor in the physical computer, each virtual machine works like a separate physical computer. Because each virtual machine has its own operating system, you can run several different operating systems at the same time on a single computer.”

Facts about VPC

- VPC is made by Microsoft.
- Each VPC machine is really just a single (VHD) file of about 2Gb size that contains everything you would expect to find on a hard drive — the operating system, software, RAM contents and its own registry. You can create new VPC machines easily by copying this file.
- In addition to the VHD file, you can set view and other settings for the VPC machine. In fact, you can even set BIOS settings as it has a BIOS emulator.
- You can save the VPC as you work with it and at any time discard all the changes made since the last save.
- You can freeze a VPC machine at any time, so that the exact state of the files and processes is stored. A frozen machine can be restarted at any later stage, so that the processes continue where they left off.
- You can connect a VPC machine to a network just like a normal pc.
- The performance and robustness is so good that after activating full screen mode you will not know that you are inside a virtual machine.

2 How Virtual PC Can Help Picis Departments

2.1 PE, Development and PLS (documentation)

Main benefit to these departments: Switching between different systems without reinstalling.

In a matter of seconds you can switch to any Picis product version configured with whatever database you want. For example, you could have all the following systems set up on one PC:

- CS 6.3 on Windows NT
- CS7.0 and CS7.1 on W2K
- CS73 (NPfIT) with all databases installed locally

Suppose you want to compare adding orders to the patient chart in CS70 with doing the same thing in CS72…you could open a frozen state for your CS70 instance (with the program up and running) in about 10 seconds, do what you want to do and then click another button to open a frozen state for your CS72 in another 10 seconds to check the same thing there.

2.2 SQ

Main benefit to these departments: Testing functional areas without having to reinstall (after crashes or in order to "refresh" the configuration). Demonstrating bugs to other departments instantly by unfreezing a saved state.

Besides creating instances from scratch (installing operating systems etc) they can also be made based on Ghost images.

Note: In the four years I have been using Virtual PC, I have never had a problem with Picis or other software related to the fact that the software is running inside a Virtual PC...never. There are certain limitations to be aware of, but nothing that would prevent you from wanting to use Virtual PC for testing.

Limitations:

- No support for USB devices (except keyboard and mouse).
- For tests performed over a long period of time you need to disable time synchronization with the host (easily done). Otherwise, you can get problems like real-time devices skipping time columns etc.
- Strictly speaking, Virtual PC does not support running server software inside the Virtual PC (the program Virtual Server does allow this). However, in practice you can install server software as long as you do not attempt to use the "server aspect" of the software ie. you don't connect more than 10 clients to it at once.
  (Note that you can connect a VPC instance to a real server instance with no problem whatsoever.)
- Because VPC emulates certain hardware it's probably not a good idea using it for performance testing.
- As with Ghost images, instances are processor-dependent…for example, an image made on a PC having an AMD CPU can't be used on a Pentium-based PC.

2.3 Usability, Implementation and Customer Services

Main benefit to these departments: Discussing functionality and workflow with clients

Suppose Usability wants to discuss the Manage Bookings window with a view to adding a new button...before going to the client, ORM can be started inside the Virtual PC, the Manage Bookings window opened and then the virtual pc instance frozen (in seconds). Once in front of the client, a button is clicked to unfreeze the state and 10 seconds later the client is looking at the Manage Bookings window. And if an unstable build crashes when a certain button is clicked, you just have to reload it from the DVD.

2.4 Sales and Marketing

Main benefit to these departments: Demonstrating Picis products without the hassle of installing.

A master VPC instance could be made (e.g by Development and Usability) and placed on a DVD. Copies could then be distributed to all Sales and Marketing staff. Loading the instance takes about 15 minutes even if you know nothing about Virtual PC. Compare this to the hours needed to create each installation separately.

2.5 Implementation and PLS (training)

Main benefit to these departments: Use for training room setup.

No matter what a course attendee does to a program or machine setup, any damage done can be instantly rectified by reloading the Virtual PC instance.

Note that Virtual PC has full-screen mode, which means that a user need never know he or she is actually inside a virtual PC instance.

3 Hardware Requirements

You need a minimum amount of free RAM just for running the VPC program (before running any VPC machines). For W2K, you need 96MB; for XP, you need 128MB.

In addition to this, you need a minimum amount of free RAM and hard disk space for each guest VPC machine that you want to have running (started up) on your pc at any one time. The amount depends on the operating system:

Guest operating system	**RAM**	***Space for one instance**
XP	128 MB	2.5 GB
W2K	96 MB	2.5 GB
NT 4.0 SP6	64 MB	1.5 GB

(***** These disk space requirements are those you need to install all third-party software plus Anesthesia Mgr with a local Careman db. If you want to install more dbs or Picis programs the size can increase, but is unlikely to be exceed 4 GB. E.g. The NPfIT installation with all local dbs occupies about 3.5GB).

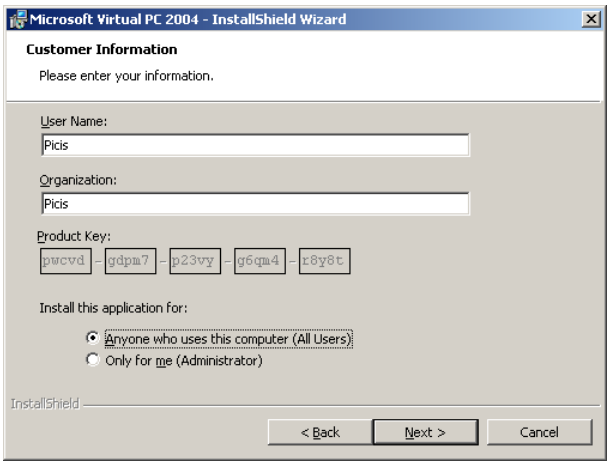
When you calculate the RAM you should bear in mind that other programs on your host pc, such as SQL Server, consume a lot of memory.

If you only have enough RAM to run one VPC machine you can still install multiple machines on your pc...just don't open more than one at once.

If you try to open a VPC machine when you do not have enough free RAM, you will probably get a crash. If a VPC machine is already running when another host program needs more physical memory than is available, you may not get a crash, but the host program will run slower.

4 Installing the Virtual PC program

1 Copy the installation files locally unless you have the CD.
2 Double-click **Setup.exe**.
The Welcome dialog box appears.
3 Click **Next>.**
4 Accept the license agreement and click Next>.
The following dialog box appears:



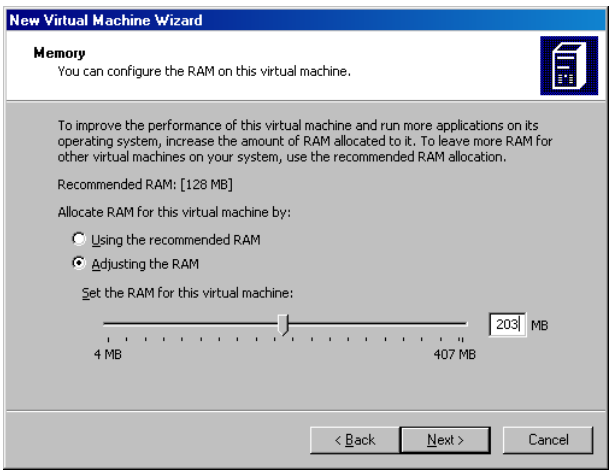
5 Under **User Name**, enter Picis. Under **Organization**, enter Picis. The product key should be automatically filled in. Click **Next>**.
6 Click **Install**.
7 When the installation is complete a new dialog box will appear. Click **Finish**.

If you want to install virtual machines running XP SP2, you must now install the VPC2004 service pack (SP1) found in the same folder as the VPC2004 installer.

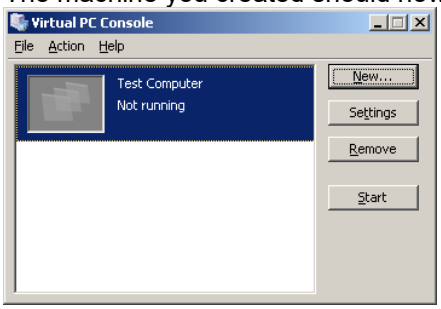
5 Quick Start—10 Minute* Install Based on Another Virtual PC

(*plus time needed to copy the approx 2.5Gb file to your local drive)

1. First check that you have enough space available.
2. Create a local folder on your PC to store VPC images.
3. Copy the VHD file from the VPC you want to duplicate (it must be closed down before you copy) paste it into a new subfolder under your VPC folder.
4. Remove the “read-only” setting from the VHD file if you copied it from a DVD.
5. Start Virtual PC.
6. Click **New**.
   The “Welcome to the New Virtual Machine Wizard” dialog box appears.
7. Click **Next>**.
8. Click **Create a virtual machine** then click **Next>**.
9. Click **Browse**, navigate to the folder where your machine is installed and then enter the machine name but with the extension “VMC” not “VHD”. Click **Save** then click **Next>**.
10. Under **Operating System**, select the operating system for the machine you are installing.
11. Select **Adjusting the RAM**.
    The sliding scale will then appear, as shown below.



12. Choose a RAM setting about half the size of your entire installed RAM (you can change this later) then click **Next>**.
13. Select **An existing virtual hard disk**, then click **Next>**.
14. Click **Browse** then navigate to the machine on your workstation (.e.g W2KCS72.vhd) and click **Open**. Then check **Enable undo disks** and click **Next>**.
15. Click **Finish**.
16. The machine you created should now appear in the Virtual PC console:



5.1 Optional things to do after starting up a machine

1. Start Virtual PC, select the machine and click **Start**.
   A window will appear with the machine running inside. From this point onwards, you can consider the machine just like a ghost image that has been applied to a workstation.
2. Log in locally as **Administrator** with the password **1london1**
3. Set the things you would normally set after applying a Ghost machine:

- Change the Windows computer name and join it to a domain (see the *Picis Virtual PC Guide* for more details)
- If you have a non-US keyboard, change the keyboard layout.
- Add printers.
- If necessary, create local Windows user accounts
- Rerun the CFGTool to set CS data such as location name etc
- Change the references in the medsurg.ini and medsecur.ini files as required

6 Creating a Virtual PC machine

6.1 Overview

You can create a VPC machine by copying an existing VPC machine or by starting with an empty VPC machine.

Copying an existing machine is easy; you just have to install it, start it up and use it!

If you start with an empty machine, it is just like starting with an empty real pc; you first need to install an operating system! Then you will need to install some additional files called **Virtual Machine Additions**. These enable you to do a number of things that you won't otherwise be able to do (see section 6.4). After this you should install the software you want to use in the VPC machine.

6.2 Copying another VPC machine

This is the easiest way to get VPC running on your pc. Full details for copying another VPC machine can be found in the *Appendix*. You can copy a file from the Library (provided on DVD by Sys Admin) or you can copy them from another workstation. (If you choose the latter, it is best to do it during the evening so that you don't kill the network.)

After copying a VPC machine, you should set the things you would normally set after applying a Ghost image:

- Change the Windows computer name (see section 11.2 for more details)

- Join the VPC machine to a domain (ask Sys Admin if you need help with this)
- If you have a non-US keyboard, change the keyboard layout.
- Add printers.
- If necessary, create local Windows user accounts
- Rerun the CFGTool to set CS data such as location name etc
- Change the references in the medsurg.ini and medsecur.ini files, as required

6.3 Starting with an empty VPC machine

After creating an empty machine, you can either apply a Ghost image or install operating system and software directly.

Ghosts

Applying a Ghost image is much quicker, but you must bear in mind the following points:

- You cannot install Ghost images from the network; you must put them on a CD/DVD or as an ISO image on the host pc.
  (If you have Nero on your host pc you can also make a Nero (nrg) image of the Ghost image and then use NeroImageDrive to mount this image on your host pc as if it were a DVD. (NeroImageDrive is installed to the Program Files folder when you install Nero).)

- You cannot use a Ghost boot disk created on a real pc, you must use one that was created using the Ghost program inside a virtual pc.

- Some newsgroup contributors have reported problems due to differences between the VPC virtual hardware drivers and real ones loaded with the Ghost image, but I suspect this is because they are using a Ghost boot disk from a real pc that doesn't point to the correct virtual drivers.

Installing operating system and software directly

Just install and configure in the normal way...see Sys Admin if you need help.

After installing a Ghost image or directly installing software, you need to install "Virtual Machine Additions" in order to perform certain functions. See the next section.

6.4 Installing Virtual Machine Additions

Virtual Machine Additions allow you to do the following:

- Drag and drop
- Folder sharing
- Integrated mouse
- DOS CD-ROM support
- Optimized video drivers
- Time synchronization
- Clipboard sharing
- Improved operating system performance
- Dynamic resizing of the virtual machine window, which automatically adjusts the size of the guest operating system desktop

To install them, start the VPC machine up, then click the **Action** menu and choose **Install or Update Virtual Machine Additions**.

6.5 Clock Synchronization

After installing Virtual Machine Additions a guest operating system clock will synchronize itself with the host operating system clock at regular intervals (about once per minute). Sometimes, this is not what you want. (For example, if you want to mimic a long patient stay in CS by changing the clock time or want to test DST changes.) You can disable clock synchronization with the host (without removing the other virtual machine additions) by disabling the following service via the Administrative Tools folder in the control panel:

Virtual Machine Additions Services Application

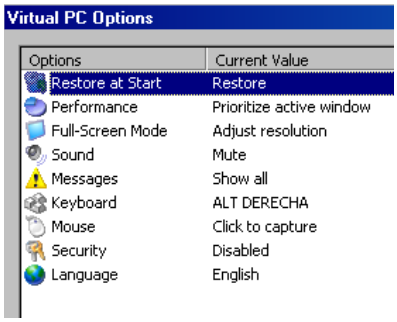
Note that this does not affect domain clock synchronization: if your Virtual PC instance is part of a domain, the clock will automatically synchronize itself with the domain server clock whenever the guest OS is restarted and a user logs on to the domain.

Note that some servers on the Picis network (e.g. Bubble) can only be accessed if the workstation's clock is more or less synchronized with the domain server clock. If necessary, you can manually force such synchronization by typing the following line in a command line prompt window:

net time /set /yes

6.6 Settings for all VPC machines

In the VPC Console, click **Options** on the **File** menu to see the settings that apply to all VPC machines:

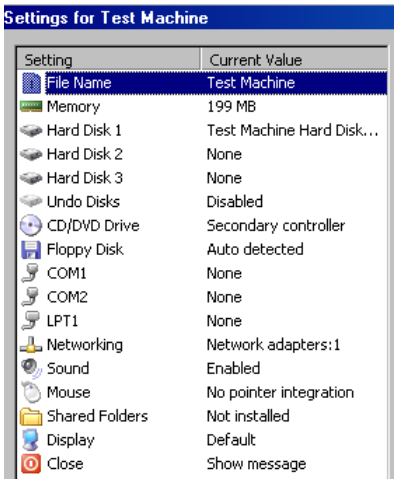


Performance allows you to give processor priority to the real pc or virtual pcs.

Full-screen mode allows you to set the resolution (in general, this should be selected).

6.7 Settings for a particular VPC machine

In the VPC Console, click a VPC machine and then click **Settings** to see the settings that apply to that VPC machine:



Shared Folders allows you to share a folder on your real pc that your guest pc can use. This is very useful for transferring data if you haven't yet connected the VPC machine to the network.

Networking allows you to specify whether the VPC machine will use its own network connection or share the host's. In general, you will want it to use its own. (When set to share the host's adapter, VPC starts its own virtual DHCP server and dynamically assigns IP addresses to guest pcs using a specific IP range.)

This is the emulated network adapter used by VPC, so don't delete it:

COM1 and **COM2** allow you to define ports...they can be physical, named pipes or text files.

Undo disks allows you to revert to a previously saved system. This should be enabled. (The VPC machine must be shut down (not just switched off) if you want to change this setting.)

7 Working with a VPC instance

Virtual PC provides much of the required keyboard functionality through the use of a host key. By default the host key is the right ALT key. You use the host key in two ways:

- If a virtual machine has captured the pointer, you can press the host key to return control of the mouse to the host computer.
- When Virtual PC is running, you can use the host key in combination with other keys for specific functions. (See the help for more info.)

(For instance, to set a VPC machine to full-screen mode, click Host key + Return.)

To access floppies, CDs and DVDs directly, you first have to capture control from the host system. E.g. to capture a CD, on the **CD** menu, click **Capture CD**.

You can also capture local or network ISO images in the same way. E.g. to capture an image of a DVD, on the **CD** menu, click **Capture ISO Image**.

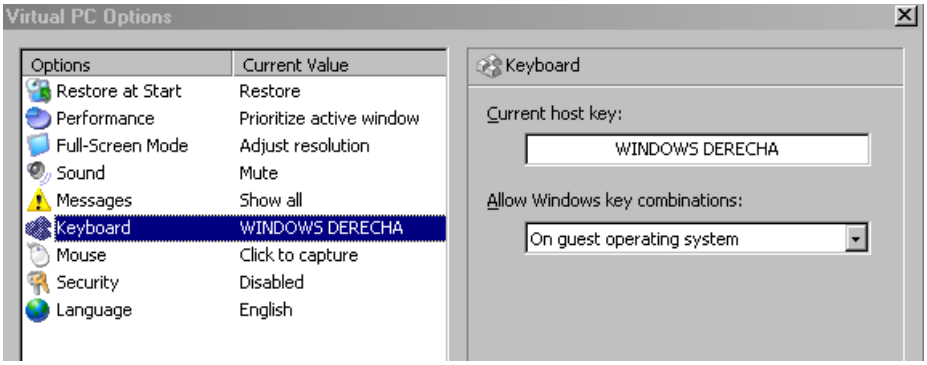
If you need to use a CD on your host system, remember to release control inside the VPC machine first!

For more information about how you can use the host key, see the help file included with VPC.

8 Tips and Tricks

- Use the same shared folder on your host pc for all VPC machines
- If you start typing and nothing happens try clicking **CTRL** and then trying again.
- Keep a file in your shared folder for common symbols, such as ": \ / -" just in case the keyboard layout is different and you can't find the characters you need.
- You can change the host key to any key you want. This is particularly useful if you need to have the ALT Gr (ALT DERECHA) key available for selecting special characters on keys. A good choice of host key is the Windows Right key.

  To change the host key, click **Options** on the **File** menu in the VPC main console, then select **Keyboard**, then place the cursor in the **Current Host Key** field and click the key you want to use.



9 Reducing VHD File Size

You can reduce the size of a VHD file (e.g. to fit on a laptop or to reduce copy times) as follows:

1 Inside the VHD, delete all temporary and unwanted files.
2 Inside the VHD, use a 3rd party utility to zero out blank spaces.
3 Run the Virtual Hard Disk wizard to compress the VHD file (see the Help).

The Picis Library folder includes a zero-out freeware utility called Eraser that works very well. (Make sure to set it to replace deleted data with zeroes, not with pseudorandom data or your file size will increase :-))

Alternatively, or as well as, you can zip the VHD file. For files greater than 4Gb, you should use Winzip version 9.0. For files less than 4Gb, previous versions of Winzip should do the job.

10 CS in a VPC machine

10.1 Picis VPC Library

You can install a VPC machine containing CS in a matter of minutes by copying one from the Picis Virtual PC Library. The appendix describes all VPC machines in the library and how to install them. Ask Sys Admin where the library is located.

10.2 Setting up a “virtual laboratory”

VPC machines can connect to other VPC machines (on the same host pc or on different host pcs) or they can connect to normal pcs.

If you have enough memory and processor power, you can even set up a small virtual lab entirely on your own pc, with one VPC machine for the database, one for services etc.

11 Security Issues

11.1 Overview

Virtual PCs have exactly the same vulnerability to viruses, Trojans and intrusion attempts as normal pcs. It’s true that they can be easily replaced if they are corrupted, but it’s also true that they can be used as the back door into your real pc or other pcs on the network. Because of this, security measures are important.

- Name your VPC according to the established convention
- Make sure that a password is used for the local administrator
- Install and maintain anti-virus software on each VPC you use*
- Install the latest Windows security patches on each VPC if possible*

- Do not use email inside a VPC
- Avoid using IE inside a VPC
- If you detect a virus, Trojan or intrusion turn off the virtual pc and contact Sys Admin immediately.

*Not necessary if included in ghost or VPC machine taken from library.

11.2 Setting the Windows Name of a VPC Machine

In order to avoid a proliferation of unknown computers on the network, Sys Admin asks that we name VPC machines as follows:

VDepartment-Userdefined

e.g. VSQ-WXP01, VDev-Carmen1, VGTS-Test1, VPLS-Adrian-W2K

(note that names are limited to 15 characters)

11.3 Local Administrator

Make sure that the Administrator user for the virtual pc has a password; do not leave it blank! This should be taken into account when ghosts are made.

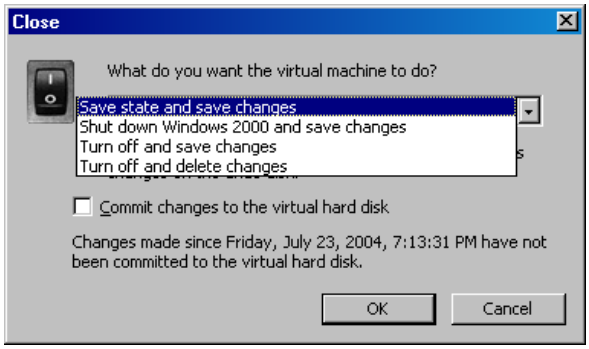
12 Troubleshooting

Picis people with VPC experience: Adrian, [redacted], [redacted], [redacted], [redacted]

Newsgroups…microsoft.public.virtualpc

13 Appendix 1 — VPC Machine Close Options

When you have Undo Disks enabled, you see the following options for closing a VPC machine



You have the option to commit changes for all selections except the bottom one. This means that there are effectively seven ways that you can switch off a VPC machine. Choosing the right one is not always obvious!

First, you should understand a little about how VPC works:

Besides the Virtual Hard Disk (VHD) file, you have a Virtual Update Disk (VUD) file that stores all hard drive changes since the last time changes were committed to the hard drive file. You also have a Virtual Memory Container (VMC) that is created on demand to store all processor states in the RAM at that moment.

In the following table, the arrows show how data is saved.

VPC CLOSE OPTIONS AND THEIR USAGE

	Option	VHD	VUD	VMC	Notes
1	Save state and changes	---------->	---->	----->	Quick, safe. You might want to use this for speed, even though you are not interested in the saved state.
2	Save state and changes, commit	---------->		----->	Quick, safe, updates VHD. You might want to use this for speed, even though you are not interested in the saved state. After this, you cannot go back to your original VHD file (unless you made a copy)
3	Shut down O.S and save changes	---------->	---->		Safest way to close if you are not sure you want to keep the changes to the VHD.
4	Shut down O.S and save changes, commit	---------->			Safest way to close if you are sure you want to keep the changes to the VHD. After this, you cannot go back to your original VHD file (unless you made a copy)
5	Turn off and save changes	---------->	---->		Only use if you have a crash and want to try and recover the data (risky) or the OS is already shut down. Like switching off a real pc by the power button, but worse. May or may not screw up the VHD file. Safe to try though..if it doesn't work, then Turn off and delete changes.
6	Turn off and save changes, commit	---------->			Only use if the OS is already shut down. Never use after a crash. Like switching off a real pc by the power button...but worse! Not safe to try.
7	Turn off and delete changes	---------->			Safest way to recover from a crash. If the VHD was saved when the OS was shut down, you will lose no data from the VHD. It will be like switching off a real pc by the power button. Also use this method to clear the VUD file if you do not want to keep the changes you have made.

14 Appendix 2 — Reported Problems

1. I can't install a Ghost image from a network drive

This seems to be a problem with VPC. You must install Ghost images from the CD/DVD or from an ISO image on the host pc.

Also, it seems you cannot use a Ghost boot disk created on a real pc, you must use one that was created on a virtual pc.

2. When shutting down the operating system in one of the library images, there is a long pause (approx 30 seconds) before anything seems to happen.

This is not a VPC problem, but is related to a known conflict between Norton AntiVirus and the Windows system file checker that runs in the background. (It occurs with some of the library machines because of the way Windows was installed on those machines.) You can resolve the problem by setting NAV to exclude real-time file checking in the "system32" folder.

(See Adrian for more info.)

3. I have trouble connecting the NTCS63SP1 instance to the network

First ask Sys Admin for help. You may need to manually set an exact IP address because the "Obtain an IP address from the DHCP server" setting doesn't work. I've no idea why not. If you know, please tell me. Anyway, if you have to manually set the IP, please speak to Sys Admin for the gateway ip and other settings.

4. USB support

You cannot install USB devices directly into a Virtual PC, but you can use a USB keyboard/mouse installed on the host machine. USB storage drives can be accessed via shared folders.

5. My XP SP2 instance is about as fast as a three-legged tortoise

You need to install Service Pack 1 for VPC2004. Before installing, make sure that all of your VPC instances are shut down and not in a saved state or they will be corrupted. After installing, you need to reinstall VPC additions inside each of your VPC instances.

6. After a while, real-time data from physical devices no longer appears on the patient chart in Anes Mgr etc

This problem is most likely due to the regular forced clock synchronization between the guest OS and host OS. You can turn off this synchronization, as described in section 6.5.

Note that the problem does not affect demo driver data.