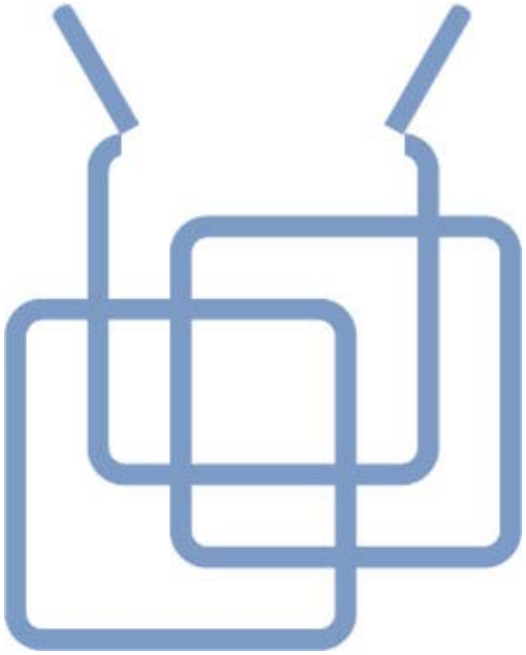
Converting a Windows 2000 Terminal Server to a Virtual Machine



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Document Revision History

Please send any and all suggestions and or comments to:
AlphenIT@GMail.com

Date	Version	Updated By	Changes
January 2005	1.0	A. Nikolić	Initial Release
April 2005	1.1	A. Nikolić	Openmanage should work
May 2005	1.2	Bouke VMGuru from vmug.nl	A lot of good tips ;)

Why this document?

When I was trying to convert my Terminal Server to a Virtual Machine, I had some problems with the Bootable P2V Assistant cd. I decided to follow the B-Road using a Ghost image. At some points I found the VMWare documentation a little confusing, so I figured I'd might be handy to write all the steps down and give something back to the community! This document is not claiming to be the ultimate guide to P2V a machine. It's just my way of doing it and you might be able to benefit from that!
I would like to thank Bouke from http://www.vmug.nl He made a big contribution to this document. Many many thanks Bouke!

About me

My name is Aleks Nikolić from the Netherlands and I'm a system administrator.

Prerequisites

Working knowledge of:

- Windows 2000 (Terminal Server)
- Ghost
- VMWare Workstation

System requirements:

- A W2K Terminal Server (duh), in my case a HP Proliant DL-360 G3
- Ghost 7.5 Enterprise
- Ghostcast floppy for the Terminal Server
- Ghostcast floppy for your Virtual Machine

A Laptop/PC/Server with:

- Large harddisk (I used a Lacie USB2.0 Portable HD)
- Symantec Ghostcast Server
- VMWare Workstation
- VMWare P2V Assistant

Grab a cup of tea and lets do this..!

Preparing the Terminal Server

Before we begin, **ALWAYS** make sure you have a proper backup of your server !
(I recommend a Ghost file).
On my HP Proliant I had several system tools to check the Array controller, Management Agents etc. I started with de-installing all software that I won't be needing in a Virtual Machine (called VM from now on).*
After that, remove the server from the domain. (NT4 Domain in my case)
* According to vmware, it should be no problem running Insight Manager agents in **ESX** Server. Read more here: **http://tinyurl.com/auzeo**

Cooking the Ghostfile

Use the Ghostcast server to create a session the Terminal Server can connect to. I selected a TSVM.GHO as destination file.
After removing the server from the domain, reboot the server with your Ghostcast-floppy to connect to your Ghostcast server.(I connected a cross cable between the two)
My Terminalserver has one disk with two partitions with remapped drives. C=M, D=N (DVD Drive = O). Because I want to make sure that Ghost doesn't make a mess of these remappings, I used the Ghost.exe –fdsp –szee switch to tell Ghost not to touch the drivemappings.
Connect to the GhostCast session, select the drive to be Ghosted and wait while the Ghostfile is being cooked.

After the Ghost

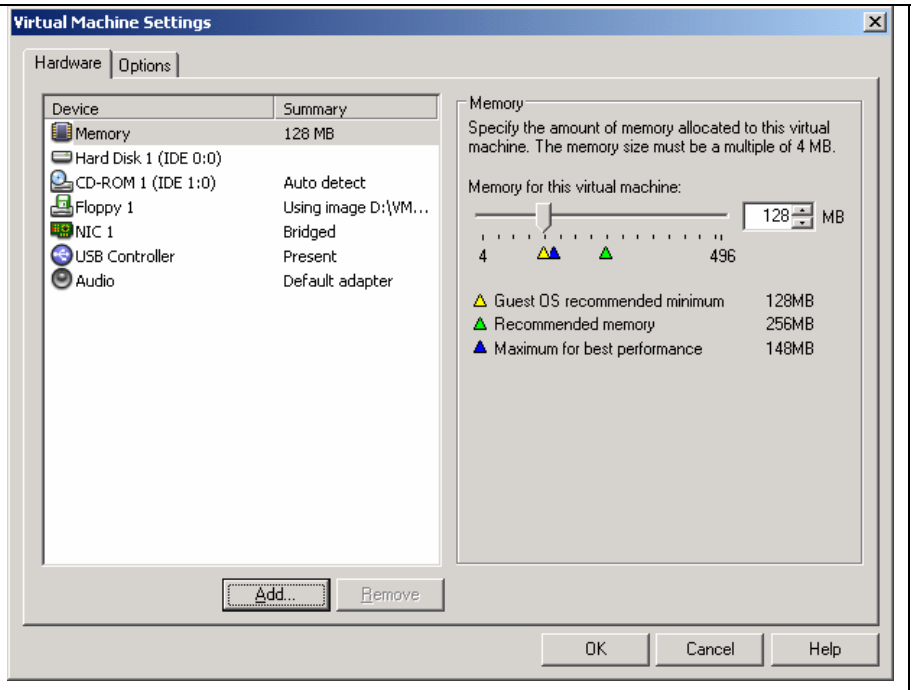
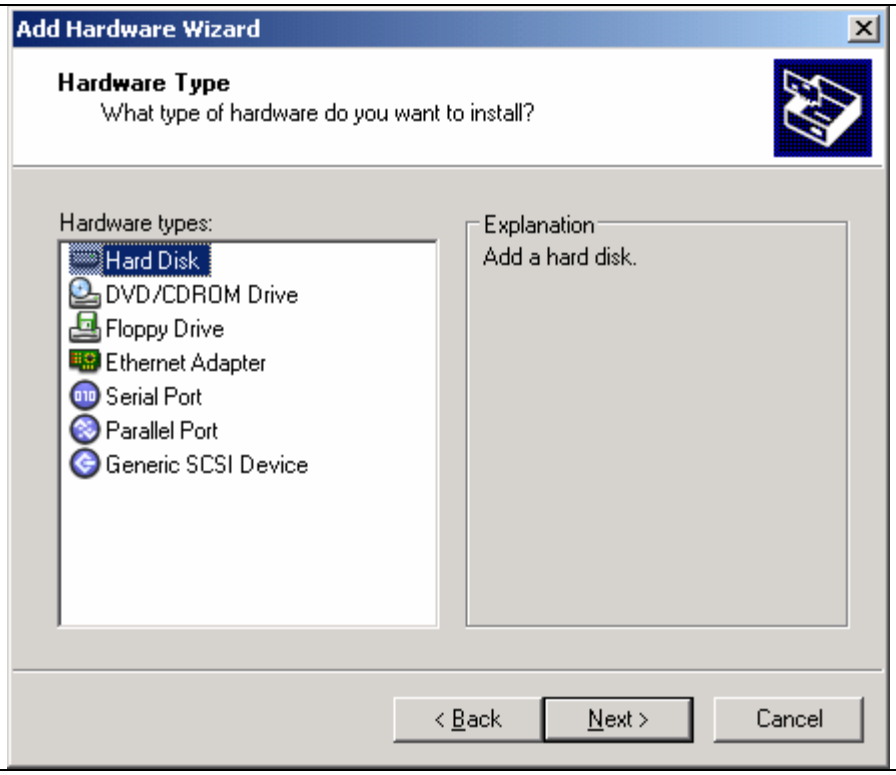
When the Ghostfile has been created, I used another ghostfile to restore my Terminal Server to it's previous state because it was a production server!

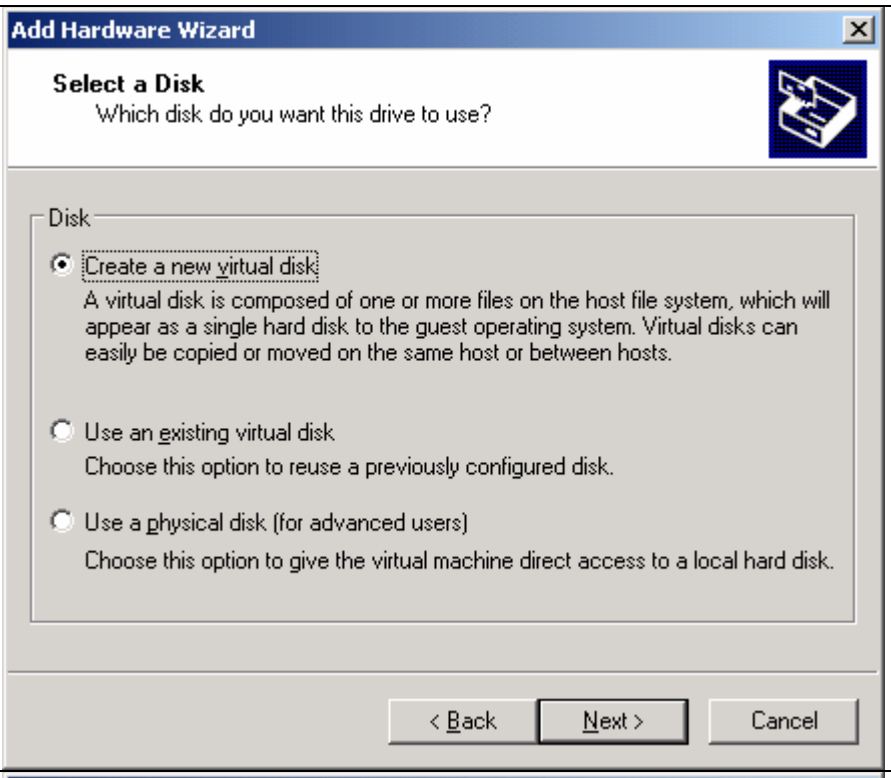
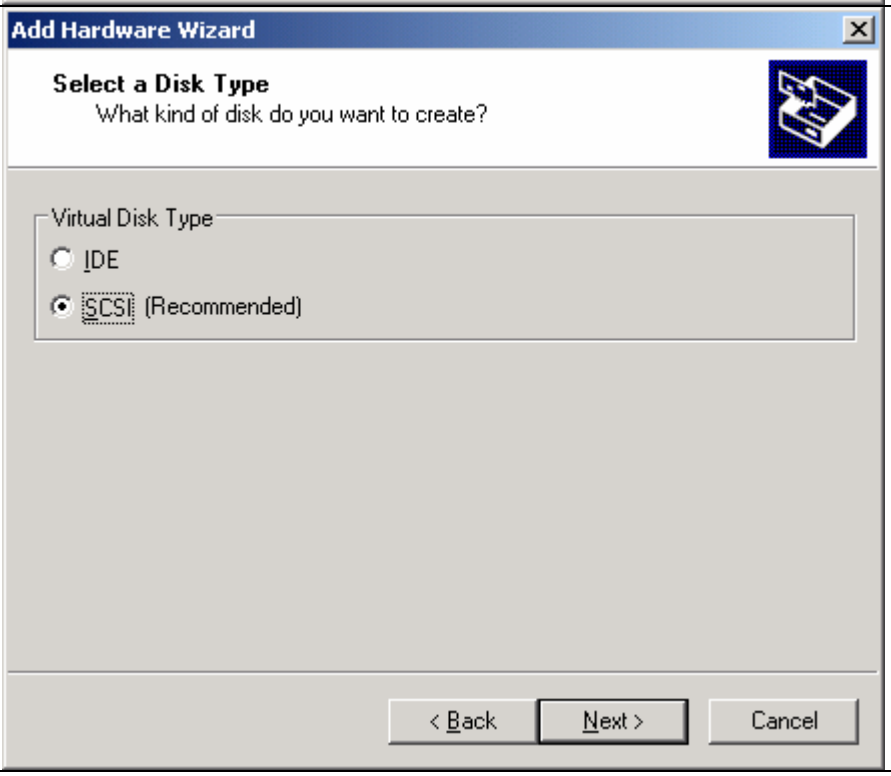
Even VMWare needs a little help

In order to build your VM, you need to help VMWare a little.
On your PC with VMWare Workstation, you need to create a "VM Helper Machine" with ***the same or higher*** Operating System as the one used in your Ghost file (W2K in my case). So Windows 2000 Server or Windows 2003 Server will do.
Create a VM with Windows 2000 Server as your (Guest) OS.
After the W2K installation, install the P2V Assistant on this VM Helper Machine.
We can use a few methods in order to restore the ghost image we created earlier:
METHOD A: Add a virtual harddisk (SCSI) to your VM Helper Machine and use the VMWare Ghostcast floppy to connect your VM Helper Machine to the GhostCast Server and restore across the network (or using a crosscable).

METHOD B: Add 2 virtual harddrives to your VM Helper Machine. 1 SCSI and 1 FAT32. Copy your ghostfile (*.gho) to the FAT32 partition and use the VMWare Ghostcast floppy to start a local restore from the FAT32 to the empty SCSI Drive.

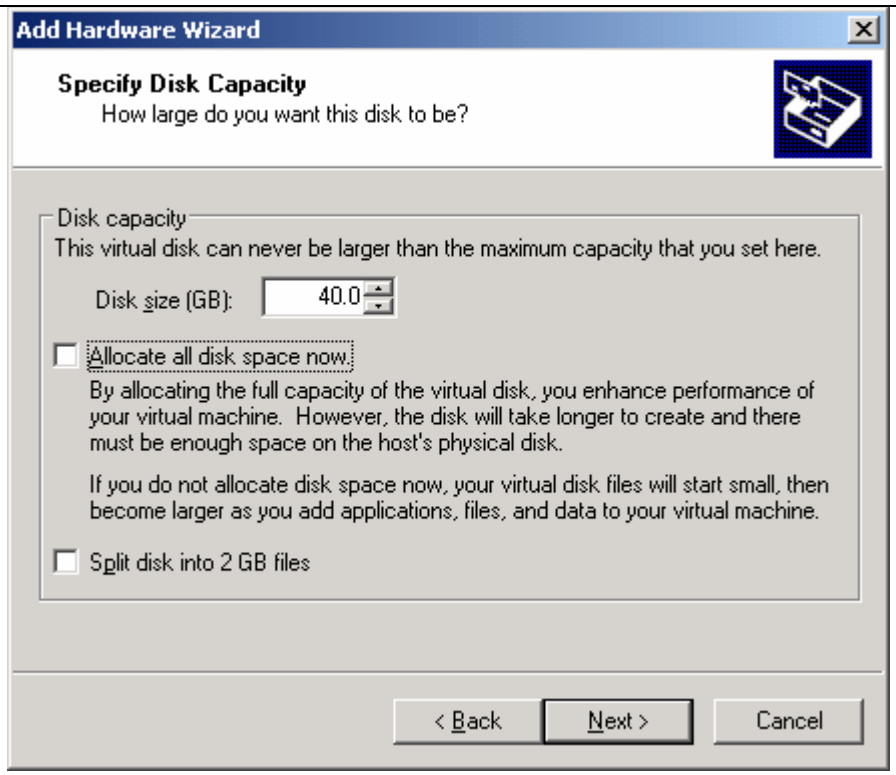
METHOD A

Edit your VM after shutting it down. Click on "Add"	
Select Hard Disk and Click "Next"	

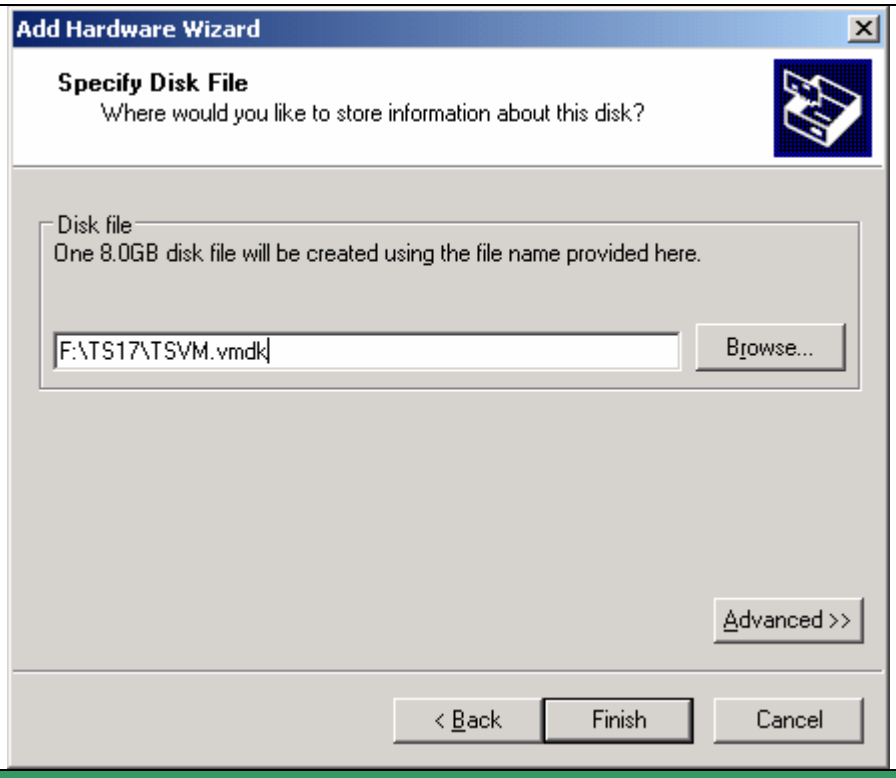
Select Create a new Virtual Disk and select “Next”	
Select SCSI en press “Next”	

My Terminal Server Harddisk has a size of 36 GB so I selected 40GB as disk size.

!
Don't make this virtual disk smaller then your TS Harddisk!!! If you do this, Ghost is going to tell you that the disk is too small!! (the Ghost file contains information about how large your HD is.)
! NOTE: You might be able to trick Ghost with the fdsp and fdsz switches but I haven't tested this

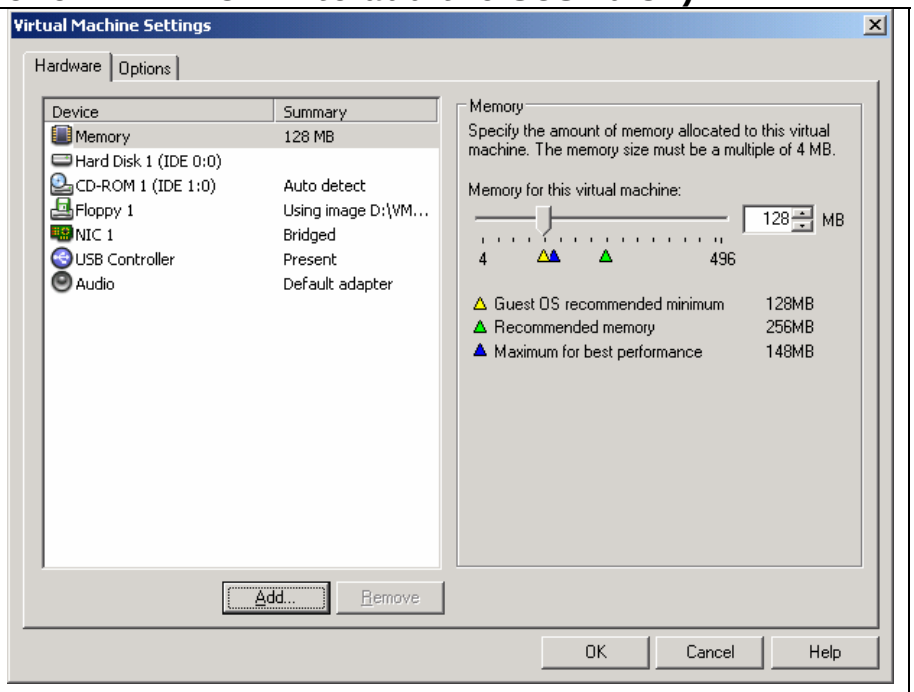
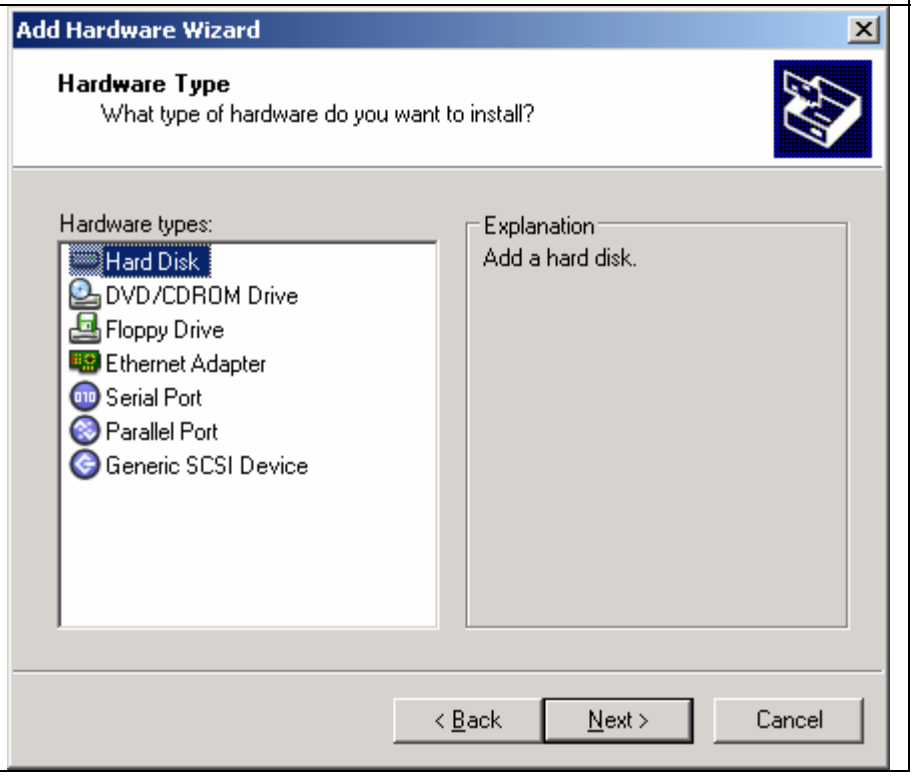


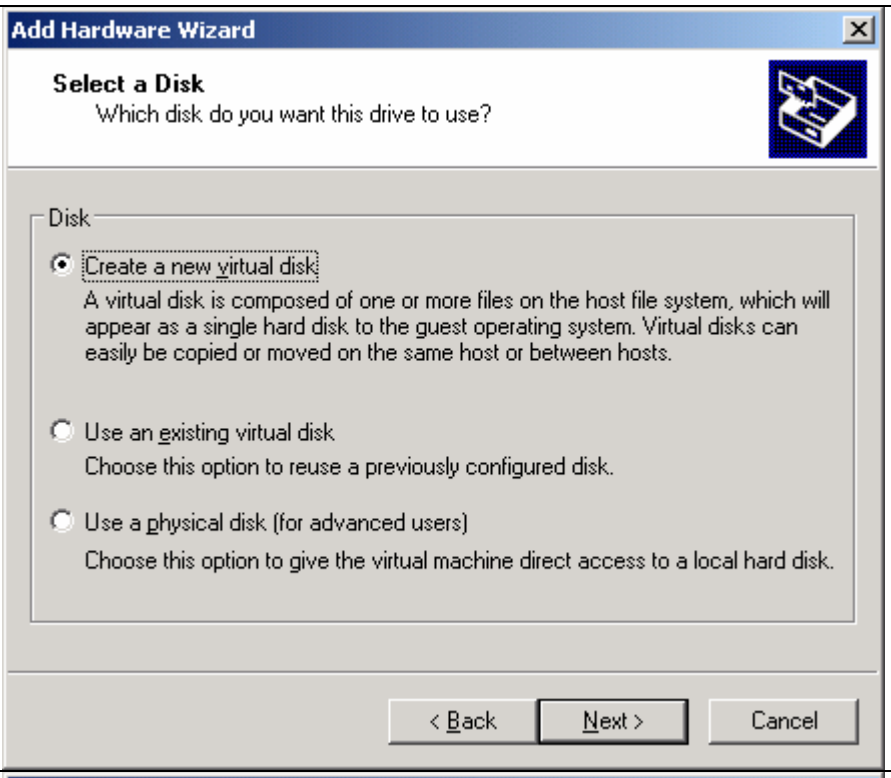
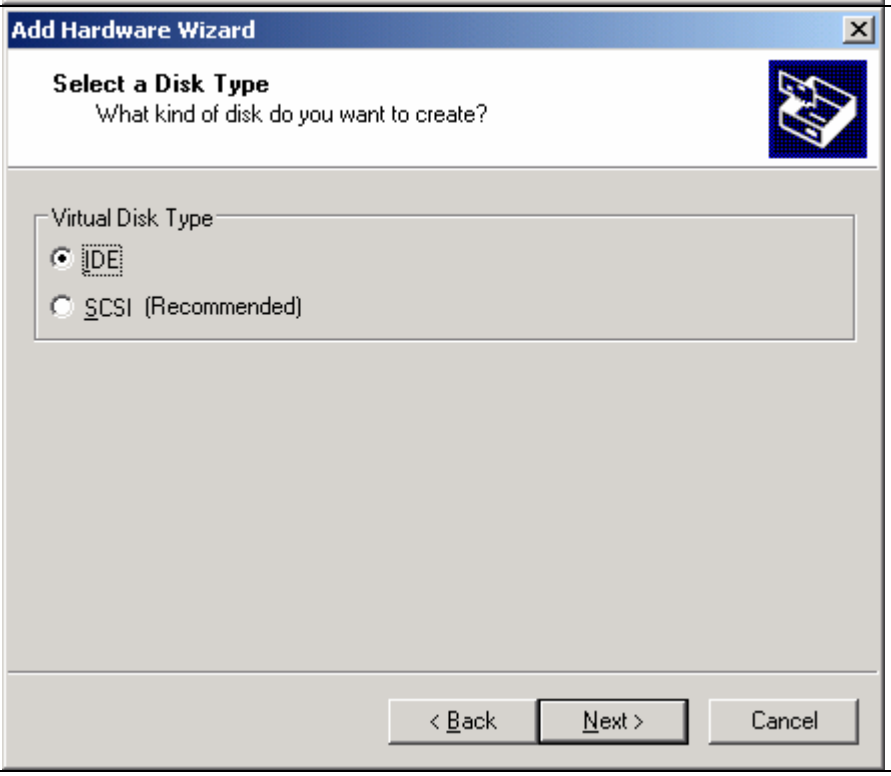
Select a destination and press "Finish"



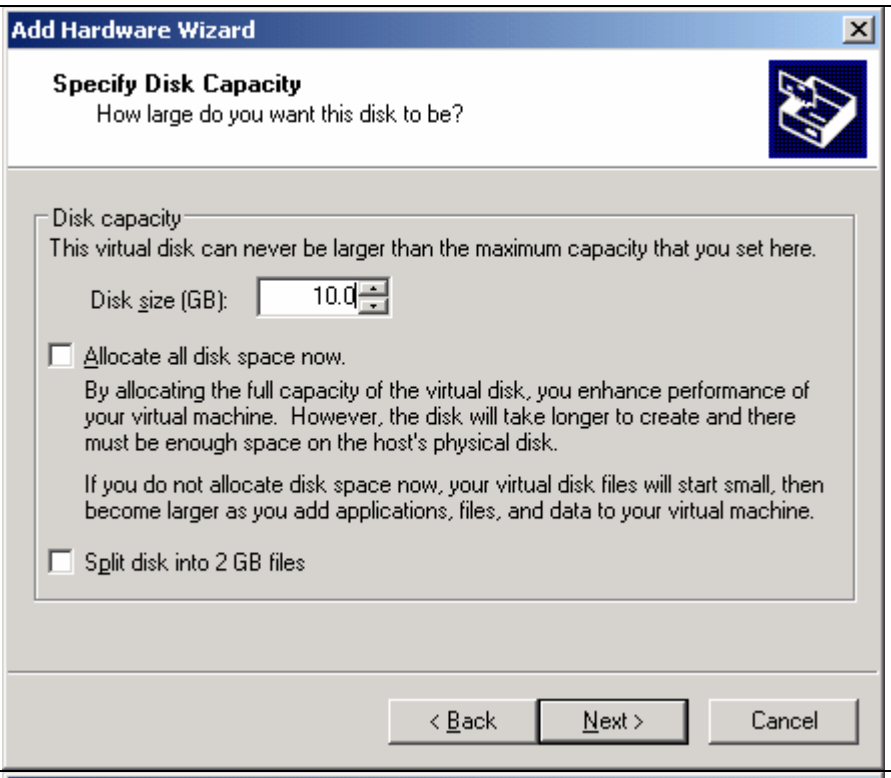
After this step, please continue to the Chapter: **The VMWare Ghostfloppy**

METHOD B (First follow METHOD A to add the SCSI disk)

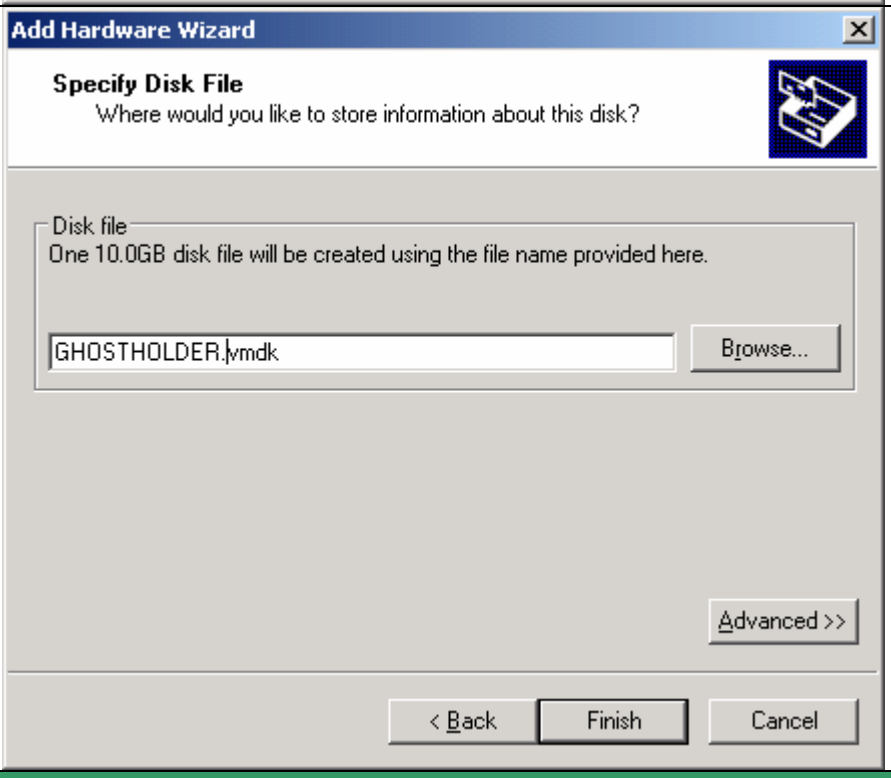
Edit your VM again after adding the SCSI disk from Method A	
Select Hard Disk and Click "Next"	

Select Create a new Virtual Disk and select “Next”	
Select IDE en press “Next”	

My Ghostfile has a size about 1.5 GB so this is MORE than enough.



Select a destination and press "Finish"

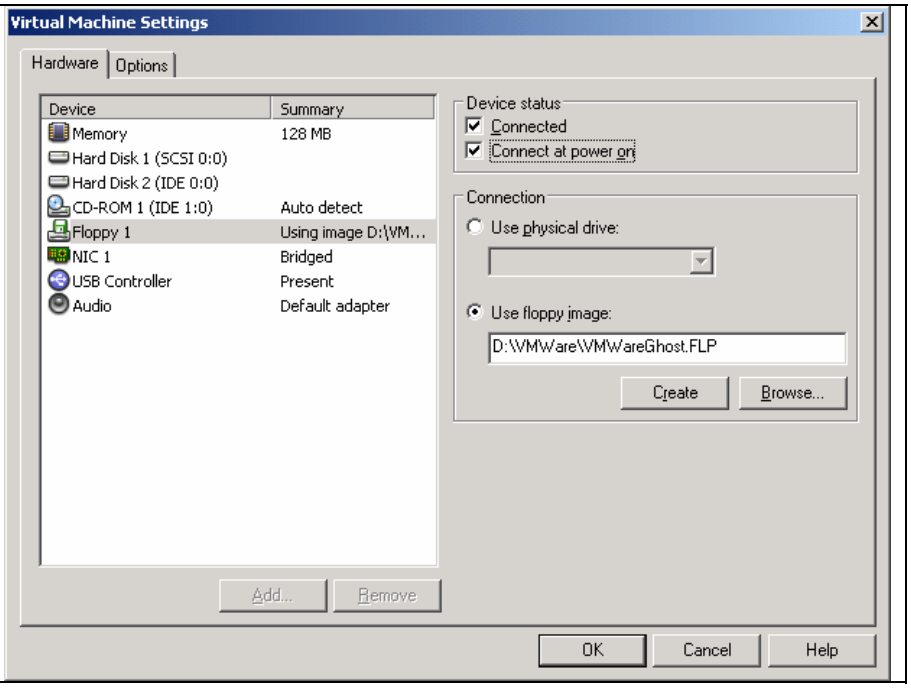


! After this step, Start your VM Helper Machine and format the 10 GB disk with FAT32. Then copy the Ghostfile you made to this FAT32 partition.
Now you can continue with the **The VMWare Ghostfloppy** chapter, the only big change is that you don't start a GhostCast. Instead, use the **Local**, **Disk**, **from Image** feature. (Restoring will be done at lightspeed ;))

The VMWare Ghostfloppy

We are going to connect our VM Helper Machine to a GhostCast Server (Yes really!). In order to do so, you need a Ghostfloppy to use in your VM Helper Machine. You can make one yourself using the AMD PCNet Drivers, or you can download one I already made here: http://vmware.webhop.net

Of course I cannot include the ghost.exe (license restrictions) so you need a tool like WinImage (http://www.winimage.com) to edit the .flp file. Just inject ghost.exe (and optionally, ghstwalk.exe) in the \GHOST subdirectory and you're done! (save the image as .ima and rename to .flp)

Configure your virtual Floppy Drive to start from the .flp image	

The Starting Line

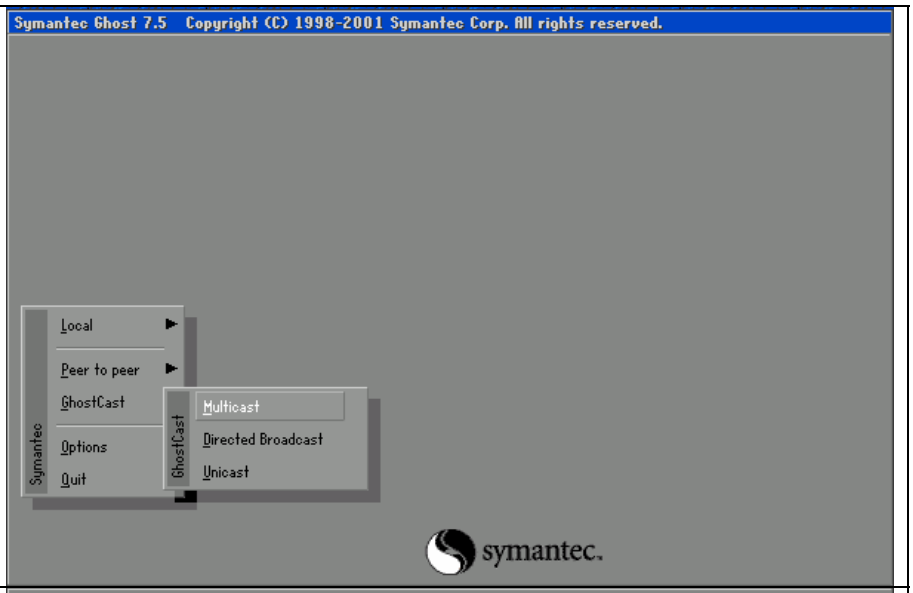
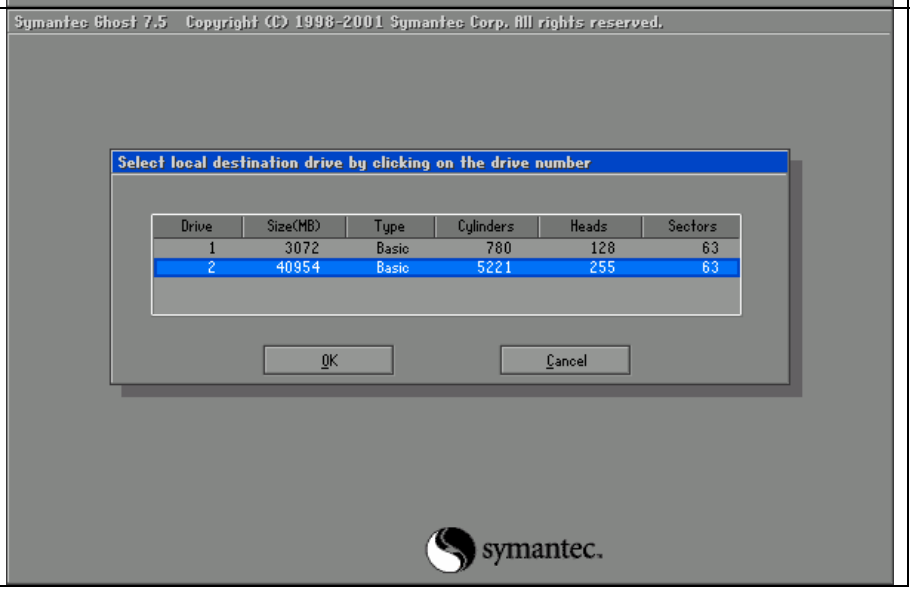
Before we start, let's have a quick roundup of what you should have up to this point:

- A Ghost image of your Terminal Server
- A VMWare Ghostfloppy
- A PC/Laptop with VMWare workstation
- On this PC/Laptop you have a VM with the following:
  - Windows 2000 Server
  - P2V Assistant
  - A virtual 40 GB empty SCSI HD attached to your VM Helper Machine
  - (A virtual FAT32 Disk attached to your VM Helper Machine that holds your Ghost file if you chose Method B)

The Magic

Start your ghostcast server and create a new session where you are going to load the TSVM.GHO to your client (the VM Helper Machine).

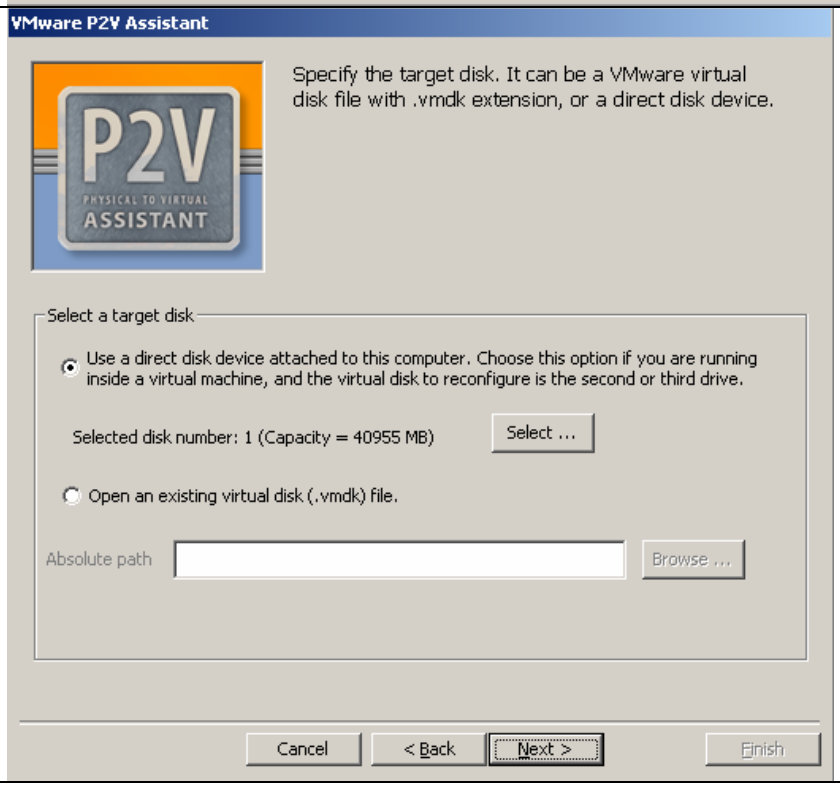
Next, boot up your virtual machine and watch the VMWare Ghostfloppy doing it's thing. (if the VM won't boot from floppy, go into the Setup of the VM (F2 during bootscreen and change the bootorder)

Method A: Select GhostCast, Multicast and connect to your GhostCast Server **Method B**: Select Local, Disk, From Image and select the ghostfile from the FAT32 disk	
Select your empty 40GB HD as destination and Click on "OK"	

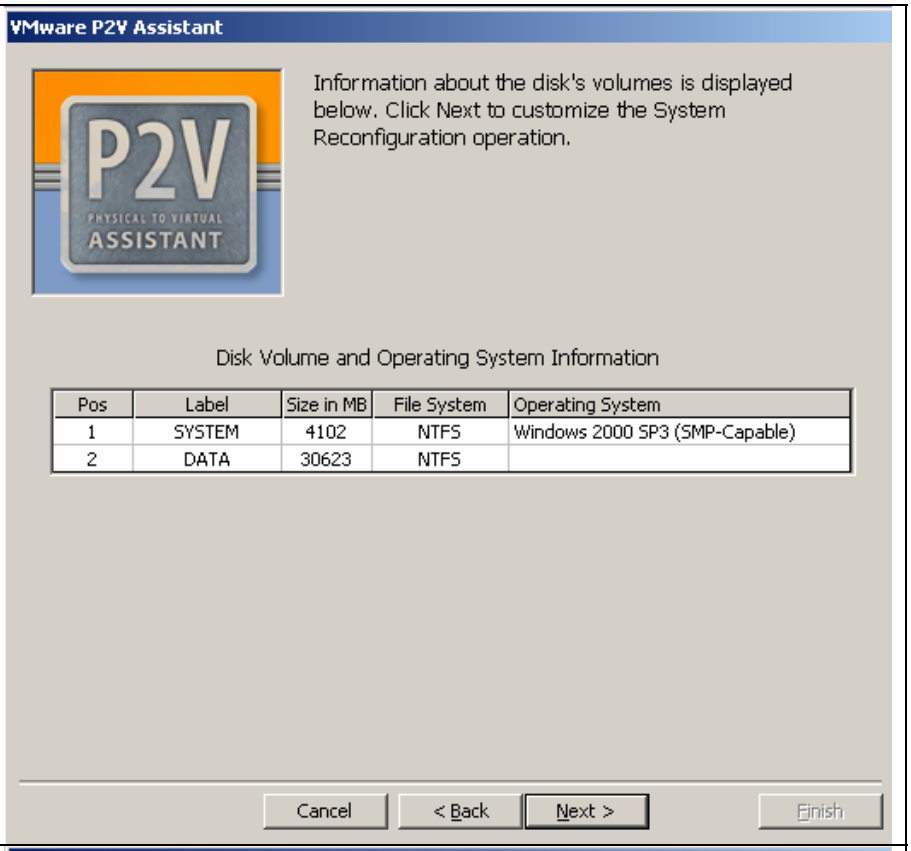
The Ghostimage of your Terminal Server will now be restored to your VM SCSI Disk. When the ghosting has completed, shutdown the VM Helper Machine. Configure your VM not to boot from the floppy.
Start your VM Helper Machine, it's time for P2V!!!

Lets get Physical 2 Virtual!

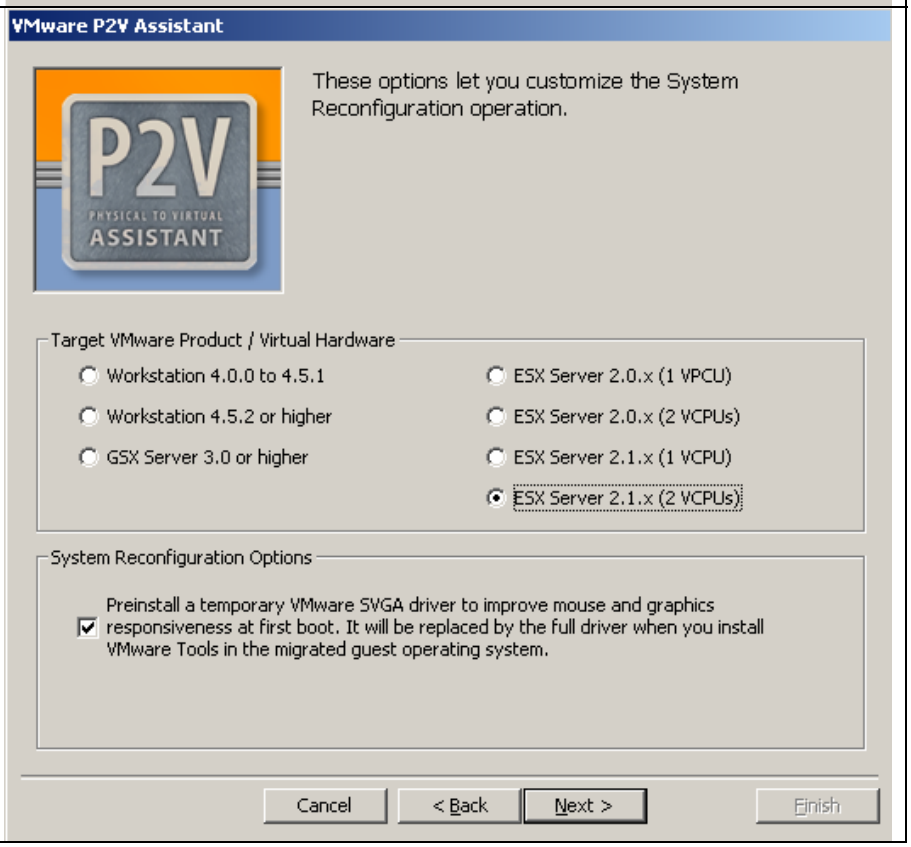
When your VM Helper Machine has booted, start P2V Assistant and follow the screenshots!

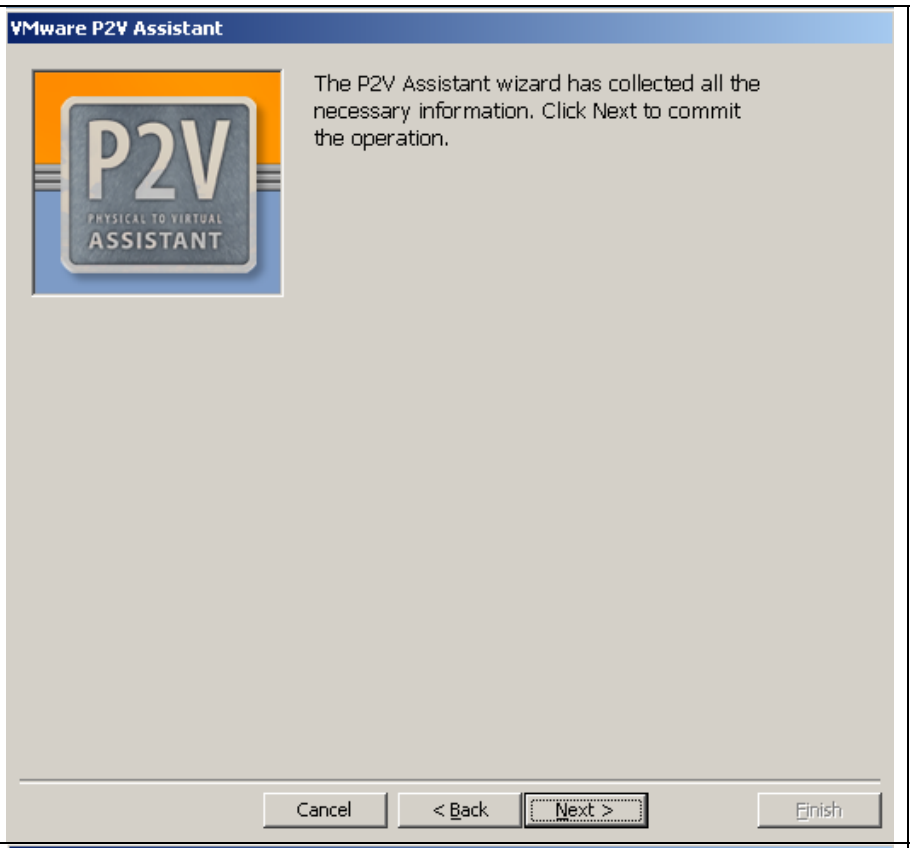
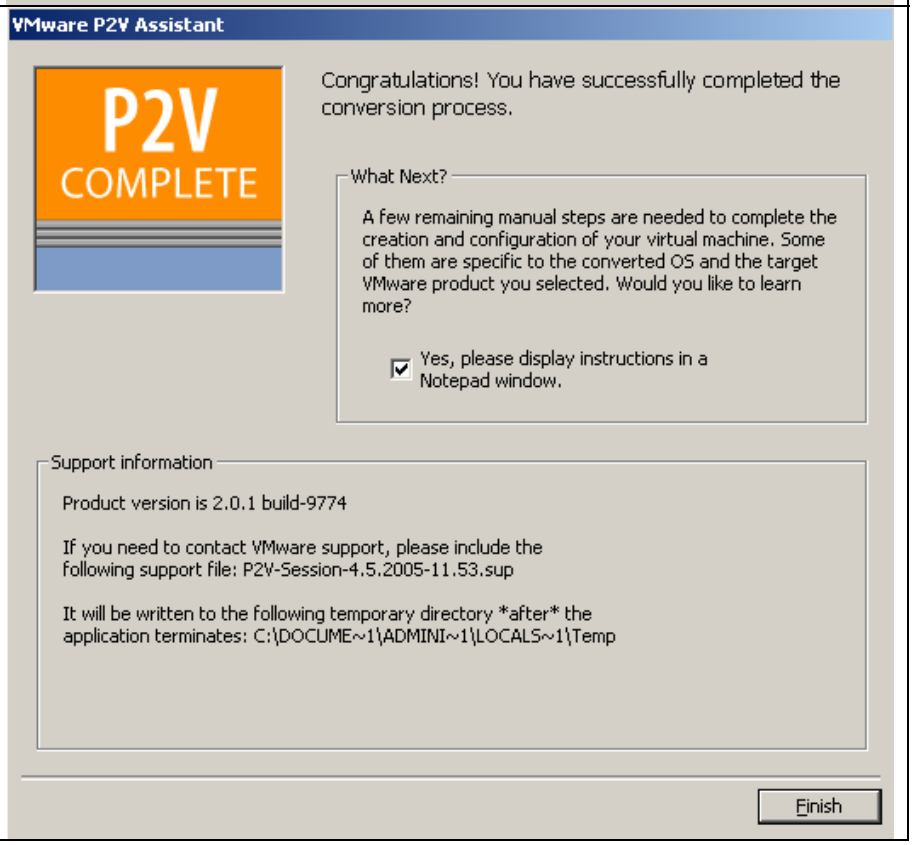
Start P2V Assistant and select Perform a System Reconfiguration on an existing virtual disk that contains an operating system and click "Next"	
Select disk 1 (in my case a 40 GB SCSI disk) and click "Next"	

A screen will appear "Mounting your disk" wait a little while, the next screen should popup
Select Pos 1 (Where it says Windows 2000 SP3) and click "Next"



Select your flavor. I want to use my VM in ESX Server, so I selected: ESX Server 2.1.x (and 2 VCPUs) because my TS has 2 CPU's
I also selected the "Preinstall a temporary VMWare SVGA…"
This will improve mouse and graphics speed when using your VM. Click "Next"



Click “Next”	
After a few short moments you’ll see this if all is well. Click: “Finish” After that, Notepad will open with Notes on what to do next.	

P2V Assistant Notes:

Follow the instructions below to the letter!

P2V Assistant Notes:
Guest OS type: Windows 2000
Guest OS computer configuration: ACPI Multiprocessor PC
Target virtual machine product: VMWare ESX Server 2.1.x with 2 VCPUs

Note: pay special attention to items marked IMPORTANT

-- 1. Preparation --

!

If the P2V Assistant was running in a virtual machine and the target virtual disk is attached as a secondary drive, shut down and power off the virtual machine, and then ***use your VMWare product's configuration editor to remove the target virtual disk from the virtual machine***.

! (note: Very important and easy to forget, so please don't. I did and it was no fun)

Use your virtual machine product's user interface to **create a new virtual machine with the guest OS type set to: Windows 2000**
When configuring the primary virtual disk, choose the **'use existing disk'** option and *select the target virtual disk that P2V Assistant created or populated.*

-- 2. Tasks to perform inside the new virtual machine --

Power on the virtual machine. Wait until you see the logon screen, then log on as a member of the Administrators group.

Let the guest operating system detect and configure the virtual machine's devices. This process typically takes several minutes, and ends with a request to restart the OS.

Answer Yes and wait for the guest to reboot.
-- 3. Final Steps --

After the guest reboots, log on as a member of the Administrators group, and then use your virtual machine product's user interface to install the VMWare Tools package.

Restart the guest operating system one more time after installing VMWare Tools.
------- END OF VMWARE NOTES -------

Good, thanks I'll take it over from here.
Earlier in this document I tried to tell Ghost to leave my driveletters alone, well this partially succeeded. My N: drive was shot to letter D: and my DVD drive was changed to letter E:. But no worries, this is nothing the Disk Manager can't fix. The most important thing is that the System Drive remains untouched or else you might not be able to login to your VM.
After that has been settled, you still have a VM that has the name of an existing Physical Server. So, Shutdown your Terminal Server VM and reconfigure your floppy drive to boot from the VMWareGhost floppy
After booting, exit ghost
Start GhstWalk.exe
Rename your server to something else, wait a few moments and reboot
Voila!, a VM Terminal Server with a new name. (don't forget to change IP Settings etc.)
Of course you can also change the name from within Windows 2000 but I like GhostWalker, do what you have to!

A few final tips:

After the VM was running I noticed some performance issues when logging in. The logintime was twice as long compared to the Physical Terminal Server! I found a document at the VMWare site which pointed me in the right direction (disabling the comports!) You can find the document here: http://tinyurl.com/dspo6

If you are using Workstation 5, make sure you create the P2V helper as 'legacy' machine 'cos the Workstation 5 virtual hardware (monitor, virtual disk) are not compatible with Workstation 4.5.2, ACE, GSX 3.1 and ESX 2.5.

I hope you enjoyed this tutorial and that it was of some help. I enjoyed writing this document and giving back to the community…