

Upgrading from VC 2.0.x to VC 2.0.2 and ESX 3.0.x to 3.0.2

RTFM Education

Beyond the Manual... with Mike Laverick

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Well, as you might gather I am back from my well-earned holiday in Italy. My partner and I (Carmel) spent some wonderful time in Florence, Lucca and Pisa. I dare say we will find ourselves in Italy next year hopefully to see some forum & instructor friends who are based in Milan.

Today I turned my attention to upgrading from VirtualCenter 2.0.1 to 2.0.2 and from ESX 3.0.1 to 3.0.2. I choose a number of different methods for the upgrade and wasn't expecting any nasty surprises. I was right. What follows below is a brief account of my experiences which I hope you will find interesting...

As you know the 3.0.2 and 2.0.2 releases are maintenance ones. These releases are primarily there to fix bugs, and roll-up hot-fixes in one installation media. However, even with these maintenance releases VMware does tend introduce new features such as new guest operating system support. I feel this is a bit "naughty" of them, but heck they have to give something to us to sweeten the pill, and justify all that extra overtime!

I began with a VirtualCenter upgrade as this generally recommended for any upgrade path from VirtualCenter 1.x.x and ESX 2.x.x. The other thing I did was a WinMd5sum on the ISOs and source code I downloaded to make sure they weren't corrupted.

I did my first upgrade on the VirtualCenter server system I built specifically for the writing the new book (vi3book.com) before using what I learnt there on my "virtual classroom" system which is now held in a co-location. If something went wrong I didn't want have to walk round to the co-location to fix it. Yes, it's about 5mins walk away, but I am lazy guy...

Upgrading VirtualCenter

Before beginning (I took a backup and VM snapshot!) I checked my SQL box was set to use both SQL/Windows Authentication and that the main VirtualCenter DB was using SQL Authentication. VMware do not currently support Windows Authentication - and I got badly burned on this with my VC 1.x.x upgrade tests last year. I'm still using SQL 2000 with Service Pack 4 on Windows 2003. I've not moved up to the latest version of MS SQL because I don't have a license for it - and I have this pathological objection to spending my own money on software and cannot bear time locked evaluation editions that require activation or parting with ca\$h.

If you want to check you authentication settings where to look is in:

Enterprise Manager >> Console Root >> Microsoft SQL Servers >> SQL Server Group >> Properties of the SQL Server >> Security Tab

To check the authentication settings on the VC DB

Enterprise Manager >> Console Root >> Microsoft SQL Servers >> SQL Server Group >> Security >> Logins

Double-click the account use to authenticate to your VCDB

Observations and Experiences

1. The VC Installer still says 2.0 rather than full version number of 2.0.2. It's nothing important it just irritates me. Don't ask me why.
2. The VC Installer still gives the god awful dialog box messages which states:

"The DSN 'VMware VirtualCenter' points to an existing VMware VirtualCenter repository. Do you want to reinitialize the database and start over with a blank configuration".

The default is NO

Considering, I've just said OK to an upgrade dialog box earlier it seems a curious question to ask. This dialog box has been around through innumerable iterations (irritations?) of VC. Personally, as someone who works in multiple language zones across Europe I think the phraseology is quite poor. It's up there with the Guest Customization Wizard's "non-empty password". Those of you have been using VMware VirtualCenter for a while will on the look out for this, but newbies beware. To keep your stuff, choose NO.

3. Transaction Log/Full-Recovery Warning

After choosing NO, you will most like get very lengthy warning about using SQL's "Full Recovery Mode" and the danger that without frequent backups the SQL's transaction logs will eventually consume all disk space. It's an advisory dialog box so nothing to stress about unless your SQL admin guys don't both with backups or monitor the SQL server disk capacity. The dialog box quotes an VMware KB article (which leads to M\$ locations) for those unfamiliar with the issue

Link: <http://kb.vmware.com/kb/1001046>

4. After this point things are pretty much straight forwarded. You get an upgrade of the License Service, and if you run it on the same box as the VC service - it should know the path to the LIC file right away. I accept pretty much all the defaults for the Web-Service, although I noticed it wasn't a default to **X Set the Apache Tomcat service for automatic Start-up** or **X Start the Apache Tomcat Service**.

GOTCHA:

Installer does NOT appear check for available disk space in C: so if you given your VC a tiny wee small virtual disk like me watch out! This happened to me, and the roll-back process did successful undo the installation - but it appeared to have left the DB in a damaged state. The problem was largely cause by me extracting the VC software from a zip file, and copying it to the C: drive of my VC rather than just mounting an ISO within the VC. This gave me error 25014 'Setup failed to upgrade the vpxd_stats_rollup procedure in the VirtualCenter database'. The roll-back of the VC install did not fix this DB error so I forced to resort to backup. Fortunately, this was easy - as I'd used VMware snapshots on my VC and SQL box (they run as VMs) so all I had to do was revert and try again.

Post-Upgrade Experiences:

Inexplicably two of my three ESX hosts had become disconnected from VC after the upgrade. The cause was not clear; it could have been network problem on my side. A simple right-click and connect fixed the problem. The other thing I noticed was that I wasn't asked to upgrade the VI Client by the VC. I decide to carry on an ignore this to see what the affect would be.

Conclusions:

As long as you do a backup, check your SQL Authentication settings, check you have plenty of disk space, and don't click Yes by accident -

Verdict:

Mostly harmless (that's a "Hitchhikers Guide to the Galaxy" reference if you didn't spot it)

Upgrading ESX 3.x.x

There are couple of methods of upgrading ESX.

Method 1. ISO/CD and choose Upgrade

This allows you to boot from CD (either physical media or virtual media). It's slow and involves human interaction

Method 2. Headless with esxupdate

This uses "tar-ball" version of the ESX server software and you upgrade using the RPMs. You have to copy and extract the tar-ball and then run commands to update the ESX host. It useful in restricted environments where CD and deployment tools such as the UDA and Alteris are not available. (The headless method has nothing to do with Washington Irving's story "The Legend of Sleepy Hollow")

Method 3. UDA or Similar

This method uses PXE boot to deliver the media, and small kickstart file to handle all the upgrade questions. It's fast and quick, and requires no human interaction - but does require DHCP which might not be approved for use in your environment.

Hardware Woes

I tried all three - using maintenance mode to trigger a VMotion of all the VMs of the ESX host before hand. I use fully-automated with my DRS clusters so this was a relatively painless event. I don't do any VM Clustering (except for development purposes) so there was nothing that would be show-stopper in terms of moving VMs about. Of course, one approach is double punch of maintenance mode and method 3 to completely wipe and rebuild an ESX host. It depends on how good your deployment post-configuration scripting is that will determine whether clean-install or upgrade is your preferred choice. My plan in writing this post was do upgrades where ever possible as method of judging how viable the upgrade path is.

I was hoping a problem I have with my SAN would be fixed by the release of the ESX 3.0.2 source code. Put simply my QLA2200 Jurassic era HBAs get wrongly detected and use the wrong 2GB QLA2200_707 driver, when they should use the 1GB QLA2200_7xx driver. Saying this makes me feel like I'm some nerd/spod at a cocktail party trying impress a lady with my mastery of Asus motherboard model numbers.

The work-around is the same as ESX 3.0.0, 3.0.1 which is uninstall the wrong RPM, install the right RPM, edit /etc/vmware/esx.conf and run esxcfg-boot -b. I found this all out from a helpful KB article on VMware's website at the beginning of this year:

<http://kb.vmware.com/selfservice/microsites/search.do?cmd=displayKC&externalId=1560391>

Once I followed the instructions in the KB then everything is rosy in the garden once more. I've automated this process using my kickstart scripts in the past - and it looks like I will have to continue doing this for the foreseeable future. Unless some kind person donates a MSA1000 and 4 decent QLA2340 cards to the RTFM cause. [The silence is deafening...]

In terms of the upgrade I found the old QLA2200 device and driver were disabled in a esx.conf, and the new (but wrong driver was enabled). I had to do a compare of known-good esx.conf file to correct the modified one correctly. For example my upgraded esx.conf looked like this:

```
/vmkmodule[0005]/enabled = "false"  
/vmkmodule[0005]/module = "qla2200_7xx.o"  
/vmkmodule[0006]/enabled = "true"  
/vmkmodule[0006]/module = "qla2200_707.o"  
/vmkmodule[0006]/type = "fc"
```

But my clean installed esx.conf with my script that handles the switch in the driver type looked like this:

```
/vmkmodule[0005]/enabled = "true"  
/vmkmodule[0005]/module = "qla2200_7xx.o"  
/vmkmodule[0005]/type = "fc"
```

I ended up modifying my original to look like my known good removing the lines added by the upgrade. I also had to find the correct driver in the ESX 3.0.2 media and install it with the RPM. Effectively I followed the instructions in the KB article I just mentioned above.

You might wonder why I boring you with my Jurassic QLA2200 woes. Well, I feel there's a moral to this story, if you have funny hardware that requires manual intervention to make it sing and dance – expect similar problems with the upgrade. You might want to opt for a clean installation after all which fixes the problem from the very beginning. This driver problem which I've lived with for a while affect ALL the various methods available so it was pretty serious. This work-around seemed to me so unpleasant that if faced with this problem in the real world I would have wiped the ESX host and started from scratch.

Observations and Experiences

Method 1: ILO & Virtual Media

As my kit is in a co-location, I download the ISO for ESX 3.0.2 from VMware's website using my remote access to the co-location - and used virtual media within ILO1 on a HP DL385. It was slow - as ILO/virtual media access just is slow. I used text mode as is it easier to handle through remote Citrix links. I was asked about my mouse, regional settings and if I wanted to modify my boot loader settings - I choose No. If choose Yes, the installer told me could have serious consequences so, I choose No.

After that things went a bit pear-shaped. The virtual media inexplicably got disconnected. I reconnected it and clicked OK. To be honest I think this because I (still) haven't got round to updating the firmware on the ILO and/or, it's the file server that hosts my couple of ISOs can't be depended on. Whatever the source it was a pain in the ass and I will be doing something about it – quite what I'm not sure. I will probably find an alternative source for the ISOs, as I hate doing firmware updates. They just scare the be-Jesus out of me.

Verdict:

Bloody awful. Don't rely on ILO's – they can let you down. Plus whether they are reliable or not they are mightily slow. In fact I was able to write the remainder of this post, and upgrade another server using method 3, by the time my server using method 1 had completed.

Method 2: Headless with esxupdate

The headless method uses a tar-ball of RPMs to do upgrade your ESX host. It comes in two formats an ESX 2.x.x to 3.0.2 version and an ESX 3 to 3.0.2 version. In the past VMware have called these tar-balls as the "upgrade" and "full" versions respectively. I believe for clarity these terms have now been changed, so they are just referred to as upgrade packages, and you select and download the right tar-ball for task.

I download the tar-ball, and upload to my SAN using Veeam's Fast SCP for ESX. I usually use central SAN LUN available to all my ESX hosts – this generally is a "ISOs" VMFS volume where I put all my ISOs, software, patches and drivers. Then using PuTTY I to get a command-line on the Service Console – I extract the tar-ball with the tar command like so:

```
tar -xzvf esx-upgrade-from-esx3-3.0.2-52542.tar.gz
```

This extracts the RPMs to directory with the same number as the build number in the tar-ball. My example above the directory would be called 52542. For clarity I rename the directory with the move command like so:

```
mv 52542 esx3-3.0.2-upgrade
```

To trigger the upgrade I use the esxupdate utility which is more commonly used to apply individual patches to an ESX host like so:

```
esxupdate -r file:/vmfs/volumes/vmfsvolume/ esx3-3.0.2-upgrade -n update
```

Verdict:

Generally, this approach works quite well, especially where ILO access is not allowed, and you cannot use deployment tools like the UDA. However, I've seen the esxupdate utility report unnerving messages such like the one below which appeared about 50 times. Although it didn't stall or hang the update process

```
"INFO: | Use of uninitialized value in string eq at /usr/lib/vmware/esx-perl/perl5/site_perl/5.8.0/VMware/PCI/DriverManager.pm line 236."
```

Along with these worrying messages (which I have no idea or the time to resolve) there are more reassuring message such as:

```
"INFO: | Enabling repackaging capability...  
INFO: | Running test transaction:  
INFO: | Test transaction complete, Success"
```

At the end of the update process I had a nice friendly message

```
"INFO: --- TOTALS: 222 packages installed, 0 pending or failed, 2 removed, 0  
excluded ---  
INFO: Install succeeded - please come again."
```

All I need to do was issue the reboot command, and exit maintenance mode at the end of the process.

You can see from all this command-line information, that from another advantage of the headless mode is that it gives you maximum data about the progress of the upgrade – although I am sure there logging methods available for the other methods too. But the results of an esxupdate style upgrade could be easily redirected to > a text file which perhaps could be submitted to VMware Support guy if the worst came to the worst.

Method 3: UDA

For those of you who don't yet know what the UDA is (where have you been!). It standard for the Ultimate Deployment Appliance – and is basically away of PXE booting a server, and doing an over-the-network install full-automated with kickstart anaconda scripts. It's basically a poor-mans Alteris.

A typical ESX upgrade kickstart script will look very simple – because in only has to answer a fraction of a cleaning installs questions, and of course an upgrade preserves you settings so there is no "post" configuration to speak off.

Samples of these upgrade scripts are available on rtfm-ed.co.uk in the UDA section of the site. I've used these upgrade scripts on ESX 2 to 3 upgrades and for 3.0.0 to 3.0.1 upgrades too. The worked without modification for a 3.0.1 to 3.0.2 upgrade. Here's the one I used against one of my HP DL 385

```
# Auto-Generated Scripted Install Configuration file.  
# This file is used for VMware ESX Server Scripted Install Deployment  
  
# Regional Settings
```

```
keyboard uk
lang en_GB
langsupport --default en_GB
timezone Europe/London

# Installation Method
url --url http://192.168.0.150/esx/esx301/

# root Password

# Authconfig

# BootLoader ( The user has to use grub by default )
bootloader --location=mbr --driveorder=cciss/c0d0

# Timezone

# X windowing System
skipx

# Install or Upgrade
upgrade

# Text Mode
text

# Network install type
# Language
# Language Support
# Keyboard
# Mouse
mouse none

# Reboot after install ?
reboot

# Firewall settings
firewall --disabled

# Clear Partitions
# Partitioning

# VMware Specific Commands
vmaccepteula

%packages
@base

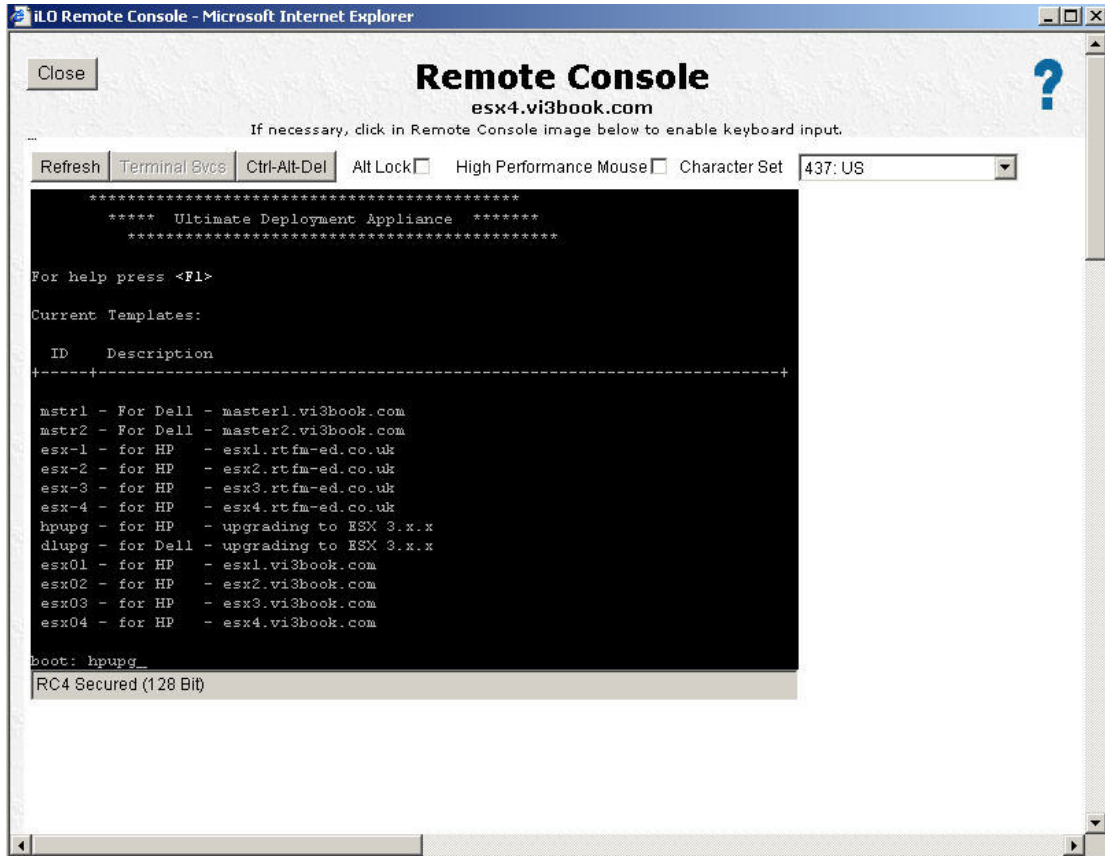
%post

%vmlicense_text
```

Setting up the UDA for this very simple. I copied the new esx3.0.2 CD to my storage location. I use a second disk in the UDA (remote NFS/SMB mounting of exports/shares is support as well). Using the OS option in the web-admin tool I umounted the old esx3.0.1 CD. I then click the Configure option and mounted the new CD like so:

esx252	VMWare ESX Server	2.5.2	DISK2	esx2.5.4.iso	Configure	Unconfigure	Mounted	Mount	Unmount
esx301	VMWare ESX Server	3.0.x	DISK2	esx-3.0.2.iso	Configure	Unconfigure	Mounted	Mount	Unmount

To trigger the upgrade I reboot the ESX host, and pressed [F12] to trigger a PXE boot – typed in the name of my upgrade template and away it went.



Verdict:

Fast, quick, reliable and remotely accessible. The only downside I can see if you need DHCP for PXE to work, and in some server rooms this could be a major ask

Conclusions

UDA/Alteris is the way to go for both upgrades and clean installations. After that the headless/tar method is OK – and is a good alternative you cannot run with the UDA/Alteris. If you must use an ISO try to make sure your virtual media is ultra-reliable or use a physical CD.

If you have peculiar hardware that requires special intervention to work, you may wish to script your installations and opt for a clean installation instead. This is what I will be doing in future.

Upgrading the VI Client

In my mind I was always thought that as soon as your client was out of sync with either VirtualCenter or the ESX host – you would get a message to upgrade. With this upgrade I was given no such message even though my VI client is circa ESX 3.0.1 and VC 2.0.1. Although I found the old client was reliable - in the end I did a manual upgrade of the client.

I spun up the source code; said yes to the upgrade dialog and did next and finish.

Verdict:

If you cannot upgrade your Vi Client, book an appointment with a careers advisor.

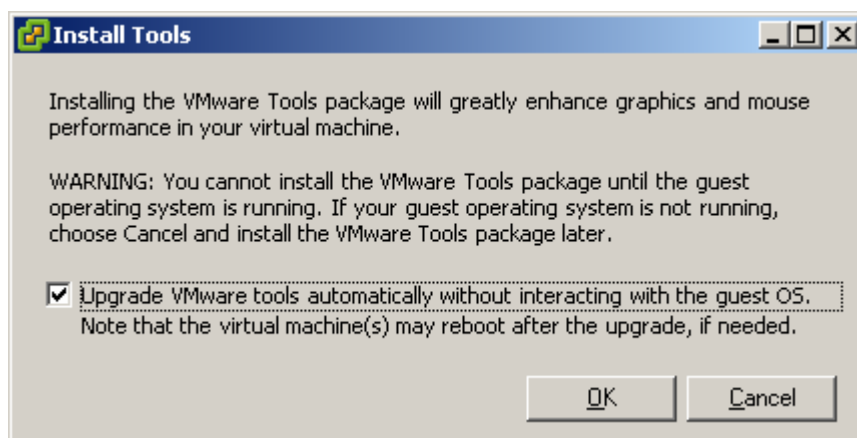
Upgrading VMware Tools

Since Vi-3 shipped last year there has always been two ways of upgrading VMware Tools inside a VM. A semi-automatic method and fully-automatic method.

Ladies and Gentlemen - Choose your weapon!

Semi-Automatic Method

With the semi-automatic method you right-click the VM in the Vi Client, and choose Install VMware Tools and enable the option



The only problem with this are the rather unnerving words "may reboot". I'm imagining a conversation with a user that goes like this "I may reboot your Exchange server, but I haven't really decided yet". If this kind of conversation doesn't appeal, then remove the tick. In my experience even a base Windows 2003 with Service Pack 1 install with NO extra software – got rebooted. I imagine once you have a whole application stack on top of Windows this gets progressively more likely.

The downside if you remove the tick is you have to then **INTERACT WITH WINDOWS**. This is not an experience I would recommend to anyone on a daily basis. It seriously damages your mental health and should come with a government warning like a packet of smokes do.

The WARNING: in the dialog above is quite nice - it makes me smile like white picket fences do, and open copy of the Adventures of Tom Sawyer. I've been in IT some while but never worked never met anyone who thought you could run a setup programme on a PC without the power cord plugged in the back. ☺

The Fully-Automatic Method

This said the fully automatic method has some bizzaro logic going on when it comes to doing upgrades.

The fully-automatic method uses a command-line utility at the VirtualCenter server. It has some merits. It can do many VMs in a bulk fashion. Weirdly, you have to power off your VMs before you run it. The upgrade CLI then powers on

your VMs, does the upgrade of VMware Tools and then powers them all off at the end. Sounds great, but excuse me wouldn't the reverse be better? I think this could be scripted – but think about doing this feels with me such a yawning lack of excitement that I think I will stick with fully-automatic method instead.

Additionally, unless you want to specify each VM individual in a one chuffing list, the best way is to say with the CLI upgrade utility is to use the "upgrade all VMs on ESX1" approach. This is fine, but it ticks me off. I'm always being told (and telling students) it's VC that knows where the VM is, because of DRS and HA – not ESX. Quite why the CLI doesn't allow an "upgrade all VMs in this folder" method is beyond me. But heck, I'm mere end-user and the mysteries of these decisions are not ones which I am privy to. Boo-hoo

Anyway, whining and moaning aside to trigger a fully-automatic upgrade – first power off the VMs and login to the VC server. Open a command prompt to C:\Program Files\VMware\VMware VirtualCenter 2.0

Type something like

```
vmware-vmupgrade.exe -u vi3book\administrator -p vmware -h "London DataCenter/Intel Hosts/AMD Cluster/esx1.vi3book.com" -m 2 -t 10
```

Note:

The switches -u and -p are required and they set the user name and password to authenticate against VirtualCenter. The -h switch is also required and it sets the path to an ESX host within the Inventory. In this case all powered off VMs running on esx1.vi3book.com will be updated.

The switches -m and -t are optional and set how many VMs can be simultaneously updated and how long VMs are allow to stay powered on (in mins). This deals with the issue of VMs that will not power down gracefully after a VMware Tools upgrade.

Alternatively, you can specify each VM individually – you will soon how much fun that's going to be. Here's a sample

vmware-vmupgrade.exe

```
-u vi3book\administrator -p vmware  
-n "London DataCenter/Mike's VMs/vm1"  
-n "London DataCenter/Mike's VMs/vm2"  
-n "London DataCenter/Mike's VMs/vm3"  
-n "London DataCenter/Mike's VMs/vm4"  
-n "London DataCenter/Mike's VMs/vm5"  
-n "London DataCenter/Mike's VMs/vm6"
```

Note:

As you can see with the -n switch we can specify multiple VMs, and yes, you must specify -n each and every time! Such fun! ☺

GOTCHAS:

There some couple of frequent errors people see with vmware-vmupgrade. Firstly, remember the VMs have to be powered off first, if not the tool will give you this error message:

```
"London DataCenter/Mike's VMs/vm1: Cannot upgrade. VM is not powered-off"
```

Secondly, people often forget to input the / to indicate the end of one object in the VirtualCenter inventory and the start of another. If you do this you will get this type of error message:

"Failed to upgrade: failed to find object at London DataCenter\Mike's VMs\vm1"

Lastly, the last most common error is failing to authenticate with VirtualCenter correctly.

"Failed to connect to VirtualCenter server: vim.fault.InvalidLogin"

Conclusions

In terms of VMware Tools upgrades there is "nothing new under the sun". Personally, I think this is a missed opportunity. Keeping VMware Tools up to date is a PITA for a lot of people, and I had hoped that VMware would do something about it. Go right ahead and examine AD methods of pushing out VMware Tools or perhaps using VBS with msiexec if you like. But quite frankly I haven't the time, energy or inclination to get these working, and then validate them. Upgrading "client" software was something I hoped to see the back off when I stopped doing end-user training/support more than a decade ago – but it seems to hang around like a bad smell in the bathroom.

Let the Games Commence

Well, now you have upgraded VirtualCenter, ESX, the Vi Client and VMware Tools what new and fun things can you do in the playground of VMware Virtual Infrastructure 3?

Well, I could repeat what's in the release notes – but decided against this – so read it for itself here:

ESX 3.0.2

http://www.vmware.com/support/vi3/doc/releasenotes_esx302.html#whatsnew

VirtualCenter 2.0.2

http://www.vmware.com/support/vi3/doc/releasenotes_vc202.html#whatsnew

VCB 1.0.3

http://www.vmware.com/support/vi3/doc/releasenotes_vcb103.html#whatsnew