VMware ESX 3.5 Server
and
VirtualCenter 2.5
(GA Build)
Upgrade Guide

Document Version 1.1

RTFM Education
Beyond the Manual... with Mike Laverick

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© RTFM Education

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This guide does change. Have you got the latest copy?

IMPORTANT:

This guide covers my experiences of upgrading from VirtualCenter 2.0.2 to 2.5 – and various methods of upgrading from ESX 3.0.2 to ESX 3.5.

You should full research the upgrade process using authorised documentation. This guide after all is just one guy's experiences.

Upgrading to VirtualCenter 2.5

WARNING: STOP!
BEFORE PROCEEDING READ THIS KB ARTICLE (1003346) FROM VMWARE

http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=
displayKC&externalId=1003346

Additionally, you should know that the permissions to either do a clean install or an upgrade have changed. During the install/upgrade process your VirtualCenter DB account will need (temporarily) privileges to the MSDB.

http://pubs.vmware.com/vi35/upgrade/wwhelp/wwhimpl/common/html/wwhelp.
htm?context=upgrade&file=upgrade_guide_update.10.2.html

Failure to research and validate either of these issues will result in a failed upgrade/install. I know – I tried!!! ☹

Changing VirtualCenter Database Permissions (SQL 2000)

Note:
I run on Microsoft SQL Server 2000 with Service Pack4. I have not tested these procedures on SQL 2005, but they should be the same. As ever – Backup, Backup, Backup!

1. **Login into the SQL Server**
2. Run the **SQL Enterprise Manager**
3. Open up the plus for **+ Microsoft SQL Servers, + SQL Server Group, + Local, + Security** and select the **Logins node**
4. **Double-click the account used to access the VirtualCenter Database** – in my case rtfm-ed\vcdb and in the dialog box select the **Database Access** tab
5. **In the list of databases locate the msdb**, and **grant the right of db_owner**
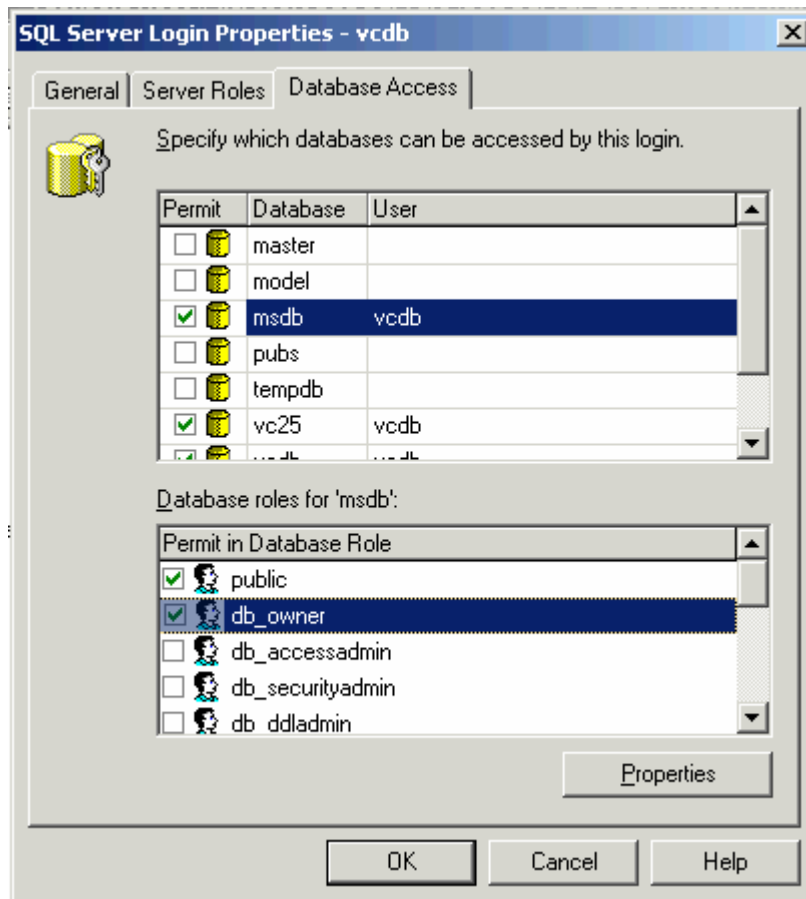
Creating an VMware Update Database (Optional)

Note:
During the upgrade process you could add additional services. One new extension to Vi3 is "Update Manager". This system patches your ESX hosts – and optionally can patch your VMs too. Update Manager uses it own database to track and trace its updates – and to store its own internal logic. Whilst creating an Update Manager database might be desirable *not required* for an upgrade. Update Manager can be installed separately from VirtualCenter (indeed in my evaluation of the Beta/RC1 I found it often installed easier on a separate windows instance) and can reside on your VirtualCenter server. In addition to its database storage requirements – Update Manager needs disk storage (preferably not the C: Drive!) for downloading patches.

At the SQL Server

1. Open **Enterprise Admins**, and Expand **+ Microsoft SQL Servers, + SQL Server Group, + (Local) (Windows NT)**
2. **Right-click the Database folder**, and choose **New Database** and type: **vum-db** (or something similar/appropriate) – and choose **OK**

3. Expand the **+ Security** tab, and **right-click Logins**, and choose **New Login**
4. **Browse with ... button** to select the account created for VirtualCenter database…
5. Click the **Database Access** tab, **Permit** access for the database, for VirtualCenter Database User, also enable the permission **db_owner** – and choose **OK**
6. Click **OK**, and Confirm the password again

Configuring VirtualCenter with Microsoft DSN

Previous VirtualCenter installations had a button in the installer to load the Data Sources (ODBC) manager. This Microsoft Management tool is used to configure DSN settings to allow the VirtualCenter to "speak" to the Microsoft SQL Database. Prior to starting the VirtualCenter 2.5 installation these settings need to pre-configured for both databases.

At the VirtualCenter Server

1. Open **ODBC Data Source Administrator** from Administrative Tools on the Start, Programs menu
2. In the **ODBC Data Source Administrator** choose the **System DSN** tab
3. Click the **Add** button
4. From the end of the list choose **SQL Server**, and select **Finish**
5. In name field of the **Create a New Data Source to SQL Server** dialog box, type **VMware Update Manager**

    Note:
    The VirtualCenter installation assumes this name

6. From the drop-down list **select your SQL server** and click **Next**
7. Select "**With SQL Authentication...**" and type in the user account and password for the database set up in SQL and click **Next**
8. Enable "**Change the default database to**" and select the VirtualCenter Database you created earlier
9. Click **Next** and **Finish**

    Note:
    You should be now able to confirm all the dialog boxes associated with the ODBC setup – and also test that you have connectivity to the database server. This test is nearly always successful. It does *not* test your user account credentials.

Initiating the Upgrade Process

IMPORTANT:
Backup both your VirtualCenter and Database backend, as my Vi Infrastructure node are virtual – clone them using a second VirtualCenter system, and additionally I power them off – and take a cold snapshot of them. This allows me to completely rollback these VMs should the upgrade process fail. Aside from database permissions causing a failed upgrade – I have had other errors as well when the database upgrade wizard runs. For example I have frequently had this error occur on my "test" VC environment – I was unable to resolve this issue:

[24/01/2008 14:00:06] Info: Running procedure upd_rollback_proc
[24/01/2008 14:00:07] Error: Failed to execute SQL procedure. Got exception: ERROR [42000] [Microsoft][ODBC SQL Server Driver][**SQL Server]The specified @job_name ('Past Week stats rollup') does not exist.**
[24/01/2008 14:00:07] Error: Failed to execute procedure: upd_rollback_proc
[24/01/2008 14:00:12] Error: Aborting Cleanup of Database because of an exception. Exception details: ERROR [42000] [Microsoft][ODBC SQL Server Driver][SQL Server]**The specified @job_name ('Past Week stats rollup') does not exist.**

Interestingly, I did not have this problem on a more permanent VC which is up and running 99% of the time. I think this problem above was caused by the VC being powered of 99%, which stopped various expected internal procedures to not execute.

1. **Mount/Insert the VirtualCenter CD or execute the autorun.exe from download**

---

2. **Next your way through the usual suspects** (Welcome, What VC does, EULA, Customer Info)
3. **If you want to also install VMware Update Manager choose © Custom**. Alternatively, if you **merely wish to upgrade or would rather have separate Windows instance for your Update Manager choose © VMware VirtualCenter** Server
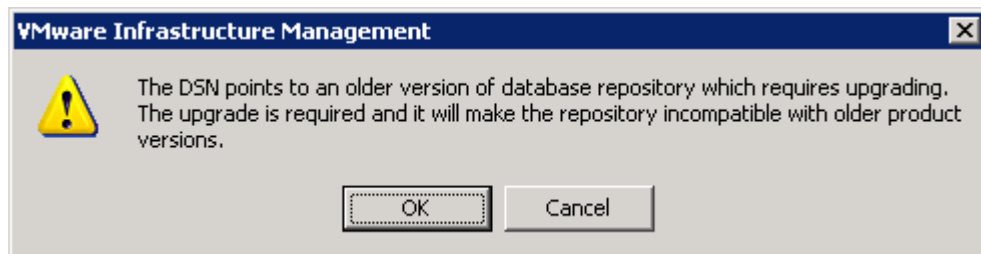
   Note:
   I'm trying a custom option

4. **Accept all the components offered** (Client, VirtualCenter, Update Manager, Converter) and click Next
5. Choose **© Use an existing database server**, and supply the **password for your VirtualCenter DB user account** and Click **Next**

   Note:
   This should produce a warning that states that the repository (DB) will need upgrading, and that the upgrade process will stop it working with older versions of VMware software. Click OK


   Note:
   Confirm the dialog box that states the SQL Agent must be running and confirm the second dialog box that warns that unmanaged transactional logs on SQL will inevitable fill the disk of a SQL server

6. **In the License dialog box**, as long as you have followed the recommendations you should be able click to **Next**. VMware recommend the license server service runs on the VirtualCenter (.i.e. localhost)
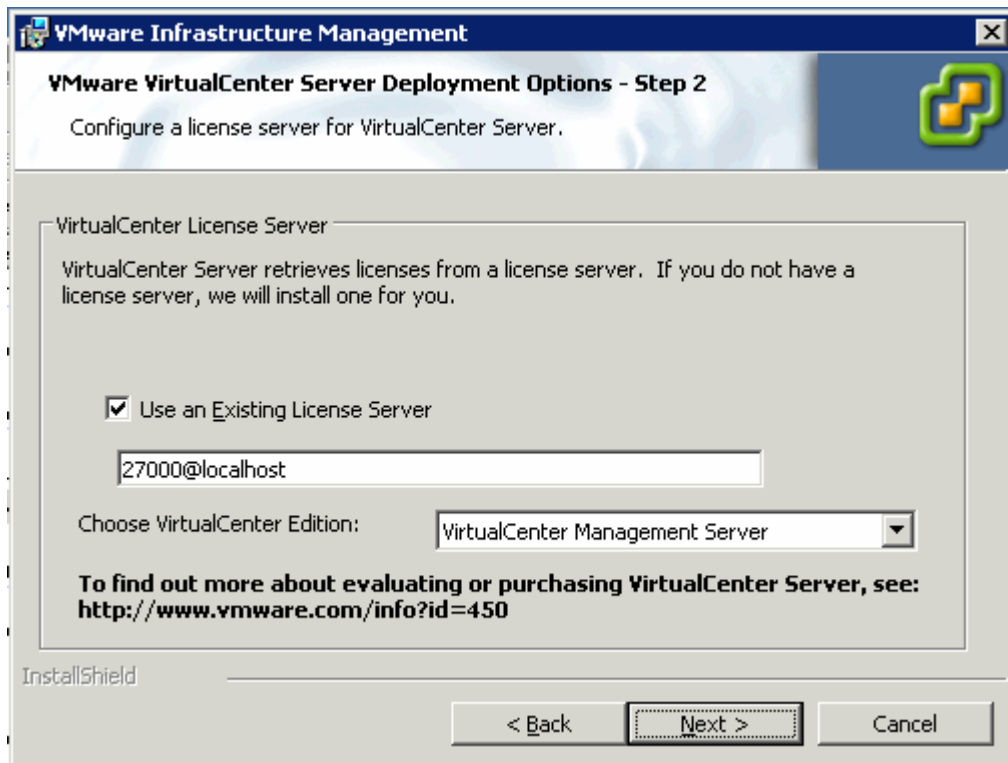
7. **Accept the default TCP port numbers** used by VMware
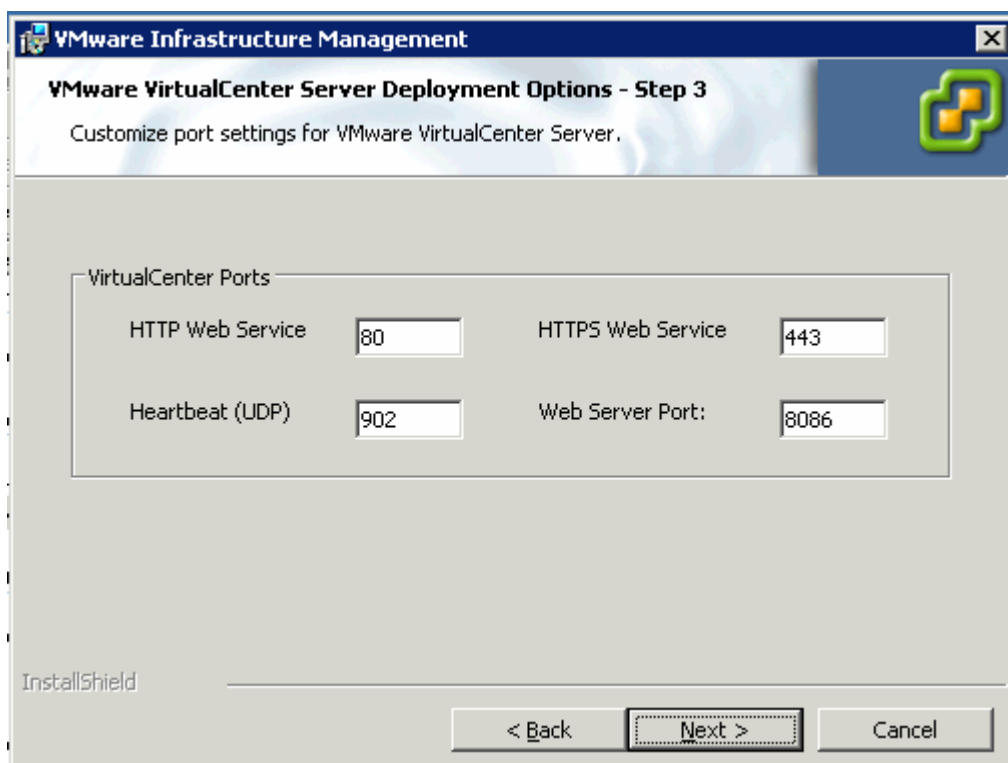
8. **In the VirtualCenter Server Authorization**, type in the **username and password of the "Administrator" for VirtualCenter**. This dialog box is need for plug-ins/extensions to work. Plug-ins/Extensions are optional components that extend the functionality of the Vi Client – in case offer a

UI for Update Manager and Converter.

Warning:
The credentials that you supply hear are ones that are used to authenticate to VC – not the credentials used to access the SQL Database!
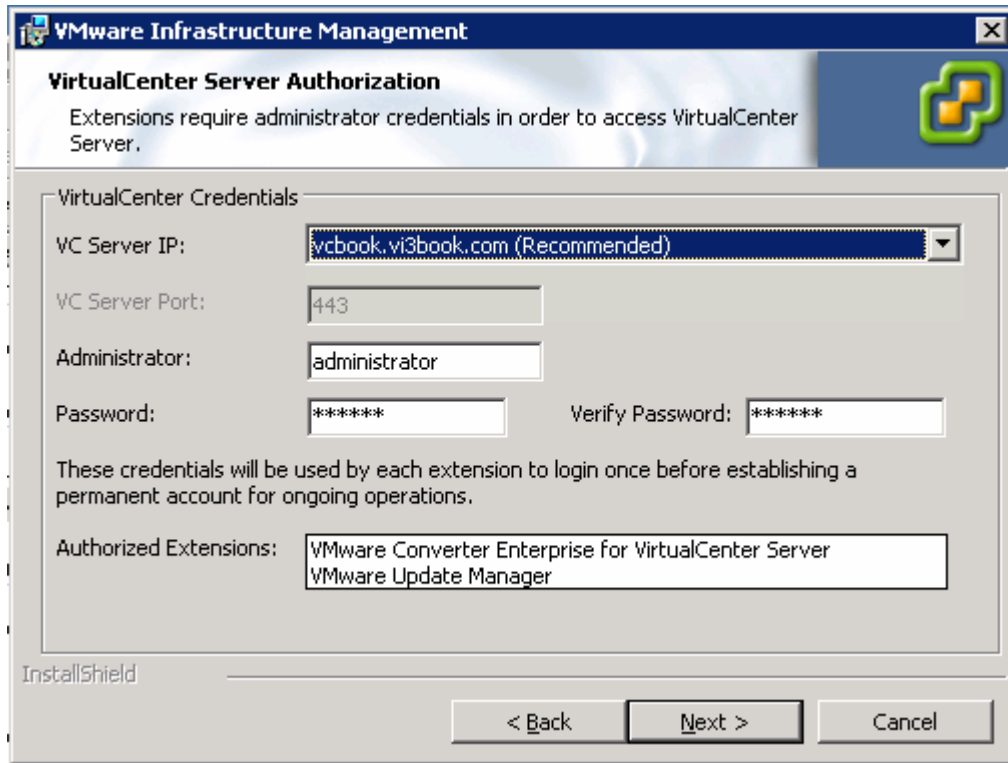
Plug-ins/Extensions need to communicate to the VC server during their download and installation – VMware recommend using a FQDN for this – in case you change the IP address of your VC server. You can use an IP address if you really want/need to.

9. **In the VMware Update Manager Deployment Option (Step 1) dialog box** – select **© Use an existing database server**, and provide the username and password configured to access the VUM (VMware Update Manager) database. **In my case these are the SAME credentials I use for the main VirtualCenter database**
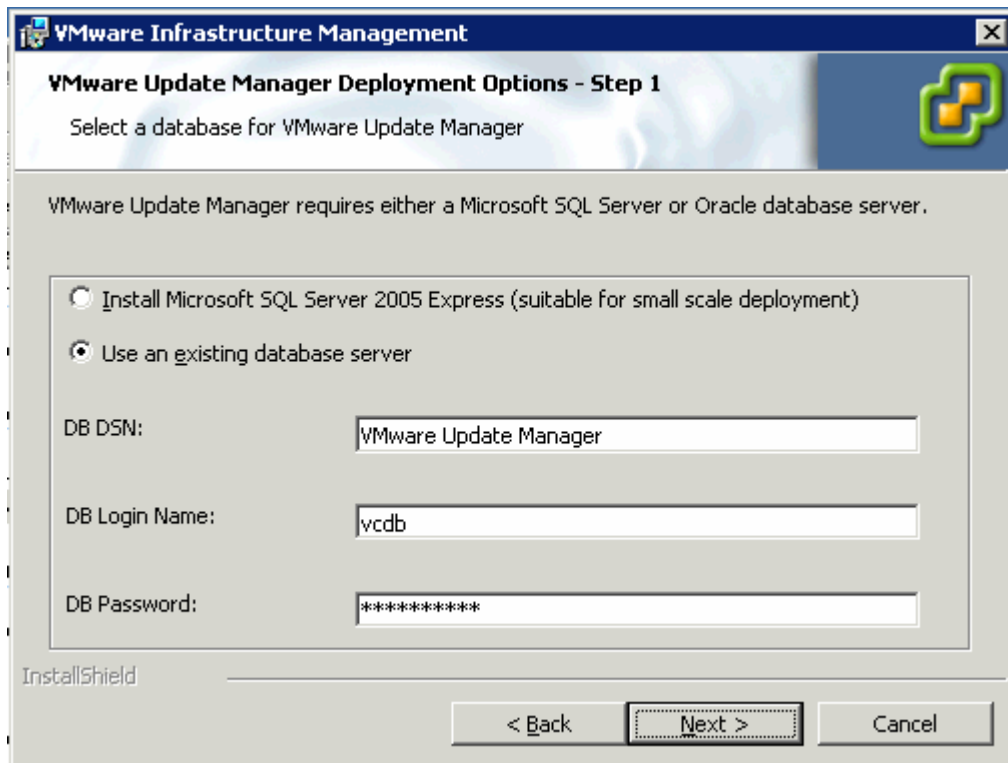
Note:
After clicking, Next – accept a second dialog box warning you about transaction logs in SQL

10. **In the VMware Update Manager Deployment Option (Step 2)** dialog box configure how update manager communicates to the internet
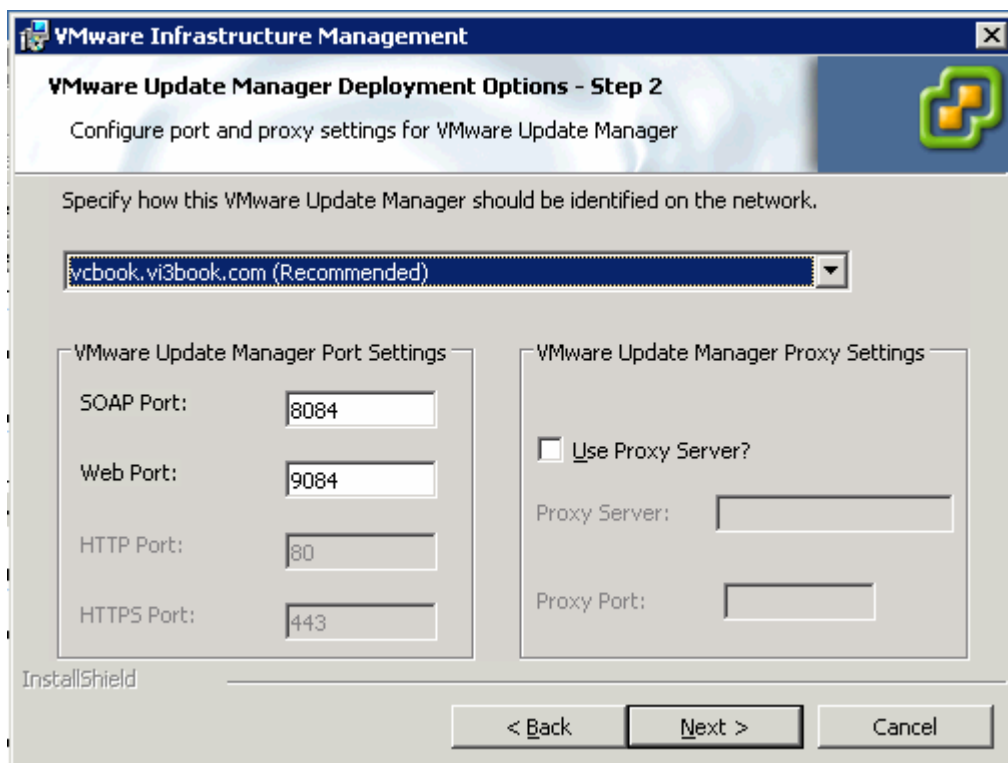
Note:

Update Manager download patches from the internet – and so will need internet access. This one good reason to run VUM on a separate box to your VirtualCenter server. You may feel uncomfortable with VC having internet access or network/political restrictions prevent you from doing so. Personally, I'm trying to save myself some money (Windows License) by not creating a separate instance

11. **Accept the default port numbers for VMware Converter Enterprise** to function
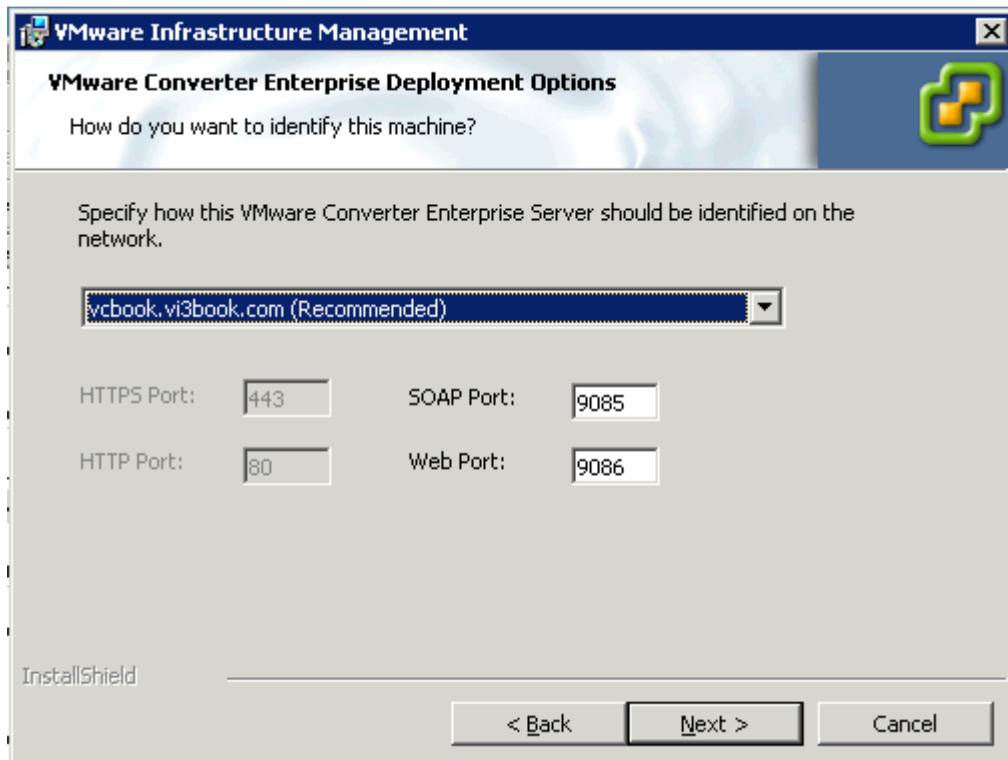
12. **Change the second directory path to ensure your patches for VUM are not download to the C: Drive**
13. Finally click **Install**

Note:
Go away and have a nice cup of tea (if your British) or Skinny-Latte-Bolivian Coffee (if your American) because .NET 2.0 will most like need to be installed first – and this does appear to take sometime…
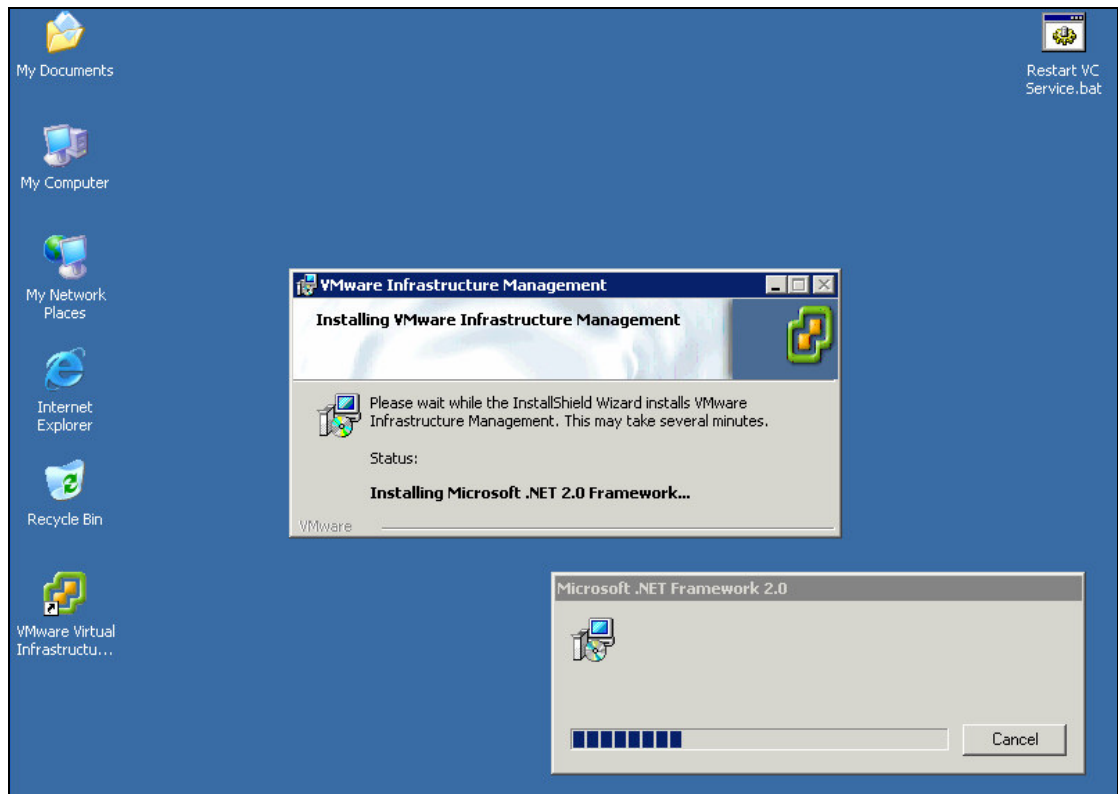
14. The Moment of Truth… At the end of the install you will be confronted by the Database Upgrade Wizard. If anything will go wrong during your upgrade its here – and the most common reason is permissions.

    Click **Next to the Welcome message** – the Wizard will then calculate size requirements – and on the next page indicate how much free space is required for the upgrade

15. In the **Upgrade Dialog box** – indicate if you wish to keep your performance & events and Tasks history

    Note:
    I found if I did this my upgrade failed. I think this is because my "test" VirtualCenter had been powered off for a long time. The error in stated there was a problem processing the "Performance Today" procedure. I think this may have been caused by my "test" VirtualCenter system being so inactive in the period running up to the upgrade.

Post Upgrade Experiences

Generally, my upgrade experiences were good. I did have one issue and that was with the VMware "extensions" or "plug-ins". This was the *same* experience during a clean installation of Beta/RC1. I found when VirtualCenter is also the VMware Update Manager – that some no plug-ins appeared in the plug-ins list or only VMware Converter appears in the list. Whereas if Update Manager was installed to a separate Windows install the plug-ins did appear.

In the end I did a re-install of VirtualCenter using the autorun executable – this seemed to fix my plug-in problem

Upgrading to ESX 3.5

With ISO

It is possible to use a physical CD or ISO inserted into the physical CD or mounted as virtual media. Very simply you choose Upgrade when given the opportunity – re-supply your Region and Keyboard settings – and then watch status bars. This worked perfectly fine too. The only thing I would say is using CD's via ILO is horribly slow and if the ISO is on a network location can be unreliable

With the UDA or other Scripting Installation Method

I use the UDA (Ultimate Deployment Appliance) to do clean installations of ESX and also upgrades. In case you don't know the UDA is a free PXE appliance that allows you to PXE boot (physical or virtual machines) and have scripted installation perform an installation or upgrade. I use it to build my ESX hosts and try out upgrades across the network. I found my kickstart file used to perform upgrades worked without error. Upgrade kickstart file are very simple and don't contain any information about how to do things like partition disks – because that process has already been decided. Below is sample kickstart file used to upgrade one of my HP Proliants:

```
# 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://192.168.2.150/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
# Langauge 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
```

With the Update .TAR file

This method is sometime referred to as a "headless" upgrade – as you do not require access to an ILO or physical access. It does require SSH access the ability to use su - command get root access. I've used this method in the past with success – and I found reliable.

You begin by downloading the 3-3.5 upgrade TAR file from VMware's website and then uploading to a storage location accessible to an ESX host. This tar file contains all the RPMs (RedHat Package Management) files required for an upgrade. The storage location could be NAS or VMFS volume.

I used Veeam's Fast SCP utility to upload the TAR file to SAN location, and then used tar –xzvf to extract it. Using VMotion/Maintenance mode I then evacuated the target ESX host of all its VMs. At the command-line I used the esxupdate tool to start the upgrade:

esxupdate -r file:/vmfs/volumes/update/3.5.0-64607/ -n update

Warning:
One thing I did find is that the upgrade utility does not like colons (:) in VMFS volume names. Initially, I tried using local storage – with a VMFS volume name of esx1:storage1. The esxupdate utility did start – but then aborted the process halfway through with a missing file statement. It worked without error once I removed the colon. I found this same problem with the "Storage VMotion" CLI tool called svmotion.pl

Moral of the story:
Colons and VMFS volumes causes problems with some VMware command-line tools. Shame that the default for local VMFS volumes is hostname:storage1 if you use automatic partitioning. I will be using hostname_local as VMFS volume name for the time being!

Progress:
Its pretty much a dull affair watching a "esxupdate" go through (what upgrade is exciting to watch, I hear you ask!)

At the end of the upgrade I received this reassuring status
INFO: | Transaction(s) Complete
INFO: Shutting down hostd...
INFO: Running esxcfg-pciid to update the PCI ID tables...
INFO: Running esxcfg-boot to regenerate initrds...
INFO: Restarting hostd...
INFO: --- TOTALS: 102 packages installed, **0 pending or failed, 0 removed, 0 excluded ---**
INFO: Install of ['3.5.0-64607'] is almost done.
INFO: Please reboot the ESX Server by typing 'reboot' to complete the update.

Post Upgrade Experiences

I lost a couple of things about my configuration of my ESX host after an upgrade.

SSH Banner Messages:

All of my ESX hosts have a custom "issue" file (/etc/issue) which prints standard message to any SSH connection about being an authorised user. This disappear after my upgrade. The issues file had been replaced with standard issue file and the sshd_config file had the entry which calls the issue remarked out with

#Banner /some/path

Upgrade of VMware Tools

There are three ways to upgrade VMware Tools:

- Interactive Tools Upgrade
- Automatic Tools Upgrade
- Using the cmd-tool at the VirtualCenter Server called "vmware-vmupgrade"

Interactive Tools Upgrade Method

I found I had to reboot the VM with an interactive installation. I was able to choose if I wanted that reboot to happen, and defer it to a later time if needed.

Automatic Tools Upgrade Method

With an Automatic Tools upgrade – this reboot happen automatically. Additionally, you can pipe command-line options to an edit box in the VMware Tools Upgrade dialog box:
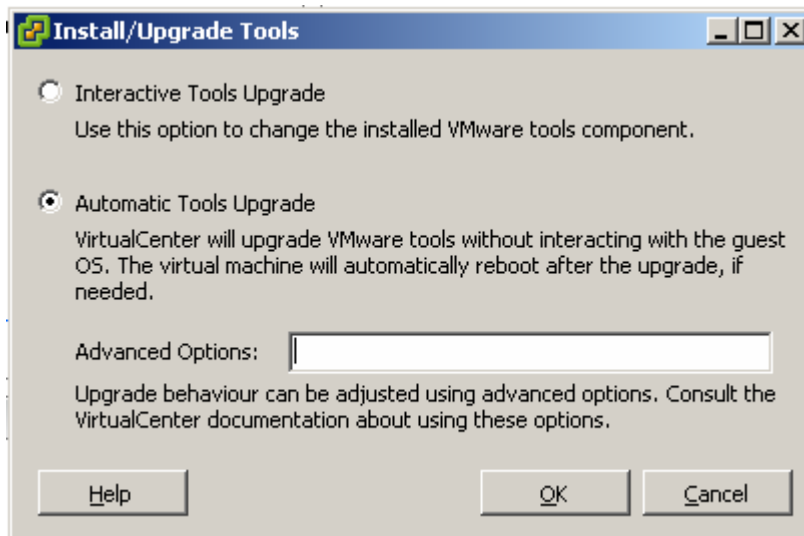
This dialog box appears when you select a single VM, if you select more than VM the dialog box is modified – but offers the same command-line options
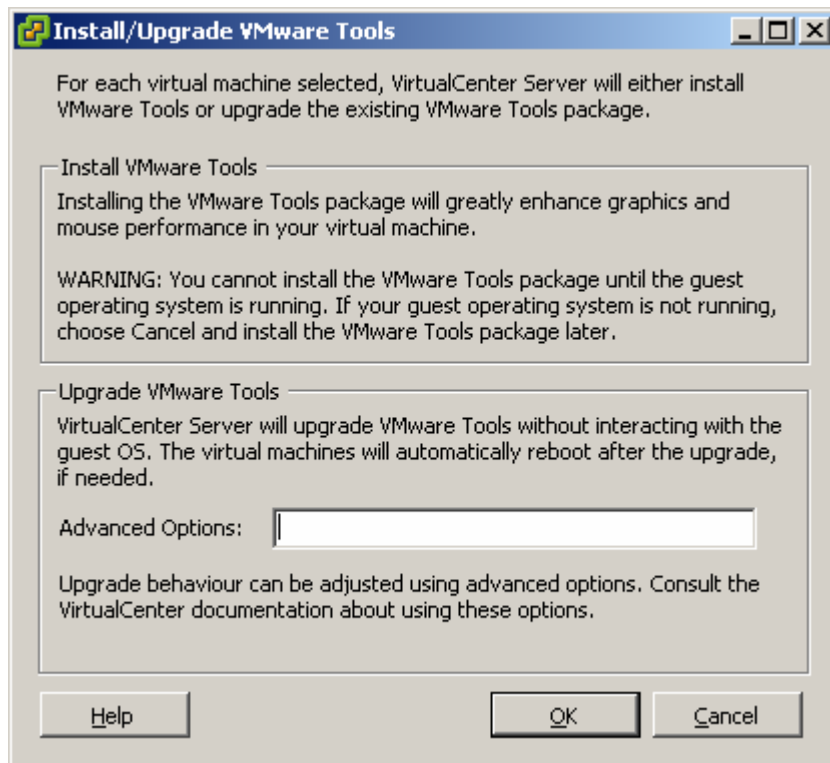
Command-Line Method: vmware-vmupgrade

This tool remains unchanged in VirtualCenter. Its functionality is also allowed in the Advanced Options dialog box. It still has limits – for example unless you want to do a VMware Tools upgrade on a particular ESX host, you must specify each VM with –n switch. It is not possible using the command-line tool to do a bulk upgrade by specifying every VM in a folder.

vmware-vmupgrade -u rtfm-ed\administrator -p password

-n "Lab DataCenter/Mike's VMs/Test VMs/mike01"
-n "Lab DataCenter/Mike's VMs/Test VMs/mike02"
-n "Lab DataCenter/Mike's VMs/Test VMs/mike03"
-n "Lab DataCenter/Mike's VMs/Test VMs/mike04"

The other gotcha with this vmupgrade tool is the VM must be power off (!) before issuing the command and the powered back on again once the process has completed, in contrast the GUI automatic process did this for me

For this reason I preferred to use the GUI automatic upgrade option.

Changes in VMware Tools

You will notice two main changes in VMware Tools. The new version contains a notification feature which in future give you a pop-message in the Guest Operating System if a new version of VMware Tools is made available.
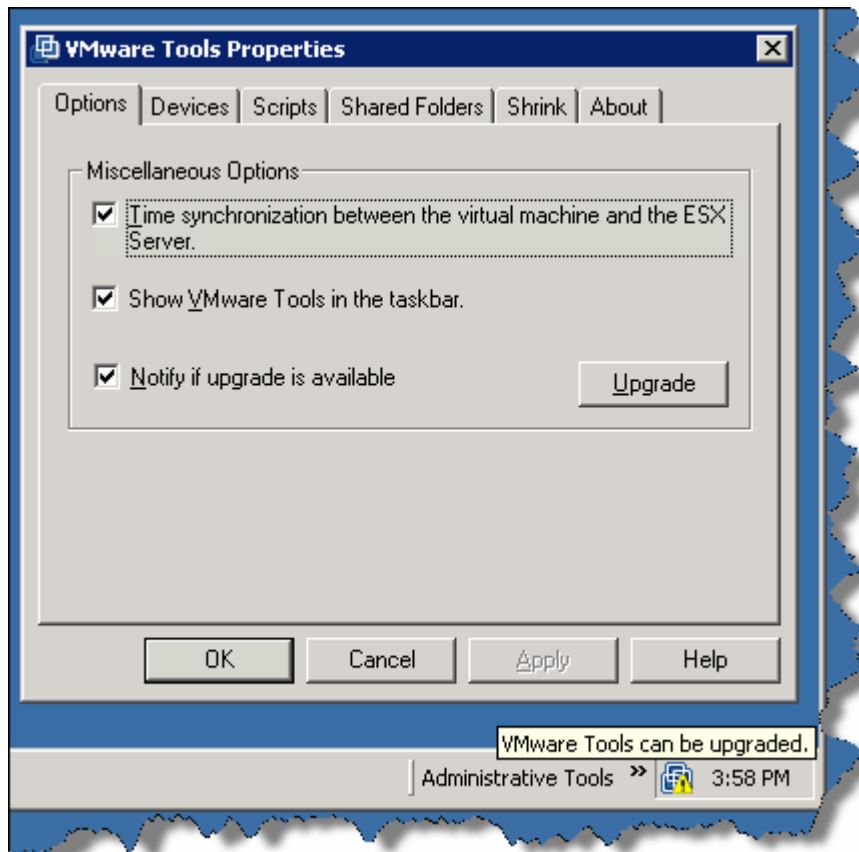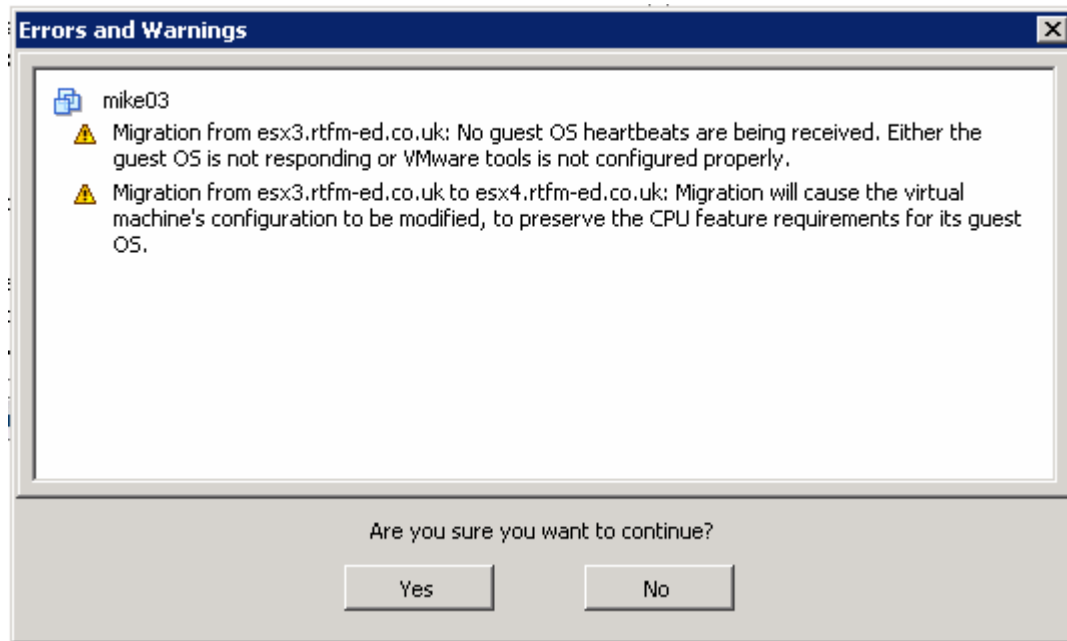
In this screen grab you can see there is a yellow exclaimation mark next to the VMware Tools toolbox, and the "Upgrade" button in VMware Tools dialog is enabled.

Additionally, the "shrink" feature has been re-introduced to VMware Tools. This feature was "depreciated" in ESX 3.0.x (i.e. the feature was removed). The shrink features allows to instruct the VM to "zero out" deleted files within the Virtual Disk. This is useful prior to export of the VM to make sure you only copy genuine data – rather than genuine data AND deleted files.

VMotion between ESX 3.0.2 to ESX 3.5

After upgrading one of my ESX hosts to version 3.5, I thought I would try to do a VMotion between 3.0.2 and 3.5. VMotion was successful. I did receive the following warning dialog before the VMotion:

```
Errors and Warnings                                              ✕

   🔁  mike03
   ⚠  Migration from esx3.rtfm-ed.co.uk: No guest OS heartbeats are being received. Either the
       guest OS is not responding or VMware tools is not configured properly.
   ⚠  Migration from esx3.rtfm-ed.co.uk to esx4.rtfm-ed.co.uk: Migration will cause the virtual
       machine's configuration to be modified, to preserve the CPU feature requirements for its guest
       OS.



                      Are you sure you want to continue?

                    Yes                    No
```

I imagine there are new CPU features such as MMU and Nested Page Tables that now must be checked on power on, which caused a VMX file update.

Conclusions

Generally, the upgrade process is OK. But I'm still irritated by some of inexplicable database upgrade error messages I've had in VirtualCenter. What's really annoying about them is you have no idea that you will have them until the very end of the upgrade process. Once the Upgrade Database wizard has malfunctioned it does try to "rollback" your database to good state – but your VirtualCenter installation is usually poached – and you in re-install to an existing database territory. For that reason I would urge people to backup and snapshot their SQL and VirtualCenter installation. I'm also somewhat irritated by plug-ins. Sometimes they appear and other times you don't. You have install them AND enable them for every Vi Client instance you have. Whilst I appreciate that plug-ins offer third parties to opportunity to extend the functionality of the Vi Client – personally I would be happier if these things were just included in the Vi Client and enabled by a license.

The ESX upgrade part is relatively easy – given that the upgrade process can modify your configuration (as in my SSH example) and that moving a VM off an ESX host is simple. I think I would still prefer to wipe my ESX hosts and do a clean install – adding them back into VirtualCenter. This is not without consequences. It means loosing some of that precious performance data collected over a number of weeks or months.