white paper

How to Install ESX 4.0 on Workstation 6.5.2 as a VM

Title:	How to Install ESX 4.0 on Workstation 6.5.2 as a VM
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Content Overview:

- Step by step install guide for VMware ESX 4.0 as a virtual machine within VMware Workstation 6.5.2
- Why this is useful as a portable demo or training environment

1.0 Introduction

Being able to run VMware ESX 4.0 under VMware Workstation as a VM gives users and professionals in the IT community great flexibility when it comes to learning, experimenting or even demonstrating the product. Needless to say, this is not an officially supported deployment.

The approach is fundamentally no different to that previously devised for VMware ESX 3.5, the main difference simply being the change in minimum hardware requirements.

2.0 Pre-Requisites

The minimum hardware requirements for the machine running VMware Workstation are:

- 2GB RAM
- A 64-bit x86 Intel VT-x or AMD-V capable processor (with the feature enabled in the BIOS)
- 1 Ethernet NIC
- 16GB disk space

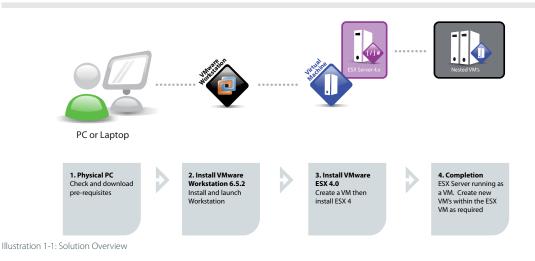
The following software is required:

- VMware Workstation 6.5.2 (Build 156735) presumed to already be installed
- VMware ESX Server 4.0 (Build 164009) ISO image

This installation was tested on a Lenovo T60 laptop computer with the following specification:

- Intel Mobile Core 2 Duo T5600 1.83GHz CPU
- 2GB RAM
- Intel PRO/1000PL Ethernet NIC
- Windows XP Professional with SP3
- VMware Workstation 6.5.2 (Build 156735)

Note: The VMware ESX 4.0 installer will abort if it detects less than 2GB RAM, so the machine running VMware Workstation must have a minimum of this amount of RAM installed. If, as in this example, 2GB RAM is all that is installed, it will also be necessary to configure VMware Workstation to allow most of the VM's RAM requirements to be swapped out to disk. See section 2.1 below.



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2.1 VMware Workstation Configuration

 Start VMware Workstation and go to Edit -> Preferences. Select to the Memory tab, select the Allow most virtual machine memory to be swapped radio button. Click OK.

Preferences	×
Workspace Input Hot Keys Display Tools Memory Priority Devices Lockout	
Reserved memory How much host RAM should the system be able to reserve for all running virtual machines? 16 1843	
Additional memory How should the system allocate memory for virtual machines? C Fit all virtual machine memory into reserved host RAM Allow some virtual machine memory to be swapped C Allow most virtual machine memory to be swapped Swapping virtual machine memory allows more virtual machines to run but can degrade system performance if the virtual machines use their memory intensively.	
OK Cancel Help	

Figure 2-1: Allow most VM memory to be swapped

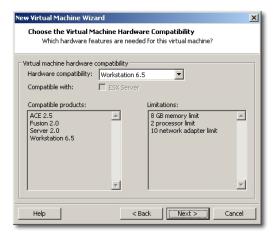
3.0 Define the VMware ESX 4.0 Virtual Machine

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 Start VMware Workstation and go File -> New -> Virtual Machine. Select the Custom radio button and click Next.



 Choose the Virtual Machine Hardware Compatibility. Ensure that VMware Workstation
 6.5 is selected in the Hardware Compatibility field. Click Next.



 Guest Operating System Installation. Select I will install the operating system later option. Click Next.

New Virtual Machine Wizard	×
Guest Operating System Installation A virtual machine is like a physical computer; it needs an operating system. How will you install the guest operating system?	
Install from:	
O Installer disc:	
S DVD-RAM Drive (D:)	
C	
C Installer disc image file (iso)	
Browse	
I will install the operating system later	
The virtual machine will be created with a blank hard disk.	
Help Help Cancel Next > Cancel	1

 Select a Guest Operating System. Select Linux, then in the Version field select Red Hat Enterprise Linux 5 64-bit. Click Next.

ew Virtual Machine Wizard		x
Select a Guest Operating Which operating system	System will be installed on this virtual machine?	
Guest operating system		
C Microsoft Windows		
Einux		
C Novell NetWare		
🔿 Sun Solaris		
C Other		
Version		
		-
Red Hat Enterprise Linux 5 64-	bit	
Help	< Back Next > Cancel	
		-

5. Name the Virtual Machine. Enter a VM name and specify a location to store VM files. Click **Next**.

New Virtual Machine Wizard		X
Name the Virtual Machine What name would you like to use for this virtual machine?		
Virtual machine name		
E5X4.0		
Location		
C:\Virtual Machines\ESX4.0	Browse	
The default location can be changed at Edit > Preferences.		
< Back Next >	Cancel	

6. Processor Configuration. Select **One**. Click **Next**.

ew Virtual Machine Wiza	ard	
Processor Configurat Specify the number	ion of processors for this virtual machin	e.
Processors		
Number of processors:	• One	
	C Two	
	< Back	

7. Memory for the Virtual Machine. Select a minimum of **2048MB**. Click **Next**.

New ¥irtual Machine Wizard	×
Memory for the Virtual Machine How much memory would you like to use for t	nis virtual machine?
Memory	
Specify the amount of memory allocated to this virtumust be a multiple of 4 MB.	al machine. The memory size
Memory for this virtual machine:	2048 MB
4 🛆 📥	4096
△ Guest OS recommended minimum: 512 MB	
A Recommended memory: 1024 MB	
A Maximum recommended memory: 924 MB	
Help Ack	Next > Cancel

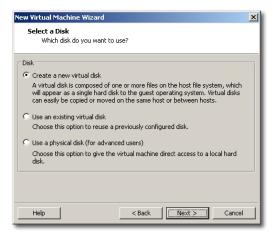
8. Network Type. For this example the **Use bridged networking** option was selected. Click **Next**.

ew Virtual Machine Wizard	x
Network Type	
What type of network do you want to add?	
Network connection	
• Use bridged networking	
Give the guest operating system direct access to an external Ethernet network. The guest must have its own IP address on the external network.	
O Use network address translation (NAT)	
Give the guest operating system access to the host computer's dial-up or external Ethernet network connection using the host's IP address.	
C Use host-only networking	
Connect the guest operating system to a private virtual network on the host computer.	
C Do not use a network connection	
	_
Help < Back Next > Cancel	

9. Select I/O Adapter Types. Select LSI Logic. Click Next.

hine Wizard	x
85	
ATAPI	
C BusLogic (Not available for 64-bit guests)	
 LSI Logic (Recommended) 	
C LSI Logic SAS	
< Back Next > Cance	
	C Buslogic (Not available for 64-bit guests) C LSI Logic (Recommended) C LSI Logic SAS

10. Select a Disk. Select **Create a new virtual disk**. Click **Next**.



11. Select a Disk Type. Select SCSI. Click Next.

New Virtual Machine Wizard	×
Select a Disk Type What kind of disk do you want to create?	
└─ Virtual disk type	
○ IDE	
⊙ SCSI (Recommended)	
	-
Help < Back Next > Cancel	

12. Specify Disk Capacity. **16GB** was used in this example. Select the **Allocate all disk space now** checkbox and also select **Store virtual disk as a single file**. Click **Next**.

New Virtual Machine Wizard
Specify Disk Capacity How large do you want this disk to be?
Maximum disk size (GB): 16.0 💻
Recommended size for Red Hat Enterprise Linux 5 64-bit: 8 GB
Allocate all disk space now.
Allocating the full capacity can enhance performance but requires as much physical disk space as you specify for the virtual disk. If you do not allocate all disk space now, the virtual disk starts small and is created quickly. It grows as you add applications, files and data.
Store virtual disk as a single file
C Split virtual disk into 2 GB files
Splitting the disk makes it easier to move the virtual machine to another computer.
Pocket ACE size calculator
Help < Back Next > Cancel

 Specify Disk File. Rename the disk file if required. Click Next.

New Virtual Machine Wizard
Specify Disk File Where would you like to store information about this disk?
Disk File One 16 GB disk file will be created using the file name provided here.
E5X4.0.vmdk Browse
Help < Back Cancel Cancel

14. Ready to Create Virtual Machine. Deselect the **Power on this virtual machine after creation** checkbox. Click **Customize Hardware**.

New Virtual Machine	Wizard	×		
Ready to Create Click Finish to c Enterprise Linu:	reate the virtual machine and start installing Red Hat			
The virtual machine w	ill be created with the following settings:			
Name: Location: Version: Operating System: Hard Disk: Memory: Network Adapter: Other Devices:	ESX4.0 C:\Virtual Machines\ESX4.0 Workstation 6.5 Red Hat Enterprise Linux 5 64-bit 16 GB, Pre-allocated 2048 MB Bridged CD/DVD, Floppy, USB Controller, Sound Card			
Customize Hardware Customize Hardware Power on this virtual machine after creation Starting Cancel				

15. Hardware. Remove the following hardware: Floppy, USB Controller, Sound Card.

Device	Summary 2016 PB Auto detect Auto detect Bridged Present Auto detect I	Memory Specify the amount of memory allocated to this virtual machine: Memory for this virtual machine: 2016 → 100 4 Δ 4006 Δ Gost 05 recommended minimum: 512 MB A Recommended minimum: 1024 HB Memory sequenced minimum: 1024 HB Memory sequenced minimum: 924 HB (Memory swapping may occur beyond this size)
	Add Remove	

 Hardware. Select CD/DVD (IDE). Select Connect at power on and in the Use ISO image file field, browse to the location of the VMware ESX 4.0 ISO previously downloaded. Click OK.

Device	Summary	Device status
Memory	2048 MB	Gonnected
New CD/DVD (IDE)	Auto detect	V Connect at power on
Network Adapter	Bridged	Connection
🕎 Display	Auto detect	C Use physical drive:
Processors	1	
		Auto detect
		Use ISO image file:
		C:\esx-DVD-4.0.0-164009.is V Browse
		Advanced
	Add Remove	1
_	Add Kemove	
		OK Cancel Help

17. Hardware. Select **Network Adapter**. Tick **Replicate physical network connection state**.

	C Custom: Specific virtual network Virtuel0 (default Bridged)	Processors
Add Remove		

Hardware, Select **Display**. Deselect the **Accelerate 3D graphics** checkbox.

Device	Summary	Monitors	
Menory CODVO (DE) Processors	2049 MB Using fire E(No Bvidged Auto detect 1	Maximum resolution of any one monitor:	<u>_</u>
[Add Remove		

 Hardware. Select **Processors**. In the Preferred Mode field select the **Intel-VTx or AMD-V** option. Click **OK**.

dware		2
Davida # Mennoy CoD/040 (Dic) Hennoy (Independent) Processors Processors	Sumary 2040 MB Using Tile Erl/Do Bridged Auto detect 4	Processors Number of processors: © One © Two Execution Mode Preferred mode: [Intel VT-s or A/D-V © Deable acceleration for binary translation © Waves learned paravirtualisation Whyse learned paravirtualisation Manually specifying the execution mode may inpact performance under certain workloads.
	Add Remove	
		Cancel Help

20. Click **Finish**. The virtual disk will be allocated. This step may take some time.

New Virtual Machine Wizard	x
Ready to Create Virtual Machine Click Finish to create the virtual machine and start installing Red Hat Enterprise Linux 5 64-bit.	
The virtual machine will be created with the following settings:	
Namo: ECV4.0	_
VMware Workstation	
Creating Disk Cancel	
Customize Hardware	
< Back Finish Cance	

21. To enable nested VMs, a line needs to be added to the .vmx file for this virtual machine. Without it, you won't be able to power on a VM under VMware ESX4 and will see the following message:



22. The name and location of the .vmx file is show in the VMware Workstation GUI. Edit the .vmx file using Notepad. Add the following line, monitor_ control.restrict_backdoor = "TRUE". Save the file and close.



4.0 Install VMware ESX 4.0

 Initial ESX Installer screen. Select Install ESX in graphical mode and press Enter.



2. Welcome to the ESX Installer. Click Next.



 End User License Agreement. Review the license agreement and select the I accept the terms of the license agreement checkbox. Click Next.

ESX 4.0	-
End User License Agreement To continue with the installation, please read and accept the end user license agreement.	
VMWARE MASTER END USER LICENSE AGREEMENT	-
NOTCE: BY DOWILGADING AND INSTALLING, COPING OR OTHERWES USING THE SOFTWARE, YOU AGREE TO BE DOWID BY THE THEMS OF THIS WURWARE MASTER BOD SEIL LCENES AGRESHIT ("EULA"). TO UD ON OT AGREE TO THE TERMS OF THIS ULA, YOU MAN NOT DOWILGAD, INSTALL, COPI GRU USE THE SOFTWARE, AND UD WAR TERMS THE UNUSES DO STURALE TO THE VEROBEN FIGMEW THEIL OT ULA COURTER TI WITHIN THE THIS '100, UD WAR TERMS THE UNUSES DO STURALE TO THE VEROBE FIGHT AND WITH THE TOTAL OTHER THER DEPLOTES AND THEIRD BATT, DO THE ANTITY THAT IS AGREENCE TO BE BOUND BY THIS ULA. THERE REPLOTES MO THEIRD BATT, DO THE CHITTY THAT IS AGREENCE TO TO US BOUND BY THIS CAREED AND THEIRD BATT, DO THE CHITTY THAT IS AGREENCE TO US DO SHOULD BY THIS CAREED AND THEIRD BATT, DO THE CHITTY THAT IS AGREENCE TO US DO THE BE LIABLE FOR ANY FAULURE BY SUCH EMPLOYEES AND THIRD PARTY CONTRACTORS TO COMPLY WITH THE TERMS OF THIS DAGREENCY.	
1. DEFINITIONS	
1.1 "Designated Administrative Access" means that access to the standard user interfaces of a given instance of the Software (designated in this section) that you may grant to a designated thin party (a) for which you have provided advance written notice to Wave that you are providen guidance actives and (b) for whose dedicated benefit you have licensed such instance of the Software. Designated Administrative Access is dedicated benefit you have licensed such instance of the Software. Designated Administrative Access is to a client Ammanian and Administrative Administrative Access is a client Administrative Adm	
🗢 Back 🗘 🖗 Next 🗶 🕻	ncel

 Select Keyboard. Select the appropriate keyboard for your system type. Click Next.

ESX 4.0			
Select Keyboard Select the type of keyboard for this system			
Keyboard			-
Portuguese			
Romanian			
Russian			
Russian (Microsoft)			
Russian (cp1251)			
Slovenlan			
Spanish			
Swedish			
Swiss French (latin1)			
Swiss German (latin1)			
Turkish			
U.S. English			-
U.S. International			
Ukrainian			
United Kingdom			
	ack	₩ext	X Cancel

5. Custom Drivers. Select No. Click Next.

Custom Driver			
Select custom and	vers to install for ESX		
you want to install cus No	tom drivers?		
Yes			

6. Load Drivers. Click Yes.

ESX 4.0	
Custom Drivers Select custom drivers to install for ESX	
Do you want to install custom drivers?	
Net Load Drivers Cicke "Add.of" to get Image: Add of the size by is compared and in the size by is compared. Add on only cannot be banded. Driver Image: Add of the size by is compared. Add on only cannot be banded. Load the system drivers? Image: Add of the size by is compared. Add	ers
4 Back	Next Zancel

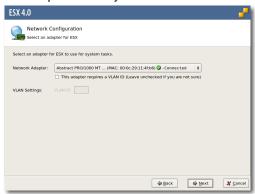


ESX 4.0			<u> </u>
Loading Drivers The installation wizard will resume after all necessary drive	rs are loaded		
Status: 100% Complete			
	da Back	₩ <u>N</u> ext	X Cancel

 License. If you have one, enter a serial number, otherwise select the Enter a serial number later radio button to evaluate the product. Click Next.



9. Network Configuration. Select the required **network** adapter for ESX system tasks. Click Next.



10. Network Configuration. Enter the required **network configuration information**. Click **Next**.

etwork Adapter: vm	nic0
Adapter Settings	
 Set automaticall 	y using DHCP
Ose the following	g network settings:
IP Address:	192.168.20.71
Subnet Mask:	255.255.255.0
Gateway:	192.168.20.1
Primary DNS:	192.168.20.5
Secondary DNS:	
Host name:	esx40.xtravirt.lab
	Enter a fully qualified host name (e.g. host.example.com)

11. Setup Type. Select the **Standard setup** radio button. Click **Next**.

ESX 4.0			-
Secup Type Specify the type of setup for this installation			
 Standard setup Setup ESX on a single hard drive or LUN. 			
O Advanced setup View and customize the individual ESX partitions.			
	∲ <u>B</u> ack	₩ <u>N</u> ext	X Cancel

12. ESX Storage Device. Select the required **storage device**. Click **Next**.

ESX 4.0			
ESX Storage Device Select a location to Install ESX			
Select the storage device to install ESX (requires at least 9.5 GB).			
Storage Device	LUN ID	Capacity	
VMware, VMware Virtual S (mpx.vmhba0:C0:T0:L0)	0	16.38 GB	
	Back	₩ <u>N</u> ext	X Cancel

13. Data Loss Warning. Click OK.

ESX 4.0 ESX Storage I Select a location				
Storage Device	Delete Device Co	LUN ID	Capacity	
▼ Local Storage VMware, VMwar	Data Loss Warning The contents of the selected st before installing ESX. All exist want to save this content, pleas another option.	ng data will be lost. se cancel out and cho	If you	

14. Time Zone Settings. Select the required **Time zone**. Click **Next**.

	ne Settings time zone for ESX			
Time	one: Europe/London		Advanced	
		da Back	i <u>N</u> ext	Cancel

15. Date and Time. Configure the **current date and time**. Click **Next**.

ESX 4.0												- 2
Date Specif				me f	or ES	x						
How should the O Automatica NTP.Server:		and ti	me f	or ES	X be	confi	gured?					
③ Manually	Sat 30 6 13 20	31 7 14 21	1 8 15 22	Tue 2 9 16 23	Wed 3 10 17 24	Thu 4 11 18 25	5 12 19 26	12:54:02				
	27 4	28	29 6	30					da Back	Next	(X Cancel

16. Set Administrator Password. Enter and confirm the required **root password**. Click **Next**.

ESX 4.0	· 🥜
Set Administra Enter the adminis	ator Password strator (root) password for ESX
The password must be a	t least 6 characters long.
User Name:	
Password:	******
Confirm Password:	******
Additional Accounts:	User Name Add Remove
	∲Back ∳Bext ¥ Cancel

17. Summary of installation settings. Click Next.

ESX 4.0	· _
Summary of installation setti Review the summary of the installa	
Click Next to install ESX.	
License:	Evaluation mode
Keyboard:	United Kingdom
Custom Drivers:	(none)
ESX Storage Device:	
Nane:	mpx.vmhba0:C0:T0:L0
Boot Loader Location:	Master Boot Record
Datastore:	
Name:	(auto-generated)
Type:	New
Storage Device:	mpx.vmhba0:C0:T0:L0
Service Console Partitions:	
	vnfs3 15.17 GB
	swap 600 MB
	ext3 5.00 GB /
	ext3 1.10 GB /boot
	ext3 2.00 GB /var/log
	↓ Back ▶ Next X Cancel

18. Installing ESX 4.0. The installation will proceed and may take a few minutes to complete.

	5X 4.0 ng installed; this may :	take several minu	tes.	
	,,			
Status: 26% Complete	Installing Packages			
To stop the installation,	click Cancel.			

19. Installing ESX 4.0 Click Next.

ESX 4.0			
ESX 4.0 ESX 4.0 ESX 4.0 Is being installed; this may take several minu	tes.		
Status: 100% Complete			
To stop the installation, click Cancel.			
	da Back	₩ext	X ⊆ano

20. ESX 4.0 Installation Complete. Click Finish.



21. The ESX server will now reboot and the ISO image can be unmounted from the VM. After the splash screen appears it may take a few minutes for ESX to complete loading. Check by pressing **ALT-F1** in the ESX VM console – if you see a login prompt then ESX has completed booting.



22. Using your Internet browser (IE8 in this case), navigate to the IP address of your ESX VM, eg: https://192.168.20.71. If using DHCP, press ALT-F11 in the ESX VM console to show the assigned IP address. Elect to ignore any website certificate warnings, eg: Continue to this website.



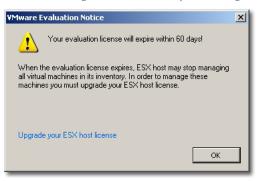
23. Click **Download vSphere Client**. Follow the installation prompts to install the vSphere Client.



24. Once complete, launch the vSphere Client, enter the ESX IP address, root username and its password. Click Login.



25. If using ESX in evaluation mode, click **OK** to acknowledge the number of days remaining.

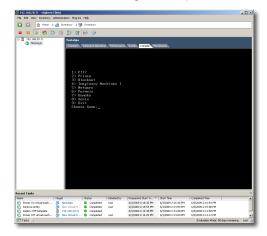


5.0 Define a Nested Virtual Machine

1. From the vSphere Client Home page, select Hosts and Clusters.

			0 days remaining)	
	Surwary Vetral Machines Res	source Allocation Performance	Configuration Users & Brouges (Even	VS Permissions
	Nanufasturer:	Wiware, Inc.	CPU usage: 95 MHz	Capacity
	Mulei	Where Vehal Before		1 × 1.821 G-R
	CPU Cores	1 CPU x 1.821 GHz	Nencry usage: 705.00 MB	Capacity
	Processor Type:	Intel(R) Core(TH(2 CPU T5600 (9 1.835Hz		2047.86 MB
	License:	Evaluation Mode	Datastore Capa	
	Processor Sockets:	1	Storaget 14.7	5 G8 6.95 G8 6/3/2009 t
	Processor Sockets: Cores per Socket:	1	1	
	Cores per Societ: Logical Processors:	1	Network Type	N
	Hyperthreading:	r		f switch network 0
	Number of NICs:	1		
	2.46	Connected	•	
	Virtual Nachines and Templates:	0	Host Management	
	Whotion Enabled:	NGA	Host Management	
	Whene EVC Mode:	NUA.	Manage this host through Wilware vi	Center.
	FaultTolerance Enabled:	N(LA		
	Active Taska:			
	Host Profile:	N(UL		
	Profile Compliance:	🕢 NSA		
	Commands			
	B ¹ New Would Machine			
	New Resource Pool			
	Enter Maintenance Mode			
	Experience Relation			
	🛅 Shutdown			
	L			
nt Tasks				
e Target	9:40.8	Risted by Requested Start		ced Time

 Go File -> Browse VA Marketplace and select a VM. Nostalgia was selected as it is only a 6MB download. Follow the import wizard and the VM will download and register with the VMware ESX VM. Power on the VM. The screenshot below shows the VM having started up.



3. And lastly, a game in progress.



This concludes the white paper on how to install VMware ESX 4.0 on VMware Workstation 6.5.2 as a VM.

About Xtravirt

Xtravirt is a knowledge-based company that delivers its expertise in virtualization online and in person. We have developed a reputation for astute leadership and expertise through our work with an impressive array of organisations. It is this real-world experience that drives our ability to provide independent, current and free advice online.

We work with organisations whose IT staff are frustrated with how hard it is to find detailed information and skills around virtualisation. We help our clients deliver the true benefits of virtualization, resulting in cost and time savings.

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References 1. Nil.

Tags

VMware, vSphere, ESX 4, Workstation 6.5, Install Guide, Intel VT, AMD-V, VI in a box, demo, training

Useful Links

1. VMware vSphere Downloads, <u>http://www.vmware.com/</u> <u>download/vsphere/</u>

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