

Install ESXi in a VirtualBox VM

<https://4sysops.com/archives/install-esxi-in-a-virtualbox-vm/comment-page-1/#comment-1185643>

VirtualBox provides an effective and free solution for running ESXi in a lab environment. However, at this point, the support for nested virtualization doesn't allow the installation of current versions of VMware's hypervisor. As with Hyper-V VMs, a nested configuration is limited to ESXi 6.x. If you need to enable Microsoft's hypervisor on a Windows PC, VirtualBox can run on top of it.

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When I attempted to install ESXi 7.0 and ESXi 8.0, I received various purple screen of death (PSOD) messages.

AP 1 is incompatible with BSP; cannot start

In addition, when I did get the ESXi 7.0 installation to work, there were network issues with a lack of network adapter drivers.

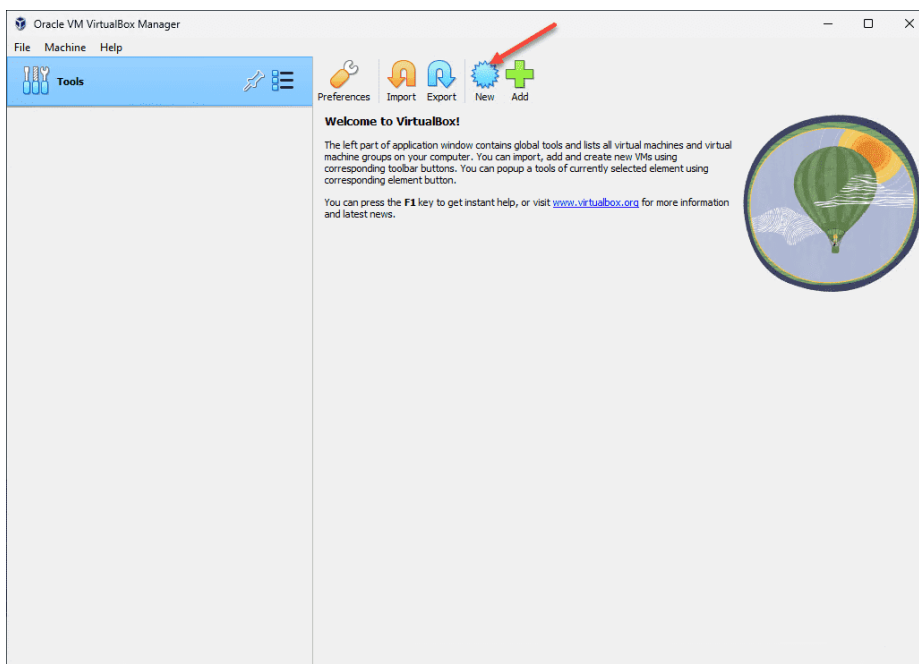
```
VMware ESXi 8.0.0 [Releasebuild-20513097 x86_64]
AP 1 is incompatible with BSP; cannot start
ESXi in VM cr0=0x8001003d cr2=0x0 cr3=0x80003000 cr4=0x4012c
FMS=06/56/3 uCode=0x0
*PCPU1:65537/idle1
PCPU 0: SI
Code start: 0x420024c00000 VMK uptime: 0:00:00:03.532
0x45388009bda0:[0x420024d10c0d]PanicvPanicInt@vkernel#nover+0x1f9 stack: 0x0
0x45388009be50:[0x420024d11274]Panic_NoSave@vkernel#nover+0x4d stack: 0x45388009beb0
0x45388009beb0:[0x420024c830b6]SMPAPIdle@vkernel#nover+0xeb stack: 0x0
base fs=0x0 gs=0x420040400000 Kgs=0x0
TSC: 623003073 cpu0:1)MTRR: 905: No variable MTRRs; assuming ESX is running in a VM
No place on disk to dump data.
No file configured to dump data.
No port for remote debugger. "Escape" for local debugger.
```

PSOD when installing ESXi 7 or 8

I decided to install VMware ESXi 6.7 in VirtualBox for various testing purposes, as it does not appear to have the issues associated with the newer releases.

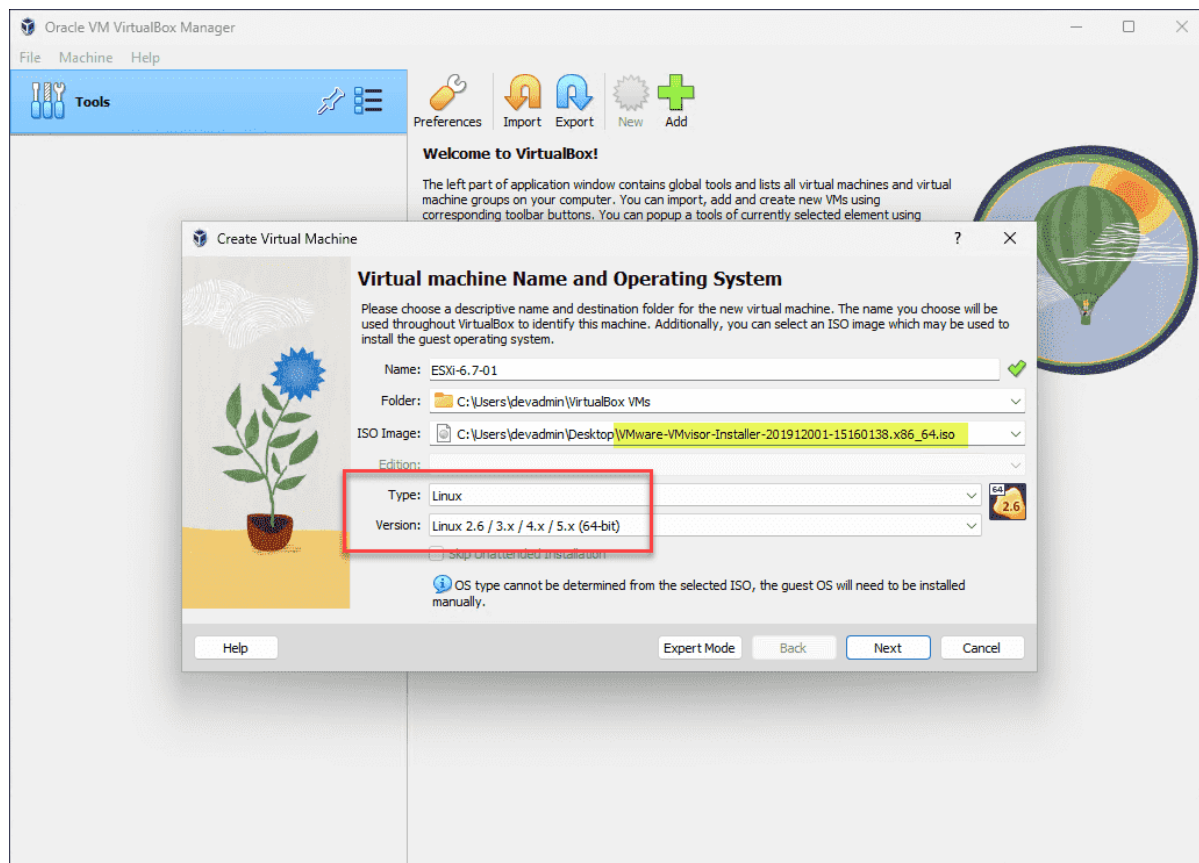
Create the ESXi-VM in VirtualBox

Once you have VirtualBox installed and configured on your host system, the first step is to create the virtual machine that will be used for the ESXi installation. Click the *New* button in the VirtualBox GUI.



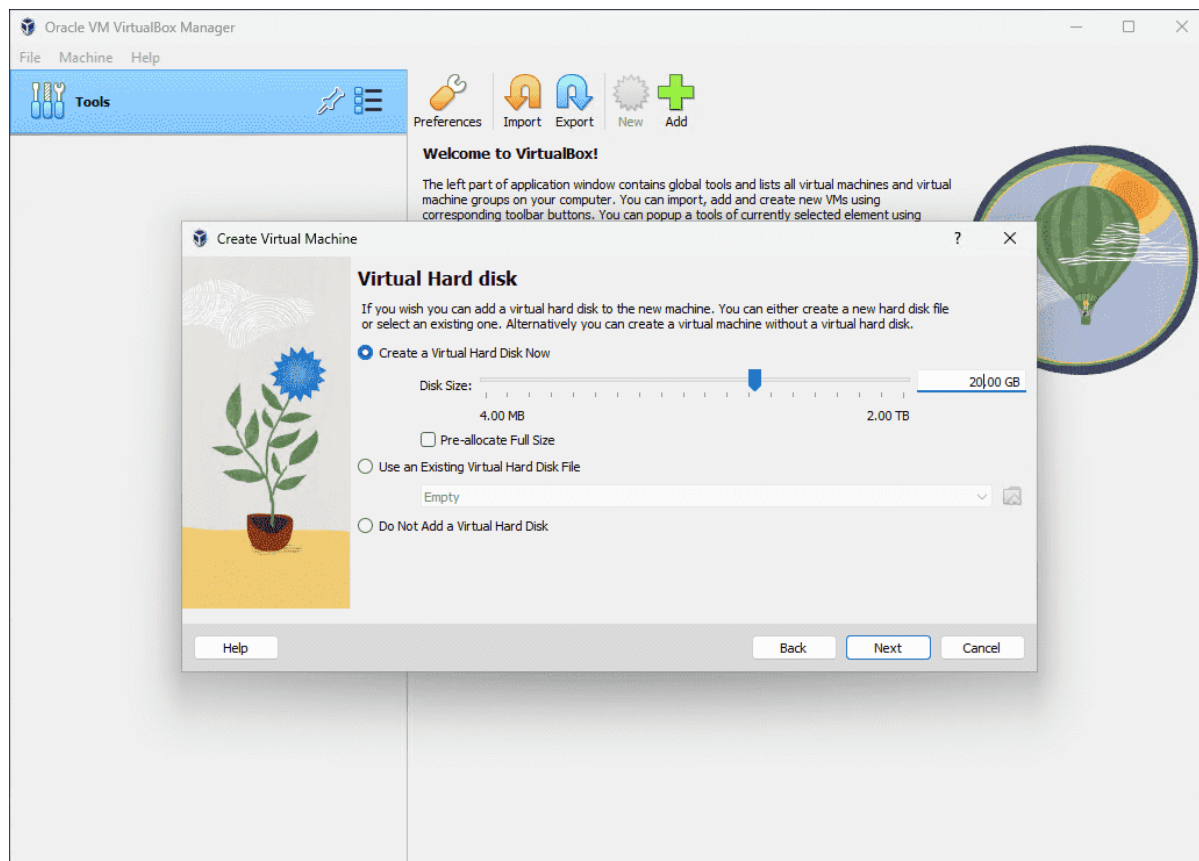
Creating a new VM in VirtualBox

This launches the *Create Virtual Machine* wizard. On the first screen, you need to name the virtual machine, choose the storage location for the VM files, and point it to an ISO file for installation. I downloaded the ESXi 6.7 installation ISO and configured the path in the ISO image configuration. Choose *Linux 2.6 / 3.x / 4.x / 5.x (64-bit)* for the version.



Create a new VM for ESXi and point to the ISO

On the *Hardware* configuration screen, set the values for RAM and CPU. When configuring your virtual hard disk, you might factor in the storage space demand for VMs you run on top of ESXi.



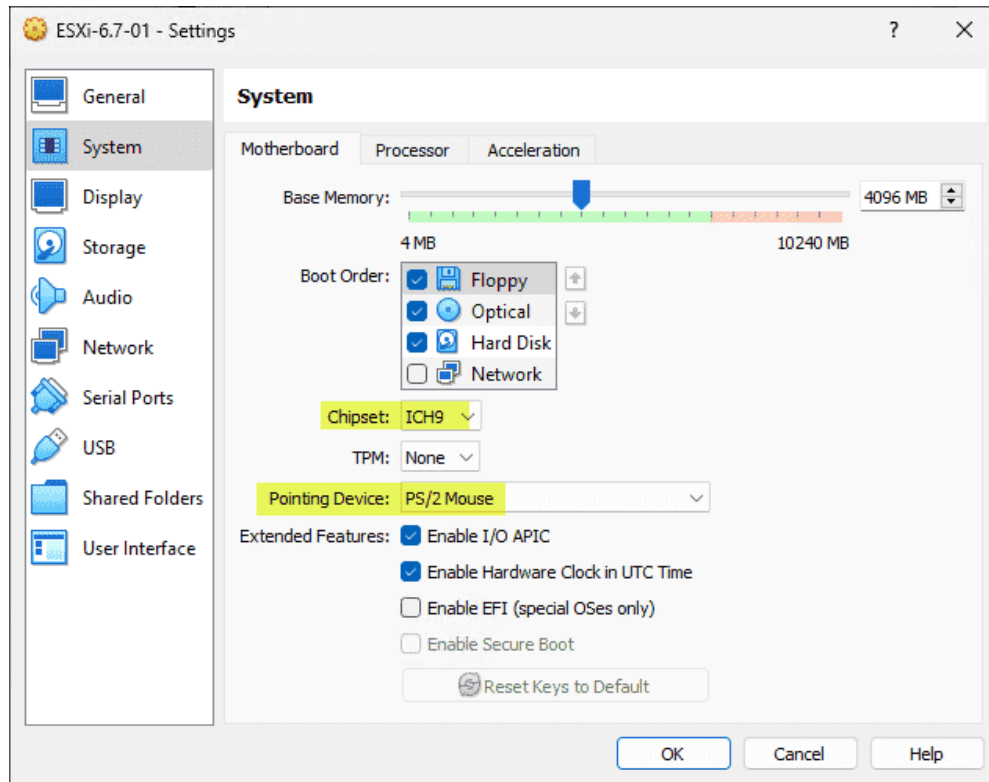
Create a new virtual hard disk for installing ESXi

Finally, you will see the *Summary* screen. Click *Finish*.

Changing the settings of the VirtualBox VM

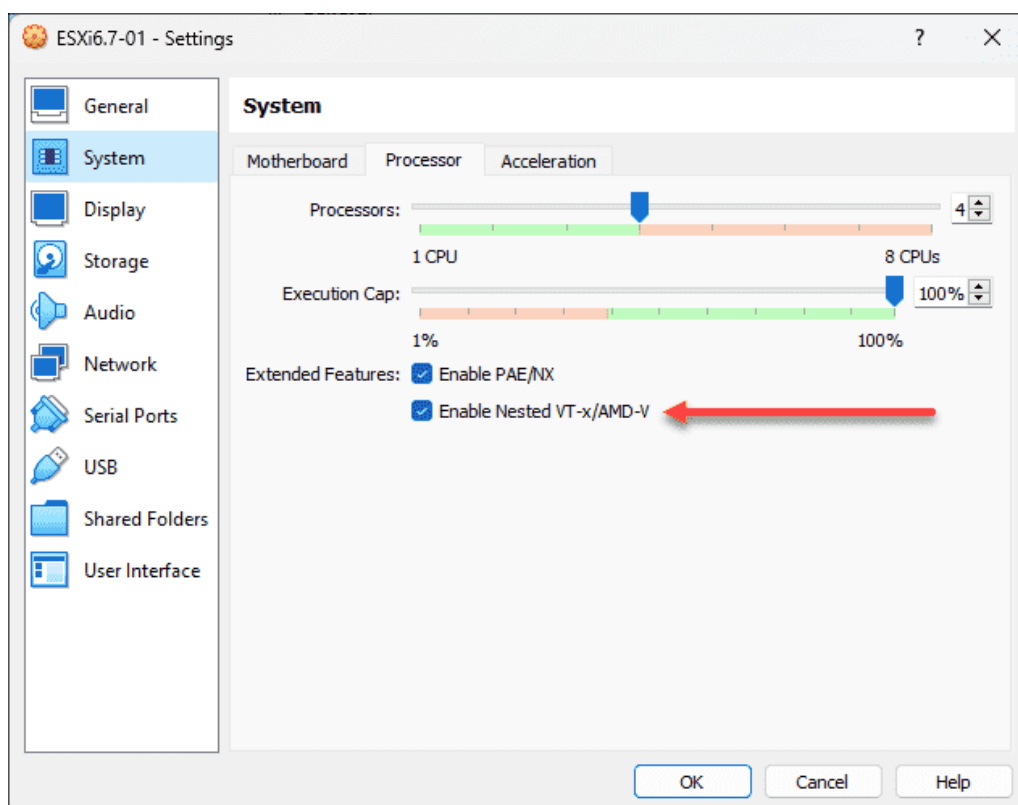
After we create the virtual machine that will house the ESXi installation, we need to make a few changes to its settings. Under *System > Motherboard*, select the following:

- Chipset: ICH9
- Pointing Device: PS/2 Mouse



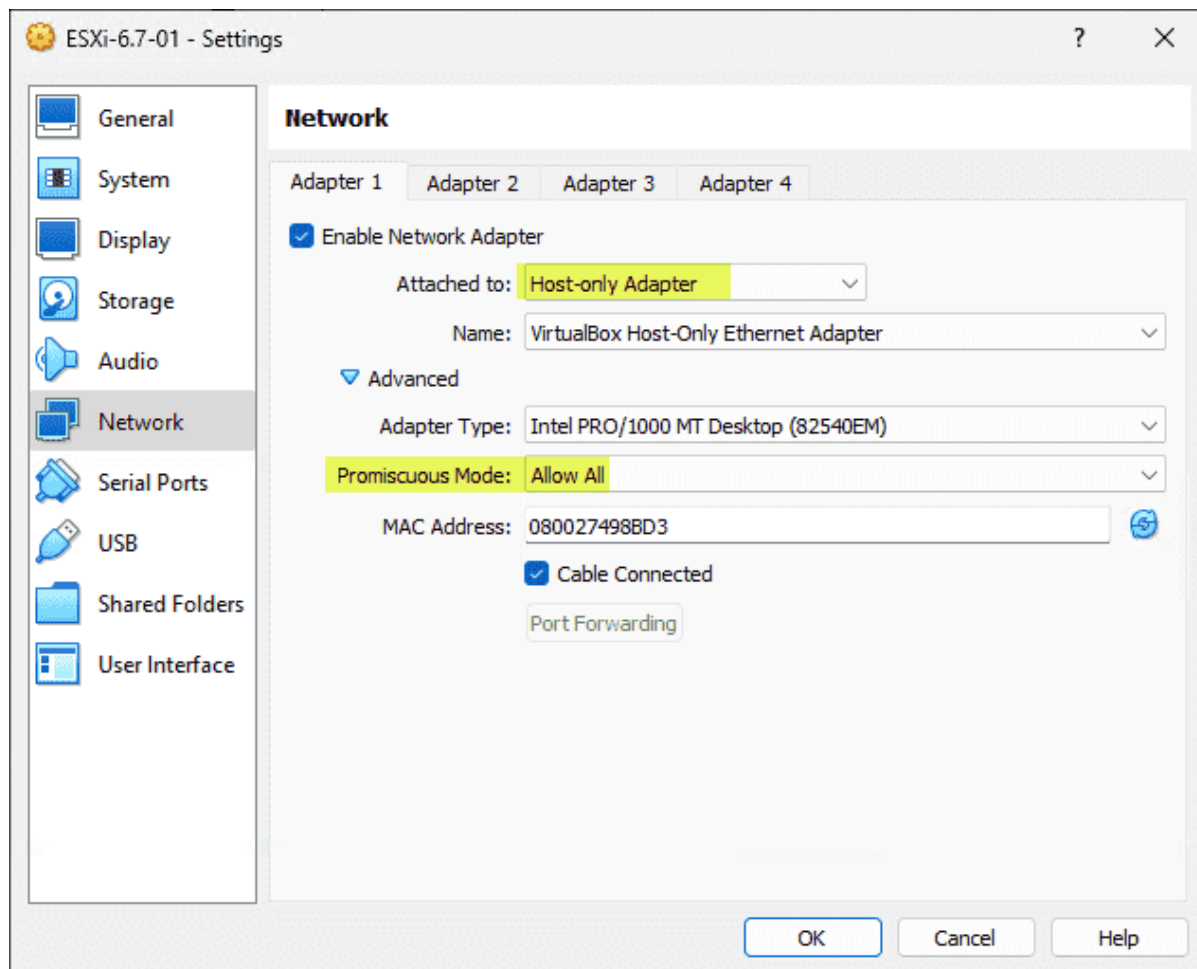
Changing the Chipset and Pointing Device configuration

On the *Processor* tab, enable the *Extended Features > Enable PAE/NX* and *Nested VT-x/AMD-V* settings.



Change the Processor configuration of the ESXi VM in VirtualBox

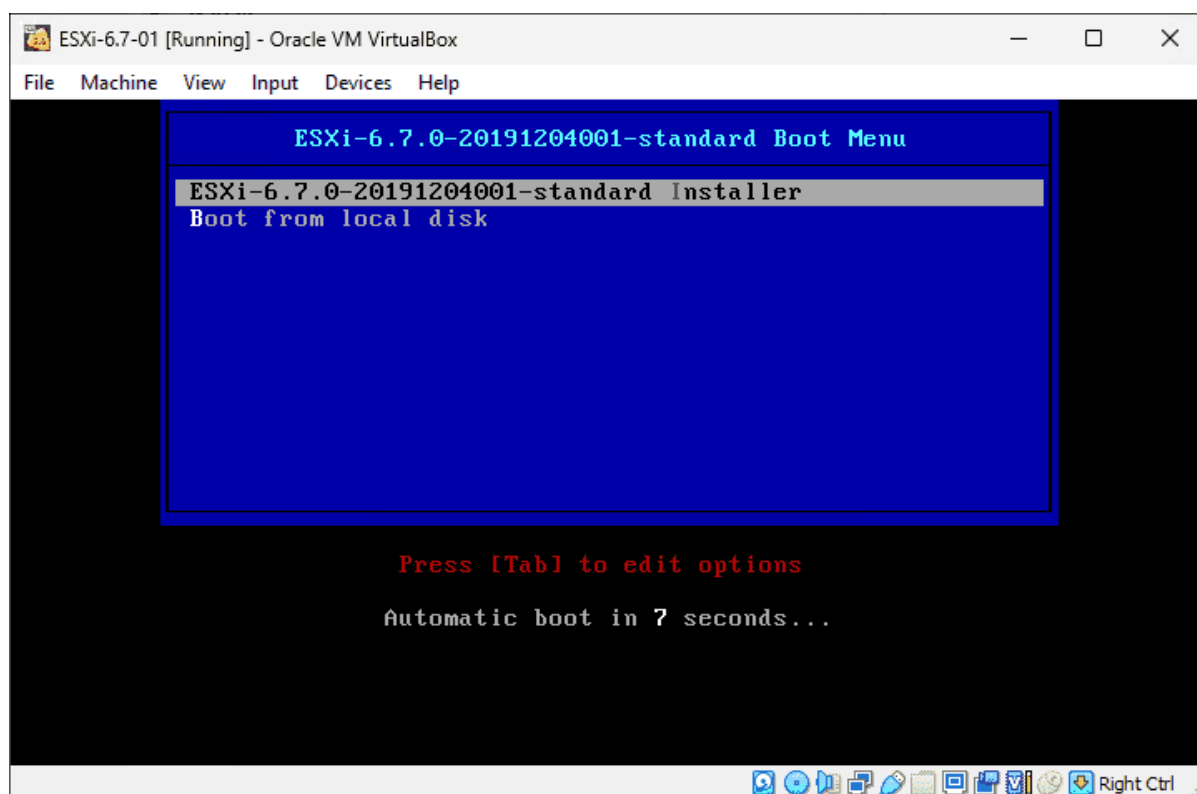
For the *Network* configuration, select the *Host-only Adapter*. For *Promiscuous Mode*, select *Allow All*.



Updating the network configuration

Install ESXi

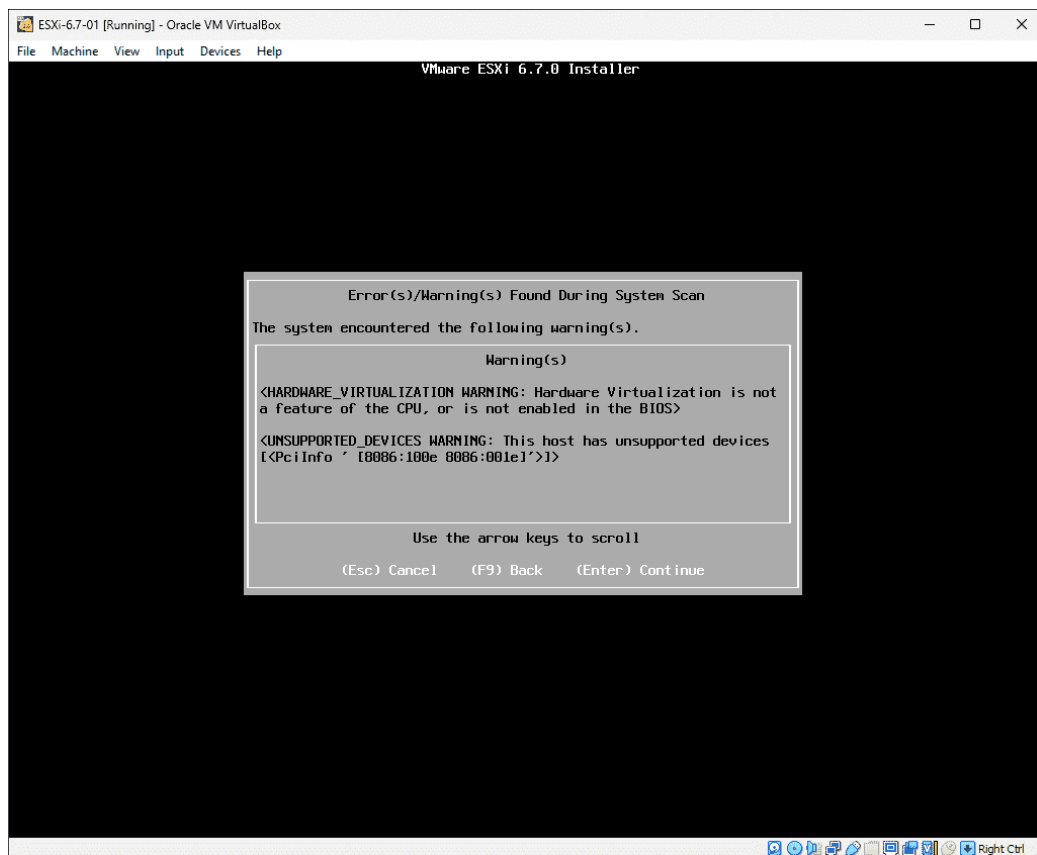
The final step is installing VMware ESXi. After updating the settings, we power on the ESXi VM in VirtualBox.



Boot into the ESXi installer

This will launch the familiar installer that guides you through all steps of setting up VMware's hypervisor.

If you receive the warning below, you need to make sure you have set the *Enable Nested VT-x/AMD-V* setting in the properties of your VirtualBox VM. The installer will proceed with the warning. However, this may prevent you from running nested virtual machines on the ESXi installation.

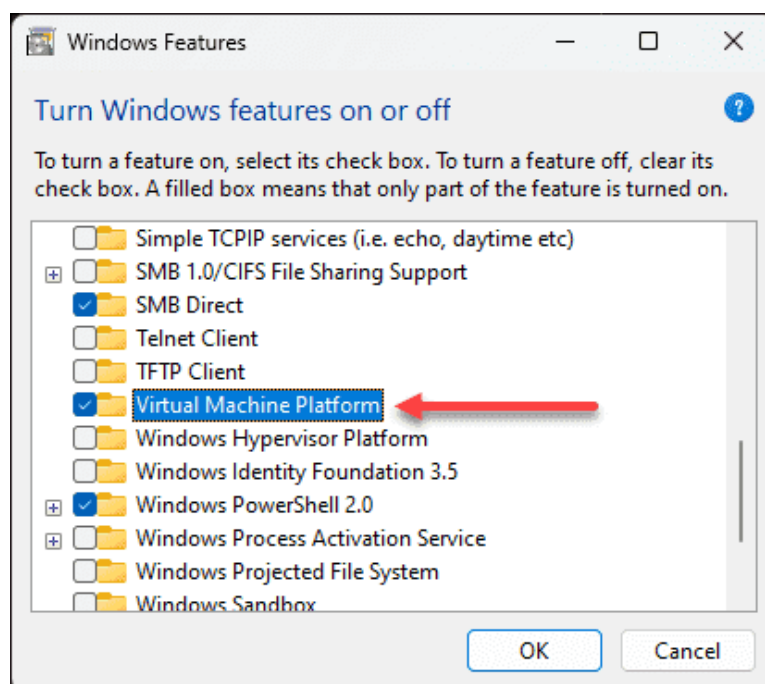


Warning about hardware virtualization

Hyper-V-enabled VirtualBox hosts

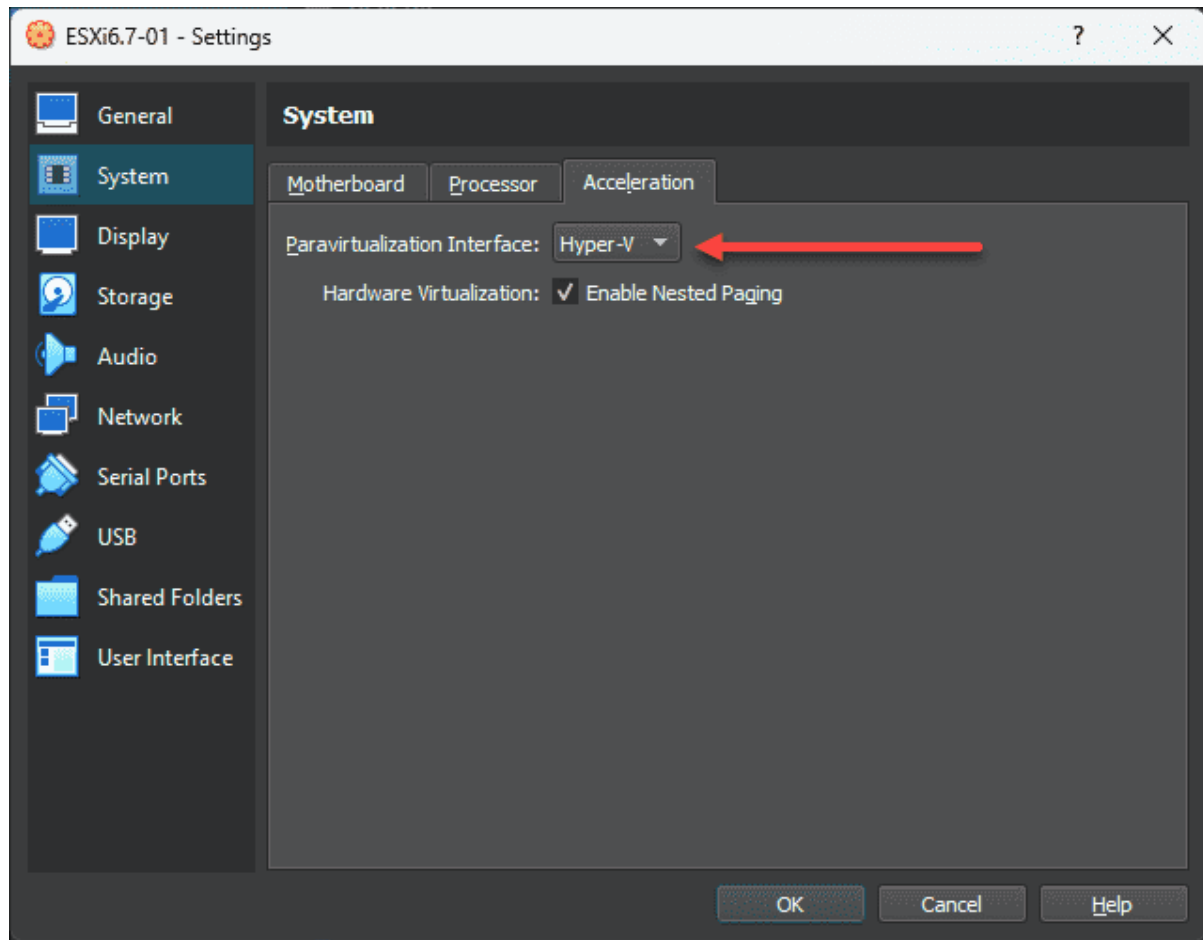
VirtualBox virtual machines can run in parallel with Hyper-V with a few settings changes. Keep in mind that if you are running modern security technologies such as *virtualization-based security (VBS)*, they use Hyper-V as the underlying virtualization technology.

To run VirtualBox with Hyper-V technologies enabled, you must add the Virtual Machine Platform optional component.



Adding a Virtual Machine Platform to Windows hosts

Then, in VirtualBox, you can select *Hyper-V* for the *Paravirtualization Interface*.



Enabling the Hyper V paravirtualization interface

Wrapping up

VirtualBox has long been a popular enthusiast virtualization platform used for running various operating systems on top of desktop operating systems. It is free to download and provides various installation capabilities and configuration features.

As shown, it is a viable option to install and play around with VMware ESXi. However, there appear to be incompatibilities with ESXi 7 and higher, both from a CPU and network perspective. In my testing, installing these versions of ESXi ended with mixed results.

There may be a workaround for this issue or an ESXi kernel option that allows bypassing a check initiated with newer ESXi installations to prevent PSODs. It may also be possible to slipstream additional network drivers to work with VirtualBox.